APPENDIX A – 6

Regional Policies: Long-Range Planning / Plan Bay Area

MTC Public Participation Plan
for the San Francisco Bay Area

MTC Resolution No. 4174

Date: February 25, 2015
W.I.: 1112
Referred by: Planning

ABSTRACT

Resolution No. 4174

This resolution adopts the MTC Public Participation Plan.

This resolution supersedes MTC Resolution No. 3821.

Date: February 25, 2015
W.I.: 1112
Referred by: Planning

Re: MTC Public Participation Plan

METROPOLITAN TRANSPORTATION COMMISSION

RESOLUTION 4174

WHEREAS, the Metropolitan Transportation Commission (MTC) is the regional transportation planning agency for the San Francisco Bay Area pursuant to Government Code Section 66500 *et seq.* and is the federally designated metropolitan planning organization for the San Francisco Bay Area; and

WHEREAS, MTC is committed to involving Bay Area residents, as well as public agencies and officials, Tribal governments, freight providers and other interested parties in the development of transportation plans and programs in a manner consistent with federal legislation, Moving Ahead for the 21st Century (Map 21, PL 112-141) and pursuant to requirements of the Federal Highway Administration and the Federal Transit Administration that metropolitan planning organizations adopt and periodically update public participation plans [23 CFR Part 450 and 49 CFR Part 613]; and

WHEREAS, MTC is committed to implementing California Senate Bill 375 (Chapter 728, 2008 Statutes), which calls upon metropolitan planning organizations to adopt participation plans to engage the public in development of the regional transportation plan/sustainable communities strategy; and

WHEREAS, MTC in March 2006, as part of adopting principles on Environmental Justice, committed to "Create an open and transparent public participation process that empowers low-income communities and communities of color to participate in decision making that affects them"; and

WHEREAS, MTC, recognizing the value to be gained from listening to and learning from many voices from throughout the diverse nine-county Bay Area, developed the attached Public Participation Plan after numerous conversations, meetings, surveys, focus groups and a public meeting; now, therefore, be it

RESOLVED, that MTC adopts the Public Participation Plan attached hereto and incorporated herein as Attachment A; be it further

RESOLVED, that Attachment A shall be revised periodically by MTC as part of its ongoing commitment to inform and include the people of the Bay Area in its decision-making process; and be it further

RESOLVED, that this resolution supersedes MTC resolutions 3821 (Public Participation Plan, 2007), 2648 (Federal Public Involvement Procedures, 2003) and 3351 (Public Involvement Action Plan, 2001), and be it further

RESOLVED that the Executive Director is authorized to implement and administer the Commission's Public Participation Plan, and shall submit a copy of this resolution to the Federal Highway Administration and the Federal Transit Administration, and to other agencies as appropriate.

METROPOLITAN TRANSPORTATION COMMISSION



Chair

The above resolution was entered into by the Metropolitan Transportation Commission at a regular meeting of the Commission held in Oakland, California on February 25, 2015.

Date: February 25, 2015
W.I.: 1112
Referred by: Planning

Attachment A
Resolution No. 4174

The Public Participation Plan is on file in the offices of the Metropolitan Transportation Commission, MetroCenter, 101 Eighth Street, Oakland, CA 94607.

METROPOLITAN TRANSPORTATION COMMISSION

PUBLIC PARTICIPATION PLAN

for the SAN FRANCISCO BAY AREA

Metropolitan Transportation Commission
Joseph P. Bort MetroCenter
101 Eighth Street, Oakland, CA 94607-4700

Approved: February 25, 2015

Also available in Chinese and Spanish
Other languages available upon request by calling 510.817.5757

請撥打電話 510.817.5757 來索取中文版公眾參與計劃的初稿。

Para solicitar una copia en español del
Borrador Preliminar del Plan para la Participación del Público llame al 510.817.5757.

METROPOLITAN
TRANSPORTATION
COMMISSION

Joseph P. Bort MetroCenter
101 Eighth Street
Oakland, CA 94607
Phone: 510.817.5700
TTY/TDD: 510.817.5769
Fax: 510.817.5848
Web: www.mtc.ca.gov

METROPOLITAN TRANSPORTATION COMMISSION

PUBLIC PARTICIPATION PLAN

TABLE OF CONTENTS

I. Introduction 1

MTC's Commitment to Public Participation 2

Federal and State Requirements 3

MAP 21 3

Title VI of the Civil Rights Act of 1964 4

Executive Orders 4

2008 California Legislation 5

Other Requirements 6

II. Continuing Public Engagement 7

MTC's Policy Advisory Council 7

Working With Neighboring Regions 8

Commission and Committee Meetings 8

Database Keeps Persons in the Loop 10

Public Meetings, Workshops and Forums 11

MTC's Library: Information for the Asking 11

Social Media 12

Website: www.mtc.ca.gov 13

Media Outlets Help Engage More Persons 13

Staff Dedicated to Assistance and Outreach 14

III. Public Participation Techniques 15

IV. Public Participation Procedures for the Regional Transportation Plan and the Transportation Improvement Program 19

Regional Transportation Plan (RTP) 20

Transportation Improvement Program (TIP) 25

V. Interagency and Tribal Government Consultation Procedures for the Regional Transportation Plan and the Transportation Improvement Program.....32

Public Agency Consultation..... 32

Other Protocol for Working with Public Agencies.....35

Tribal Government Consultation 37

VI. Evaluation and Update of the Public Participation Plan 39

APPENDICES

Appendix A: A Public Participation Plan for the 2017 Update to Plan Bay Area

Metropolitan Transportation Commission
Public Participation Plan

I know of no safe depository of the ultimate powers of the society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them but to inform their discretion.

— Thomas Jefferson

I. Introduction

The Metropolitan Transportation Commission (MTC) is the transportation planning and financing agency for the nine-county San Francisco Bay Area. The Commission also serves as the Bay Area Toll Authority (BATA), with oversight of the toll revenue from the region's seven state-owned toll bridges, and the Service Authority for Freeways and Expressways (SAFE), with oversight of a region-wide network of freeway call boxes and roving tow trucks. MTC, through agreements with various state and local transportation agencies, also has responsibility to develop, operate, and finance an Express Lane Program.

The Metropolitan Transportation Commission's public involvement process aims to give the public ample opportunities for early and continuing participation in critical transportation projects, plans and decisions, and to provide full public access to key decisions. Engaging the public early and often in the decision-making process is critical to the success of any transportation plan or program, and is required by numerous state and federal laws, as well as by the Commission's own internal procedures.

This Public Participation Plan spells out MTC's process for providing the public and interested parties with reasonable opportunities to be involved in the regional transportation planning process.

MTC'S COMMITMENT TO PUBLIC PARTICIPATION

Guiding Principles

The Metropolitan Transportation Commission's public involvement procedures are built on the following guiding principles:

1. Public participation is a dynamic activity that requires teamwork and commitment at all levels of the MTC organization.

2. One size does not fit all — input from diverse perspectives enhances the process.

3. Effective public outreach and involvement requires relationship building — with local governments, with stakeholders and advisory groups.

4. Engaging interested persons in 'regional' transportation issues is challenging, yet possible, by making it relevant, removing barriers to participation, and saying it simply.

5. An open and transparent public participation process empowers low-income communities and communities of color to participate in decision making that affects them (adopted by the Commission in 2006).

MTC undertakes specific strategies to involve the public, including low-income persons and communities of color, in MTC's planning and investment decisions.

Strategy 1: Early Engagement Is Best

MTC structures its major planning initiatives and funding decisions to provide for meaningful opportunities to help shape outcomes. For example, because MTC's Regional Transportation Plan (RTP) is the blueprint for both new policies and new investments for the Bay Area, updates to the RTP are one of the best places for interested persons to get involved.

Strategy 2: Access to All

MTC works to provide all Bay Area residents opportunities for meaningful participation, regardless of disabilities or language barriers. Further, we recognize that one should not need to be a transportation professional to understand our written and oral communications. In this spirit, we:

- hold public meetings in facilities that are accessible under the Americans With Disabilities Act,
- provide auxiliary aids or interpreters to persons with disabilities or language translation barriers,
- strive to communicate in plain language and provide appropriate public education materials, and
- use visual tools to translate detailed data into information that is more readily understood.

Strategy 3: Response to Written Comments

MTC pays close attention to the views of the public. MTC is committed to responding to every letter and e-mail sent by individual members of the public.

Strategy 4: Inform Commissioners and Public of Areas of Agreement and Disagreement

MTC staff summarizes comments heard by various parties so that the Commissioners and the public have a clear understanding of the depth and breadth of opinion on a given issue.

Strategy 5: Notify Public of Proposed or Final Actions

MTC staff makes every effort to ensure that meeting minutes reflect public comments and document how comments are considered in MTC's decisions. We strive to inform participants about how public meetings and participation are helping to shape or have contributed to MTC's key decisions and actions. When outcomes don't correspond to the views expressed, every effort is made to explain why not.

FLAG AREAS OF AGREEMENT AND DISAGREEMENT

MTC staff summarizes comments heard by various parties so that the Commissioners and the public have a clear understanding of the depth and breadth of opinion on a given issue.

FEDERAL AND STATE REQUIREMENTS

MAP 21

Federal surface transportation legislation, known as MAP-21 (Moving Ahead for Progress in the 21st Century Act) and signed into law in 2012, underscores the need for public involvement. The law requires metropolitan planning agencies such as MTC to "provide citizens, affected public agencies, representatives of public transportation agency employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways

and bicycle transportation facilities, representatives of the disabled, and other interested parties with a reasonable opportunity to comment" on transportation plans and programs.

MAP-21 also requires MTC — when developing the Regional Transportation Plan and the Transportation Improvement Program (TIP) — to coordinate transportation plans with expected growth, economic development, environmental protection and other related planning activities within our region. Toward this end, this Public Participation Plan outlines key decision points for consulting with affected local, regional, state and federal agencies and Tribal governments.

Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 provides that no person shall, on the basis of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance. Therefore, Title VI prohibits MTC from discriminating on the basis of race, color or national origin in carrying out its transportation planning and programming activities, which receive federal funding. Title VI was further clarified and supplemented by the Civil Rights Restoration Act of 1987 and a series of federal statutes enacted in the 1990s.

Executive Orders

An Executive Order is an order given by the president to federal agencies. As a recipient of federal revenues, MTC assists federal transportation agencies in complying with these orders.

- *Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

  Executive Order 12898 mandates that federal agencies make achieving environmental justice part of their missions. The fundamental principles of environmental justice include:

  - Avoiding, minimizing or mitigating disproportionately high and adverse human health or environmental effects on minority and low-income populations;
  - Ensuring full and fair participation by all potentially affected communities in the transportation decision-making process; and

- Preventing the denial, reduction or significant delay in the receipt of benefits by minority populations and low-income communities.

- *Executive Order 13166: Improving Access to Services for Persons with Limited English Proficiency*

  Executive Order 13166 states that people who, as a result of national origin, are limited in their English proficiency, should have meaningful access to federally conducted and federally funded programs and activities. It requires that all federal agencies identify any need for services to those with limited English proficiency and develop and implement a system to provide those services so all persons can have meaningful access to services. MTC's Plan for Special Language Services to Limited English Proficient Populations can be found in English, Spanish and Chinese on MTC's website at http://www.mtc.ca.gov/get_involved/lep.htm.

- *Executive Order 12372: Intergovernmental Review of Federal Programs*

  Executive Order 12372 calls for intergovernmental review of projects to ensure that federally funded or assisted projects do not inadvertently interfere with state and local plans and priorities. The Executive Order does not replace public participation, comment, or review requirements of other federal laws, such as the National Environmental Policy Act (NEPA), but gives elected officials of state and local governments an additional mechanism to ensure federal agency responsiveness to state and local concerns.

2008 California Legislation

State law (SB 375, Steinberg, Chapter 728, 2008 Statutes) calls on MTC and the Association of Bay Area Governments to develop a Sustainable Communities Strategy — a new element of the Regional Transportation Plan — to integrate planning for growth and housing with long-range transportation investments, to strive to reduce greenhouse gas emissions for cars and light trucks. The law also calls for a separate Public Participation Plan for development of the Regional Transportation Plan and the Sustainable Communities Strategy. Appendix A contains the Public Participation Plan for Plan Bay Area, the region's long-range transportation plan and Sustainable Communities Strategy.

Other Requirements

A number of other federal and state laws call on MTC to involve the public in or notify the public of its decisions. MTC complies with all other public notification or participation requirements of the state's Ralph M. Brown Act, the California Public Records Act, and the California Environmental Quality Act, the federal Americans with Disabilities Act, and other applicable state and federal laws.

II. Continuing Public Engagement

MTC is committed to an active public involvement process that provides comprehensive information, timely public notice and full public access to key decisions. MTC provides the public with myriad opportunities for continuing involvement in the work of the agency, through the following methods:

MTC'S POLICY ADVISORY COUNCIL

The Policy Advisory Council is a 27-member advisory panel that brings a range of interests to a single table to offer the Commission policy advice. Formed in 2010, the Policy Advisory Council builds on MTC's long tradition of advisory committees and reflects efforts to improve the effectiveness of advisors by merging what were previously three separate advisory committees. The members of the Policy Advisory Council reflect the "Three E's" of the Economy, The Environment and Social Equity.

The Council will be consulted during the development of MTC policies and strategies, and their recommendations on various issues will be reported directly to the Commission. The Council may pursue its own policy/program discussions and forward independent ideas to the Commission for consideration. The Council will address Commissioners directly at MTC committee and Commission meetings. MTC Resolution No. 3931 spells out the role and responsibilities of the Policy Advisory Council, including ways to encourage more dialogue between Commissioners and the Council.

All Policy Advisory Council meetings are audiocast and archived on MTC's website. Meetings are open to the public. In fact, tracking the agenda and discussions of MTC's Policy Advisory Council is one of the best ways for interested persons to engage early in the major policy and fiscal issues confronting MTC. Agendas are posted on MTC's website and persons can request to be placed on the mailing list.

In addition to the panels listed above, MTC facilitates policy and technical discussions through numerous ad hoc working groups, and serves on other multi-agency advisory committees.

GET INVOLVED: SERVE ON MTC'S POLICY ADVISORY COUNCIL

A major recruitment is done periodically to fill advisory council seats. However, MTC may open recruitment to fill interim vacancies. Check MTC's website for current opportunities (www.mtc.ca.gov/get_involved/) or call MTC's Public Information Office at 510.817.5757.

WORKING WITH NEIGHBORING REGIONS

MTC and its counterpart agencies in adjacent regions often coordinate with each other to identify transportation programs and projects of mutual interest for key travel corridors traversing both regions. While no formal agreements are in place, MTC works closely with the neighboring regions on a number of planning initiatives with the Sacramento, San Joaquin, Stanislaus, Santa Cruz and Monterey regions, among others. When updating long-range plans and Transportation Improvement Programs, the regions do keep each other informed and solicit input on planning and programming activities. For air quality planning purposes, MTC has an agreement with the Sacramento Area Council of Governments to detail agency responsibilities relating to transportation conformity and to coordinate the funding of certain projects receiving federal air quality funding in eastern Solano County, which is within the Bay Area but falls partly in the Yolo-Sacramento air basin.

COMMISSION AND COMMITTEE MEETINGS

MTC encourages interested persons to attend MTC Commission and standing committee meetings to express their views. Items on the Commission agenda usually come in the form of recommendations from MTC's standing committees. Much of the detailed work of MTC is done at the committee level, and the Commission encourages the public to participate at this stage, either in person or by tracking developments via the web. At times it is necessary to impose a time limit on public comments in order to allow all attendees the opportunity to speak.

At times it may be necessary to call a special meeting of the Commission or one of its committee meetings – one that will be held on a different day of the week than called for in MTC's regular meeting schedule. A "Call and Notice of Special Meeting" will be distributed at least 72 hours in advance of the meeting, or in accordance with the Brown Act. The notice will be signed by the committee chair and posted on MTC's website, posted in the MTC Library, emailed to at least one newspaper of general circulation in each of the nine Bay Area counties, and emailed to any member of the news media upon request.

Current MTC standing committees are shown in the following table:

GET INVOLVED: ACCESSIBLE MEETINGS

All Commission public meetings, workshops, forums, etc. are held in locations accessible to persons with disabilities. Monthly meetings of the Commission, and those of MTC standing committees and advisory committees, usually take place at MTC's offices.

Assistive listening devices or other auxiliary aids are available upon request. Sign-language interpreters, readers for persons with visual impairments, or language translators will be provided if requested through MTC Public Information (510.817.5757) at least three working days (72 hours) prior to the meeting (five or more days' notice is preferred).

MTC Standing Committee Structure and Responsibilities

Administration Committee	**Programming & Allocations Committee**	**Planning Committee**	**Operations Committee**	**Legislation Committee**
These committees regularly meet the second Wednesday of each month, in the morning, at MTC's offices. Meeting dates and times are tentative; confirm at www.mtc.ca.gov.		*These committees regularly meet the second Friday of each month, in the morning, at MTC's offices. Meeting dates and times are tentative; confirm at www.mtc.ca.gov.*		
Oversight of Agency Budget and Agency Work Program Agency Financial Reports/Audits Contracts Commission Procedures Staff Salaries And Benefits	Annual Fund Estimate Fund Allocations State Transportation Improvement Program (STIP) Federal Transportation Improvement Program (TIP)	Regional Transportation Plan Other Regional Plans (airports, seaports) State and Federal Air Quality Plans Corridor Planning Studies Transportation and Land Use Initiatives	Transportation System Management and Operational Activities Contracts Related to System Management and Operations Service Authority for Freeways and Expressways (SAFE)	Annual MTC Legislative Program Positions on Legislation & Regulations Public Participation Policy Advisory Council

In addition to the above committees, MTC has other committees dedicated to specific issues, such as the Bay Area Toll Authority Oversight Committee, regarding toll-bridge accounts and improvement projects, the Bay Area Infrastructure Financing Agency, regarding express lanes, and the Bay Area Headquarters Authority to discuss issues relating to the new regional headquarters building under construction in San Francisco.

Access to MTC Meetings

Web Access to MTC Meetings [www.mtc.ca.gov]				**If You Have Limited or No Web Access *** *Contact the MTC Library or the Public Information Office to request meeting materials*
Meeting Materials	*WHAT …* is available on the web?	*WHEN …* is it posted on the web?	*HOW LONG…* is it available on the web?	
Meeting Agendas	♦ MTC Commission ♦ Standing committees ♦Advisory committees	One week prior to meeting**	6 months	Mailed to interested public or available at meeting
Meeting Packets	*Same as above*	*Same as above*	6 months	*Same as above*
Audiocast of Meetings	♦ MTC Commission ♦ Standing committees ♦ Policy Advisory Council meetings	Listen to meeting live	6 months	Meeting minutes will be mailed to interested public; copies of electronic recordings are available
MTC Meeting Schedule	Schedule of all Commission and advisory committee meetings	Posted and updated continuously	Posted and updated continuously	Mailed to interested public or available at MTC

*** Final agendas are posted 72 business hours in advance of the meeting time in the MTC Library.*

DATABASE KEEPS PERSONS IN THE LOOP

MTC maintains a database of local government officials and staff, and other public agency staff and interested persons. The database allows MTC to send targeted mailings to keep the public updated on the specific issues they have requested to be kept up to date on, including information on how public meetings/participation have contributed to its key decisions and actions.

GET INVOLVED: SIGN UP FOR MTC'S DATABASE

Stay informed by signing up to receive mailings or periodic emails concerning major MTC initiatives. Anyone may request to be added to MTC's database by calling MTC's Public Information Office at 510.817.5757 or e-mailing info@mtc.ca.gov.

PUBLIC MEETINGS, WORKSHOPS AND FORUMS

Public meetings on specific issues are held as needed. If statutorily required, formal public hearings are conducted, and notice of these public hearings is placed in the legal section of numerous newspapers in the MTC region, including newspapers circulated in minority communities of the Bay Area. Materials to be considered at MTC public hearings are posted on MTC's website, and are made available to interested persons upon request. In addition, materials are placed on file in the MTC Library.

MTC also conducts workshops, community forums, conferences and other events to keep the public informed and involved in various high-profile transportation projects and plans, and to elicit feedback from the public and MTC's partners. MTC holds meetings throughout the nine-county San Francisco Bay Area to solicit comments on major plans and programs, such as the long-range Regional Transportation Plan. Meetings are located and scheduled to maximize public participation (including evening meetings).

For major initiatives and events, MTC typically provides notice through posting information on MTC's website, and, if appropriate, through e-mail notices and news releases to local media outlets.

GET INVOLVED: ALTERNATIVE LANGUAGE TRANSLATIONS

If language is a barrier to your participation in meetings, MTC can arrange for an interpreter or translate meeting materials. Sign-language interpreters and readers for persons with visual impairments are also available. Please call MTC Public Information (510.817.5757) at least three working days (72 hours) prior to the meeting (five or more days' notice is preferred).

MTC'S LIBRARY: INFORMATION FOR THE ASKING

The MTC Library, located in the Joseph P. Bort MetroCenter (the building that houses MTC offices) at 101 Eighth Street in Oakland, is open to the public week days. Check the website or call MTC Public Information (510.817.5757) for exact hours. This special library has an extensive collection of reports, books and magazines, covering transportation planning, demographics, economic analysis, public policy issues and regional planning in the San Francisco Bay Area. It is designed to meet the information needs of government agencies, researchers, students, the media and anyone else who is interested in transportation, regional planning and related fields. Special features include:

- Extensive reference assistance by telephone, e-mail, fax and in-person
- Two public access Internet terminals
- Newspaper and magazine reading areas
- Coin-operated copier
- Open stacks

The commitment to using technology to extend public outreach continues with MTC Library staff posting on MTC's website the headlines of transportation and related stories from Bay Area daily newspapers as well as key statewide and national journals and other such publications. Readers can view the headlines each morning on MTC's website or subscribe to the service via e-mail or by RSS feed (a method of electronic notification of web updates).

The library makes public resource materials available for download by posting on the MTC website: http://www.mtc.ca.gov/library/pub.php and including URLs whenever available for all materials in our publicly available catalog http://slk060.liberty3.net/mtc/opac.htm.

SOCIAL MEDIA

Another way to keep abreast of hot topics, events and comment opportunities is to follow MTC on social media, including Facebook, twitter, Instagram and YouTube. Likewise you can be notified when web content is updated by subscribing via RSS feel or through a service known as GovDelivery. All of MTC's social media platforms are accessible via the home page of MTC's web site: www.mtc.ca.gov.

GET INVOLVED: THE FACTS AT YOUR FINGERTIPS

MTC's publications listed on MTC's website can be ordered by phone (510.817.5836), e-mail (library@mtc.ca.gov) or by completing an online form. The entire Library collection can be searched using the online catalog. A wide range of MTC publications are available for downloading.

GET INVOLVED: KEEP ON TOP OF TRANSPORTATION NEWS

MTC's Library compiles an electronic news summary with links to transportation-related articles appearing in major Bay Area and national news outlets. To subscribe, visit MTC's website: www.mtc.ca.gov/news/headlines.htm.

WEBSITE: WWW.MTC.CA.GOV

MTC's website — www.mtc.ca.gov — is targeted to audiences ranging from transit riders seeking bus schedules to transportation professionals, elected officials and news media seeking information on particular programs, projects and public meetings.

Updated daily, the site provides information about MTC's projects and programs, the agency's structure and governing body and upcoming public meetings and workshops. It contains the names, e-mail addresses and phone numbers for staff and Commission members; all of MTC's current planning documents, publications located in the MTC Library, data from the U.S. Census as well as detailed facts about the region's travel patterns. It also includes important links to partner government agencies as well as to other sites such as the Bay Area's 511.org for traveler information and the FasTrak®.org site for users of the region's automated toll system.

Interested persons also may access a wealth of data on Bay Area travel and commute patterns online at: www.mtc.ca.gov/maps_and_data/**.** Included is access to maps, census data, transit operator statistics, background on travel models, and research papers.

GET INVOLVED: TRACK MTC VIA WEB

Log onto MTC's website — www.mtc.ca.gov — for meeting agendas and packets. Live and archived audiocasts of meetings make it possible for interested parties to "tune in" at their convenience to all Commission and standing committee meetings.

MEDIA OUTLETS HELP ENGAGE MORE PERSONS

MTC regularly issues news releases about Commission programs and actions of interest to the public. These include announcements of public workshops and hearings, recruitment for positions on MTC's advisory committees, and employment opportunities through MTC's high school and college internship programs. News releases are sent to regional, state and national media — including minority print and broadcast outlets — and some are translated into Spanish, Chinese and other languages. In addition to news releases, MTC staff and Commissioners also host press events and news conferences (often in conjunction with other transportation agencies), visit newspaper editorial boards, and conduct briefings with Bay Area reporters and editors to discuss key initiatives such as the Regional Transportation Plan. These briefings provide an opportunity for both print and broadcast journalists to learn about MTC programs that may not immediately produce traditional hard news stories, thus providing background

context for subsequent articles or radio/TV pieces. A list of media outlets can be found at this project website: www.PlanBayArea.org.

STAFF DEDICATED TO ASSISTANCE AND OUTREACH

In addition to the components of MTC's public outreach program detailed above, MTC's commitment to public participation includes staff dedicated to involving the public in MTC's work. Public Information staff provides the following materials and services:

- Public Information staff can make available to the public any item on the MTC website (including meeting notices, agendas, and materials that accompany agenda items for meetings of the Commission and its committees and advisory panels) if a person does not have Internet access.
- Public Information staff works with interested organizations to arrange for MTC staff and commissioners to make presentations to community groups.
- MTC staff participates in region-wide community and special events, especially events in targeted ethnic and under-represented communities.
- Public Information staff will respond by telephone (510.817.5757), U.S. mail (101 Eighth Street, Oakland, CA 94607) or e-mail (info@mtc.ca.gov) from the public and the media about MTC.

III. Public Participation Techniques

MTC uses various techniques to develop and execute specific public participation programs to inform its major decisions, such as for corridor studies, new funding policies or updates to the Regional Transportation Plan.

A menu of participation techniques follows, and includes some tried-and-true approaches as well as new suggestions we heard from the public while developing this plan.

Public Meetings/Workshops

- Offer customized presentations to existing groups and organizations
- Co-host workshops with community groups, business associations, etc.
- Contract with community-based organizations in low-income and minority communities for targeted outreach
- Sponsor a topical forum or summit with partner agencies, with the media or other community organizations
- Encourage opportunities for public input directly to policy board members

Techniques for Public Meetings/Workshops

- Open Houses
- Question-and-Answer sessions with planners and policy board members
- Break-out sessions for smaller group discussions on multiple topics
- Interactive exercises
- Customized presentations
- Vary time of day for workshops (day/evening)
- Conduct meeting entirely in alternative language (Spanish, Chinese, for example)

Visualization Techniques

- Maps
- Charts, illustrations, photographs
- Table-top displays and models
- Web content and interactive games
- Electronic voting at workshops
- PowerPoint slide shows

Polls/Surveys

- For major planning efforts (such as the Regional Transportation Plan and Sustainable Communities Strategy), conduct statistically valid telephone polls
- Electronic surveys via web
- Intercept interviews where people congregate, such as at transit hubs
- Printed surveys distributed at meetings, transit hubs, on-board transit vehicles, etc.

Focus Groups

- Participants recruited randomly from telephone polls
- Participants recruited by interest area

Online and Printed Materials

- User-friendly documents (including use of executive summaries)
- Outside review of publications to ensure clear, concise language
- Post cards
- Maps, charts, photographs and other visual means of displaying information

Targeted Mailings/Flyers

- Work with community-based organizations to distribute flyers
- E-mail to targeted database lists
- Distribute "Take-one" flyers to key community organizations
- Place notices on-board transit vehicles and at transit hubs

Utilize local media

- News releases
- Invite reporters to news briefings
- Meet with editorial staff
- Opinion pieces/commentaries
- Purchase display ads
- Negotiate inserts into local printed media
- Visit minority media outlets to encourage use of MTC news releases
- Place speakers on Radio/TV talk shows
- Public Service Announcements on radio and TV

- Develop content for public access/cable television programming
- Civic journalism partnerships

Use of the Internet/Electronic Access to Information

- Website with updated content
- Use social media to reach a larger audience
- Audio-cast of past public meetings/workshops
- Electronic duplication of open house/workshop materials
- Interactive web with surveys, comment line
- Use the web to provide interaction among participants
- Access to planning data (such as maps, charts, background on travel models, forecasts, census data, research reports)
- Provide information in advance of public meeting

Notify Public via

- Blast e-mails
- Notice widely disseminated through partnerships with local government and community-based and interest organizations
- Electronic newsletters
- Social media such as Twitter and Facebook
- Local media
- Notices placed on-board transit vehicles and at transit hubs

Newsletters

- MTC's electronic newsletter
- Submit articles for publication in community/corporate newsletters

Techniques for Involving Low-Literacy Populations

- Train staff to be alert to and anticipate the need of low-literacy participants in meetings, workshops, and the like
- Robust use of "visualization" techniques, including maps and graphics to illustrate trends, choices being debated, etc.
- Personal interviews or use of audio recording devices to obtain oral comments

Techniques for Involving Low Income Communities and Communities of Color

- Involve MTC's Policy Advisory
- Grants to community-based organizations to co-host meetings and remove barriers to participation by offering such assistance as child care or translation services
- "Take One" flyers on transit vehicles and at transit hubs
- Outreach in the community (flea markets, churches, health centers, etc.)
- Use of community and minority media outlets to announce participation opportunities

Techniques for Involving Limited-English Proficient Populations

See also MTC's Final Revised Plan for Special Language Services to Limited English Proficient (LEP) Populations (the "LEP Plan"), which can be found in English, Spanish and Chinese on MTC's website at www.mtc.ca.gov/get_involved/lep.htm.

- Use of the above-noted techniques, modified where appropriate in accordance with the LEP Plan
- Train staff to be alert to and anticipate the needs of Limited-English Proficient participants in meetings, workshops, and the like
- Personal interviews or use of audio recording devices to obtain oral comments in languages other than English
- Translated documents and web content on key initiatives
- Translate materials; have translators available at meetings as requested
- Include information on meeting notices on how to request translation assistance
- On-call translators for meetings
- Translated news releases and outreach to alternative language media, such as radio, television, newspapers and social media
- When conducting statistically valid polls, surveys or focus groups, offer the information in other languages such as Spanish or Chinese

Techniques for Reporting on Impact of Public Comments

- Summarize key themes of public comments in staff reports to MTC standing committees
- Direct mail and email to participants from meetings, surveys, etc. to report final outcomes
- Newsletter articles
- Updated and interactive web content

IV. Public Participation Procedures for the Regional Transportation Plan and the Transportation Improvement Program

There are two key transportation initiatives of MTC's that are specially called out in federal law as needing early and continuing opportunities for public participation — development of the Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP).

Public Participation Opportunities in the RTP and TIP

Because of its comprehensive, long-term vision, the RTP provides the earliest and the best opportunity for interested persons and public agencies to influence MTC's policy and investment priorities for Bay Area transportation. It is at this earlier RTP stage where investment priorities and major planning-level project design concepts are established, and broad, regional impacts of transportation on the environment are addressed. Thus, it might be easier for a member of the public to influence decisions about projects at this stage. Another opportunity for public participation, but further along in the process, is the TIP, which is a programming document that identifies funding for only those programs and projects that are already included in the RTP. A mid-point between the RTP and TIP is the project-selection process. Interested residents can become versed in how a transportation project moves from an idea to implementation — including local project review, details for how projects are included in MTC's RTP, MTC's Project Selection Process, the TIP and environmental review/construction phases — in a publication titled "A Guide to the San Francisco Bay Area's Transportation Improvement Program, or TIP." This document is available on MTC's website (http://files.mtc.ca.gov/pdf/TIP/2015/guide_to_the_2015_tip.pdf) and from the MTC Library.

Another easy way to engage on transportation policies and investment is to request to be added to MTC's RTP database (see sidebar at left for instructions).

GET INVOLVED: SIGN UP FOR MTC'S RTP DATABASE

One of the ways to have the most impact on MTC's policy and investment decision is to participate in an update of the regional transportation plan (RTP). Contact MTC's Public Information Office online at www.PlanBayArea.org or at info@mtc.ca.gov, or call at 510.817.5757, and ask to be included in MTC's database.

A. REGIONAL TRANSPORTATION PLAN

The long-range Regional Transportation Plan (RTP) prioritizes and guides Bay Area transportation development over 25 years. The RTP is the comprehensive blueprint for transportation investment (transit, highway, local roads, bicycle and pedestrian projects), and establishes the financial foundation for how the region invests in its surface transportation system by identifying how much money is available to address critical transportation needs and setting the policy on how projected revenues are to be spent. The RTP is updated at least once every four years to reflect reaffirmed or new planning priorities and changing projections of growth and travel demand based on a reasonable forecast of future revenues available to the region.

Under California Senate Bill 375 (Steinberg, Chapter 728, 2008 Statutes) the RTP must include a regional Sustainable Communities Strategy for achieving a regional target for reducing greenhouse gases for cars and light trucks and identify specific areas in the nine-county Bay Area to accommodate all the region's projected population growth, including all income groups, for at least the next 25 years. The legislation requires MTC and the Association of Bay Area Governments (ABAG) to jointly develop the regional Sustainable Communities Strategy to integrate planning for growth and housing with long-range transportation investments. In the Bay Area, MTC and ABAG are joined by the Bay Area Air Quality Management District and the Bay Conservation and Development Commission to develop a plan that also incorporates shoreline planning and air quality objectives.

The law also calls for a separate Public Participation Plan for development of the regional transportation plan and Sustainable Communities Strategy. Appendix A describes a Public Participation Plan for Plan Bay Area, the region's Sustainable Communities Strategy and Regional Transportation Plan.

MTC prepares several technical companion documents for RTP updates. These include a program-level Environmental Impact Report per California Environmental Quality Act (CEQA) guidelines, and transportation air quality conformity analyses (to ensure clean air mandates are met) per federal Clean Air Act requirements. Certain revisions to the RTP may warrant a revision or update to these technical documents. The process for preparing and conducting interagency consultation on the conformity analysis is described in MTC Resolution No. 3757.

MTC also prepares an equity analysis of RTP updates to determine whether minority and low- income communities in the Bay Area share equitably in the benefits of the regional transportation plan without bearing a disproportionate share of the burdens. As an assessment of the region's long-range transportation investment strategy, this analysis is conducted at a regional, program-level scale. This assessment of the long-range plan is intended to satisfy federal requirements under Title VI of the Civil Rights Act and federal policies and guidance on environmental justice. For each update of the RTP, MTC will prepare a public participation plan (see below "RTP Update") that will provide more information on how the equity analysis will be conducted throughout that update of the RTP.

Updating and Revising the Regional Transportation Plan

A complete update of an existing regional transportation plan is required at least once every four years. The RTP also may be revised in between major updates under certain circumstances, as described below in the table and narrative:

- **RTP Update**

This is a complete update of the most current long-range regional transportation plan, which is prepared pursuant to state and federal requirements.

RTP updates include extensive public consultation and participation involving hundreds of Bay Area residents, public agency officials and stakeholder groups over many months. MTC's Policy Advisory Council and other members of the public play key roles in providing feedback on the policy and investment strategies contained in the plan. Local and Tribal governments, transit operators and other federal, state and regional agencies also actively participate in the development of an RTP update via existing and ad hoc forums.

For each RTP update MTC will prepare a multi-phased public outreach and involvement program to ensure that all those with a stake in the outcome are actively involved in its preparation. See Appendix A for specific information on public engagement for Plan Bay Area, which is slated to be updated in 2017.

- **RTP Amendment**

An amendment is a major revision to a long-range RTP, including adding or deleting a project, major changes in project/project phase costs, initiation dates, and/or design concept and scope (e.g., changing project locations or the number of through traffic lanes). Changes to projects that are included in the RTP only for illustrative purposes (such as in the financially unconstrained "vision" element) do not require an amendment. An amendment requires public review and comment, demonstration that the project can be completed based on expected funding, and/or a finding that the change is consistent with federal transportation conformity mandates. Amendments that require an update to the air quality conformity analysis will be subject to the conformity and interagency consultation procedures described in MTC Resolution No. 3757.

- **RTP Administrative Modification**

This is a minor revision to the RTP for minor changes to project/project phase costs, funding sources, and/or initiation dates. An administrative modification does not require public review and comment, demonstration that the project can be completed based on expected funding, nor a finding that the change is consistent with federal transportation conformity requirements. As with an RTP amendment, changes to projects that are included in the RTP's financially unconstrained "vision" element may be changed without going through this process.

Updating and Revising the Regional Transportation Plan (RTP)

Public Participation for an RTP Update
❶ Prepare a public participation plan to provide early and continuing opportunities to comment. Review public outreach and involvement program with the public and advisory groups.
❷ Implement public outreach and involvement program, which may include: • Numerous targeted workshops with local governments, partner agencies, advisory groups including MTC's Policy Advisory Council, and the general public • Opportunities to participate via the web, online surveys, etc. • Posting draft documents to the web for public review and comment • Documents available for viewing at the MTC Library
❸ Notify the public of opportunities to participate using such methods as local media outlets, web postings, electronic-mailings to MTC's database and advocacy groups.
❹ Conduct inter-governmental consultation, as appropriate.
❺ Conduct interagency consultation as appropriate based on Air Quality Conformity Protocol (MTC Resolution No. 3757).
❻ Release Draft Plan for at least a 55-day public review period • Hold at least three public hearings in different parts of the region • Respond to significant comments • Provide additional review and comment opportunity of 5 days if the final RTP differs significantly from the Draft RTP and raises new material issues.
❼ Adoption by the MTC Commission at a public meeting. Notify the public about the Commission's action with electronic mailings to MTC's database.

Public Participation for an RTP Amendment
❶ Release proposed amendment for a 30-day public review • Notify the public of opportunities to participate and comment using such methods as local media outlets, email notice to MTC's database or web postings. • Post amendment on MTC's website for public review • Amendment available for viewing at the MTC Library
❷ RTP Amendment reviewed at a public meeting of the MTC Planning Committee.
❸ Approval at a public meeting by the MTC Commission.
❹ Post approved RTP Amendment on the MTC website and notify the public about its approval via email to MTC's database.

Public Participation for RTP Administrative Modification
❶ No formal public review.
❷ Approval by MTC Executive Director.
❸ RTP Administrative Modification posted on MTC website following approval.

Countywide Transportation Plans

Bay Area counties are authorized by state law to develop Countywide Transportation Plans on a voluntary basis, and the countywide plans are an integral part of the Regional Transportation Plan. These long-range planning and policy documents assess transportation needs and guide transportation priorities and funding decisions for that county over a 20-25 year horizon. These countywide plans inform the transportation projects and programs that are forwarded to MTC for consideration in the region's long-range plan. MTC's guidelines for development of countywide plans by the county Congestion Management Agencies can be found here: http://www.mtc.ca.gov/planning/ctp/

Congestion Management Process

Under federal regulations, MTC is required to prepare a congestion management process (CMP) for the Bay Area that includes strategies for managing travel demand, traffic operational improvements, public transportation improvements, and the like. MTC's Planning Committee at a public meeting adopts a CMP approximately every two years, with the results of this technical evaluation used to inform MTC decisions on program and investment priorities, including the Regional Transportation Plan. Those interested in this exercise may obtain copies of the relevant memoranda via MTC's website, or by requesting to be added to the Planning Committee's mailing list.

B. TRANSPORTATION IMPROVEMENT PROGRAM

The Transportation Improvement Program (TIP) helps implement the policy and investment priorities expressed by the public and adopted by MTC in the Regional Transportation Plan (RTP). In this way, public comments made as part of the RTP are reflected in the TIP as well. The TIP covers at least a four-year timeframe, and all projects included in the TIP must be consistent with the RTP, which covers 25 or more years. The TIP is a comprehensive listing of Bay Area surface transportation projects — including transit, highway, local roadway, bicycle and pedestrian investments — that:

- receive federal surface transportation funding, or are
- subject to a federally required action, or are
- regionally significant, for federal air quality conformity purposes.

The TIP does not contain all funds or projects or programs identified in the Regional Transportation Plan. The majority of revenues identified in the Plan are never included in the TIP. These include local and state funds used to operate and maintain the transportation network that do not meet the criteria listed above. The TIP in itself does not implement the plan, but is a subset of projects that are consistent with implementing the Plan.

The TIP includes a financial plan that demonstrates there are sufficient revenues to ensure that the funds committed (or "programmed") to the projects are available to implement the projects or project phases. Adoption of the TIP also requires a finding of conformity with federal transportation-air quality conformity mandates.

Individual project listings may be viewed through MTC's web-based Fund Management System at http://www.mtc.ca.gov/funding/fms_intro.htm. As part of MTC's commitment to public involvement, many projects in the TIP are mapped to present the online reader with a visual location of the project. Individuals without access to the internet may view a printed copy of the project listings at the MTC library.

In addition to a Transportation Improvement Program that is accessible online at: http://www.mtc.ca.gov/funding/tip/, MTC maintains free, subscription-based e-mail distribution lists to inform interested individuals, transportation officials and staff of changes and actions related to the TIP. Through this system, individuals

may be alerted as needed regarding the development and approval of a new TIP and updates, such as the notice of a TIP update, or notice and approval of the TIP amendments. The TIP-INFO Notification tool helps facilitate public review and comments as well as coordination with transportation and other public agencies. Sign up for the service by contacting MTC at info@mtc.ca.gov.

To further assist in the public assessment of the TIP, and specifically to analyze the equity implications of the proposed TIP investments, MTC conducts an investment analysis for the TIP with a focus on minority and low-income communities.

Updating and Revising the TIP

Federal regulations require that the TIP be updated at least once every four years. From time to time, circumstances dictate that revisions be made to the TIP between updates. MTC will consider such revisions when the circumstances prompting the change are compelling. The change must be consistent with the RTP, not negatively impact financial constraint, or adversely affect transportation-air quality conformity findings of the TIP.

In addition to a TIP update, revisions to the TIP may occur as TIP amendments, TIP administrative modifications, or TIP Technical Corrections. The criteria for administrative modifications and amendments are defined in federal regulations, specifically Title 23, CFR part 450.104.

The Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and California Department of Transportation (Caltrans) have developed amendment and administrative modification procedures for the TIP. These procedures are posted online at: www.mtc.ca.gov/funding/tip/tiprevisionprocedures.pdf. Further explanation about TIP updates and how the types of revisions are processed are shown in the narrative and table that follows.

- **TIP Update**

This is a complete update of the existing TIP, to reflect new or revised transportation investment strategies and priorities. Federal regulations require an update of the TIP at least once every four years. Because all projects included in the TIP are consistent with the RTP, MTC's extensive public outreach for development of the RTP is reflected in the TIP as well. The TIP supports

implementation in the short-term, the financially constrained element of the RTP and is responsive to comments received during the development of the RTP. TIP updates will be subject to the conformity and interagency consultation procedures described in MTC Resolution No. 3757.

The State of California may require a TIP update more frequently than the federally required four-year update cycle. In such circumstances MTC may perform a limited and less robust update and outreach effort by simply updating information reflecting updated project information using prior TIP reports, analysis and methodologies. Significant modification of analytical approaches and additional features to the TIP will be made on the federal 4-year update cycle, and more in-line with the four-year update cycle of the RTP.

- **TIP Amendment**

This is a revision that involves a major change to the TIP, such as the addition or deletion of a project; a major change in project cost or project/project phase initiation date; or a major change in design concept or design scope (e.g., changing project termini or the number of through traffic lanes). An amendment is a revision that requires public review and comment, re-demonstration of fiscal constraint, or an air quality conformity determination. Amendments requiring a transportation-air quality conformity analysis will be subject to the conformity and interagency consultation procedures described in MTC Resolution No. 3757.

- **TIP Administrative Modification**

An administrative modification includes minor changes to a project's costs or to the cost of a project phase; minor changes to funding sources of previously included projects; and minor changes to the initiation date of a project or project phase. An administrative modification does not require public review and comment, re-demonstration of fiscal constraint, or conformity determination.

- **TIP Technical Correction**

Technical corrections may be made by MTC staff as necessary. Technical corrections are not subject to an administrative modification or an amendment, and may include revisions such as: changes to information and projects that are included only for illustrative purposes; changes to information outside of the TIP period; changes to information not required to be included in the TIP per federal regulations; or changes to correct simple errors or omissions including data entry errors. These technical corrections cannot significantly impact the cost, scope, or

schedule within the TIP period, nor will they be subject to a public review and comment process, re-demonstration of fiscal constraint, or a conformity determination.

Public Participation for Updating and Revising the Transportation Improvement Program

TIP Update
❶ Notify public of opportunities to participate; use appropriate lists within MTC's database, including list of Regional Transportation Plan participants. Also notify the public using such methods as local media outlets; electronic-mailings to advocacy groups; or via an electronic subscription system that is open for anyone to sign up to be kept informed about the TIP, such as TIP-INFO e-mail notification.
❷ Notify Bay Area Partnership technical committees or working groups. Conduct intergovernmental review and consultation, as appropriate.
❸ Release Draft TIP for 30-day public review and comment period. ▪ Draft TIP available for viewing in MTC Library; ▪ Sent to major libraries throughout the Bay Area upon request ▪ Posted on MTC website ▪ MTC staff may make minor, technical edits to the Draft TIP during the review and comment period; in these instances MTC will display the technical edits on MTC's web site and notify interested parties via e-mail notification. Provide additional review and comment opportunity of 5 days if the final TIP differs significantly from the Draft TIP and raises new material issues.
❹ Respond to significant material comments pertinent to the TIP; MTC's response compiled into an appendix in the final TIP.
❺ Review by an MTC standing committee, typically the Programming & Allocations Committee (a public meeting); referral to Commission.
❻ Adoption by Commission at a public meeting. Approval by California Department of Transportation (Caltrans). Approval by Federal Highway Administration and Federal Transit Administration (FHWA/FTA).
❼ After approval: • post in MTC Library • post on MTC website • notify Bay Area Partnership technical committees or working groups. • Notify the public about the Commission's action with electronic notifications, such as TIP-INFO (an electronic subscription system anyone can sign up to be kept informed about the TIP.)

Public Participation for Updating and Revising the Transportation Improvement Program

TIP Amendment
❶ Notify public via TIP-INFO Notification (e-mail) or other electronic notification methods.
❷ Notify Bay Area Partnership technical committees or working groups Available for viewing in MTC Library Posted on MTC website for public review
❸ Amendments deleting or adding or changing a project subject to a new air quality conformity analysis: o 30-day public review and comment period, with review by an MTC standing committee at a public meeting; and o Approval by the full Commission at a public meeting. • Amendments deleting or adding a project *not* subject to an air quality conformity analysis (such as a roadway rehabilitation): o Review and approval by an MTC standing committee or the full Commission at a public meeting. • Amendments changing an existing project that is not subject to an air quality conformity analysis, or changing an existing grouped project listing (such as the highway bridge program), or bringing a previously listed project or phase back into the TIP for financial purposes; or changing TIP funding revenues: o Approval by the MTC Executive Director or designee, following 5-day notice on MTC's website, **or** o Review and approval by an MTC standing committee or the full Commission at a public meeting.
❹ Approval by Caltrans → Approval by FHWA/FTA
❺ After approval: • post in MTC Library • post on MTC website • notify Bay Area Partnership technical committees or working groups • notify public via electronic subscription system open to anyone who requests to be kept informed about the TIP, such as TIP-INFO email notification.

TIP Administrative Modification
❶ No public review.
❷ Approval by MTC Executive Director or designee by delegated authority (authority is delegated by the Federal Highway Administration/Federal Transit Administration), or Caltrans
❸ After approval: • post in MTC Library • post on MTC website

TIP Technical Correction
❶ No public review.
❷ Technical corrections by staff.
❸ No approval required.

Federal Transit Administration Program of Projects Public Participation Requirements

Federal transit law and joint Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) planning regulations governing the metropolitan planning process require a locality to include the public and solicit comment when the locality develops its metropolitan long- range transportation plan and its metropolitan TIP. FTA has determined that when a recipient follows the procedures of the public involvement process outlined in the FHWA/FTA planning regulations, the recipient satisfies the public participation requirements associated with development of the Program of Projects (POP) that recipients of Section 5307, Section 5337 and Section 5339 funds must meet. This Public Participation Plan is being used by the following recipient(s)* to satisfy their public participation process for the POP. This Public Participation Plan follows the procedures for public involvement associated with TIP development and therefore satisfies public participation requirements for the POP. All public notices of public involvement activities and times established for public review and comment on the TIP will state that they satisfy the POP requirements of the Section 5307, Section 5337 and Section 5339 Programs.

*Recipients using MTC's Public Participation Plan to satisfy their public participation process for the POP.

1. AC Transit (Alameda-Contra Costa Transit District)
2. ACE (Altamont Corridor Express)
3. BART (Bay Area Rapid Transit District)
4. Caltrain (Peninsula Corridor Joint Powers Board)
5. County Connection (Central Contra Costa Transit Authority)
6. City of Dixon Readi-Ride
7. FAST (Fairfield/Suisun Transit System)

8. Golden Gate Transit (Golden Gate Bridge, Highway and Transportation District)
9. LAVTA (Livermore-Amador Valley Transit Authority/ Wheels)
10. Marin Transit (Marin County Transit District)
11. Petaluma Transit
12. Rio Vista Delta Breeze
13. SamTrans (San Mateo County Transit District)
14. San Francisco Bay Ferry (WETA/Water Emergency Transportation Authority)
15. SFMTA (San Francisco Municipal Transportation Agency)
16. Santa Rosa CityBus
17. SolTrans (Solano County Transit)
18. Sonoma County Transit
19. SMART (Sonoma Marin Area Rail Transit)
20. Tri Delta Transit (Eastern Contra Costa Transit Authority)
21. Union City Transit
22. Vacaville City Coach
23. VINE (Napa County Transportation and Planning Agency)
24. VTA (Santa Clara Valley Transportation Authority)
25. WestCAT (Western Contra Costa Transit Authority)

Annual Listing of Obligated Projects

By federal requirement, MTC publishes at the end of each calendar year an annual listing of obligated projects, which is a record of project delivery for the previous year. The listing also is intended to increase the awareness of government spending on transportation projects to the public. Copies of this annual listing may be obtained from MTC's website: http://www.mtc.ca.gov/funding/delivery/ or by contacting MTC's Library.

V. Interagency and Tribal Government Consultation Procedures for the Regional Transportation Plan and the Transportation Improvement Program

A. PUBLIC AGENCY CONSULTATION

The Moving Ahead for Progress in the 21st Century Act – better known as MAP-21 – is federal surface transportation legislation that specifies a public participation process, directing metropolitan transportation agencies like MTC to consult with officials responsible for other types of planning activities that are affected by transportation in the area, be that conservation and historic preservation or local planned growth and land use management.

The most effective time to involve the public and governmental agencies in the planning and programming process is as early as possible. As such, the development of the regional transportation plan, with its long-range timeframe, is the earliest and the key decision point for the interagency consultation process. It is at this stage where funding priorities and major projects' planning-level design concepts and scopes are introduced, prioritized and considered for implementation. Furthermore, MTC's funding programs and any projects flowing from them are derived directly from the policies and the transportation investments contained in the RTP. Because the RTP governs the selection and programming of projects in the TIP, MTC considers the agency consultation process as a continuum starting with the regional transportation plan. The RTP is the key decision point for policy decisions regarding project and program priorities that address mobility, congestion, air quality, and other planning factors; the TIP is a short-term programming document detailing the funding for only those investments identified and adopted in the RTP.

MTC will use the following approaches to coordinate and consult with affected agencies in the development of the RTP and the TIP. Throughout the process, consultation will be based on the agency's needs and interests. At a minimum, all agencies will be provided an opportunity to comment on the RTP and TIP updates.

Regional Transportation Plan (RTP)

MTC's compliance with the California Environmental Quality Act (CEQA) serves as the framework to consult, as appropriate, in the development of the RTP with federal, state and local resource agencies responsible for land use management, natural resources, environmental protections, conservation, and historic preservation. This consultation will include other agencies and officials responsible for other planning activities in the MTC region that are affected by transportation, to the maximum extent practicable.

As required by CEQA, the Notice of Preparation (NOP) stating that MTC as the lead agency will prepare a program-level Environmental Impact Report (EIR) for the RTP is the first step in the environmental process. The NOP gives federal, state and local agencies and the public an early opportunity to identify areas of concern to be addressed in the EIR and to submit them in writing to MTC. Further, MTC also will hold agency and public scoping meeting(s) to explain the environmental process and solicit early input on areas of concern. During the development of the Draft EIR, MTC will consult with affected agencies on resource maps and inventories for use in the EIR analysis.

MTC will consider the issues raised during the NOP period and scoping meetings(s) during its preparation of the EIR. Subsequently, as soon as MTC completes the Draft EIR, MTC will file a Notice of Completion (NOC) with the State Clearinghouse and release the Draft EIR for a 45-day public review period. MTC will seek written comments from agencies and the public on the environmental effects and mitigation measures identified in the Draft EIR. During the comment period, MTC may consult directly with any agency or person with respect to any environmental impact or mitigation measure. MTC will respond to written comments received prior to the close of comment period and make technical corrections to the Draft EIR where necessary. The Commission will be requested to certify the Final EIR, and MTC will file a Notice of Determination (NOD) within five days of Commission certification.

Note that while the RTP is not subject to the federal National Environmental Policy Act (NEPA), MTC will consult with federal agencies as appropriate during the preparation of the CEQA environmental document. Additionally, the involvement of federal agencies in the RTP can link the transportation planning process with the federal NEPA process. As the projects in the RTP and TIP

continue down the pipeline toward construction or implementation, most must comply with NEPA to address individual project impacts.

Transportation Improvement Program (TIP)

As discussed above, crucial decisions whether or not to support or fund a transportation program or project in the region first occurs at the RTP level. The TIP translates recommendations from the RTP into a short-term program of improvements focused on projects that have a federal interest. Therefore, the earlier, and more effective, timeframe for public comment on the merits of a particular transportation project is during the development of the long-range plan. The TIP defines project budgets, schedules and phasing for those programs and projects that are already part of the RTP. The TIP does not provide any additional information regarding environmental impacts, beyond that found in the program-level environmental analysis prepared for the RTP.

As such, starting at the RTP development stage, MTC staff will concurrently consult with all agencies regarding the TIP. Subsequent to the RTP, additional consultations at the TIP stage will be based on an agency's needs and interests. At a minimum, all agencies will be provided with an opportunity to review and comment on the TIP. Project sponsors — including the California Department of Transportation (Caltrans), local jurisdictions, transit operators, and county congestion management agencies (CMAs) — review and consult with MTC on each of their respective projects in the TIP. These agencies (and any other interested agency) are involved every step of the way in the establishment of MTC programs, selection of projects and their inclusion in the TIP.

B. OTHER PROTOCOLS FOR WORKING WITH PUBLIC AGENCIES

The Bay Area Partnership Review and Coordination

MTC established the Bay Area Partnership to collaboratively assist the Commission in fashioning consensus among its federal, state, regional, and local transportation agency partners regarding the policies, plans, and programs to be adopted and implemented by the Commission. More recently, that focus has shifted to advising the Commission on specific transportation investment policies or matters related to the Regional Transportation Plan. Membership includes a chief staff officer from all public agencies representing the following transportation interests:

- Transit operations
- Transportation facilities
- Congestion management agencies
- Public works agencies
- Airports and seaports
- Regional, state and federal transportation, environmental, and land use agencies

The Partnership Board's technical/advisory committees consider the on-going and more technical aspects of investment issues. The Partnership Board (audiocast live and later archived on MTC's website) and its technical advisory committee meetings are open to the public. The status of TIP revisions are provided to the partnership through email notifications. For TIP updates, technical/advisory committee(s) and working group(s) will be kept informed and consulted throughout the process by e-mail notifications or presentations as appropriate.

Air Quality Conformity and Interagency Consultation

A dialogue between agencies over transportation-air quality conformity considerations must take place in certain instances prior to MTC adoption of its RTP or TIP. These consultations are conducted through the Air Quality Conformity Task Force — which includes representatives of the U.S. Environmental Protection Agency, the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), the California Air Resources Board (CARB), Caltrans, the Bay Area Air Quality Management District, and other state and local transportation agencies. These agencies review updates and, in certain instances,

amendments to the RTP and TIP to ensure they conform to federal transportation conformity regulations via transportation-air quality conformity analysis.

In accordance with Transportation-Air Quality Conformity and Interagency Consultation Protocol procedures (MTC Resolution No. 3757), MTC must implement the interagency consultation process for the nine-county San Francisco Bay Area before making a transportation conformity determination on the RTP or TIP. In developing an update to the RTP/TIP, MTC will bring important issues to the Partnership or its technical committees/working groups for discussion and feedback. All materials that are relevant to interagency consultation, such as the RTP/TIP schedule, important RTP/TIP-related issues, and draft RTP/TIP, will also be transmitted to the Conformity Task Force for discussion and feedback. Similar consultation will occur for RTP/TIP amendments requiring an air quality conformity analysis.

Intergovernmental Review via Regional and State Information Clearinghouses

The intent of intergovernmental review, per Executive Order 12372, is to ensure that federally funded or assisted projects do not inadvertently interfere with state and local plans and priorities. Applicants in the Bay Area with programs/projects for inter-governmental review are required to submit documentation to Association of Bay Area Government's (ABAG) Area-wide Clearinghouse and the State Clearinghouse in Sacramento, which are responsible for coordinating state and local review of applications for federal grants or loans under state-selected programs. In this capacity, it is also the function of the Clearinghouses to coordinate state and local review of federal financial assistance applications, federally required state plans, direct federal development activities, and federal environmental documents. The purpose of the clearinghouses is to afford state and local participation in federal activities occurring within California. The Executive Order does not replace public participation, comment, or review requirements of other federal laws, such as the National Environmental Policy Act (NEPA), but gives the states an additional mechanism to ensure federal agency responsiveness to state and local concerns.

ABAG's clearinghouse notifies, via the bi-weekly e-mail Intergovernmental Review Newsletter, entities and individuals at all governmental levels, as well as certain public interest groups that might be affected the proposed project or program. The state and area- wide clearinghouses are a valuable tool to help ensure that state

and local agency comments are included along with any applications submitted by an applicant to the federal agencies.

MTC uses this service to notice TIP updates and those TIP amendments that require an air quality determination. This service is not used for TIP amendments that do not require an air quality conformity determination, for TIP administrative modifications and for TIP technical corrections. The clearinghouses also receive and distribute environmental documents prepared pursuant to the California Environmental Quality Act (CEQA) and coordinate the state-level environmental review process. The RTP is subject to CEQA and therefore is reviewed through the clearinghouses as well.

C. TRIBAL GOVERNMENT CONSULTATION

There are six federally recognized Native American tribes in the San Francisco Bay Area. MTC invites the tribes to conduct government-to-government consultation throughout the regional transportation planning process and the companion Transportation Improvement Program. MTC lays the groundwork for consultation early in the process of developing the regional transportation plan, and generally includes a "Tribal summit" for all six Tribal governments. MTC expresses to each tribe a willingness to conduct individual meetings at the tribe's convenience.

MTC board members and executive staff participate in consultation with the Tribal governments. MTC will conduct consultation and associated activities in locations convenient for the Tribal governments. Past meetings have been held in Sonoma County, where most of the Tribal governments are located.

The Tribal summit often will include MTC's partner agencies, the Association of Bay Area Governments, the state Department of Transportation and the appropriate congestion management agencies. The Tribal summit also may include facilitation by an individual or organization known to the Tribal governments.

The Tribal summit will include discussion about how the Tribal governments will participate in development of the long-range plan, as well as the companion TIP. The Tribal summit also serves to introduce the Tribal governments to MTC's partner agencies.

As a next step after the tribal summit, MTC encourages individual meetings with each tribal government throughout development of the regional transportation plan to discuss issues and concerns specific to each tribe. MTC offers to conduct consultation at a time and location convenient for the tribe, which may include attendance at meetings of the tribal council or committees. The governments also receive material from MTC throughout the RTP planning effort.

VI. Evaluation and Update of the Public Participation Plan

MTC's Public Participation Plan is not a static document, but an on-going strategy that will be periodically reviewed and updated based on our experiences and the changing circumstances of the Commission and the transportation community it serves.

As part of every public outreach and involvement program developed for the regional transportation plan, MTC will set performance measures for the effectiveness of the participation program and report on the results. These performance reports will serve to inform and improve future outreach and involvement programs, including future updates to this Public Participation Plan.

Additionally, MTC will periodically evaluate various components of the items identified under Section II, "Continuing Public Engagement," which form the core of MTC's public involvement activities.

This Public Participation Plan may be subject to minor changes from time to time. Any major updates will include a review by MTC's advisory committees, 45-day public comment period with wide release and notification of the public about the proposed changes, review by the Commission's Legislation Committee (a public meeting), and approval by the Commission. We will extend the public comment period by an additional 45 days in instances where major revisions are proposed in response to comments heard.

MTC Public Participation Plan
Appendix A

A Public Participation Plan for the 2017 Update to Plan Bay Area

Metropolitan Transportation Commission
Joseph P. Bort MetroCenter
101 Eighth Street, Oakland, CA 94607-4700

Approved: February 25, 2015

Also available in Chinese and Spanish
Other languages available upon request by calling 510.817.5757

請撥打電話 510.817.5757 來索取中文版公眾參與計劃的初稿。

Para solicitar una copia en español del
Borrador Preliminar del Plan para la Participación del Público llame al 510.817.5757.

A Public Participation Plan for



TABLE OF CONTENTS

I. Introduction 1

II. Developing an Update to Plan Bay Area..... 3

A. Plan Update Process & Schedule 3
B. Summary of Key Milestones 4

1. Policy Element

a) Goals 4
b) Performance Targets 5

2. Regional Forecasts

a) Population, Employment, Housing and Travel Demand Forecasts 6
b) Transportation Revenue Forecast 7

3. Project Performance

a) Call for Projects 8
b) Project Performance Assessment 9
c) Operations and Maintenance Need Assessments ..10

4. Scenario Analysis

a) Define and Evaluate Scenarios 10
b) Adopt Preferred Scenario 12

5. Draft and Final Plan

a) Draft & Final Environmental Impact Report 13
b) Title VI and Environmental Justice Analysis 13
c) Air Quality Conformity Analysis 14
d) Draft and Final Plan 14

III. Related Work 16

A. Tracking Performance.....16
B. Countywide Transportation Plans 16
C. Legal Settlements 17

IV. Public Engagement..... 18

A. Local Governments 18
B. General Public 19
C. Policy and Advisory Committees 20
D. Additional Outreach to Government..... 23

V. Public Participation Strategies 25

A. Voices from Underserved Communities 25
B. Other Partnerships 25
C. Participation Activities..... 26

VI. Public Participation Goals for Plan Bay Area.... 28

ATTACHMENTS

A. Key Milestones 2014-2017 31
B. Responsibilities & Roles..... 32

I. Introduction

In July 2013, the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) adopted Plan Bay Area, the first Regional Transportation Plan for the nine-county San Francisco Bay Area that also includes a Sustainable Communities Strategy as required by California Senate Bill 375 (2008). Per federal requirements, MTC must update the regional transportation plan every four years. This Appendix A to MTC's Public Participation Plan outlines the anticipated approach and schedule for the update of Plan Bay Area.

Senate Bill 375 gives MTC and ABAG joint responsibility for Plan Bay Area. In general, ABAG is responsible for land use and housing forecasts; MTC will forecast travel demand and transportation revenue. The legislation also states that the two agencies are jointly responsible for "set(ting) forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the greenhouse gas emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the greenhouse gas emission reduction targets approved by the state board."

Plan Bay Area focuses on where the region is expected to grow and what transportation investments will support that growth. The adopted Plan charts a course for accommodating anticipated growth while fostering an innovative, prosperous and competitive economy; preserving a healthy and safe environment; and allowing all Bay Area residents to share the benefits of vibrant communities connected by an efficient and well-maintained transportation network.

Although the federal guidelines require the Regional Transportation Plan to be updated every four years, the plans themselves are long-range plans, and many key policy priorities, projects and programs remain the same from one plan to the next. As ABAG and MTC look towards the 2017 update of the Plan, our approach for this planning cycle is to conduct a focused update of Plan Bay Area building off of the core framework established by the 2013 Plan.

PLAN BAY AREA UPDATED EVERY FOUR YEARS

One key difference between the 2013 Plan Bay Area and the 2017 update is that the 2017 update does not include the Regional Housing Needs Allocation (RHNA), which was required in 2013, and is expected to be included again in the 2021 Sustainable Communities Strategy.

Public Participation Plan

This appendix outlines the ways that ABAG and MTC will work to involve Bay Area residents and public officials in the 2017 update to Plan Bay Area. The process will promote an open, transparent process that encourages the ongoing and active participation of local governments and a broad range of community members.

The update to Plan Bay Area will require MTC and ABAG to work together with local governments, county congestion management agencies, public transit agencies, business and community groups, nonprofits, and interested residents to allow all who are interested have the opportunity to be involved. We invite all Bay Area residents to join in the dialogue to make our region a better, more livable place.

One key difference between the 2013 Plan Bay Area and the 2017 update is that the 2017 update does not include the Regional Housing Needs Allocation (RHNA), which was required in 2013, and is expected to be included again in the 2021 Sustainable Communities Strategy.

II. Developing an Update to Plan Bay Area

ABAG and MTC will complete the main work elements for the update to Plan Bay Area. In an effort to integrate transportation and land use planning with clean air and climate adaptation planning, the Bay Area Air Quality Management District (BAAQMD) and the Bay Conservation and Development Commission (BCDC) will provide support on the update. Local government participation is also vital; regional agencies will partner with cities and counties on this effort — including on public engagement. Outreach will highlight locally approved plans or policies for future growth, and illustrate how the regional planning process supports local priorities.

Local government participation is vital; regional agencies will partner with cities and counties on this effort — including on public engagement.

A. Plan Update Process & Schedule

Developing a multibillion-dollar, long-range plan for the nine-county San Francisco Bay region is not a simple task. The update will take place over two-and-a-half-years and involve four regional agencies, nine counties, 101 towns and cities, elected officials, planners, stakeholder organizations, the public and other interested residents. The many moving parts include goal setting, statutory and voluntary targets, land use forecasting, financial projections, project evaluation, scenario analysis and more. The figure below provides a high-level overview of the Plan development process. Public participation is critical to ensure an open process, in which all interested residents have the opportunity to offer input and share their vision for what the Bay Area will look like decades from now.

Plan Development Process



The process will need to be flexible and is subject to change, as needed, to reflect and respond to the input received as we move through the steps of updating Plan Bay Area. To help direct interested Bay Area residents and organizations to participate in key actions or decisions being taken, any changes as well as additional detail will be posted on the PlanBayArea.org website.

B. Summary of Key Milestones

This section describes key milestones along the path to developing the update to Plan Bay Area. For more detail also see Attachment A, Key Milestones 2014-2017, which illustrates the expected timing of decision making for the planning effort; and Attachment B, Responsibilities & Roles. For descriptions of advisory committees, please refer to Section IV, Public Engagement.

1. Policy Element

This task establishes goals and a performance framework for outcomes the region desires to achieve. The goals and performance framework for the update of the Plan will build off the 2013 Plan.

a. Goals

Before proposing a land use approach or recommending a transportation investment strategy, the two agencies will set regional goals to guide policy and investment decisions to help the region achieve its desired outcomes.

- *Opportunities for Input:* Evening public open houses; discussion at the Regional Advisory Working Group and MTC's Policy Advisory Council.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; adoption by MTC Commission and ABAG Executive Board.
- *Significance:* Regional goals will be used to guide policy direction and investment decisions.
- *Timeframe:* A first step toward the update. (See Attachment A.)

b. Performance Targets

Performance targets provide a framework from which we can measure and evaluate various land use scenarios and transportation investments and policies. Taken together, performance targets allow us to better understand how different projects and policies might affect the region's future. The current Plan Bay Area adopted in 2013 includes a complementary set of 10 performance measures (see table below).

Two of the 10 adopted Plan Bay Area targets are not only ambitious — they also are mandated by state law (SB 375). The first mandatory target requires the Bay Area to reduce its per-capita greenhouse gas emissions from cars and light-duty trucks by 15 percent by 2035. The second mandatory target addresses adequate housing by requiring the region to house 100 percent of its projected population growth.

The remaining targets are voluntary targets and were adopted though consultation with experts and the public. The targets focus on the economy, environment and equity, with additional metrics focused on the state of the region's transportation system. All 10 performance targets tied to the current adopted Plan are listed below. These targets may be revised for the Plan Bay Area update.

PLAN BAY AREA PERFORMANCE TARGETS

The first mandatory target requires the Bay Area to reduce its per-capita greenhouse gas emissions from cars and light-duty trucks by 15 percent by 2035.

The second mandatory target addresses adequate housing by requiring the region to house 100 percent of its projected population growth.

Performance Targets from Plan Bay Area, adopted July 2013

Climate Protection	• Reduce per-capita greenhouse gas emissions from cars and light-duty trucks by 15%
Adequate Housing	• Requires the region to house 100 percent of its projected population growth
A Prosperous and Globally Competitive Economy	• To increase the Bay Area's gross regional product (GRP) • Maintain the transportation system • Decrease automobile vehicle miles traveled per capita and increase non-auto mode share
A Healthy and Safe Environment	• Reduce premature deaths from air pollution • Reduce injuries and fatalities from collisions • Increase the amount of time people walk or cycle for transportation • Protect open space and agricultural lands
Equitable Access	• Decrease the share of low-income and lower-middle income residents' household income consumed by transportation and housing

- *Opportunities for Input:* Evening public workshops; discussion at the Regional Advisory Working Group, and MTC's Policy Advisory Council.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; approval from MTC Commission.
- *Significance:* Targets and metrics provide a framework to measure and evaluate various land use scenarios and transportation investments and policies.
- *Timeframe:* A first step toward the update. (See Attachment A.)

2. Regional Forecasts

ABAG and MTC track and forecast the region's demographics, transportation and economic trends to inform and guide Plan Bay Area investments and policy decisions. The forecasts provide a picture of what the Bay Area may look like in 2040, so that today's decisions align with tomorrow's expected transportation, business and housing needs. These forecasts form the basis for developing the regional land use plan, which is critical for the region's ability to forecast and analyze regional travel patterns and to develop the region's transportation investment strategy. For Plan Bay Area, ABAG is responsible for the land use forecasts, including jobs, housing and population forecasts; MTC is responsible for travel demand forecasts and analysis as well as developing the transportation revenue forecasts.

REGIONAL FORECASTS

For Plan Bay Area, ABAG is responsible for the land use forecasts, including jobs, housing and population forecasts; MTC is responsible for travel demand forecasts and analysis as well as developing the transportation revenue forecasts.

a. Population, Employment, Housing and Travel Demand Forecasts

The total regional jobs, housing and population forecasts provide essential information for the update to Plan Bay Area. ABAG will forecast regional employment by industry, population and households by age and income. This forecast will be built with several forecasting tools — including REMI (an econometric model), a demographic model developed by Meyers and Pitkin (USC), and a housing model developed by ABAG. These models will provide insights on the potential economic and demographic drivers for the Bay Area over the next 30 years. The forecast methodology and results will be reviewed by a technical advisory committee that includes regional agencies, consultants and scholars with substantial experience in regional analysis.

The 2017 update will not include the Regional Housing Needs Allocation (RHNA), which was required in 2013, and is expected to be included again in the 2021 Sustainable Communities Strategy.

MTC uses the population, employment and housing forecasts developed by ABAG to estimate and analyze regional travel patterns and demand on the transportation system and the resulting emissions.

- *Opportunities for Input:* Discussion at the Regional Advisory Working Group, ABAG's Regional Planning Committee, MTC's Policy Advisory Council.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; adoption by ABAG Executive Board.
- *Significance:* This technical work sets the stage for future analysis by identifying anticipated employment, population and housing growth.
- *Timeframe:* Forecasts are needed before scenario options are fully defined and evaluated. (See Attachment A.)

b. Transportation Revenue Forecast

The investment strategy for the update to Plan Bay Area will be based on an estimate of total transportation funding available looking forward at least 20 years, per federal requirements. MTC will work with partner agencies and use financial models to forecast how much revenue will be available for transportation purposes over the duration of the Plan. These forecasts are used to plan investments that fit within the "financially constrained" envelope of revenues that are reasonably expected to be available.

Under the current Plan Bay Area, revenue forecasts total $292 billion over the 28-year period, in year of expenditure dollars. Over two-thirds (68 percent) of these funds are from regional and local sources, including transit fares, dedicated sales tax programs, city and county revenues, and bridge tolls, among others. Making up the remainder are state and federal revenues (mainly derived from fuel taxes) and "anticipated" revenues, which are unspecified revenues that reasonably can be expected to become available within the Plan horizon.

- *Opportunities for Input:* Discussion at the Regional Advisory Working Group and the Policy Advisory Council.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee.
- *Significance:* This technical work sets the stage for future investment strategy, identifies transportation revenue expected to flow to region over the life of the plan (at least 20 years).
- *Timeframe:* Forecasts are needed before scenario options are fully defined and evaluated. (See Attachment A.)

3. Project Performance

This component identifies potential transportation projects; evaluates those projects to determine their cost-effectiveness and contribution toward achieving the Plan's adopted performance targets; provides information on what is needed to operate and maintain the region's transportation network; and considers the effects of the transportation projects on the region's low-income and minority populations.

a. Call for Projects

The Call for Projects allows public agencies to submit candidate transportation projects for consideration in the update to Plan Bay Area. Draft guidance for submitting projects will be released in advance of the initial call for projects. The initial step will be to update information for projects included in the 2013 Plan Bay Area. The submittal process will call for each county Congestion Management Agency (CMA) to coordinate the project submittal process for their respective county and provide public comment opportunities. Larger projects spanning multiple counties or that are regional in nature may be submitted by a public agency directly to MTC.

- *Opportunities for Input:* Discussion at the Regional Advisory Working Group, MTC's Policy Advisory Council and locally through county Congestion Management Agencies. Currently planned projects will be a topic at the Plan Bay Area evening public open houses, slated for May 2015.

- *Decision-Making Roles:* CMA boards will approve project listings from each county; MTC's Planning Committee will provide overall direction.
- *Significance:* Opportunity to submit transportation projects for consideration in the update to Plan Bay Area.
- *Timeframe:* Potential projects must be identified before scenario options are fully defined and evaluated. (See Attachment A.)

b. Project Performance Assessment

Plan Bay Area is also based on MTC's commitment to evaluate major transportation projects to make sure dollars are allocated to the most cost-effective projects that support the established goals and targets. MTC will again perform a project performance assessment on major projects across the region in order to evaluate projects on two criteria: benefit-cost ratio (which captures the project's cost-effectiveness) and a target score. The target score measures the contribution the project makes toward achieving the Plan's adopted performance targets, and also evaluates how well projects meet goals related to equity, the environment and the economy.

The Commission will use its policy discretion along with the project performance assessment results to decide which transportation projects and programs to include in the preferred transportation investment strategy.

- *Opportunities for Input:* Discussion at the Regional Advisory Working Group and the Policy Advisory Council; results of this assessment will be discussed at the second round of evening public meetings relating to planning scenarios (see page 12).
- *Decision-Making Roles:* Direction from MTC's Planning Committee; approval by MTC Commission.
- *Significance:* Provides information to use in deciding which projects and programs to include in the preferred transportation investment strategy.
- *Timeframe:* Potential projects are evaluated before scenario options are fully defined and evaluated; precedes any decision by ABAG and MTC on a preferred scenario for the Plan. (See Attachment A.)

c. Operations and Maintenance Need Assessments

Plan Bay Area's "fix it first" policy ensures the region directs a majority of funding to maintaining and operating the existing transportation system. The operations and maintenance needs assessment identifies the funding needed to operate and maintain the existing transportation network — including local streets and roads, the state highway system and public transit services. MTC staff work directly with staff from transit agencies and local streets and roads agencies to get information for the need assessments.

- *Opportunities for Input:* Discussion at Regional Advisory Working Group and MTC's Policy Advisory Council.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee.
- *Significance:* This technical evaluation will provide information on the funding needed to operate and maintain the region's transportation network.
- *Timeframe:* Precedes any decision by ABAG and MTC on a preferred scenario for the Plan. (See Attachment A.)

4. Scenario Analysis

With the goals and targets clearly identified, MTC and ABAG will formulate possible scenarios — combinations of land use patterns and transportation investments — that could be evaluated together to see if (and by how much) they achieve (or fall short of) the performance targets.

a. Define and Evaluate Scenarios

As part of the update to Plan Bay Area, ABAG and MTC will develop up to three land use and transportation scenarios that will provide options for distribution of the total amount of growth forecasted for the region to specific locations, coupled with different transportation investment strategies. These scenarios will seek to address the needs and aspirations of each Bay Area jurisdiction, while meeting Plan Bay Area performance targets to guide and gauge the region's future growth. The analysis of various scenarios will inform the development of a preferred alternative, both for transportation investments and a land use strategy as well as identify alternatives to analyze in the environmental review process.

The metrics identified earlier in the process (see Performance Targets, page 5) will be the basis of an analysis to gauge the effects of Plan Bay Area on the region's economy, environment, and low-income and minority populations.

- ***Economic Metrics*** seek to track the strength of the Bay Area's economy and business climate and provide a framework for evaluating the overall strength of the region's economy. The currently adopted Plan Bay Area seeks to increase gross regional product (GRP).

- ***Environmental Metrics*** measure impacts on public health and the natural environment from vehicle emissions, including greenhouse gasses and particle pollution. They also track open space preservation and active transportation.

- ***Equity Metrics*** provide a framework for evaluating equity concerns for the approximately one-fifth of the Bay Area's total population that live in areas with large numbers of low-income and minority populations. Promoting access to housing, jobs and transportation for these residents advances Plan Bay Area's objective to advance equity in the region; it also increases our chances of meeting the other performance targets. For the update to Plan Bay Area, the analysis of the equity metrics (including the supplemental equity analysis conducted for Plan Bay Area) will be fully integrated into the performance analysis of the scenarios rather than developed through a separate evaluation. To further address any issues related to low-income communities and communities of color, a Regional Equity Working Group will be established and meet as needed for the focused update to Plan Bay Area, drawing from membership of the Regional Advisory Working Group and MTC's Policy Advisory Council.

A number of potential transportation investments will be considered as part of the update to Plan Bay Area, but not all of these items will be funded due to limited resources. Likewise, a variety of policies will be considered to achieve the goals set earlier for the Plan. But which supporting policies will help the region achieve its goals? The tradeoffs considered in these decisions will be the focus of this component to the update of Plan Bay Area.

- *Opportunities for Input:* Topic at evening public workshops to allow public review and comment on the results of the analysis of the scenario alternatives. Discussion also at the Regional Advisory Working Group, MTC's Policy Advisory Council and ABAG's Regional Planning Committee.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; approval of land use distribution by ABAG Executive Board; and approval of transportation investment strategy by MTC Commission.
- *Significance:* The scenarios offer a regional-scale analysis for a package of investments and policies.
- *Timeframe:* Precedes any decisions by ABAG and MTC on a preferred scenario for the Plan. (See Attachment A.)

b. Adopt Preferred Scenario

Based on the results of the scenario and project performance assessments, ABAG and MTC will define a preferred scenario to advance to final environmental analysis. The preferred scenario will include a land use distribution, a transportation investment strategy and policies MTC and ABAG believe will best meet the goals and targets established early in the process.

- *Opportunities for Input:* Selection of Preferred Scenario follows the second round of evening public meetings that discussed the scenario options. Discussion at Regional Advisory Working Group, MTC's Policy Advisory Council and ABAG's Regional Planning Committee.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; adoption by MTC Commission and ABAG Executive Board.
- *Significance:* The Preferred Scenario pairs a single land use distribution that is a flexible blueprint for accommodating growth over the long term with a financially-constrained transportation investment strategy.
- *Timeframe:* Occurs after the second round of public meetings and before the detailed environmental review work can begin. (See Attachment A.)

5. Draft and Final Plan

a. Draft and Final Environmental Impact Report (EIR)

A programmatic environmental impact report on the Plan, including the preferred scenario and a limited set of alternatives, will identify the environmental impacts of the proposed long-range land-use changes and transportation investments and policies taken as a whole. A Draft EIR will be released for public comment and submitted to the appropriate resource agencies for review and comment.

- *Opportunities for Input:* A Notice of Preparation will be issued and a public scoping meeting(s) will be held to explain the environmental process and solicit early input on areas of concern. The Draft EIR will be the subject of three public hearings. Discussion at Regional Advisory Working Group, MTC's Policy Advisory Council and ABAG's Regional Planning Committee. A public comment period will be established for written and oral public comments, as per guidelines under the California Environmental Quality Act (CEQA); responses to comments will be in the Final EIR.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; approval from MTC Commission and ABAG Executive Board.
- *Significance:* Final set of actions leading to adoption of the updated Plan Bay Area.
- *Timeframe:* Final set of actions. (See Attachment A.)

PROGRAM EIR

A Program EIR is prepared on the Draft Plan and looks at the environmental impacts of proposed transportation investments and land use forecasts taken as a whole, as one large project, as required by the California Environmental Quality Act (CEQA).

b. Title VI and Environmental Justice Analysis

MTC and ABAG will conduct an equity analysis to satisfy federal requirements with respect to the metropolitan planning process. The analysis will measure both the benefits and burdens associated with the investments in the update to Plan Bay Area to determine that minority, limited English proficient and low-income communities share equitably in the benefits of the investments without bearing a disproportionate share of the burdens.

- *Opportunities for Input:* Discussion at Regional Advisory Working Group and MTC's Policy Advisory Council.
- *Decision-Making Roles:* Direction from MTC's Planning Committee.

- *Significance:* Provides information on the effects of Plan Bay Area on the region's minority, limited English proficient and low-income communities.
- *Timeframe:* Final set of actions. (See Attachment A.)

c. Air Quality Conformity Analysis

The air quality conformity analysis considers if the transportation projects in the financially constrained Plan Bay Area, taken together, do not cause new air quality violations, worsen existing air quality, or delay timely attainment of the federal air quality standards pertaining to ozone, carbon monoxide and particulate matter (PM2.5). The analysis is done to meet federal planning requirements in accordance with the latest U.S. Environmental Protection Agency transportation conformity regulations and the Bay Area Air Quality Conformity Protocol (MTC Resolution No. 3757).

- *Opportunities for Input:* Technical analysis will be discussed by the Regional Air Quality Conformity Task Force.
- *Decision-Making Roles:* Direction from MTC's Planning Committee; approval from MTC Commission.
- *Significance:* Final set of actions leading to adoption of the updated Plan Bay Area.
- *Timeframe:* Final set of actions. (See Attachment A.)

d. Draft and Final Plan

Release of the Draft Plan Bay Area will initiate another round of public meetings to gather comments on the draft in preparation for final Plan adoption. MTC and ABAG will seek input on the Draft Plan through a variety of methods.

Staff anticipates a concurrent release of the Draft EIR and Draft Plan Bay Area documents for 45-day and 55-day public comment periods, respectively. The Draft EIR analysis, together with input from the public on the Draft Plan, will inform the policy discussions and public dialogue leading to the Final Plan Bay Area adoption by both ABAG and MTC, anticipated to occur in June 2017.

- *Opportunities for Input:* The Draft Plan will be the subject of the third series of public meetings, including at least three public hearings. Discussion at Regional Advisory Working Group, MTC's Policy Advisory Council and ABAG's Regional Planning Committee.
- *Decision-Making Roles:* Direction from MTC's Planning Committee and ABAG's Administrative Committee; approval from MTC Commission and ABAG Executive Board.
- *Significance:* Final set of actions leading to adoption of the updated Plan Bay Area.
- *Timeframe:* Final set of actions. (See Attachment A.)

III. Related Work

A. Tracking Performance

At both the scenario and project levels, Plan Bay Area emphasizes performance. To complement this performance focus, a new, dynamic performance monitoring effort is underway.

Vital Signs Regional Performance Monitoring Initiative –
In coordination with regional partners, MTC is leading a new regional performance monitoring initiative to track regional progress toward key transportation, land use, environmental, and economic goals. Vital Signs will measure on-the-ground performance and help to inform the public and policymakers alike about critical regional trends. The results will provide an early look at progress towards regional objectives established in Plan Bay Area and help inform its update.

Vital Signs will focus on observed data and be updated annually. These results will be shared with the public through a new interactive performance monitoring portal, integrating maps and graphs to explore regional data and allowing the public to better understand the performance of their neighborhood or city in the broader regional context.

Performance results will be released in multiple phases, starting with transportation and land use metrics in early 2015. Additional Vital Signs metrics related to economic and environmental performance will be released through mid-2015.

B. Countywide Transportation Plans

Bay Area counties are authorized by state law to develop Countywide Transportation Plans on a voluntary basis, and the countywide plans are an integral part of Plan Bay Area. These long-range planning and policy documents assess transportation needs and guide transportation priorities and funding decisions for that county over a 20-25 year horizon. These countywide plans inform the transportation projects and programs that are forwarded to MTC for consideration in the region's long-range plan. Adopted countywide transportation plans in the Bay Area can be found at the links shown below. MTC's guidelines for

development of countywide plans by the county Congestion Management Agencies can be found here:

http://www.mtc.ca.gov/planning/ctp/RES-2120.pdf

Alameda County: Alameda County Transportation Commission
http://www.alamedactc.org/app_pages/view/795

Contra Costa County: Contra Costa Transportation Authority
http://ccta.net/sources/detail/11/1

Marin County: *No current plan*

Napa County: Napa County Transportation and Planning Agency
http://www.nctpa.net/vision-2040-project-overview

San Francisco County: San Francisco County Transportation Authority
www.sfcta.org/transportation-planning-and-studies/san-francisco-transportation-plan-2040-home

San Mateo County: City/County Association of Government of San Mateo County
http://ccag.ca.gov/programs/planning/countywide-transportation-plan/

Santa Clara County: Santa Clara Valley Transportation Authority
http://www.vta.org/projects-and-programs/planning/valley-transportation-plan-2040-vtp-2040

Solano County: Solano Transportation Authority
http://www.sta.ca.gov/Content/10054/ComprehensivePlans.html

Sonoma County: Sonoma County Transportation Authority
http://www.sctainfo.org/reports/Comprehensive_Transportation_Plan/2009%20Comprehensive%20Transportation%20Plan.htm

C. Legal Settlements

ABAG and MTC agreed to perform a number of activities associated with the 2017 update to Plan Bay Area and its companion programmatic Environmental Impact Report (EIR) as part of legal settlements. These activities include, but are not limited to, feasibility analyses, healthy infill guidelines and Priority Development Area performance assessment. The settlement agreements can be found online at http://planbayarea.org/plan-bay-area/legal-settlements.html.

IV. Public Engagement

In developing the update to Plan Bay Area, ABAG and MTC strive to promote an open, transparent process that encourages the ongoing and active participation of local governments and a broad range of interest groups and individuals from the general public. That will entail involving both government and non-government agencies, organizations and individuals in the multi-year planning effort.

A. Local Governments

A partnership with local governments — from elected officials to city managers, planning and public works directors, transit operators, and congestion management agencies — is critical to the update to Plan Bay Area. Local officials can provide the valuable context and specifics about local priorities, and explain how the regional plan supports these. One avenue for discussion with local government staff is through the Regional Advisory Working Group (RAWG), described below. In addition to the staff-to-staff discussions that will occur at the RAWG meetings, ABAG and MTC will work with members of their policy boards to coordinate meetings in each county with elected officials and local government staff. County Congestion Management Agencies (CMAs) provide a meeting structure that will also be used to discuss issues related to Plan Bay Area.

LOCAL CONTEXT

For public workshops, MTC and ABAG will seek partnerships with local and county government, Caltrans and other public agencies to explain the relationship of the regional plan to adopted local priorities for transportation and land use.

Regional Advisory Working Group (RAWG): Comprised of local government staff as well as staff from county Congestion Management Agencies, transit agencies and county health departments, the primary purpose of this ad hoc group is to enable MTC and ABAG staff to provide information to and receive input from local and county-level staff. Regular discussions on technical milestones will be held; the group will meet as needed. It is anticipated that the RAWG will meet approximately monthly throughout 2015 and early 2016.

The Regional Advisory Working Group has no set membership, its meetings are open to the public and representatives from other organizations, and any individuals interested in the development of Plan Bay Area are invited to participate and provide feedback. Because it is primarily a staff-to-staff group, RAWG meets during the workday. Meeting materials are posted on the Plan Bay Area website; meetings are audiocast over the Internet and archived on the web.

ABAG DELEGATE MEETINGS

An elected official from each city, town and county in the Bay Area serves as a delegate to ABAG's General Assembly. Shortly after adoption of Plan Bay Area in 2013, ABAG staff convened regular meetings of their ABAG delegates in each county to start an ongoing dialogue with these elected officials about the challenges in implementing Plan Bay Area and how ABAG could be of greater help.

To date, ABAG has held delegate meetings in San Mateo, Santa Clara, Alameda, Solano, Sonoma, Marin, Napa and Contra Costa counties with anywhere from five to 15 delegates in each meeting. These conversations are helping to inform ABAG and MTC about the challenges facing local jurisdictions as they seek to implement Plan Bay Area in ways that reflect their local land use controls as well as their unique assets and values. Some communities are focused on creating more open space and recreation areas for their residents while others seek to attract more jobs or create additional transportation and housing options for local families.

ABAG staff will conduct a second and third round of delegate meetings with elected officials in each county over the next two years to continue learning about local issues and challenges and to provide local officials an even greater voice in the shaping of the update to Plan Bay Area.

B. General Public

The general public has several avenues for ongoing participation in the development of the Plan.

- Key issues and policy matters will be presented at public meetings or open houses held in the evening. MTC and ABAG will hold a minimum of three public meetings in Alameda, Contra Costa, San Francisco, San Mateo and Santa Clara counties, and one or more meetings in the less populous Marin, Napa, Solano and Sonoma counties over the course of developing the Plan. Topics will include goals, alternative scenarios, and the Draft Plan and Draft Environmental Impact report, as detailed in Attachment A, Key Milestones 2014-2017.
- For public workshops, MTC and ABAG will seek partnerships with cities and counties, Caltrans and other public agencies to explain the relationship of the regional plan to adopted local priorities for transportation and land use.

- ABAG and MTC policy board meetings present another opportunity for the public to keep abreast of the Plan's development. The committees are described below.
- Additionally, ABAG and MTC both have advisory panels that meet on a regular basis. The Plan's development will be presented to these groups for discussion and comment. The committees are described below; meetings are open to the public.
- The public is invited to be an active participant in meetings of the Regional Advisory Working Group, where a wide range technical and policy issues will be discussed.
- The Plan Bay Area website (www.PlanBayArea.org) is another way for the public to stay informed on the progress of the update or participate in online surveys or comment forums.
- Regular updates will be sent to interested members of the public via electronic newsletters and email.

C. Policy & Advisory Committees

Regularly scheduled meetings of ABAG's and MTC's policy and advisory committees present another opportunity for interested members of the public — whether government or non-government — to stay involved. Meeting times and locations will be posted on the Plan Bay Area website. If unable to attend, meeting materials will be accessible via the Plan Bay Area website (www.PlanBayArea.org) as well.

Additionally, meetings of MTC's policy board are audiocast and archived at mtc.ca.gov/meetings/schedule/. ABAG's major meetings (Executive Board, Legislation and Governmental Organization Committee, Finance and Personnel Committee, Regional Planning Committee and General Assembly) are videotaped and available on regional-video.com/mtc-abag-video-index/ (YouTube) and also linked from ABAG's website abag.ca.gov/meetings/.

The ABAG Executive Board: ABAG's Executive Board carries out policies established by the General Assembly, which is composed of representatives of the Bay Area's 101 cities, towns and counties. ABAG's Executive Board makes operating decisions and controls expenditures and acts on recommendations from other Association committees. The 38 voting memberships on the Executive Board include elected officials reflecting population size of the nine counties, with non-

voting members representing state or federal agencies invited to serve at the pleasure of the Board. The Executive Committee meets the third Thursday of every other month, beginning in January, at 7 p.m. in the auditorium of the Joseph P. Bort MetroCenter.

ABAG General Assembly: ABAG's General Assembly meets twice a year (usually in April and October) and determines policy matters for the Association, including adoption of the annual budget and work program, and reviews major policy actions and recommendations of the Executive Board. General Assembly delegates from each member city and county and their alternates must be elected officials from the jurisdiction they represent — except for the City of San Francisco, where the mayor may appoint as his or her alternate any officer of that government. Each member city and county has one vote in the General Assembly; San Francisco is counted as both a city and county for the purposes of membership. Votes are tabulated separately for county representatives and for city representatives, with majority vote of each group required for action or adoption of policy recommendations.

Metropolitan Transportation Commission: MTC is guided by a 21-member policy board composed of local officials from the nine Bay Area counties, including two members who represent regional agencies — ABAG and the Bay Conservation and Development Commission — as well as three nonvoting members appointed to represent the U.S. Department of Housing and Urban Development, the U.S. Department of Transportation, and the California Department of Transportation. Sixteen of the voting commissioners are appointed by local elected officials in each county, including the mayors of the three most populous cities in the region — San Jose, San Francisco and Oakland. The Commission generally meets monthly on the fourth Wednesday of the month, at approximately 10 a.m., at MTC's offices in Oakland, in the Joseph P. Bort MetroCenter.

Joint ABAG and MTC Meetings: To more fully collaborate, the **MTC Planning Committee** and **ABAG's Administrative Committee** will meet jointly as needed to oversee development of the update to Plan Bay Area. At major planning milestones, staff will present a summary of key comments heard from public workshops, open houses, online forums, telephone polls and the like. ABAG's Administrative Committee submits reports and recommendations to the Executive Board or acts for the Executive Board in a month when the Board does not meet or in an emergency. MTC's Planning Committee considers issues related

to Plan Bay Area and other regional plans, state and federal air quality plans, corridor studies, as well as connections between transportation and land use.

Additionally, both the full MTC Commission and ABAG Executive Board will meet jointly at key milestones throughout the process.

ADVISORY COMMITTEES TO THE PLAN BAY AREA UPDATE

Joint Policy Committee: The Bay Area Joint Policy Committee (JPC) coordinates the planning efforts of ABAG and MTC, as well as the Bay Area Air Quality Management District (BAAQMD) and the Bay Conservation and Development Commission (BCDC). The JPC has 20 voting members (five each from the four regional agencies) who work on issues of interest to the four agencies, including climate change adaptation, regional economic development, renewable energy and Plan Bay Area.

MTC's Policy Advisory Council: The Policy Advisory Council is a 27-seat advisory panel established to advise MTC on transportation policies in the San Francisco Bay Area, incorporating diverse perspectives relating to the environment, the economy and social equity. This panel will be an active participant in the update to Plan Bay Area by providing input on regional planning efforts linking transportation, housing and land use plans to reduce greenhouse gas emissions. The Policy Advisory Council meets monthly, on the second Wednesday of the month, at 1:30 p.m. at MTC's offices in the Joseph P. Bort MetroCenter, Oakland.

ABAG's Regional Planning Committee: The Regional Planning Committee hears Bay Area planning issues of regional concern and makes recommendations to the ABAG Executive Board. The Regional Planning Committee includes 36 members, with a minimum of 18 elected officials from the nine Bay Area counties; representatives of the four regional agencies; and stakeholders representing a broad range of issues, including business, economic development, recreation/open space, environment, public interest, housing and labor; as well as representatives from ethnic minority groups and special districts. The Regional Planning Committee meets the first Wednesday of alternate months, from 1-3 p.m. in the Joseph P. Bort MetroCenter Auditorium, in Oakland.

The Bay Area Partnership: This group of top executives from Bay Area transit operators, county Congestion Management Agencies and public works

departments, as well as regional, state and federal transportation, environmental and land use agencies, advises MTC periodically on key planning issues, including Plan Bay Area. Staff level working groups meet occasionally on issues such as local roads, public transit and transportation finance.

The Active Transportation Working Group: The Active Transportation Working Group is an advisory group to MTC staff focused on bicycle and pedestrian policy to reduce crashes and encourage more people to use active modes. The group is comprised of staff members from local cities, transit agencies, county Congestion Management Agencies, advocacy groups, public health departments and other interested residents. They advise MTC staff on pedestrian and bicycle policy, funding, engineering and design issues. They meet approximately every other month at MTC's offices and will provide staff-level feedback as appropriate.

D. Additional Outreach to Government

FEDERAL, STATE AND OTHER GOVERNMENT AGENCIES AND NATIVE AMERICAN TRIBAL GOVERNMENTS

In addition to the local governments that will be involved in the update to Plan Bay Area, MTC and ABAG will consult with officials responsible for other types of planning activities that are affected by transportation in the area, such as federal and state conservation and historic preservation agencies. Consultation will be based on the agency's needs and interests. At a minimum, agencies will be informed about the process to develop the update and will be provided an opportunity to participate.

Consultation with the region's Native American governments also will occur. There are six federally recognized Native American tribes in the San Francisco Bay Area. MTC and ABAG will invite the tribes to participate in government-to-government consultation during development of the update to the Plan. The groundwork for consultation will occur early in the process of developing the regional transportation plan and will include a "Tribal summit" for all six Tribal governments. MTC and ABAG will also conduct individual meetings at each tribe's convenience.

STATUTORILY REQUIRED INPUT

As required by SB 375 legislation, at least two informational meetings in each county will be held for members of the county board of supervisors and city councils to review and discuss the Draft Plan and consider their input and recommendations. Notice of the meeting shall be sent to each city clerk and to the clerk of the board of supervisors. One informational meeting will be conducted if attendance at the one meeting includes county board of supervisors and city council members representing a majority of the cities representing a majority of the population in the incorporated areas of that county.

V. Public Participation Strategies

Development of the update to Plan Bay Area will be a multi-year effort. Public participation strategies for major milestones will be identified and posted on www.PlanBayArea.org. Detail for all milestones is described in Chapter 2, although it is important to note that this is an iterative process that is subject to change. Throughout each phase, ABAG and MTC will use a variety of participation techniques to engage a wide range of residents, as described in this Participation Techniques section.

A. Voices from Underserved Communities

The success of Plan Bay Area is dependent on all voices in the region being represented and involved. MTC and ABAG will take special effort to engage minority and low-income residents that do not typically participate in regional government planning efforts.

In order to seek out and consider the needs of those traditionally under-represented in the planning process, including minority, low-income and limited English proficient communities, a limited number of contracts will be provided to community non-profit organizations in communities of concern through a request for proposals (RFP) competitive process for assistance in engaging their residents. See MTC's Plan for Special Language Services to Limited English Proficient (LEP) Populations for more information on involving populations with limited-English proficiency.

B. Other Partnerships

To encourage partnerships with the many interested groups and to help reach out to and involve individuals, local government officials, and community organizations, a Plan Bay Area "tool kit" will be developed. The tool kit will include information to continue discussions with other interested members of the public, publicize comment opportunities and build general awareness for the long-range planning effort. We will build upon the networks of advisors and the work of partner agencies.

C. Participation Activities

The public participation efforts will include:

Advance Notice

- Develop details for the planning process and opportunities for public engagement in advance of each phase of the Plan Bay Area development — and post these details on www.PlanBayArea.org.
- Maintain an updated calendar of events on the Plan Bay Area website.
- Provide timely notice about upcoming meetings. Post agendas and meeting materials on the web one-week in advance of policy committee meetings or ad hoc advisory group meetings.
- Use a mailing list database to keep participants notified throughout the multi-year process (via e-mail or U.S. mail).
- Circulate a Draft Plan Bay Area or Alternative Planning Strategy, if one is prepared, for public review at least 55 days before the adoption of the Final Plan Bay Area.
- Work with media outlets to encourage news coverage in advance of meetings.

Meetings, Open Houses, Workshops, Public Hearings

- Provide opportunities for a discussion in each county on important issues surrounding how Plan Bay Area can better support local activities. Pursuant to state statute, MTC and ABAG will hold a minimum of three public meetings in Alameda, Contra Costa, San Francisco, San Mateo and Santa Clara counties, and one or more meetings in the less populous Marin, Napa, Solano and Sonoma counties.
- Promote a civil atmosphere at public meetings that provides an opportunity for all participant to speak free of disruptions and personal attacks.
- Host public meetings, open houses or workshops in convenient and accessible locations and at a variety of times (evenings, weekends, as well as weekdays).
- Hold at least three public hearings on the Draft Plan Bay Area or Alternative Planning Strategy, if one is prepared; hold the public hearings in different parts of the region to maximize the opportunity for participation by members of the public throughout the region.
- Use "visualization" techniques to communicate technical planning issues and strategies to the public, such as maps, videos, graphics, animation or computer simulation to depict alternatives under consideration.
- Provide a summary of comments heard at public meetings via www.PlanBayArea.org.

Internet/Social Media

- Use a single web address — www.PlanBayArea.org — so members of the public have a single place to go for current updates and to request to receive notices and information.
- Maintain an archive of past workshop meeting materials on the Plan Bay Area website.
- Offer interactive web polls, surveys, etc.
- Provide timely, easy-to-understand information on a website that is accessible, per the Americans with Disabilities Act.
- Use social media to reach and engage residents.

Media Outlets

- Issue press releases to media outlets, including ethnic, foreign-language and community media, to keep reporters apprised of progress and generate coverage on radio, television, newspapers and the Internet.
- Translate news releases about public meetings into Spanish and Chinese, or other languages as appropriate. ,.

Outreach to targeted groups

- Recruit "ambassadors" to help spread the word about public comment opportunities.
- Piggy-back on existing meetings in order to attract greater attendance and participation.
- Seek out and consider the needs of those traditionally under-represented in the planning process, including minority, low-income and limited English proficient communities.
- Provide assistance, if requested at least three working days prior to a meeting, to people with disabilities and language assistance to people with limited English proficiency. (Five or more days' notice is preferred.) Such requests may be made through the MTC Public Information Office at 510-817-5757.

Other

- Statistically relevant public opinion poll (also available in languages other than English).
- The methods ABAG and MTC will use to report progress on the Plan Bay Area update will include, but not be limited to, the web, e-mail updates, electronic and print newsletters, and local media outlets.

VI. Public Participation Goals for Plan Bay Area

People who take the time and energy to participate should feel it was worth their while to join in the discussion and debate. MTC, with assistance from ABAG, commits to the following goals and performance benchmarks to measure the effectiveness of the public participation program.

"What I want is to get done what the people desire to have done, and the question for me is how to find that out exactly."

—Abraham Lincoln

1. **Promote a transparent process:** MTC and ABAG should make every effort to make the often-complex planning process transparent so that the public has early and continuing opportunities to help shape policies and inform decisions.

2. **Encourage broad participation:** The process should include the greatest number of people possible from throughout the region and reflect the diverse Bay Area population, regardless of individuals' language, personal mobility or ability to attend a meeting, subject to available budget and resources.

3. **Engage for impact:** The feedback received through this Public Participation Plan should be analyzed and provided to policy makers in a timely manner to inform their decisions. Interested participants should be informed of actions by MTC and ABAG at key milestones throughout the planning process.

4. **Build knowledge:** This program is an opportunity for MTC and ABAG to inform a wide range of people about transportation and land-use issues in the Bay Area. Each step of the process should include an educational element to set context and promote increased understanding of the plan and relevant topics.

Targeted Performance Measures

MTC and ABAG will survey participants in an effort to inform and improve future outreach and involvement programs. Results from the survey and other data will be used to conduct an evaluation of Plan Bay Area public engagement at the conclusion of the planning process. Following are specific performance metrics that will be tracked:

1. Promote a transparent process

    - For each major technical planning milestone, develop user-friendly web content and/or handouts written in plain language explaining:

    - the purpose of the work
    - significance or impact on other plan elements
    - opportunities for public input
    - decision-making roles
- Produce user-friendly videos, interactive data visuals, maps and other graphic elements to help tell the story.

2. Encourage broad participation

- The demographics of targeted groups (age, ethnicity, income, primary language, geographic location, disability) roughly mirror the demographics of the Bay Area's population.
- Four thousand or more comments are logged on the Plan Bay Area update or associated documents.
- There are 100,000 visits or "page views" to the Plan Bay Area website.
- Online engagement options are available for those who are not able to attend meetings.
- Meetings are held in all nine counties, in central locations and accessible by public transit to the extent feasible.
- Meetings are linguistically accessible to 100 percent of participants, with three (3) working days' advance request for translation. (Meeting announcements offer translation services with advance request for translation services.)
- All meetings are accessible under the requirements of the Americans with Disabilities Act (ADA).
- Plan Bay Area or elements of it are mentioned in at least 200 radio or TV broadcasts, online forums and blogs, social media, newspaper articles, editorials, commentaries, or other printed media.

3. Engage for impact

- One hundred percent of written correspondence received is logged, analyzed and shared in a timely manner with staff and policy makers for consideration.
- One hundred percent of written correspondence is acknowledged.
- Policy decisions and other actions are summarized and reported back to the database of interested residents at key milestones in the process.

4. Build knowledge

- Sixty percent of participants surveyed “strongly agree or agree” with statements that rate Plan Bay Area public participation efforts provided:
    - Sufficient opportunity to comment/ask questions
    - Clear information at an appropriate level of detail
    - An opportunity to learn about transportation and land use issues
    - An opportunity to hear other perspectives and different points of view.

Plan Bay Area Update: Key Milestones 2014–2017

Attachment A

BayArea Plan

Milestones

Goals & Performance Targets — Policy Element

Jobs, Housing, Population, Travel Demand & Transportation Revenue — Forecasts

Transportation Projects & Programs Assessment — Project Performance

Alternative Land Use Distributions & Transportation Investment Strategies — Scenario Analysis

EIR & Plan — Plan Development

2014 | 2015 | 2016 | 2017

Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun

PLANNING MILESTONES

Local Government & Public Engagement

- Public Workshops (May–Jun 2015)
- Phone Poll (Jan 2016)
- Public Workshops (Mar–Apr 2016)
- Public Workshops (Feb–Mar 2017)

Policy Element

- Public Participation Plan (Nov 2014 – Apr 2015) ☑
- Goals (May – Jul 2015) ☑
- Performance Targets (Jul – Sep 2015) ☑

Regional Forecasts

- Regional Forecast Approach (Feb – Jul 2015)
- Methodology & Preliminary Forecast (Jul 2015 – Jan 2016) ☐
- Final Forecast (Jul 2015 – Jan 2016) ☑
- Transportation Revenue Forecast (Jun 2015 – Nov 2015) ☐

Project Performance

- Call For Projects (Apr – Sep 2015) ☐
- Project Performance Assessment (Sep 2015 – Jan 2016) ☑
- Operations & Maintenance Need Assessments (May – Nov 2015) ☐

Scenario Analysis

- Scenario Development Approach (Jul 2015 – Apr 2016)
- Release Defined Scenarios (Apr 2016) ☑
- Release Scenario/Targets Evaluation (Apr – Jul 2016)
- Adopt Preferred Scenario — Land Use Distribution & Transportation Investment Strategy (Jul 2016) ☑

Draft & Final Plan

- Release Air Qualilty Conformity and Title VI/EJ Analysis (Feb 2017)
- Conduct Air Qualilty Conformity and Title VI/EJ Analysis (Jan – Feb 2017) ☑
- Release Draft Plan & Draft EIR (Feb 2017) ☑
- Prepare Draft Plan and Draft EIR (Sep 2016 – Feb 2017) ☑
- Adopt Plan & EIR (Mar 2017) ☑

☐ ABAG/MTC Information

☑ ABAG/MTC Action

MTC Graphics.pb — 1.29.15

METROPOLITAN TRANSPORTATION COMMISSION

Association of Bay Area Governments

Attachment B – Responsibilities & Roles: 2017 Plan Bay Area

Major Tasks	Advisory				Decision-Making		
	A	B	E	F	G	H	I
	Partnership Board	Regional Advisory Working Group	Policy Advisory Council	Regional Planning Committee	MTC Planning Committee & ABAG Administrative Committee	Executive Board	Commission
	MTC	Joint	MTC	ABAG	Joint	ABAG	MTC
1. Policy Element							
Goals		●	●		☑	☑	☑
Performance Targets		●	●		☑		☑
2. Regional Forecasts							
Population/Employment/Housing Forecasts		●	●	●	☑	☑	
Transportation Revenue Forecast		●	●		●		
3. Project Performance	●						
Call For Projects		●	●		●		
Project Performance Assessment		●	●		☑		☑
Operations & Maintenance Needs Assessment		●	●		●		
4. Scenario Analysis	●						
Define & Evaluate Scenarios		●	●	●	☑	☑	☑
Adopt Preferred Scenario [Land Use Distribution+ Transportation Investment Strategy]		●	●	●	☑	☑	☑
5. Draft and Final Plan							
Draft EIR		●	●	●	☑	☑	☑
Draft Plan		●	●	●	☑	☑	☑
Air Quality Conformity Analysis		●	●		☑		☑
Final EIR		●	●	●	☑	☑	☑
Final Plan		●	●	●	☑	☑	☑

● Input/Information
☑ Action/Decision

NOTE: Information provided is tentative and subject to change.

Action items presented jointly to MTC's Planning Committee and ABAG's Administrative Committee may seek a recommendation from one or both committees.

APPENDIX A – 7

Regional Policies: Long-Range Planning / Plan Bay Area

Equity Analysis Report



EQUITY ANALYSIS REPORT



Plan BayArea 2040

FINAL SUPPLEMENTAL REPORT

Metropolitan Transportation Commission

Association of Bay Area Governments



JULY 2017



Metropolitan Transportation Commission

Jake Mackenzie, Chair
Sonoma County and Cities

Scott Haggerty, Vice Chair
Alameda County

Alicia C. Aguirre
Cities of San Mateo County

Tom Azumbrado
U.S. Department of Housing and Urban Development

Jeannie Bruins
Cities of Santa Clara County

Damon Connolly
Marin County and Cities

Dave Cortese
Santa Clara County

Carol Dutra-Vernaci
Cities of Alameda County

Dorene M. Giacopini
U.S. Department of Transportation

Federal D. Glover
Contra Costa County

Anne W. Halsted
San Francisco Bay Conservation and Development Commission

Nick Josefowitz
San Francisco Mayor's Appointee

Jane Kim
City and County of San Francisco

Sam Liccardo
San Jose Mayor's Appointee

Alfredo Pedroza
Napa County and Cities

Julie Pierce
Association of Bay Area Governments

Bijan Sartipi
California State Transportation Agency

Libby Schaaf
Oakland Mayor's Appointee

Warren Slocum
San Mateo County

James P. Spering
Solano County and Cities

Amy R. Worth
Cities of Contra Costa County

Association of Bay Area Governments

Councilmember Julie Pierce
ABAG President
City of Clayton

Supervisor David Rabbitt
ABAG Vice President
County of Sonoma

Representatives From Each County

Supervisor Scott Haggerty
Alameda

Supervisor Nathan Miley
Alameda

Supervisor Candace Andersen
Contra Costa

Supervisor Karen Mitchoff
Contra Costa

Supervisor Dennis Rodoni
Marin

Supervisor Belia Ramos
Napa

Supervisor Norman Yee
San Francisco

Supervisor David Canepa
San Mateo

Supervisor Dave Pine
San Mateo

Supervisor Cindy Chavez
Santa Clara

Supervisor David Cortese
Santa Clara

Supervisor Erin Hannigan
Solano

Representatives From Cities in Each County

Mayor Trish Spencer
City of Alameda / Alameda

Mayor Barbara Halliday
City of Hayward / Alameda

Vice Mayor Dave Hudson
City of San Ramon / Contra Costa

Councilmember Pat Eklund
City of Novato / Marin

Mayor Leon Garcia
City of American Canyon / Napa

Mayor Edwin Lee
City and County of San Francisco

John Rahaim, Planning Director
City and County of San Francisco

Todd Rufo, Director, Economic and Workforce Development, Office of the Mayor
City and County of San Francisco

Mayor Wayne Lee
City of Millbrae / San Mateo

Mayor Pradeep Gupta
City of South San Francisco / San Mateo

Mayor Liz Gibbons
City of Campbell / Santa Clara

Mayor Greg Scharff
City of Palo Alto / Santa Clara

Mayor Len Augustine
City of Vacaville / Solano

Mayor Jake Mackenzie
City of Rohnert Park / Sonoma

Councilmember Annie Campbell Washington
City of Oakland / Alameda

Councilmember Lynette Gibson McElhaney
City of Oakland / Alameda

Councilmember Abel Guillen
City of Oakland / Alameda

Councilmember Raul Peralez
City of San Jose / Santa Clara

Councilmember Sergio Jimenez
City of San Jose / Santa Clara

Councilmember Lan Diep
City of San Jose / Santa Clara

Advisory Members

William Kissinger
Regional Water Quality Control Board

Plan Bay Area 2040:
Final Equity Analysis Report

July 2017

METROPOLITAN TRANSPORTATION COMMISSION

Association of Bay Area Governments

Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105

(415) 778-6700	*phone*	(415) 820-7900
info@mtc.ca.gov	*e-mail*	info@abag.ca.gov
www.mtc.ca.gov	*web*	www.abag.ca.gov

Project Staff

Ken Kirkey
Director, Planning

Vikrant Sood
Project Manager and Primary Author

Harold Brazil, Shimon Israel,
Demographic Analysis, Travel and Air Quality Forecasting

Joshua Croff, Tom Buckley, Kearey Smith, Michael Ziyambi
GIS Analysis and Mapping

Duane Bay
Project Manager

Cynthia Kroll
Housing, Economic, and Land Use Forecasting

List of Tables

Table 2-1: Plan Bay Area 2040 Communities of Concern Thresholds 2-3
Table 2-2: Population, Households or Families within Communities of Concern, 2014 2-3
Table 2-3: Population in Communities of Concern, 2014 and 2040 2-4
Table 2-4: Population/Use-Based Analysis 2-8
Table 2-5: FTA Requirements for Title VI Analysis 2-9
Table 3-1: Communities of Concern and Remainder of the Region, 2014 3-2
Table 3-2: Bay Area Population by Race, 1990-2014 3-2
Table 3-3: Share of Bay Area Individuals in Low-Income Households by County, 1990-2014 3-5
Table 3-4: Share of Bay Area Seniors 75 Years and Over, Bay Area, 1990-2014 3-6
Table 3-5: Single-Parent Families by Race, Bay Area, 2000-2014 3-8
Table 3-6: Share of Zero-Vehicle Households by County, Bay Area, 1990-2014 3-10
Table 3-7: Share of People with Limited English Proficiency by County, Bay Area, 1990-2014 3-11
Table 3-8: Share of Severely Rent-Burdened Households by County, Bay Area, 1990-2014 3-12
Table 3-9: Share of Population with Disabilities by Age and County, Bay Area, 2014 3-13
Table 3-10: Share of Homes for Sale that are Affordable to the Middle Class 3-15
Table 3-11: Share of Bay Area Population and Mode of Transportation, 2014 3-17
Table 4-1: Share of Low-Income and Minority Population by Disadvantage, Bay Area, 2014 4-7
Table 4-2: Low-Income and Minority Population by Type of Opportunity Area, Bay Area, 2014 4-7
Table 4-3: Population in Households Earning Below 100 Percent FPL, Bay Area, 2000-2012 4-9
Table 4-4: Share of Low-Income and Minority Population Outside TPAs and PDAs, 2016 4-11
Table 4-5: Share of Low-Income Population in Concentrated Areas of Poverty, 2014 4-13
Table 4-6: Job Growth Projections by Wage Level 4-14
Table 5-1: Summary of Performance Results for EIR Alternatives 5-2
Table 5-2: Share of Population and System Usage by Subgroup 5-5
Table 5-3: Share of System Usage by Mode by Subgroup 5-6
Table 5-4: Share of Investment by Mode by Subgroup 5-7
Table 5-5: Summary of Population/Use-Based Analysis Results 5-7
Table 6-1: Sources of Funding by Mode of Transportation, Plan Bay Area 2040 6-1
Table 6-2: Summary of Population/Use-Based Analysis for Federal and State Transit Funding 6-2
Table 6-3: Disparate Impact Analysis Results, Population-Based 6-2
Table 6-4: Disparate Impact Analysis Results, Ridership-Based 6-3
Table 6-5: Summary of Environmental Justice Analysis Results for the Draft Plan 6-4
Table 6-6: Summary of Cumulative Benefits Analysis Results for the Draft Plan 6-5

List of Charts

Chart 3-A: Share of Bay Area Population by Race, 1990-2014 3-3
Chart 3-B: Number and Share of Individuals in Low-Income Households, Bay Area, 1990-2014 3-5
Chart 3-C: Median Household Income by Race, Bay Area, 2000-2014 3-6
Chart 3-D: Number and Share of Seniors 75 Years and Over, Bay Area, 1990-2014 3-7
Chart 3-E: Share of Seniors 75 Years and Over, Select Counties, Bay Area, 1990-2014 3-7
Chart 3-F: Share of Single-Parent Families by Race, Bay Area, 2000-2014 3-8
Chart 3-G: Number of Single-Parent Families by Race, Bay Area, 2000-2014 3-9
Chart 3-H: Number of Zero-Vehicle Households by County, Bay Area, 1990-2014 3-10
Chart 3-I: Number of People with Limited English Proficiency by County, Bay Area, 1990-2014 3-13
Chart 3-K: Number of People with Disabilities by County, Bay Area, 2014 3-14
Chart 3-L: Housing Supply and Median Home Price, Bay Area, 2000-2014 3-15
Chart 3-M: Housing Affordability by Income Categories, Bay Area, 2013 3-16
Chart 3-N: Share of Transit Ridership for Minority and Low-Income Populations, Bay Area 3-18
Chart 3-O: Share of Minority and Low-Income Riders by Transit Operator, Bay Area 3-19
Chart 3-P: Means of Transportation to Work, Workers, by Income, Bay Area, 2015 3-20
Chart 3-Q: Means of Transportation to Work, Low-Income Workers, Bay Area, 2015 3-20
Chart 3-R: Means of Transportation to Work, White and Minority, Bay Area, 2015 3-21
Chart 3-S: Means of Transportation to Work by Race/Ethnicity, Bay Area, 2015 3-21
Chart 3-T: Means of Transportation to Work, Minority Workers, Bay Area, 2015 3-22
Chart 3-U: Median Earnings by Mode of Travel, Bay Area, 2015 3-23
Chart 4-A: Racial/Ethnic Makeup and CalEnviroScreen Deciles, Bay Area, 2015 4-3
Chart 4-B: Share of Population by Jurisdiction Type, Bay Area, 1970-2015 4-10
Chart 4-C: Share of Low-Income Population by Jurisdiction Type, Bay Area, 2000-2015 4-10
Chart 5-A: Share of Plan Bay Area 2040 Investments by Mode 5-6

List of Maps

Map 1. Communities of Concern
Map 2. Communities of Concern – Level of Disadvantage
Map 3. Low-Income and Minority Population 2000
Map 4. Low-Income and Minority Population 2014
Map 5. Minority Population 2000
Map 6. Minority Population 2014
Map 7. Change in Minority Population 2000-2014
Map 8. Change in White Population 2000-2014
Map 9. Change in African American/Black Population 2000-2014
Map 10. Change in Asian and Pacific Islander Population 2000-2014
Map 11. Change in Hispanic/Latino Population 2000-2014
Map 12. Low-Income Population 2000
Map 13. Low-Income Population 2014
Map 14. Change in Low-Income Population 2000-2014
Map 15. Senior Population 2000
Map 16. Senior Population 2014
Map 17. Change in Senior Population 2000-2014
Map 18. Single-Parent Families 2000
Map 19. Single-Parent Families 2014
Map 20. Change in Single-Parent Families 2000-2014
Map 21. Zero-Vehicle Households 2000
Map 22. Zero-Vehicle Households 2014
Map 23. Change in Zero-Vehicle Households 2000-2014
Map 24. Limited English Proficiency Population 2000
Map 25. Limited English Proficiency Population 2014
Map 26. Change in Limited English Proficiency Population 2000-2014
Map 27. Severely Rent-Burdened Households 2000
Map 28. Severely Rent-Burdened Households 2014
Map 29. Change in Severely Rent-Burdened Households 2000-2014
Map 30. Disabled Population 2014

List of Maps (contd.)

Map 31. Jobs-Housing Fit Ratio
Map 32. Estimated Daily Truck Volume and Communities of Concern
Map 33. Other Disadvantaged Areas
Map 34. High Opportunity Areas
Map 35. Low-Income and Minority Areas within Transit Priority Areas 2009
Map 36. Low-Income and Minority Areas within Transit Priority Areas 2016
Map 37. Communities of Concern and Transit Priority Areas 2016
Map 38. Bay Area Employment Centers 2006
Map 39. Bay Area Employment Centers 2016
Map 40. Walkability 2006
Map 41. Walkability 2017
Map 42. Displacement Risk
Map 43. Transit Projects and Communities of Concern
Map 44. Rodway Projects and Communities of Concern

Table of Contents

Chapter 1. Introduction

Senate Bill 375 1-1
Legal and Policy Context 1-1
Title VI of the Civil Rights Act of 1964 1-1
Environmental Justice Executive Order 12898 1-2
Plan Development Process 1-5
Goals and Performance Targets 1-5

Chapter 2. Methodology

Analysis Methodology 2-1
Populations and Geographies 2-1
Equity Measures 2-4
Regional Trends Analysis 2-5
Scenario Alternatives 2-6
Transportation Investment Analysis 2-7
Title VI Analysis 2-9
Environmental Justice Analysis 2-10
Data Sources 2-11

Chapter 3. Regional Trends

Demographic Characteristics 3-1
Housing 3-14
Transportation 3-17

Chapter 4. Additional Research Focus Areas

Environment 4-1
Economy 4-4

Chapter 5. Analysis Results

Analysis of Equity Measures 5-1
Transportation Investment Analysis 5-4

Chapter 6. Title VI and Environmental Justice

Title VI Analysis and Results 6-1
Environmental Justice Analysis and Results 6-3
Cumulative Benefits of the Draft Plan 6-4

Chapter 7. Next Steps

Transportation Plans, Programs and Investments 7-1
State and Federal Support 7-4
Next Equity Analysis 7-5

Chapter 1. Introduction

This report summarizes key findings from the equity analysis for Plan Bay Area (PBA) 2040, the combined Sustainable Communities Strategy (SCS) and Regional Transportation Plan (RTP) for the San Francisco Bay Area. The analysis includes both the federally-required disparate impact and non-discrimination (Title VI) and environmental justice analyses, as well as an analysis of the overall performance of PBA 2040 based on equity measures adopted by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The equity analysis for PBA 2040 demonstrates MTC's compliance as a metropolitan planning organization (MPO) with federal requirements related to Title VI and environmental justice in the RTP development process. It also helps policymakers, local jurisdictions and the public understand the equity-related implications of implementing PBA 2040 on the region's disadvantaged communities. This report is one of several activities supporting regional equity objectives that MTC and ABAG to carry out as part of their regional planning efforts. Other activities range from public outreach to technical analysis, policy and program development, and implementation and monitoring.

Senate Bill 375

PBA 2040 is the second RTP to be developed with an SCS under California State Senate Bill (SB) 375,[1] which went into effect in 2009 to help achieve reductions in greenhouse gas (GHG) emissions to levels established by the California Air Resources Board and mandated under Assembly Bill 32. The Bay Area's per capita GHG emission targets are a 7 percent reduction by 2020 and 15 percent reduction by 2035 from 2005 levels. The primary purpose of SB 375 is to integrate land use and transportation planning to help lower GHG emissions and vehicle miles traveled through the development of an SCS that links future development, including housing for all income categories, with the region's transportation investments.

Legal and Policy Context

The contents of this report are intended to satisfy several federal requirements as well as regional policy objectives outlined in this section. At the federal level, requirements include: civil rights protections against discrimination in federally-funded programs on the basis of a person's race, color, or national origin; and federal environmental justice objectives aimed at avoiding disproportionately high and adverse effects on minority and low-income populations. At the regional level, MTC has adopted environmental justice principles that incorporate social equity throughout the agency's regional planning efforts, including PBA 2040. The following sections describe each set of the requirements.

Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 states that "[n]o person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."[2] Title VI further authorizes federal agencies that make grants (for example, the U.S. Department of Transportation [DOT]) to develop compliance guidance for its recipients.

[1] For more information on the bill, see: https://www.arb.ca.gov/cc/sb375/sb375.htm.
[2] Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d et seq. See: https://www.justice.gov/crt/fcs/TitleVI-Overview.

MTC's Roles and Responsibilities

As a recipient of DOT funds, MTC is responsible for complying with DOT regulations related to Title VI[3] (see feature on page 1-4). In October 2012, the Federal Transit Administration (FTA) issued a new Circular with guidance to its recipients for compliance with DOT Title VI requirements.[4] This guidance lays out requirements for FTA's recipients, including MPOs such as MTC, to ensure that their programs, policies and activities comply with DOT's Title VI regulations. The guidance offers several specific requirements that MPOs must submit to the state and FTA as part of their overall Title VI programs, including:

- "All general requirements set out in [the General Requirements section of] the Circular;
- "A demographic profile of the metropolitan area that includes identification of the locations of minority populations in the aggregate;
- "A description of the procedures by which the mobility needs of minority populations are identified and considered within the planning process;
- "Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data … and charts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes…; and
- "An analysis of impacts identified in [the bullet above] that identifies any disparate impacts on the basis of race, color, or national origin, and, if so, determines whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact."[5]

The methodology for conducting the analysis to meet these requirements is included in Chapter 2. In addition to analyzing PBA 2040 as described in this report, MTC's Title VI program includes a variety of commitments to ensure nondiscrimination on the basis of race, color or national origin in its programs and activities.[6]

Environmental Justice Executive Order 12898

In 1994, President Clinton signed Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* which directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…"[7] Furthermore, the Executive Order directs each federal agency to develop an agency-wide environmental justice strategy.

Accordingly, the DOT issued its original Environmental Justice Order in April 1997, establishing its overall strategy and procedures to comply with EO 12898. In response to a Memorandum of Understanding on Environmental Justice (August 4, 2011) signed by heads of federal agencies, DOT issued its revised environmental justice strategy, DOT Order 5610.2(a), in March 2012.[8] This updated

[3] Part 21—Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964. 49 CFR Subtitle A. See: https://www.gpo.gov/fdsys/pkg/CFR-2012-title49-vol1/pdf/CFR-2012-title49-vol1-part21.pdf.
[4] Federal Transit Administration Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients. See: https://www.transit.dot.gov/regulations-and-guidance/civil-rights-ada/title-vi-civil-rights-act-1964.
[5] FTA Circular 4702.1B, Chapter VI-3, page VI-1f. See: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf.
[6] For more information, see MTC's Title VI page at: http://mtc.ca.gov/about-mtc/access-everyone/civil-rights-act-file-complaint.
[7] Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Code of Federal Regulations, Title 3 (1994). See: https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf.
[8] Memorandum of Understanding on Environmental Justice and Executive Order 12898. See:

DOT Order places responsibility on the head of each Operating Administration within DOT to determine whether programs, policies or activities for which they are responsible will have an adverse human health or environmental effect on minority and low-income populations and whether that adverse effect will be disproportionately high.

As operating administrations within DOT, FTA and the Federal Highway Administration (FHWA) both define three fundamental environmental justice principles consistent with the Executive and DOT Orders:[9]

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The DOT Order further defines "disproportionately high and adverse effect on minority and low-income populations" as an adverse effect that:

- Is predominately borne by a minority and/or a low-income population, or
- Will be suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority and/or non-low-income population.

In June 2012, FHWA released a new and updated Order 6640.23A, *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.[10] This Order clarifies FHWA's environmental justice policies, guidance, and responsibilities consistent with the updated DOT Order. In August 2012, FTA released its final guidance in the form of a Circular on incorporating environmental justice principles into plans, projects and activities that receive funding from FTA.[11]

This final guidance provides recommendations to recipients of FTA funds, including metropolitan planning organizations, on how to fully engage environmental justice populations in the public transportation decision-making process; how to determine whether environmental justice populations would be subjected to disproportionately high and adverse human health or environmental effects as a result of a transportation plan, project or activity; and how to avoid, minimize or mitigate these effects.

MTC's Environmental Justice Principles

In addition to MTC's long-standing commitment to supporting DOT, FHWA and FTA in fulfilling their environmental justice mission under EO 12898, MTC's commitment to environmental justice is embodied in two Environmental Justice Principles adopted by the MTC Commission in 2007.

The adopted principles affirm MTC's ongoing commitments to:

- Create an open and transparent public participation process that empowers low-income communities and communities of color to participate in decision-making that affects them; and
- Collect accurate and current data essential to defining and understanding the presence and extent of inequities, if any, in transportation funding based on race and income.

---

https://www.epa.gov/environmentaljustice/memorandum-understanding-environmental-justice-and-executive-order-12898.

[9] "Environmental Justice at Department of Transportation," Federal Highway Administration. See: http://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/.

[10] FHWA Order 6640.23A, available at: http://www.fhwa.dot.gov/legsregs/directives/orders/664023a.cfm.

[11] FTA Circular 4703.1, Environmental Justice Policy Guidance for Federal Transit Administration Recipients, available at: http://www.fta.dot.gov/legislation_law/12349_14740.html.

U.S. Department of Transportation Title VI Regulations

Specific discriminatory actions prohibited under Title VI regulations include:

(a) A recipient under any program to which this part applies may not, directly or through contractual or other arrangements, on the grounds of race, color, or national origin:

i. Deny a person any service, financial aid, or other benefit provided under the program;

ii. Provide any service, financial aid, or other benefit to a person which is different, or is provided in a different manner, from that provided to others under the program;

iii. Subject a person to segregation or separate treatment in any matter related to his receipt of any service, financial aid, or other benefit under the program;

iv. Restrict a person in any way in the enjoyment of any advantage or privilege enjoyed by others receiving any service, financial aid, or other benefit under the program;

v. Treat a person differently from others in determining whether he satisfies any admission, enrollment, quota, eligibility, membership, or other requirement or condition which persons must meet in order to be provided any service, financial aid, or other benefit provided under the program;

vi. Deny a person an opportunity to participate in the program through the provision of services or otherwise or afford him an opportunity to do so which is different from that afforded others under the program; or

vii. Deny a person the opportunity to participate as a member of a planning, advisory, or similar body which is an integral part of the program.

(b) A recipient, in determining the types of services, financial aid, or other benefits, or facilities which will be provided under any such program, or the class of person to whom, or the situations in which, such services, financial aid, other benefits, or facilities will be provided under any such program, or the class of persons to be afforded an opportunity to participate in any such program; may not, directly or through contractual or other arrangements, utilize criteria or methods of administration which have the effect of subjecting persons to discrimination because of their race, color, or national origin, or have the effect of defeating or substantially impairing accomplishment of the objectives of the program with respect to individuals of a particular race, color, or national origin.

MTC's Roles and Responsibilities

FTA's annual Master Agreement requires recipients, including MTC, to promote environmental justice by following FTA's compliance with EO 12898 and DOT's order on environmental justice. MTC fulfills these responsibilities through a range of programs and activities including:

- Identifying mobility needs of low-income and minority communities through MTC's Community-Based Transportation Planning Program;
- Developing and implementing MTC's Public Participation Plan, which lays out specific strategies for engaging low-income and minority populations and other traditionally underrepresented stakeholders throughout the metropolitan planning process;
- Conducting an environmental justice analysis of the RTP (as summarized in this report), including an analysis of the distribution of regional transportation investments for low-income and minority populations, and an analysis of benefits and burdens, using equity measures to determine whether the proposed investment strategy results in any disproportionately high and adverse human health and environmental effects on low-income and minority populations; and
- Continually refining and updating the data and analytical methods required to carry out environmental justice analysis at the regional, programmatic level, incorporating both stakeholder feedback and ongoing improvements in analytical tools and data collection.

Additional information on these and other activities as they relate specifically to PBA 2040 is provided in the following section.

Plan Development Process

Equity is one of the three overarching themes in PBA 2040. The three themes are equity, environment, and economy, or the "three Es" of sustainability. To realize all three themes, PBA 2040 was developed with meaningful and extensive participation of key stakeholders that range from community-based advocates and labor organizations to public agencies, business groups and individual residents. These engagement activities are described below.

Stakeholder Involvement

MTC and ABAG have a variety of practices and policies in place to ensure full and fair participation of all residents and stakeholder groups in the PBA 2040 update process, and specifically to identify needs and priorities of low-income, minority and underserved communities.

MTC's Public Participation Plan

In February 2015, MTC adopted an update to the region's Public Participation Plan, to guide agency outreach and public involvement efforts throughout the development of PBA 2040.[12]

This plan outlined several initiatives to support engagement with low-income and minority communities, including:

- Three rounds of equity analysis to incorporate equity considerations throughout the plan development process, including an assessment of project performance, an analysis of proposed plan scenarios, and an analysis of the preferred alternative; and
- Multiple rounds of outreach to low-income, minority and traditionally underrepresented communities via partnerships with community-based organizations, both early in the plan development process and again prior to adoption of the preferred alternative.[13]

Regional Equity Working Group

In spring 2015, MTC and ABAG staff solicited participation by members of MTC's Policy Advisory Council (PAC) and the MTC/ABAG Regional Advisory Working Group in the formation of a Regional Equity Working Group (REWG). The group first convened in May 2015 and has met frequently throughout the planning process. The primary purpose of the REWG is to advise MTC and ABAG staff on the development of the equity analysis, including identifying equity measures, defining communities of concern and developing the methodology for assessment. The REWG brought together stakeholders from around the region representing low-income and minority communities; seniors and persons with disabilities; staff representing local jurisdictions, transit agencies and county congestion management agencies (CMAs); public health departments; and community-based organizations and advocacy groups. All REWG meetings are open to the public.

Goals and Performance Targets

MTC and ABAG rely on a performance-based approach to long-range planning and forecasting activities, including indicators such as impacts on disadvantaged communities. For PBA 2040, the performance targets were developed with extensive input from the Performance Working Group, which was composed of key stakeholders including members of MTC's PAC, staff from CMAs and local jurisdictions, transit operators, community groups, business organizations, and environmental protection groups, among others. The targets were used to compare scenarios, highlight tradeoffs between goals,

[12] For more information on MTC's Public Participation Plan, see http://mtc.ca.gov/sites/default/files/FINAL_Combined-2015_PPP_and_Appendix_A.pdf.

[13] A summary of input received during the winter 2012 community-based-organization outreach efforts can be found at: http://www.planbayarea.org/previous-plan/final-supplementary-reports-and-additional-resources.

analyze proposed investments and flag issue areas where the plan may fall short.

The goals for PBA 2040 were adopted by MTC and ABAG in September 2015. In September and November 2015, the two agencies also adopted a total of 13 performance targets.[14] Two of these 13 performance targets, reducing per capita greenhouse gas emissions from passenger vehicles by 15 percent and housing future population growth in the region, are statutory requirements. The remaining 11 targets address healthy and safe communities, open space protection, equity, economic vitality and transportation system effectiveness. Six of the 13 targets are directly tied to equitable outcomes and form the basis for conducting the equity analysis. These six targets are referred to as equity measures in this report. (see Chapter 2 for more details).

[14] For more information on the performance targets and the overall Plan Bay Area 2040 performance assessment, see: http://www.planbayarea.org/2040-plan/plan-details/goals-and-targets.

Chapter 2. Methodology

In January 2016, the MTC Commission adopted Resolution 4217, which defines the equity analysis framework for Plan Bay Area (PBA) 2040.[15] The framework defines Communities of Concern (CoCs) and describes the various qualitative and quantitative analyses for the plan. Components of the equity framework are described in this chapter.

Analysis Methodology

The primary purpose of the equity analysis is to estimate the distribution of benefits and burdens of proposed land use and transportation policies and projects on disadvantaged communities, and to assess whether these benefits and burdens are shared equitably across all population groups. This chapter summarizes the various definitions and methodologies used by MTC and ABAG to identify disadvantaged populations, establish metrics to assess potential benefits and burdens, and conduct quantitative and qualitative analyses.

The analysis is conducted for the Draft Plan as well as three additional scenario alternatives being studied in the Environmental Impact Report (EIR).[16] For the analysis, the Draft Plan and other scenarios are compared to a "No Project Alternative" using six equity measures identified later in this chapter. The relative impacts of each alternative are measured over a defined time period – in the case of PBA 2040, the time period is 2010[17] to 2040, where 2010 is considered the baseline year and 2040 the plan horizon year. The No Project Alternative, also analyzed over this time period, refers to a scenario where the Draft Plan is not adopted. This comparison between scenarios and a No Project Alternative is intended to capture the specific impacts of adopting the Draft Plan versus no action, as required by state and federal environmental protection laws.

This report summarizes the results from the following four types of analysis:

- Quantitative analysis of potential benefits and burdens of proposed land use and transportation policies and projects (scenarios) on disadvantaged communities based on six performance factors (the equity measures), using outputs from land use and transportation models and forecasts;
- Quantitative analysis of the share of potential benefits of proposed transportation investments that accrue to low-income and minority populations compared to non-low-income and non-minority populations, using demographic and travel survey data;
- Qualitative analysis of the share of potential benefits of proposed transportation projects that accrue to communities of concern and minority populations compared to the rest of the region and non-minority populations, using a mapping tool; and
- Quantitative analysis to demonstrate compliance with Title VI and environmental justice laws. The findings from these analyses are summarized in Chapters 5 and 6.

Populations and Geographies

The underlying methodology for conducting an equity analysis for the Draft Plan relies on a comparison of benefits and burdens of proposed policies and investments on different population groups (minority

[15] MTC Resolution 4217, available at: https://mtc.legistar.com/LegislationDetail.aspx?ID=2542165&GUID=D89FCABA-8814-4F0C-990D-B6803291A4D5.
[16] For more information on the Draft Plan EIR, see: http://www.planbayarea.org/2040-plan/environmental-impact-report.
[17] For a limited number of measures, the baseline year is 2005.

vs. non-minority and low-income vs. non-low-income populations), and across different geographies (communities of concern vs. the remainder of the region). The section below defines these populations and geographies.

Minority Populations

The Bay Area is a "majority minority" region, where non-Hispanic Whites are not an absolute majority (they do not constitute more than 50 percent of the total population), even though they form the largest group in the region. This report uses the term "minority" primarily for maintaining consistency with the federal definition of disadvantaged populations.

Minority populations include persons who identify as any of the following groups as defined by the Census Bureau[18] in accordance with guidelines provided by the U.S. Office of Management and Budget.

- American Indian or Pacific Islander Alone (non-Hispanic/non-Latino);
- Asian Alone (non-Hispanic/non-Latino);
- Black or African-American Alone (non-Hispanic/non-Latino);
- Hispanic or Latino of Any Race;
- Native Hawaiian or Pacific Islander Alone (non-Hispanic/non-Latino); and
- Other (Some Other Race, Two or More Races).

All residents who identify as Hispanic or Latino, even if they also identify with another race, are considered Hispanic or Latino. The "Non-minority" population therefore consists of persons who identify as non-Hispanic Whites or "White alone."

Low-Income Persons and Households

MTC defines persons as low-income if they live in a household with incomes less than 200 percent of the federal poverty level established by the Census Bureau. MTC established the 200 percent threshold in 2001 to account for the Bay Area's high cost of living relative to the rest of the country.[19] The Census Bureau establishes poverty status for individuals based on a combination of an individual's household composition, size and income in the Bay Area. In 2015, 100 percent of the federal poverty level was $11,770 a year for a single person living alone, and approximately $24,250 a year for a family of four.[20]

The federal poverty level provides a reasonable benchmark to understand trends over time relative to the share of population that may be considered low-income. However, because the actual income thresholds for poverty are determined each year, it is hard to forecast the share of population below the threshold in future years. Therefore, for modeling and forecasting applications, MTC uses a different definition of low-income households, as described below.

For MTC's travel model (see description of MTC Travel Model One under the Data Sources section later in the chapter), households that earn $30,000 or less per year (in 2000 dollars)[21] are considered low-income, which represents about a quarter of all households in the region. In comparison, households that earn $100,000 or more per year (in 2000 dollars) are considered high-income, which also represents about a quarter of all households. For MTC's assessment of transportation investments, households that earn $50,000 or less per year (in 2006 dollars)[22] are considered low-income. The different definitions of

[18] For Census Bureau's definitions for race and ethnicity, see: http://www.census.gov/topics/population/race/about.html.
[19] The Census Bureau is working with other federal agencies toward development of a new Supplemental Poverty Measure (SPM). The SPM extends the information provided by the official poverty measure by including many of the government programs designed to assist low-income families and individuals that are not included in the current official poverty measure, and to account for other identified shortcomings of the current "official" poverty measure. See: https://www.census.gov/content/census/en/library/publications/2016/demo/p60-258.html.
[20] See the federal poverty level for 2015 here: https://aspe.hhs.gov/2015-poverty-guidelines#threshholds.
[21] The income is inflated based on the official inflation rate for each year since 2000.
[22] The regional Transit Passenger Demographic Survey collected information on income in 2006, which is one of several data

low- income households were established by the respective agencies that collected the underlying data (also see the Data Sources section later in the chapter). MTC will continue to work with these agencies to adopt more consistent definitions for low-income households in future data collection efforts.

Communities of Concern

MTC defines communities of concern (CoCs) as census tracts that have a concentration of both minority and low-income residents, or that have a concentration of low-income residents and any three or more of the following six disadvantage factors: persons with limited English proficiency,[23] zero-vehicle households, seniors aged 75 years and over, persons with one or more disability, single-parent families,[24] and renters paying more than 50 percent of their household income on housing.[25]

Table 2-1: Plan Bay Area 2040 Communities of Concern Thresholds

Disadvantage Factor	Share of Regional Population 2009	Share of Regional Population 2014	Concentration Threshold*
Minority	**54%**	**59%**	**70%**
Low-Income	**23%**	**25%**	**30%**
Limited English Proficiency	9%	9%	20%
Zero-Vehicle Household	9%	10%	10%
Senior	6%	6%	10%
People with a Disability	18%	9%	25%
Single-Parent Family	14%	14%	20%
Cost-Burdened Renter	10%	11%	15%

Source: 2005-2009 and 2010-2014 American Community Survey 5-Year Average, MTC analysis.
** Concentration thresholds are higher than the regional mean (average) but below one standard deviation.*

Table 2-2: Population, Households or Families within Communities of Concern, 2014

	Communities of Concern			Remainder of the Region			Region	
	Share within CoCs		% of CoCs	Share outside CoCs		% of RoR		
Minority	1,414,908	33%	83%	2,890,820	67%	51%	4,305,728	59%
Low-Income	797,603	43%	47%	1,040,227	57%	18%	1,837,830	25%
Limited English Proficiency	289,441	48%	17%	318,816	52%	6%	608,257	9%
Zero-Vehicle Household*	96,606	38%	18%	160,685	62%	8%	257,291	10%
Senior	78,821	18%	5%	349,640	82%	6%	428,461	6%
People with a Disability	187,368	28%	11%	486,533	72%	9%	673,901	9%
Single-Parent Family*	86,737	37%	25%	146,913	63%	11%	233,650	14%
Cost-Burdened Renter*	109,906	38%	20%	180,459	62%	9%	290,365	11%
Total Population	1,708,260	23%	100%	5,630,702	77%	100%	7,338,962	100

Source: 2010-2014 American Community Survey 5-Year Average
** Share calculated using the total number of households, families or renters. In 2014, the Bay Area had 2,636,267 households; 1,725,913 families; and 6,915,962 people above the age of 5.*

Based on this definition, MTC designated 365 census tracts (or 23 percent of the total number of tracts) as CoCs for the equity analysis. These census tracts have a significant concentration of disadvantage in

sets used in the Transportation Investment Analysis.
[23] Populations above the age of 5 years that can speak less than "well" as defined by the U.S. Census.
[24] As a share of all families regardless of whether or not they have any children.
[25] As a share of all households regardless of occupancy status (renter or owner).

the region. It is worth noting that 23 percent of the region's total population, 33 percent of minority persons and 43 percent of low-income persons reside within CoCs. See Table 2-2 for the shares of disadvantaged populations who reside within CoCs and the remainder of the region.

Except where noted, this report uses the Census Bureau's 2010–2014 American Community Survey data and 2010 Decennial Census geographies for analysis, the most recent data and information available that is also compatible with MTC's existing unit for conducting spatial analysis using the travel model – the traffic analysis zone (TAZ).[26] This cross-walk allows demographic characteristics from the Census data to be linked to travel characteristics from travel model outputs. This linkage is useful for comparing benefits and burdens of transportation investments on CoCs.

Table 2-3 below shows the total population within CoCs and the remainder of the region in 2014 and 2040.[27] As noted above, about 1.7 million people, or 23 percent of the region's total population in 2014, reside in CoCs. Population growth in the remainder of the region (27 percent) is forecast to outpace growth in the CoCs (20 percent) between 2014 and 2040.

Table 2-3: Population in Communities of Concern, 2014 and 2040

	2014 Population		2040 Population		Change 2014–2040	
	#	%	#	%	#	%
Communities of Concern	1,708,260	23%	2,054,137	22%	345,877	20%
Remainder of Region	5,630,702	77%	7,141,432	78%	1,510,730	27%
Bay Area Total	7,338,962	100%	9,552,300	100%	2,213,338	30%

Source: ABAG Demographic Forecast, 2010-2014 American Community Survey 5-Year Average

Equity Measures

To conduct the analysis of benefits and burdens on disadvantaged communities, MTC and ABAG adopted six quantitative performance targets, or *equity measures*. These six measures are a subset of 13 performance targets[28] for the entire plan.

The equity measures for PBA 2040 include:

1. *Healthy and Safe Communities* (Performance Target #3) – to measure the health benefits and burdens associated with air quality, road safety and physical inactivity for high-income and low-income households;[29]
2. *Equitable Access* (Performance Target #5) – to measure a lower-income household's share of income consumed by transportation and housing costs, compared to the share for a higher-income household;[30]
3. *Equitable Access* (Performance Target #6) – to measure the share of affordable housing in Priority Development Areas (PDAs), Transit-Priority Areas (TPAs), or High-Opportunity Areas (HOAs),[31] within and outside CoCs;
4. *Equitable Access* (Performance Target #7) – to measure the share of low- and moderate-

[26] Most TAZs in the region correspond to one census tract, except for dense urban areas like downtown San Francisco, where more than one TAZ may "nest" within a census tract.
[27] ABAG Demographic Forecast.
[28] Plan Bay Area 2040 Performance Targets, see: https://mtc.legistar.com/LegislationDetail.aspx?ID=2542165&GUID=D89FCABA-8814-4F0C-990D-B6803291A4D5.
[29] Households that earned more than $100,000 (in 2000 dollars) are considered high-income, and those that earn less than $30,000 (in 2000 dollars) are considered low-income for this analysis.
[30] Households that earned more than $60,000 (in 2000 dollars) are considered higher-income, and those that earn less than $60,000 (in 2000 dollars) are considered lower-income for this analysis.
[31] See the Fair Housing and Equity Assessment report, ABAG, 2015, for a definition of high-opportunity areas: http://abag.ca.gov/files/1_FHEAFinalReport_3.13.15.pdf.

income households in PDAs, TPAs and HOAs that are at an increased risk of displacement, within and outside CoCs;

5. *Economic Vitality* (Performance Target #8) – to measure the share of jobs that are accessible by auto and transit in congested conditions, within and outside CoCs; and
6. *Economic Vitality* (Performance Target #9) – to measure the share of middle-wage jobs in the region, within and outside CoCs.

MTC and ABAG conducted an equity analysis using these equity measures at four stages leading up to the adoption of a Preferred Alternative in November 2016. These phases are: project performance; scenario analysis; draft preferred analysis; and, finally, EIR. Results from the analysis of EIR scenarios are summarized in Chapter 5.

The underlying methodology for assessing the equity impacts of the Draft Plan is:

- Designate each of the region's 1,588 census tracts as either a CoC or the remainder of the region. Based on the CoC definition and demographic analysis, this report identifies 365 tracts that are CoCs. The remaining 1,223 census tracts are designated as the remainder of the region.
- Calculate the indicator variables for both CoCs and the remainder of the region for each alternative based on the six equity measures. For two of the six equity measures, this analysis is done for low-income vs. high-income populations instead of CoCs vs. the remainder of the region.
- Evaluate the results relative to the No Project Alternative to assess whether (among other questions):
  - The scenario has a beneficial effect on CoCs or low-income populations; and whether
  - This benefit is similar or greater than the benefit to the remainder of the region or high-income populations.

Regional Trends Analysis

In addition to an analysis based on the equity measures and transportation investments described above, this report also summarizes key demographic and socioeconomic trends in Chapters 3 and 4 to provide further context for understanding the challenges faced by disadvantaged communities in the Bay Area. The REWG selected the following topics for this trends analysis:

- *Proximity to Services and Amenities* – to measure trends in the share of lower-income households that live in neighborhoods with a high walk score;[32]
- *Exposure to Contamination and Pollutants* – to measure trends in the share of lower-income households exposed to air contaminants (diesel particulate matter and fine particulates [PM2.5]);[33]
- *Proximity to Opportunity Areas* – to measure trends in the share of lower-income households that live in high-opportunity areas;
- *Poverty in the Suburbs* – to measure trends in the share of low-income households that reside in suburban or inland jurisdictions, as defined by PBA 2040; and
- *Concentration of Poverty* – to measure trends in the share of low-income households that reside in neighborhoods that have a high concentration[34] of poverty.

[32] Walk score is calculated by MTC and is based on access to a range of amenities and services, including parks, schools, grocery stores, primary care facilities, transit stations, jobs and libraries, among others, subject to data availability.
[33] See Community Air Risk Evaluation Program, Bay Area Air Quality Management District, at: http://www.baaqmd.gov/plans-and-climate/community-air-risk-evaluation-care-program, and the California Environmental Protection Agency (CalEPA), California Communities Environmental Health Screening Tool: CalEnviroScreen, at: http://oehha.ca.gov/ej/ces2.html.
[34] Census tracts with more than 40 percent low-income households; see: Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. May 2015. "Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." NBER Working Paper Series. National Bureau of Economic Research. http://www.nber.org/papers/w21156.

Chapter 3 also summarizes key demographic trends, with an emphasis on the eight disadvantage factors that define CoCs, as well as recent trends in housing affordability and access to opportunity.

Scenario Alternatives

The equity analysis compares the relative performance of four scenarios described below using six equity measures. The relative performance of scenarios is calculated by comparing model outputs for a No Project Alternative, which represent conditions in 2040 if the Draft Plan is not adopted, to the three scenario alternatives (developed through an extensive public process) and the Draft Plan itself, which was adopted by MTC and ABAG in November 2016.

Each scenario alternative is defined by a set of land use and transportation policies, projects and investments that reflect different growth patterns for the region. With the exception of the No Project Alternative, all other scenarios were developed to achieve a 15 percent reduction in per capita greenhouse gas emissions (mandated by the California Air Resources Board) and a specific amount of housing growth that assumed no net increase in in-commute to the region from neighboring counties (also called the regional housing control total).

A brief description of the No Project and other scenario alternatives is provided below. For more detailed description, see the PBA 2040 Draft EIR, section 3.1.

No Project Alternative – An EIR must analyze the "no project alternative." (CEQA Guidelines, § 15126.6(e).) The purpose of the No Project Alternative is to allow a comparison of the environmental impacts of approving the proposed project with the effects of not approving it. The No Project Alternative must discuss the existing conditions, "as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services."

The No Project Alternative represents implementation of the general plans of all nine counties and 101 cities in the Bay Area without influence of a regional plan that integrates transportation, growth, and GHG reduction. No new regional land use plan would be developed and no new SCS policies would be implemented to influence the locations of housing and employment centers in the region. Transportation projects that would occur under the No Project Alternative would be substantially limited compared to the Draft Plan, consisting of five major regional transit, three local transit, and two highway projects from the previous plan that are fully committed with funding and completed environmental review.

Main Streets Alternative – The Main Streets Alternative envisions future population and employment growth in the downtowns of every city in the Bay Area to foster a region of moderately-sized, integrated town centers. This alternative comes closest to resembling a traditional suburban pattern, because it would result in increased greenfield development relative to the Draft Plan. To support this alternative's dispersed growth pattern, transportation investment priorities would emphasize highway strategies, including the expansion of high-occupancy toll lanes on all regional highway and highway widening projects at key bottlenecks.

Big Cities Alternative – The Big Cities Alternative concentrates future population and employment growth in the locally-identified PDAs and TPAs within the Bay Area's three largest cities: San Jose, San Francisco, and Oakland. Neighboring cities that are already well-connected to these three cities by transit would see moderate to substantial increases in population and employment growth, particularly in their locally-identified PDAs and HOAs. To support this alternative's big city-focused growth pattern, the transportation infrastructure within and directly serving the region's core would be maintained to a state of good repair, modernized to boost service and improve commutes and capacity, and expanded to meet increased demand. Bicycle and pedestrian infrastructure would be expanded in these cities, including a robust network of bike sharing.

Environment, Equity, and Jobs Alternative – The Environment, Equity, and Jobs (EEJ) Alternative includes strategies to focus more growth in suburban communities compared to the Draft Plan, in part to

reduce risk of displacement in urban areas. In addition, the EEJ Alternative includes more funding for bus operations in suburban areas to serve lower-income residents and reduces funding for highway expansion and efficiency projects with the objective of reducing adverse environmental impacts. This alternative would encourage intensification of land use beyond PDAs to include jobs-rich, high-opportunity TPAs not currently identified as PDAs. This alternative seeks to strengthen public transit by boosting service frequencies in most suburban and urban areas, other than on Muni, BART or Caltrain, and providing free transit passes to youth throughout the region.

Draft Plan – The Draft Plan provides a strategy for accommodating projected household and employment growth in the nine-county Bay Area by 2040 as well as a transportation investment strategy for the region. For a more detailed description of the Draft Plan, see the PBA 2040 Draft EIR, section 3.1.

Transportation Investment Analysis

In addition to modeling travel and socioeconomic outcomes based on various land use and transportation investments using equity measures, MTC carried out an off-model analysis of the Draft Plan's overall transportation investment strategy. This analysis illustrates the distribution of the investments relative to different population subgroups and communities in the region. In an ongoing effort to ensure equity in the metropolitan transportation planning process, MTC has previously carried out similar analyses of the 2009 RTP (*Transportation 2035*), the 2011 Transportation Improvement Program (TIP), the 2013 Plan Bay Area and TIP, the 2015 TIP, and, most recently, the 2017 TIP.

The Transportation Investment Analysis serves three key functions, including:

- Complying with Title VI regulations (per FTA Circular 4702.1B, issued in October 2012) by conducting an assessment with "charts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes…" and "an analysis of impacts … that identifies any disparate impacts on the basis of race, color, or national origin…";
- Complying with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…"; and
- Complying with MTC's own adopted Environmental Justice Principles.

To carry out these functions, the Transportation Investment Analysis relies on three different methodologies described in this section to determine whether the Draft Plan's investments are shared equitably among low-income and minority populations, and to determine whether there is any disparate impact at the regional level on the basis of race, color or national origin. No specific federal standard currently exists for conducting an environmental justice assessment. Similarly, FTA's Title VI guidance for MPOs does not provide any specific benchmarks for the analyses. Finally, there are no established best practices or approved comparative analyses available against which MTC can measure its findings. Therefore, for this analysis, MTC is building on its prior work undertaken in the 2013 PBA investment analysis, and the 2013, 2015 and 2017 TIP.

Population/Use-Based Analysis

The population/use-based investment analysis compares the estimated share of investments that benefit low-income and minority populations to the share of their respective use of the transportation system (roadways and transit) and to their respective share of the region's population.

As an example, if a higher share of low-income populations rely disproportionately on the transit system for their access and mobility needs, and if the Draft Plan invests a higher share of revenues in the transit

system, then the low-income population will accrue a bigger share of the benefits. This scenario would therefore be considered equitable to low-income populations. In the aggregate, the analysis measures transit and motor vehicle trips using the 2012 California Household Travel Survey (CHTS) and various transit passenger demographic surveys (TPDSs).

The steps involved in conducting the population/use-based analysis include:

1. Using Census data, determine the share of low-income (L0) and minority (M0) population in the region.
2. Using the CHTS and TPDS data, calculate the share of all roadway trips by county and all transit trips by transit operator for low-income (L1 and L2) and minority (M1 and M2) populations.
3. Using the Draft Plan transportation project list, tally the total investments in roadways by county (RR) and transit by operator (TT).
4. For roadway investments, for each county, assign a share of the investment (refer to RR above) to the low-income population (L3) based in their share of roadway trips (refer to L1 above) for that county. Repeat for minority population (M3).
5. For transit investments, for each transit operator, assign a share of the investment (refer to TT above) to the low-income population (L4) based on their share of transit trips (refer to L2). Repeat for minority population (M4).
6. Sum all the investments (roadway and transit) that were assigned to low-income (L5) and minority (M5) populations.
7. Compare the share of population (L0 and M0) and trips by mode (L1/L2 and M1/M2) to the share of assigned investments (L5 and M5) to assess the level of benefit accrued to low-income and minority populations.

Table 2-4: Population/Use-Based Analysis

Population	Share of Regional Population	Share of Roadway Trips	Share of Transit Trips	Share of Roadway Investments	Share of Transit Investments	Share of Total Investments
Low-Income	L0	L1	L2	L3	L4	L5
Minority	M0	M1	M2	M3	M4	M5

At a regional level, while this approach takes advantage of the available data on trips for low-income and minority populations by county and transit operator, it is still a coarse analysis that has the following limitations:

- The analysis does not account for benefits and burdens at the project level. While a roadway project may benefit all users of that facility, the benefits may not necessarily accrue at the same proportion to each population group as their share of all trips in a county where the facility is located.
- The analysis also assumes that the share of trips by mode by a particular population group remains the same in future years, regardless of investments that improve efficiency, safety, capacity or access.
- The analysis does not adjust for the relative size of populations in future years. For example, the share of low-income population in 2040 may or may not be the same as in 2014.

- Lastly, pedestrian and bicycle projects are assigned to local streets and roads due to a lack of sufficient data on use by income and race/ethnicity, and some regional programs such as the climate initiative were not included in the assessment since they do not fit the roadway or transit categories.[35]

The Title VI analysis is a subset of the population/use-based analysis, which only considers public transit projects that are funded through federal and state sources (described in more detail below).

Project Mapping Analysis

To supplement the population/use-based analysis described above, MTC mapped all roadway and transit projects to show the spatial distribution of projects relative to CoCs and census tracts with a concentration of minority populations. This analysis only presents data visually. It does not use a metric to estimate the potential benefit or burden of each project on disadvantaged communities. It also does not include projects that cannot be mapped. For example, a substantial share of total funding in the Draft Plan is dedicated to transit operators, but this investment cannot be mapped as a project.

This qualitative assessment involves examining the distribution of projects for any indication of systematic exclusion of CoCs or minority communities in the distribution of benefits. It also involves examining the distribution of projects for any systematic imbalances within the distribution of projects between CoCs and the remainder of the region, or between minority and non-minority communities. The analysis for minority populations satisfies one component of the Title VI analysis of the Draft Plan, as described below.

Title VI Analysis

As described in Chapter 1, the Federal Transit Administration (FTA) released updated guidance in October 2012 specifying how metropolitan planning organizations (MPOs) such as MTC must demonstrate compliance with Title VI of the Civil Rights Act of 1964 and DoTs Title VI regulations in the metropolitan planning process. This section describes the methodology for conducting the analysis that demonstrates compliance with these requirements, including the methodology for conducting a disparate impact analysis.

Table 2-5: FTA Requirements for Title VI Analysis

FTA Requirement	Related Plan Bay Area 2040 Analysis
"Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data …"	Project mapping analysis that overlays projects that can be mapped over above-regional-average concentrations of minority residents.
"[C]harts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes…"	Population/use-based analysis of public transit investments using state and federal funding sources.
"An analysis of impacts identified in paragraph [above] that identifies any disparate impacts on the basis of race, color, or national origin"[36]	Disparate impact analysis comparing Plan Bay Area 2040 investments per capita and per rider for minority and non-minority populations.

Because MTC does not have sufficient data to map only those projects that receive state and federal funds, the disparate impact analysis shows all transit investments overlaid against minority tracts, regardless of fund source. MTC will continue to investigate the feasibility of updating future Regional

[35] For example, the Sonoma-Marin Area Rail Transit service will start in early 2017, so there is no usage data currently available, even though the plan allocates funding for the project.
[36] FTA Circular 4702.1B, page VI-2. See: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf.

Transportation Plan (RTP) project databases and/or travel model parameters to include more specific fund source information in light of FTA requirements. MTC has the data to distinguish between public transportation investments that receive state and federal funds for the population/use-based analysis.

The state and federal fund sources included in the Title VI analysis are:

- *Transit Operating* – State Transit Assistance (revenue- and population-based), FTA Sections 5307 and 5311, Low Carbon Transit Operations Program (Cap and Trade);
- *Transit Capital (Replacements)* – FTA Sections 5307, 5340, 5311, 5337, and 5339, FHWA Ferry Boat Program, FTA Passenger Ferry Grant Program, FTA Bus and Bus Facilities Discretionary Program, STP/CMAQ, Anticipated; and
- *Transit Capital (Expansions)* – FTA Section 5309, STP/CMAQ, Transit and Intercity Rail Program (Cap and Trade), Affordable Housing and Sustainable Communities Program (Cap and Trade), High Speed Rail, Anticipated.

To conduct the disparate impact analysis, the results of the population/use-based analysis of public transit investments using state and federal funds are assigned to minority and non-minority populations on a per capita and per-rider basis. A comparison of the per capita and per-rider investments for the two groups determines whether there is any disparate impact.

Although FTA does not provide specific guidance or standard benchmarks to determine whether any given result represents a disparate impact, a general practice in such analysis is to use the percentage result to determine whether any differences between benefits for minority or non-minority populations may be considered statistically significant. If a disparate impact is found to be statistically significant, consideration must then be given to "whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact."[37]

Environmental Justice Analysis

Under Executive Order 12898 and the associated DOT Order on Environmental Justice, MTC must assist DOT, FTA and the Federal Highway Administration (FHWA) in their mission "to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects," on environmental justice (EJ) populations. For the EJ analysis in this report, adverse effects are estimated using the six equity measures to determine whether EJ populations share in the benefits of the Draft Plan's investments without bearing a disproportionate share of the burdens.

To make this determination, this report uses DOT's definition of a "disproportionately high and adverse effect," which relies on meeting the following two conditions:

- An adverse impact is predominately borne by minority and/or low-income populations, and
- An adverse impact on minority and/or low-income populations is significantly more severe or greater in magnitude than the adverse effect on non-minority and/or non-low-income populations.

To test the first condition, the analysis compares the effect of the No Project Alternative and the Draft Plan on EJ populations. This analysis shows whether the measure is moving in the right direction for EJ populations. To test the second condition, the analysis compares the effect of the Draft Plan on EJ populations and non-EJ populations. An EJ population is determined to experience "disproportionately high adverse effect" when this condition is met AND when the EJ population is more impacted by the Draft Plan compared to the No Project Alternative.

[37] Ibid.

Data Sources

This section describes the various data and their sources used for the analyses in this report. They range from large, multi-purpose public data products, such as those provided nationally by the Census Bureau, to smaller, more specialized regional data collected and maintained by MTC and ABAG.

Decennial Census and American Community Survey

The Census Bureau provides two key data sets used in this report. The first is the Decennial Census, which was completed in 2010 and is a 100 percent count of all persons in the U.S. The Decennial Census includes information on a person's race and ethnicity as well as age and certain household and family characteristics. The second data set is the American Community Survey (ACS) data, which is an ongoing, annual, sample-based survey of the U.S. population. Compared to the Decennial Census, ACS provides far greater detail on various socioeconomic characteristics, including data on household income, poverty status, level of proficiency in English, household vehicle ownership, disability status, housing costs and commutes.

Because the ACS is based on sample data (as opposed to 100 percent counts of the population in the Decennial Census), any analysis using detailed socioeconomic data must be done for a larger population or geography. In this report, data from ACS is used to define communities of concern, summarize regional trends (Chapters 3 and 4), and calculate the share of low-income and minority populations for the Transportation Investment Analysis (Chapter 5). Data from the 2000 Decennial Census is used mainly for historical comparisons.

ABAG Forecasts

The Association of Bay Area Governments (ABAG) maintains the regional population, household, and employment forecasts for the nine-county region. MTC and ABAG use these forecasts throughout the plan development process, starting with estimating future population size by income category, number of jobs by sector and number of households by size. This information is used as input into the land use and transportation model, as well as for off-model analysis such as healthy communities.

MTC Travel Model One

MTC's Travel Model One is an activity-based travel demand forecasting model that simulates trips and travel patterns for different time periods, such as for the baseline year as well as the plan horizon year of 2040. MTC's travel model uses an advanced population synthesizer to support more sophisticated travel behavior simulations compared to MTC's previous travel model. The simulations capture coordinated travel among members of the household and the availability of time periods in scheduling. Results for the six equity measures analyzed in Chapter 5 are calculated in part using MTC's travel model.

UrbanSim Land Use Model

In 2011, ABAG and MTC staff partnered with researchers at the University of California Berkeley to develop a spatial, parcel-based economic and land use model known as UrbanSim. The model was developed to predict economic behavior based on detailed market and regulatory information stored at a parcel level and subsequently to simulate economic behavior of developers and development patterns.[38] This modeling approach is analogous to Travel Model One's simulation of household travel behavior.

UrbanSim and Travel Model One work in an integrated manner to help regional planners examine the connections between transportation investments and land use patterns. MTC utilizes UrbanSim in conjunction with Travel Model One to estimate the relative performance of various land use and transportation strategies and investments analyzed in the EIR. The results for the six equity measures analyzed in Chapter 5 are calculated in part using the UrbanSim model.

[38] For more information, see: http://www.urbansim.org/.

Bay Area Household Travel Survey 2012-2013

The Bay Area Travel Survey (BATS) is MTC's periodic regional household travel survey, most recently completed in 2012-2013, and conducted in concert with the California Department of Transportation's statewide California Household Travel Survey (CHTS). The CHTS is an activity-based travel survey that collects information on all in-home and out-of-home activities, including all trips, over a one-day period for approximately 10,000 Bay Area households. The survey provides detailed information on many trip characteristics such as trip purpose, mode, origins and destinations, as well as household demographic and socioeconomic characteristics, and informs development of the regional travel model. In this report, data on usage of the regional transportation system, the share of trip-making on the region's road and highway system, and different demographic groups comes from CHTS.

Bay Area Transit Passenger Demographic Survey

In 2012, MTC began a program of collecting consistent demographic and trip data from Bay Area transit passengers. Since then, passengers from 15 transit agencies have been surveyed, and the rest of the region's system is anticipated to be surveyed by 2017. MTC works with transit operators to collect consistent demographic and travel-activity data across all transit systems surveyed.[39] In order to make best use of available funding and resources to support these extensive survey efforts, surveys are being conducted for different systems on a serial basis over time.

Data collected include geographic detail of the transit trip taken and passenger race/ethnicity, age, fare payment information, household income and household vehicle availability. Results for this survey are used in the Transportation Investment Analysis[40] to determine transit-investment benefits to low-income and minority populations based on these groups' share of transit use on individual systems and across the region as a whole. The Transit Passenger Demographic Survey also informs the Title VI analysis of PBA 2040 by establishing a consistent demographic profile of the region's overall transit ridership across all systems by minority and non-minority status.

[39] Surveys are being conducted on all transit systems claiming funds under the Transportation Development Act (TDA), consistent with those included in MTC's annual Statistical Summary of Bay Area Transit Operators.

[40] Operator-collected data was used when recent MTC-collected data was not available, including surveys collected by San Francisco Municipal Transportation Agency and Santa Clara Valley Transportation Authority. Data from MTC's 2007 Transit Passenger Demographic Survey provided information for the remaining six operators. Where appropriate, the 2015 MTC Statistical Summary of Bay Area Transit Operators was used to provide current ridership totals for regional comparisons.

Chapter 3. Regional Trends

This chapter describes key regional trends related to demographics, housing and transportation. The demographics section summarizes recent trends in the population subgroups, households and families at the regional and county level; the housing section summarizes the challenges associated with affordability, supply and location in relation to jobs and transit; and the transportation section summarizes travel patterns for low-income and minority populations as they relate to mode of travel, means of travel to work and affordability. The demographic trends analysis for low-income and minority populations satisfies the requirements for Environmental Justice and Title VI analysis, summarized in more detail in Chapter 6.

Demographic Characteristics

This section summarizes key demographic characteristics of Communities of Concern (CoCs) as well as trends since 1990 for the eight factors that define CoCs, including: minority, low-income, senior and disabled populations; people with limited English proficiency; zero-vehicle and rent-burdened households; and single-parent families. For a definition of each of the eight factors and CoCs, see Chapter 2.

Communities of Concern

MTC identifies CoCs based on the relative concentration of disadvantage at a census tract level. The demographic makeup of CoCs is therefore distinct from the region as a whole (see Table 3-1 below). While 23 percent of the region's total population resides in CoCs (1.71 million out of 7.34 million residents), this percentage captures a meaningful cross-section of disadvantaged communities in the Bay Area. For example, 83 percent of the population in CoCs is minority and 47 percent is low-income, compared to 59 percent and 25 percent respectively for the region. But for seniors and people with disabilities, the difference is indistinguishable, suggesting that these populations tend to be more dispersed around the region.

For all population sub-groups that comprise CoCs, the share that reside within CoCs is higher than the regional average, except for the minority population. For example, even though persons with limited English proficiency comprise about 9 percent of the region's population, 48 percent reside within CoCs. Similarly, 43 percent of the region's low-income population, 38 percent of households without a vehicle, 37 percent of single-parent families and 38 percent of severely cost-burdened renters reside within CoCs, even though they comprise 25 percent, 10 percent, 14 percent and 11 percent of the region's population, households or families, respectively. None of the population shares within CoCs are higher than in the rest of the region.

Only for minority populations, the share of population within CoCs (33 percent) is lower than the regional average (59 percent), suggesting that there is a large minority population in the Bay Area and that they are dispersed around the region. At the same time, it is important to note that a majority of all sub-groups resides outside CoCs, where they are either dispersed spatially or, if they are concentrated, do not overlap with as many other groups to qualify as a CoC.

Table 3-1: Communities of Concern (CoCs) and Remainder of the Region (RoR), 2014

	Communities of Concern			Remainder of the Region			Region	
	Share within CoCs		% of CoCs	Share outside CoCs		% of RoR		
Minority	1,414,908	33%	83%	2,890,820	67%	51%	4,305,728	59%
Low-Income	797,603	43%	47%	1,040,227	57%	18%	1,837,830	25%
Limited English Proficiency	289,441	48%	17%	318,816	52%	6%	608,257	9%
Zero-Vehicle Household*	96,606	38%	18%	160,685	62%	8%	257,291	10%
Senior	78,821	18%	5%	349,640	82%	6%	428,461	6%
People with a Disability	187,368	28%	11%	486,533	72%	9%	673,901	9%
Single-Parent Family*	86,737	37%	25%	146,913	63%	11%	233,650	14%
Cost-Burdened Renter*	109,906	38%	20%	180,459	62%	9%	290,365	11%
Total Population	1,708,260	23%	100%	5,630,702	77%	100%	7,338,962	100

Source: 2010-2014 American Community Survey 5-Year Average
** Share calculated using the total number of households, families or renters. In 2014, the Bay Area had 2,636,267 households; 1,725,913 families; and 6,915,962 people above the age of 5.*

Minority Population

The Bay Area officially became a "majority minority" region in 2000,[41] and like the rest of California and the United States, its population is expected to become even more diverse over time. At a neighborhood level, between 2000 and 2014, the minority population increased in almost every community in the region, with the notable exceptions of West and North Oakland, Emeryville, and West Berkeley, where the minority population declined significantly (see Maps 5,6 and 7).

In 2014, there were approximately 3.1 million Whites in the Bay Area, or 41.4 percent of the total population. Between 1990 and 2014, the White population declined by 608,016 (-17 percent). During the same time, the Black or African American population declined by 60,555 (-12 percent); the Asian population increased by 874,244 (+99 percent); and the Latino or Hispanic population increased by 820,348 (+89 percent). At the same time, the total Bay Area population increased by 22 percent, from approximately 6.0 million to 7.4 million (see Maps 8 to 11).

Table 3-2: Bay Area Population by Race, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
White Alone	3,658,309	3,392,204	3,165,395	3,050,293	-17
Black Alone	516,420	497,205	463,359	455,865	-12
Asian Alone[42]	884,547	1,278,515	1,519,768	1,758,791	+99
Latino / Hispanic	923,606	1,315,175	1,521,456	1,743,954	+89
All	6,023,577	6,783,760	6,950,764	7,360,487	+22

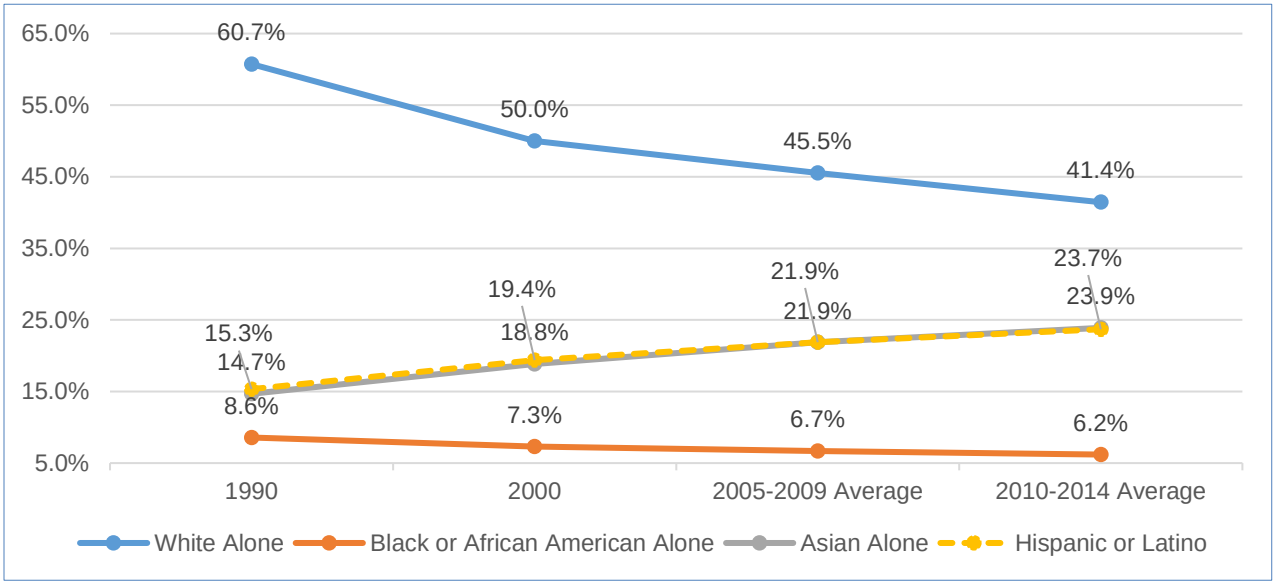
Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Table P8, American Community Survey 2005-2009 and 2010-2014 Table B03002

While all nine counties experienced a decline in their White population between 1990 and 2014, the steepest declines occurred in Alameda (-24 percent), San Mateo (-22 percent) and Santa Clara (-28 percent) counties. In 2014, the largest share of the White population in the region lived in Santa Clara County (21 percent). While the White population declined at the regional level, it increased in the

[41] U.S. Decennial Census, 2000.
[42] In 1990, the "Asian Alone" category includes Pacific Islanders, and Pacific Islanders are not included in the "Other" category.

Mission District and Presidio in San Francisco; West Berkeley, West Oakland, Oakland Chinatown, and the city of Emeryville in the East Bay; and parts of the cities of St. Helena and Napa in the North Bay.[43] Areas where the White population increased between 2000 and 2014 also experienced a decline in their share of low-income population, indicating that at least some of this shift occurred due to rising housing costs in transit-accessible areas in inner bay communities.

Chart 3-A: Share of Bay Area Population by Race, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Table P8, American Community Survey 2005-2009 and 2010-2014 Table B03002

Between 1990 and 2014, the steep declines for Black or African American populations occurred in Alameda (-19 percent), San Francisco (-40 percent), San Mateo (-46 percent) and Santa Clara (-15 percent) counties. Marin County also experienced a decline, but from a small base. At the same time, the Black or African American population increased in Contra Costa (+28 percent) and Solano (+32 percent) counties. Napa and Sonoma counties also experienced a gain, but from a small base. In 2014, the largest share of the Black or African American population lived in Alameda County (40 percent).

At a neighborhood level, between 2000 and 2014, the Black or African American population declined substantially in West Oakland, North Oakland, East Oakland, West Berkeley, the unincorporated community of North Richmond and the Iron Triangle neighborhood in the city of Richmond. The Black or African American population also declined in the cities of East Palo Alto and Dublin, in the Hunters Point and Mission District neighborhoods in San Francisco, and in parts of the city of Vallejo.[44] At the same time, the Black or African American population increased substantially in the communities of Pittsburg, Antioch and Oakley in East Contra Costa County – areas where the share of low-income residents also increased between 2000 and 2014.

Between 1990 and 2014, all nine counties experienced an increase in their Asian and Latino or Hispanic populations. Steep increases for the Asian populations occurred in Alameda (+128 percent), Contra Costa (+116 percent), San Francisco (+34 percent), San Mateo (80 percent) and Santa Clara (+141 percent) counties. Similar to the Asian population, the Latino or Hispanic population also increased in Alameda (+94 percent), Contra Costa (+193 percent), San Francisco (+27 percent), San Mateo (64 percent) and Santa Clara (+57 percent) counties. For both the Asian and the Latino or Hispanic

[43] US Decennial Census 2000 and American Community Survey 2010-2014 5-year average.
[44] Ibid.

populations, Marin, Napa, Solano and Sonoma counties also experienced a gain, but from a small base.

At a neighborhood level, between 2000 and 2014, the Hispanic population grew in almost all the communities in the region, but especially in the cities of Redwood City and Palo Alto in the Peninsula; San Jose, Mountain View and Gilroy in the South Bay; Richmond, Pinole, Oakland and Hayward in the East Bay; Pittsburg, Antioch and Concord in East Contra Costa County; and San Rafael, Santa Rosa, Napa, Vallejo and Fairfield in the North Bay.[45] Significantly, the Hispanic population declined substantially in the Mission District in San Francisco, West and South San Jose, the Great Mall area in the city of Milpitas, and the cities of Brentwood, Napa and St Helena.

Between 2000 and 2014, the Asian and Pacific Islander population increased significantly in the South Bay (Palo Alto to Cupertino and Milpitas), inner East Bay (Alameda, Hayward and Fremont), and the Tri Valley area (San Ramon, Dublin and Pleasanton) (see Map 3c).[46]

Low-Income Population

The Bay Area has experienced a significant rise in the number and share of low-income residents since 1990, a trend that is mirrored at the state and national level. The "sub-urbanization" of poverty is another overarching trend across the country, which has accelerated in the Bay Area following the Great Recession and the resulting foreclosure crisis.[47] In 1990, 43 percent of the region's population below 200 percent of the poverty level lived in the cities of San Francisco, Oakland and San Jose, which offer a relatively higher level of transit access and services but lower school quality and personal safety compared to the rest of the region. By 2000, that share had fallen to 39 percent, and continued to decline to 37 percent in 2014.[48]

At a neighborhood level, between 2000 and 2014, the low-income population declined substantially in the Presidio, Mission District, South of Market, Financial District, Chinatown and Twin Peaks neighborhoods in San Francisco; West and North Oakland, Chinatown and the Fruitvale area in the city of Oakland; the city of Vacaville and parts of Napa in the North Bay; and West San Jose and parts of Palo Alto in the South Bay (see Maps 12, 13 and 14).[49]

At the same time, the low-income population increased substantially in the Hunters Point and Visitacion Valley neighborhoods in San Francisco; the unincorporated community of North Fair Oaks in San Mateo; South and East San Jose, the Del Mar High School area, and South Morgan Hill in the South Bay; parts of the cities of Newark and Hayward in the inner East Bay; parts of the cities of Martinez, Concord, Pittsburg and Antioch in East Contra Costa County; and parts of the cities of Vallejo, Fairfield, Napa, St. Helena and Santa Rosa in the North Bay.

In 2014, 1.8 million individuals, or 25 percent of the total population in the Bay Area, lived in households that earned less than twice the federal poverty level (FPL) (200 percent FPL), or $47,700 for a family of four. Alameda County accounted for more than 23 percent of all individuals in low-income households in the region, followed by Santa Clara (23 percent), Contra Costa (14 percent) and San Francisco (13 percent) counties.

---

[45] Ibid.
[46] Ibid.
[47] Soursourian, Matthew. January 2012. "Community Development Research Brief: Suburbanization of Poverty in the Bay Area." Federal Reserve Bank of San Francisco. http://www.frbsf.org/community-development/files/Suburbanization-of-Poverty-in-the-Bay-Area2.pdf.
[48] MTC staff analysis of 1990 Census STF3 Table P117, 2000 Census SF3 Table B88, and American Community Survey 2014 1-Year Estimates Table B17002.
[49] U.S. Decennial Census 2000 and American Community Survey 2010-2014 5-year average.

Table 3-3: Share of Bay Area Individuals in Low-Income Households by County, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change in #s 1990-2014 (%)
Alameda	24%	24%	25%	28%	+42
Contra Costa	18%	19%	21%	25%	+92
Marin	14%	16%	16%	20%	+54
Napa	21%	23%	25%	28%	+70
San Francisco	30%	26%	27%	28%	+8
San Mateo	17%	16%	19%	20%	+42
Santa Clara	18%	18%	21%	23%	+57
Solano	22%	23%	24%	28%	+65
Sonoma	22%	22%	25%	30%	+72
Bay Area	21%	21%	23%	25%	+49

Source: 1990 Census data from NHGIS.ORG Code E1C, Census 2000 Table P088, American Community Survey 2005-2009 and 2010-2014 Table C17002

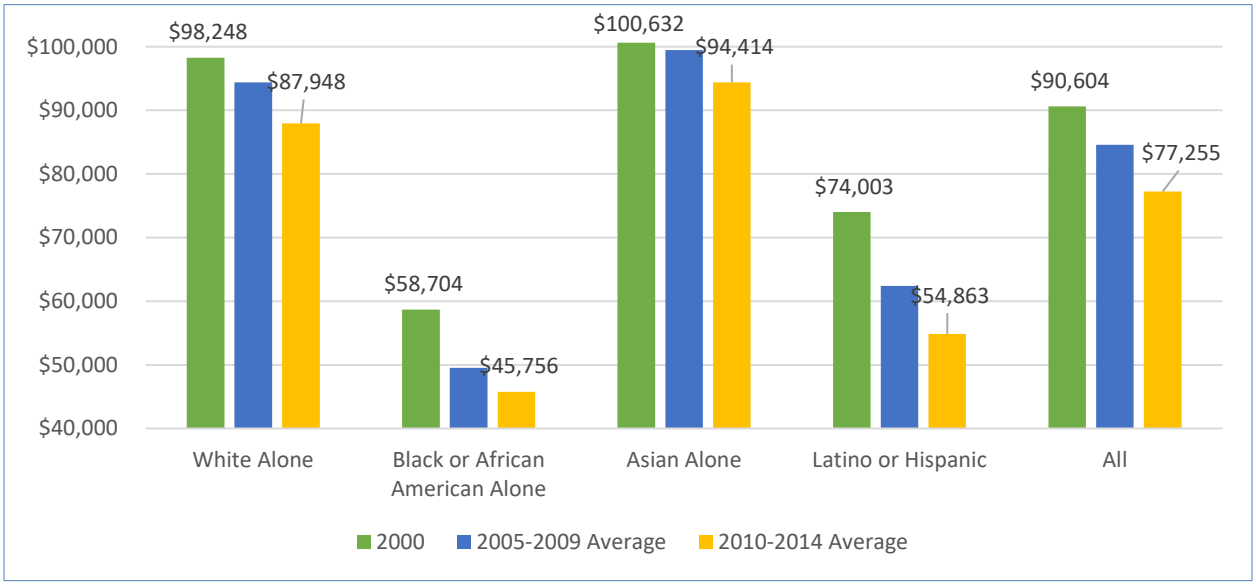
Chart 3-B: Number and Share of Individuals in Low-Income Households, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code E1C, Census 2000 Table P088, American Community Survey 2005-2009 and 2010-2014 Table C17002

Between 1990 and 2014, the number of individuals in low-income households in the Bay Area increased by 49 percent in the Bay Area, 8 percent in San Francisco and 92 percent in Contra Costa. At the same time, the share of individuals in low-income households also increased in every county except San Francisco, where the share dropped from 30 percent to 28 percent. Between 2000 and 2014, median household income in the Bay Area declined by 15 percent, from $90,604 to $77,255. At the same time, the median income (adjusted for inflation) for Black or African American households declined by 22 percent and for Latino or Hispanic households by 26 percent. In 2014, the median income for Black or African American households was below 200 percent FPL, at $45,756.

Chart 3-C: Median Household Income by Race, Bay Area, 2000-2014



Source: 1990 Census data from NHGIS.ORG Code E1C, Census 2000 Table P088, American Community Survey 2005-2009 and 2010-2014 Table C17002

Seniors 75 Years and Over

In 2014, 430,195 people in the Bay Area, or 5.8 percent of the total population, were aged 75 years and over. About 70 percent of all seniors in the region resided in four counties: Alameda (19 percent), Contra Costa (15 percent), San Francisco (13 percent) and Santa Clara (23 percent). Between 1990 and 2014, the number of seniors in the region increased by 56 percent, from 275,753 to 430,195. During the same time, the biggest increases in the number of seniors were in Contra Costa (82 percent), Marin (75 percent), Santa Clara (89 percent) and Solano (115 percent) counties (see Maps 15, 16 and 17).

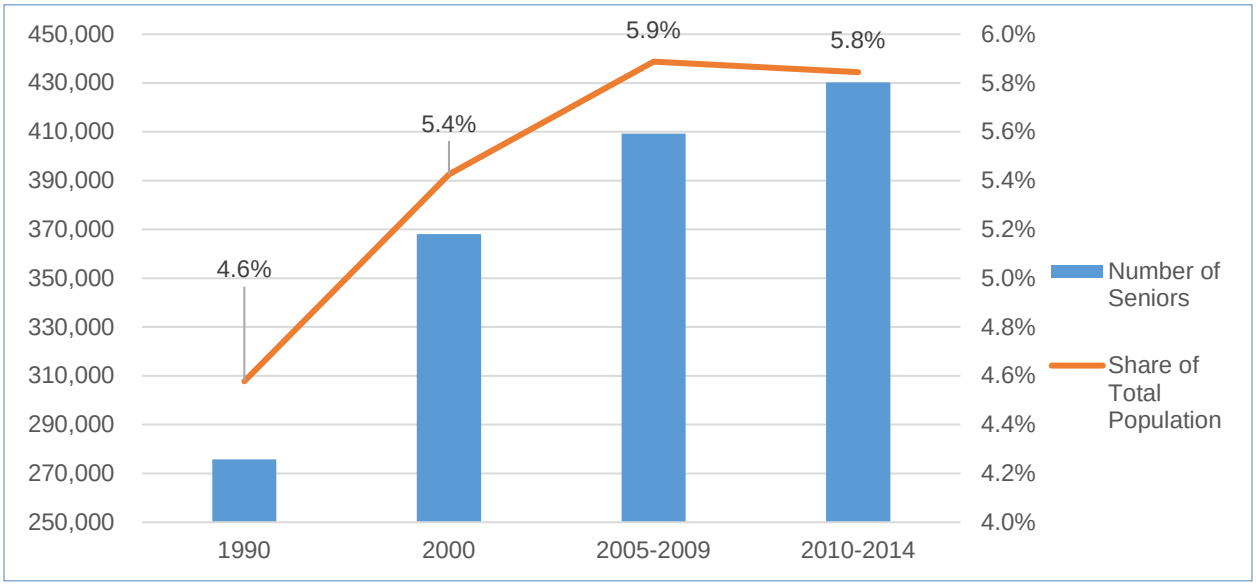
Table 3-4: Share of Bay Area Seniors 75 Years and Over, Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	4%	5%	5%	5%	+43
Contra Costa	4%	6%	6%	6%	+82
Marin	5%	7%	7%	8%	+75
Napa	8%	8%	8%	7%	+24
San Francisco	7%	7%	7%	7%	+18
San Mateo	5%	6%	7%	6%	+48
Santa Clara	3%	4%	5%	5%	+89
Solano	3%	4%	5%	5%	+115
Sonoma	6%	7%	7%	7%	+43
Bay Area	5%	5%	6%	6%	+56

Source: 1990 Census data from NHGIS.ORG Code ET3, Census 2000 Table P012, American Community Survey 2005-2009 and 2010-2014 Table B01001

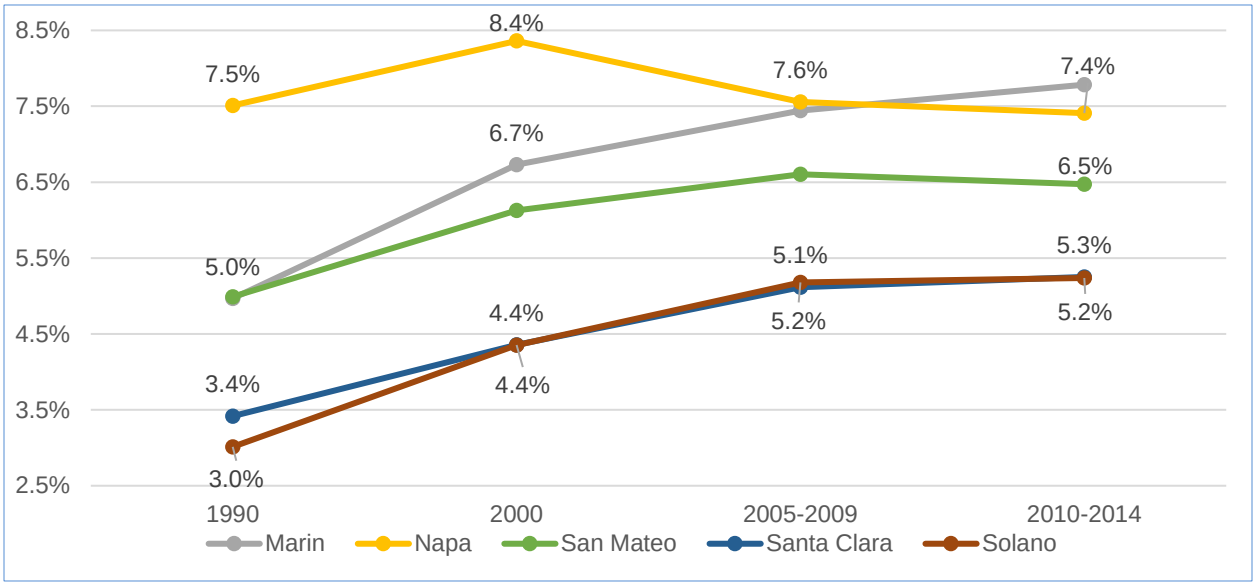
At the same time, the share of total population that was above 75 years varied by county. In Alameda, Napa, San Francisco, San Mateo and Sonoma counties, the share of seniors declined, even though the total number of seniors increased in each of these counties. About 50 percent of seniors in the Bay Area in 2014 also experience a disability (see section on people with disabilities below).

Chart 3-D: Number and Share of Seniors 75 Years and Over, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET3, Census 2000 Table P012, American Community Survey 2005-2009 and 2010-2014 Table B01001

Chart 3-E: Share of Seniors 75 Years and Over, Select Counties, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET3, Census 2000 Table P012, American Community Survey 2005-2009 and 2010-2014 Table B01001

At a neighborhood level, seniors are dispersed around the region, but between 2000 and 2014 their share decreased substantially in the Twin Peaks and South of Market neighborhoods in San Francisco and in South San Jose, while their share increased somewhat in census tracts on the periphery of existing urban areas.[50]

[50] Ibid.

Single-Parent Families

In 2014, 234,075 families with at least one child, or 27 percent of all such families in the Bay Area, were headed by a single parent. Between 2000 and 2014, the number of these single-parent families increased by 6 percent, or about 13,000 additional families. At the same time period, the number of all families with at least one child increased by 1 percent, or about 7,500 additional families.

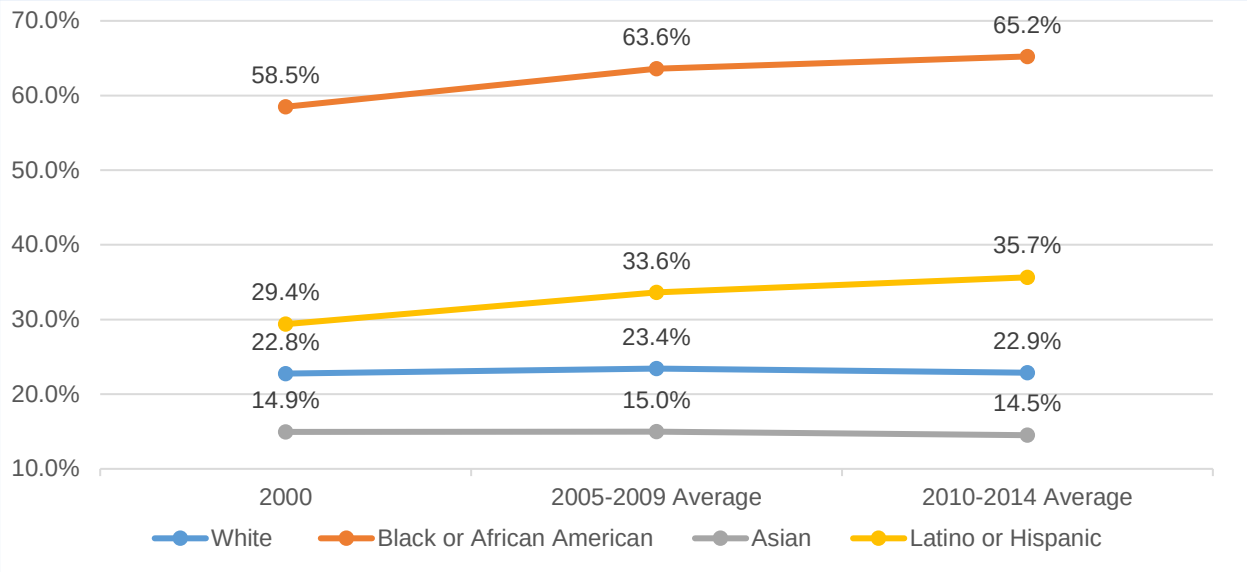
In 2014, the largest share of single-parent families who were White resided in Alameda (14 percent), Contra Costa (14 percent) and Santa Clara (15 percent) counties; who were Black or African American in Alameda (38 percent) and Contra Costa (20 percent) counties; who were Asian in Alameda (31 percent), San Francisco (20 percent) and Santa Clara (40 percent) counties; and finally, the largest share of single-parent families who were Latino or Hispanic resided in Alameda (32 percent), Contra Costa (33 percent) and Santa Clara (40 percent) counties (see Maps 18, 19 and 20).

Table 3-5: Single-Parent Families by Race, Bay Area, 2000-2014

	2000	2005-2009 Average	2010-2014 Average	Change 2000-2014 (%)
White Alone	23%	23%	23%	-18
Black or African American Alone	58%	64%	65%	-12
Asian Alone[51]	15%	15%	15%	+28
Latino or Hispanic	29%	34%	36%	+57
All	26%	27%	27%	+6

Source: 1990 Census data from NHGIS.ORG Code E1E, Census 2000 Tables P090 and P160B-I, American Community Survey 2005-2009 and 2010-2014 Tables B17010 and B17010B-I

Chart 3-F: Share of Single-Parent Families by Race, Bay Area, 2000-2014



Source: 1990 Census data from NHGIS.ORG Code E1E, Census 2000 Tables P090 and P160B-I, American Community Survey 2005-2009 and 2010-2014 Tables B17010 and B17010B-I

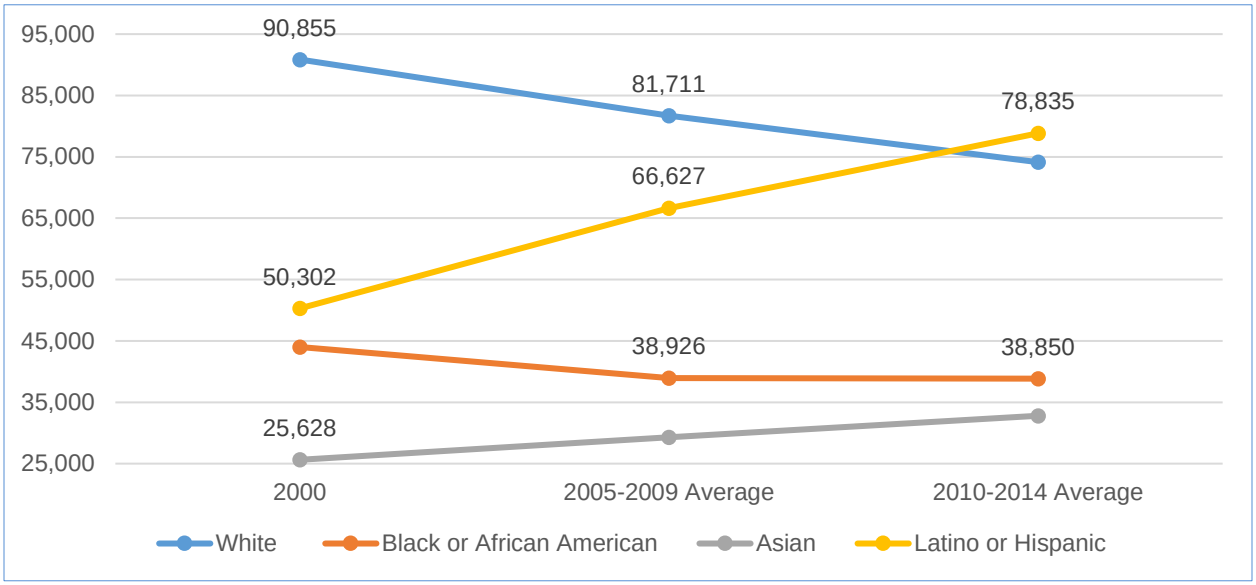
The share of Black or African American families who were headed by a single parent increased from 58.5 percent in 2000 to 65.2 percent in 2014, even when the total number of single-parent Black or African American families in the Bay Area decreased from 44,003 to 38,850. The share of Latino or Hispanic families headed by a single parent increased from 29.4 percent in 2000 to 35.7 percent in 2014.

[51] In 1990, the "Asian Alone" category includes Pacific Islanders, and Pacific Islanders are not included in the "Other" category.

But unlike the Black or African American families, the number of single-parent Latino or Hispanic families also increased in that time, from 50,302 to 78,835.

The share of single-parent White families remained about the same between 2000 and 2014, at 23 percent, though the total number of single-parent White families decreased from 90,855 to 74,129. The share of single-parent Asian families also remained about the same between 2000 and 2014, at 15 percent, but unlike the White families, their numbers increased slightly, from 25,628 to 32,801.

Chart 3-G: Number of Single-Parent Families by Race, Bay Area, 2000-2014



Source: 1990 Census data from NHGIS.ORG Code E1E, Census 2000 Tables P090 and P160B-I, American Community Survey 2005-2009 and 2010-2014 Tables B17010 and B17010B-I

Between 2000 and 2014, the share of single-parent families decreased significantly in the Hunters Point and Dogpatch neighborhoods in San Francisco, West and North Oakland, parts of Emeryville, and West Berkeley. At the same time, the share of these families increased the most in East Contra Costa County, East Oakland, South and East San Jose, and the cities of Vallejo and Alameda.[52]

Zero-Vehicle Households

In 2014, 257,502 households, or 10 percent of all households in the region did not own a personal vehicle. Between 1990 and 2014, the number of zero-vehicle households increased by 20,970, or 8.9 percent. San Francisco has the highest share of households without a personal vehicle, at 30 percent, followed by Alameda, at 10 percent. San Francisco gained the most zero-vehicle households in the region, at 12,236 additional households, while Alameda lost the most, at 1,728 households.

In 2014, over 41 percent of all zero-vehicle households (106,042) in the Bay Area were in San Francisco, followed by over 22 percent (56,983) in Alameda County. These shares reflect little change from 1990, when these two counties accounted for about 40 percent and 25 percent, of all zero-vehicle households. At the neighborhood level, in 2014, the share of zero-vehicle households was highest in the Chinatown, Haight Ashbury, Mission, Financial District, Visitacion Valley and Hunters Point neighborhoods in San Francisco; Downtown Oakland; central Vallejo; and the unincorporated community of Rocktram in Napa County (see Maps 21, 22 and 23).[53]

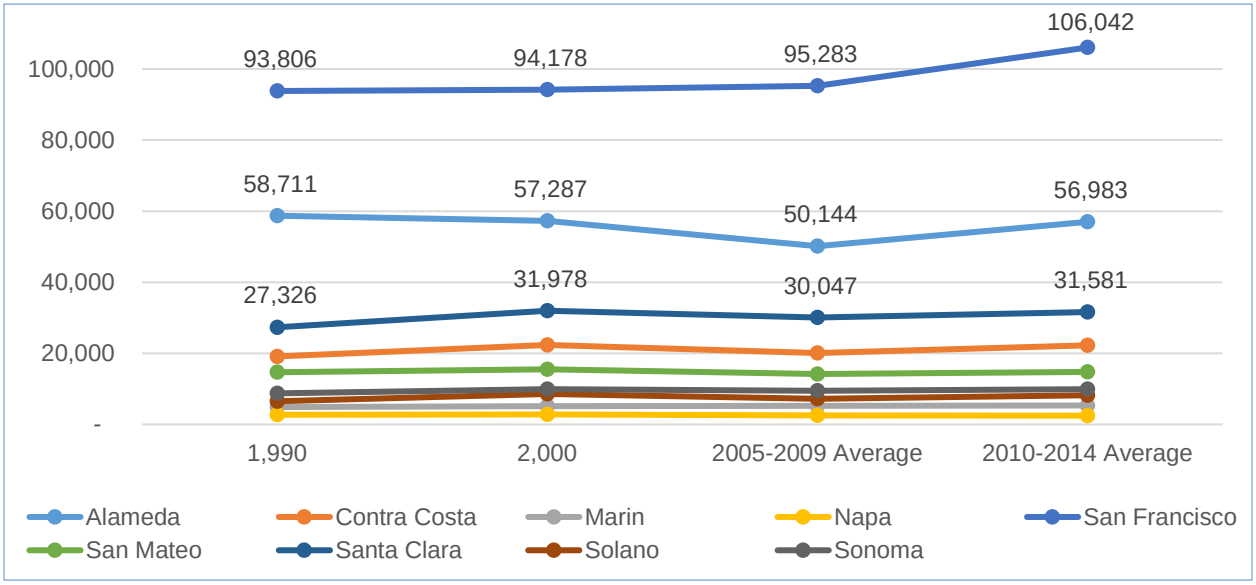
[52] U.S. Decennial Census 2000 and American Community Survey 2010-2014 5-year average.
[53] Ibid.

Table 3-6: Share of Zero-Vehicle Households by County, Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	12%	11%	10%	10%	-3%
Contra Costa	6%	6%	6%	6%	+16
Marin	5%	5%	5%	5%	+9
Napa	7%	6%	5%	5%	-10
San Francisco	31%	29%	29%	30%	+13
San Mateo	6%	6%	6%	6%	+1
Santa Clara	5%	6%	5%	5%	+16
Solano	6%	7%	5%	6%	+26
Sonoma	6%	6%	5%	5%	+13
Bay Area	11%	10%	9%	10%	+9

Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Tables H044 and HCT033B-I, American Community Survey 2005-2009 and 2010-2014 Table B25044

Chart 3-H: Number of Zero-Vehicle Households by County, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Tables H044 and HCT033B-I, American Community Survey 2005-2009 and 2010-2014 Table B25044

Between 2000 and 2014, the share of zero-vehicle households increased significantly in Visitacion Valley in San Francisco, the unincorporated community of Rocktram in Napa County, and the cities of Alameda and Fairfield. At the same time, there was a significant decrease in the Financial District in San Francisco, East San Jose, Downtown and West Oakland, central Martinez, the unincorporated community of North Richmond, and the Iron Triangle neighborhood in the city of Richmond.

People with Limited English Proficiency (LEP)

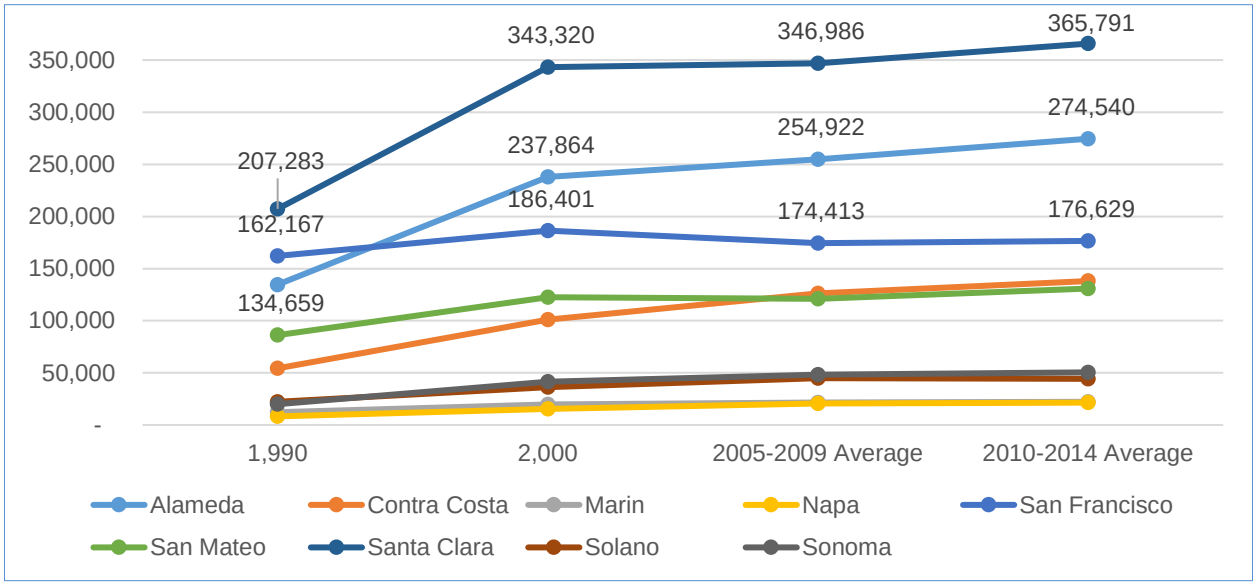
In 2014, approximately 1.2 million people, or 18 percent of the total population in the Bay Area above the age of 5 years, did not speak English "very well" as their primary language or had a limited ability to read, speak, write or understand English. Over 52 percent of LEP individuals resided in just two counties: Alameda (22 percent) and Santa Clara (30 percent). San Francisco had the highest share of LEP individuals (22 percent), followed by Santa Clara (21 percent). Marin had the lowest share of LEP individuals, at 9 percent.

Table 3-7: Share of People with Limited English Proficiency by County, Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	11%	18%	19%	19%	+104
Contra Costa	7%	11%	13%	14%	+154
Marin	6%	8%	9%	9%	+81
Napa	8%	13%	17%	16%	+159
San Francisco	24%	25%	23%	22%	+9
San Mateo	14%	18%	19%	19%	+52
Santa Clara	15%	22%	22%	21%	+76
Solano	7%	10%	12%	11%	+99
Sonoma	6%	10%	11%	11%	+153
Bay Area	13%	17%	18%	18%	+73

Source: 1990 Census data from NHGIS.ORG Code E26, Census 2000 Tables P019 and PCT062B-I, American Community Survey 2005-2009 B16005 and 2010-2014 Tables B16005 and B16005B-I

Chart 3-I: Number of People with Limited English Proficiency by County, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code E26, Census 2000 Tables P019 and PCT062B-I, American Community Survey 2005-2009 B16005 and 2010-2014 Tables B16005 and B16005B-I

Between 1990 and 2014, the number of LEP individuals grew by just 9 percent in San Francisco, the lowest rate in the region. At the same time, Napa and Sonoma grew by more than 150 percent during the same time, but from a small base. At the neighborhood level, between 2000 and 2014, the share of LEP

individuals decreased significantly in the Richmond District, South of Market and Chinatown neighborhoods in San Francisco; Chinatown and East Oakland in Oakland; the West San Jose and Alviso neighborhoods in San Jose; and the city of Sonoma (see Maps 24, 25 and 26).[54]

Severely Rent-Burdened Households[55]

In 2014, approximately 1.1 million households (43 percent) in the Bay Area were renters, of which 291,119 households (26 percent) were paying more than 50 percent of their income in rent. Between 1990 and 2014, the number of severely rent-burdened renter households increased by 58 percent, or 105,010 households. Santa Clara County gained the most severely rent-burdened households, with 25,278 additional households (24 percent of the entire increase), followed by Alameda County with 20,989 (20 percent) and Contra Costa County with 16,407 (16 percent). The slowest rate of growth in severely rent-burdened households was in San Francisco County, at 30 percent, and the fastest rate of growth was in Solano County, at 123 percent.

Table 3-8: Share of Severely Rent-Burdened (Renter) Households by County,[56] Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	22%	21%	27%	27%	+45
Contra Costa	20%	19%	28%	28%	+86
Marin	22%	21%	27%	29%	+48
Napa	23%	19%	22%	27%	+65
San Francisco	19%	17%	21%	23%	+30
San Mateo	17%	18%	23%	24%	+52
Santa Clara	18%	18%	23%	24%	+68
Solano	18%	19%	28%	30%	+123
Sonoma	21%	19%	27%	30%	+102
Bay Area	20%	19%	24%	26%	+58

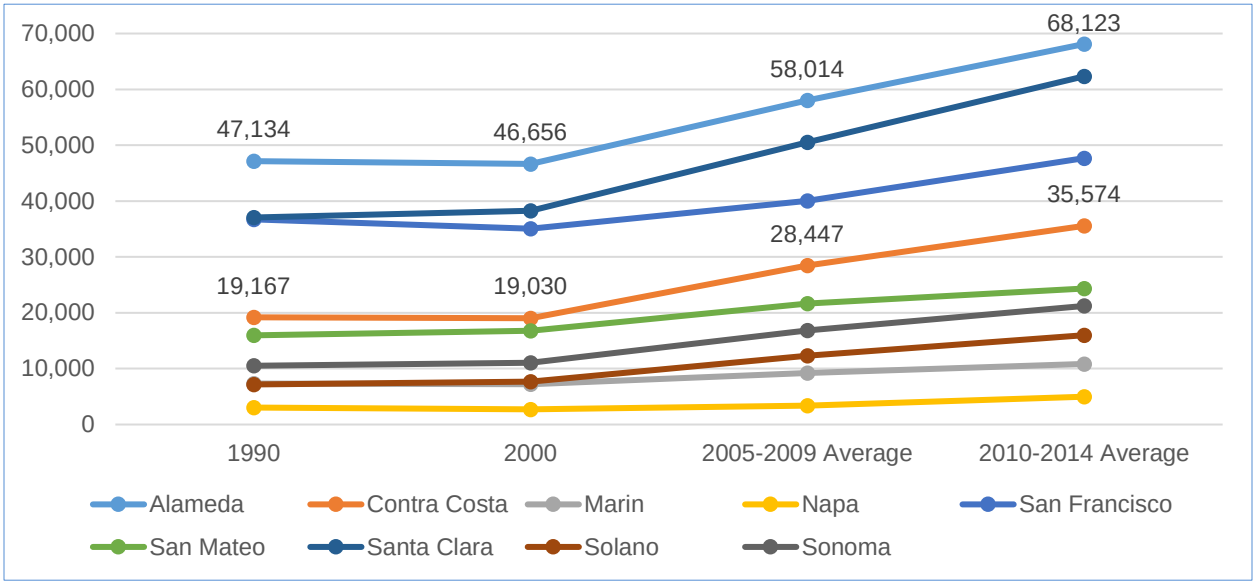
Source: 1990 Census data from NHGIS.ORG Code FBA, Census 2000 Table H069, American Community Survey 2005-2009 and 2010-2014 Table B25070

At the neighborhood level, between 2000 and 2014, the share of rent-burdened households increased significantly in the Hunters Point neighborhood in San Francisco; the unincorporated community of North Fair Oaks and the city of East Palo Alto in San Mateo County; the cities of Santa Clara, Morgan Hill and Gilroy in Santa Clara County; South and East San Jose; Newark and almost all of the inner East Bay from Union City to Richmond; the cities of Martinez, Concord, Pittsburg and Antioch in Eastern Contra Costa County; and Vallejo, Fairfield, Napa, St. Helena, Santa Rosa, and the unincorporated community of Rocktram in the North Bay (see Maps 27, 28 and 29).[57]

In 2014, neighborhoods with 40 percent or more rent-burdened households included Hunters Point in San Francisco; East San Jose and parts of Morgan Hill and Gilroy in the South Bay; parts of Newark and Hayward in the East Bay; East, West and North Oakland; parts of Danville, Concord, Pleasant Hill, Pittsburg, Antioch, Oakley and Brentwood in East Contra Costa County; the Iron Triangle neighborhood in the city of Richmond; and parts of Vallejo, Fairfield, Rohnert Park, Novato, San Rafael, and the unincorporated community of Rocktram in the North Bay.

[54] Ibid.
[55] Renter households that spend more than 50 percent of their income on rent.
[56] Note that units for which no rent was paid and units occupied by households that reported no income (about 4 percent of the total in 2014) are not included in the table above and chart below.
[57] U.S. Decennial Census 2000 and American Community Survey 2010-2014 5-year average.

Chart 3-J: Number of Severely Rent-Burdened (Renter) Households by County, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code FBA, Census 2000 Table H069, American Community Survey 2005-2009 and 2010-2014 Table B25070

People with Disabilities[58]

In 2014, 678,925 people in the Bay Area, or 9.3 percent of the total population, experienced a disability including, hearing, vision, cognitive, ambulatory, self-care or independent living difficulty. Over 70 percent of seniors 65 years and older, and over 50 percent of seniors 75 years and over, suffered from a disability. Over 71 percent of persons with a disability reside in just four counties: Alameda (21 percent), Contra Costa (17 percent), San Francisco (13 percent) and Santa Clara (21 percent). At a neighborhood level, people with disabilities are dispersed across the region (see Map 30).

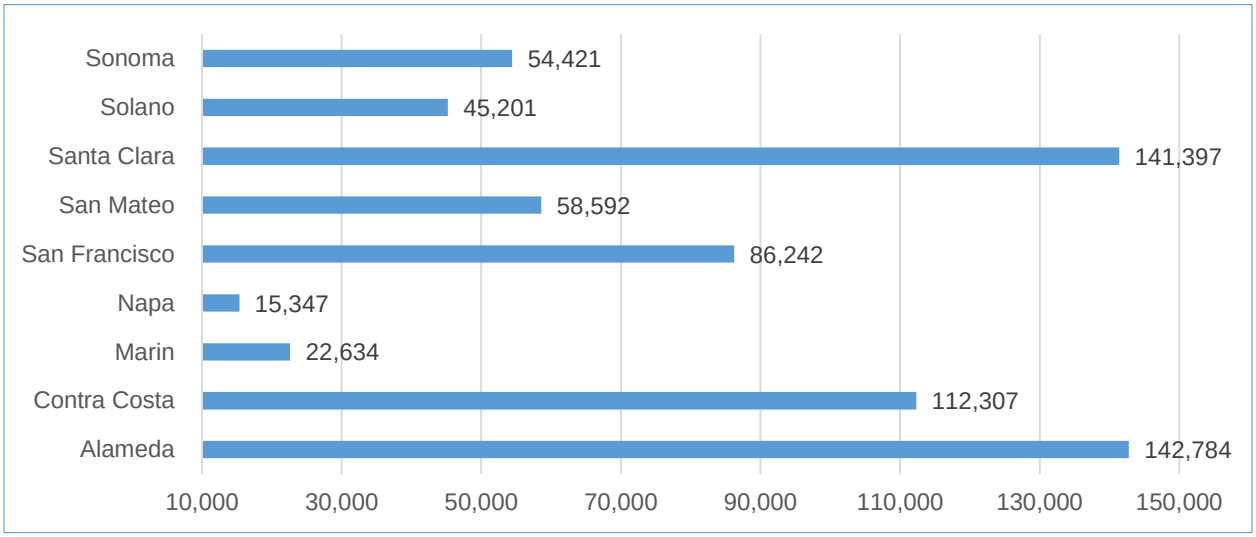
Table 3-9: Share of Population with Disabilities by Age and County, Bay Area, 2014

	<17 years	18-64 years	>65 years	>75 years	All Disabled
Alameda	4%	13%	72%	51%	9%
Contra Costa	5%	15%	73%	51%	10%
Marin	3%	11%	55%	41%	9%
Napa	4%	15%	74%	54%	11%
San Francisco	3%	13%	77%	53%	11%
San Mateo	4%	10%	61%	45%	8%
Santa Clara	4%	10%	70%	51%	8%
Solano	5%	17%	78%	53%	11%
Sonoma	5%	17%	71%	51%	11%
Bay Area	4%	12%	71%	50%	9%

Source: American Community Survey 2010-2014 Table B18101

[58] The U.S. Census Bureau defines disability as: Hearing difficulty – deaf or having serious difficulty hearing (DEAR); Vision difficulty – blind or having serious difficulty seeing, even when wearing glasses (DEYE); Cognitive difficulty – because of a physical, mental, or emotional problem, having difficulty remembering, concentrating, or making decisions (DREM); Ambulatory difficulty – having serious difficulty walking or climbing stairs (DPHY); Self-care difficulty – having difficulty bathing or dressing (DDRS); Independent living difficulty – because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping (DOUT).

Chart 3-K: Number of People with Disabilities by County, Bay Area, 2014



Source: American Community Survey 2010-2014 Table B18101

Housing

The Bay Area faces many challenges related to housing, which have a disproportionate impact on the region's low-income population. These challenges include: rising housing costs and decreasing affordability; lack of supply to meet current and future needs; a spatial mismatch between the location of jobs and housing; lack of adequate public funding to provide new affordable units or preserve existing ones; and rising poverty along with declining economic opportunities. As a result, the whole region is impacted by adverse outcomes such as diminished quality of life, as well as direct impacts on the environment, economic growth and long-term sustainability. This section summarizes some of these challenges and trends.

Rising Housing Costs

As outlined in Plan Bay Area (PBA) 2040, the acute housing affordability crisis in the Bay Area reflects the region's strong economy, with robust growth in high-wage jobs in recent years, near-zero median wage growth, and limited housing construction, especially near job centers.[59] The housing crisis is disproportionately affecting low-income households, as high costs consume an even larger share of family budgets and scarcity of affordable units limits housing options.

According to an analysis conducted by Trulia, a real estate firm, in 2014 only 14 percent of homes for sale in San Francisco were affordable to middle-class families, even though median household income is higher in San Francisco than almost anywhere else in the country.[60] This share was down from 20 percent just a year earlier. In San Jose and Oakland, the share of homes affordable to middle-class families in 2014 were 34 and 40 percent, respectively, down from 42 and 52 percent in the year before. All three metro areas were in the top ten least affordable places for a middle-class family, among a hundred metro areas studied by Trulia. These economic pressures affect not just San Francisco, San Jose and Oakland, but almost every community in the region.[61, 62]

[59] For example, between 2010 and 2015, the region added about 500,000 jobs and only about 50,000 new housing units. Source: MTC Vital Signs. See: www.vitalsigns.mtc.ca.gov.
[60] Trulia, May 2014: https://www.trulia.com/blog/trends/middle-class-may-2014/.
[61] MTC Vital Signs: http://www.vitalsigns.mtc.ca.gov/housing-affordability; 2000 and 2010 Decennial US Census; American Community Survey (2009-2013) data.
[62] The Urban Displacement Project, University of California Berkeley: www.urbandisplacement.org/.

Table 3-10: Share of Homes for Sale that are Affordable to the Middle Class[63]

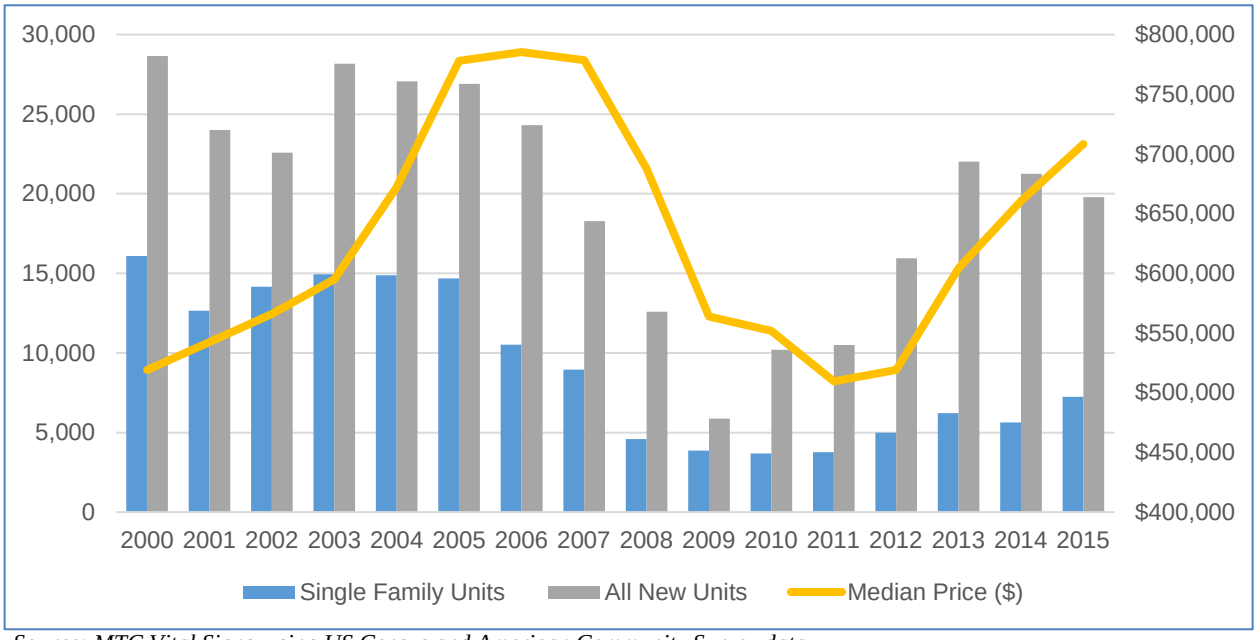
Metro Area	Rank among 100 metro areas	Percent of homes for sale within reach of the middle class		Median household income	Maximum affordable home price
		2014	2013		
San Francisco	1	14%	20%	$84,129	$440,000
San Jose	7	34%	42%	$94,078	$484,000
Oakland	10	40%	52%	$72,281	$366,000

Source: Trulia, May 2014

The Bay Area does have some affordable homes, but they are primarily located in inland communities. Median home prices in Solano County were under $300,000 in 2014, which was less than half the regional average. Antioch and Pittsburg in eastern Contra Costa County had similarly low home prices, but had seen them rise above $400,000 by the end of 2016. While these homes may be newer, larger, served by better schools, and/or more affordable, their residents face longer commutes and have access to fewer services and amenities close to where they live.[64]

Conditions are even worse for renters. The average rent in the region was $2,526 in the second quarter of 2015, which rose another 10 percent in the final quarter. The steepest rent increases were experienced in San Francisco and Oakland, where, since 2010, the average asking rent has increased 57 and 88 percent, respectively.[65] Similar to home values, all counties experienced rising rents, which gained between 46 and 82 percent in inflation-adjusted dollars between 1970 and 2013.

Chart 3-L: Housing Supply and Median Home Price (adjusted for inflation), Bay Area, 2000-2014



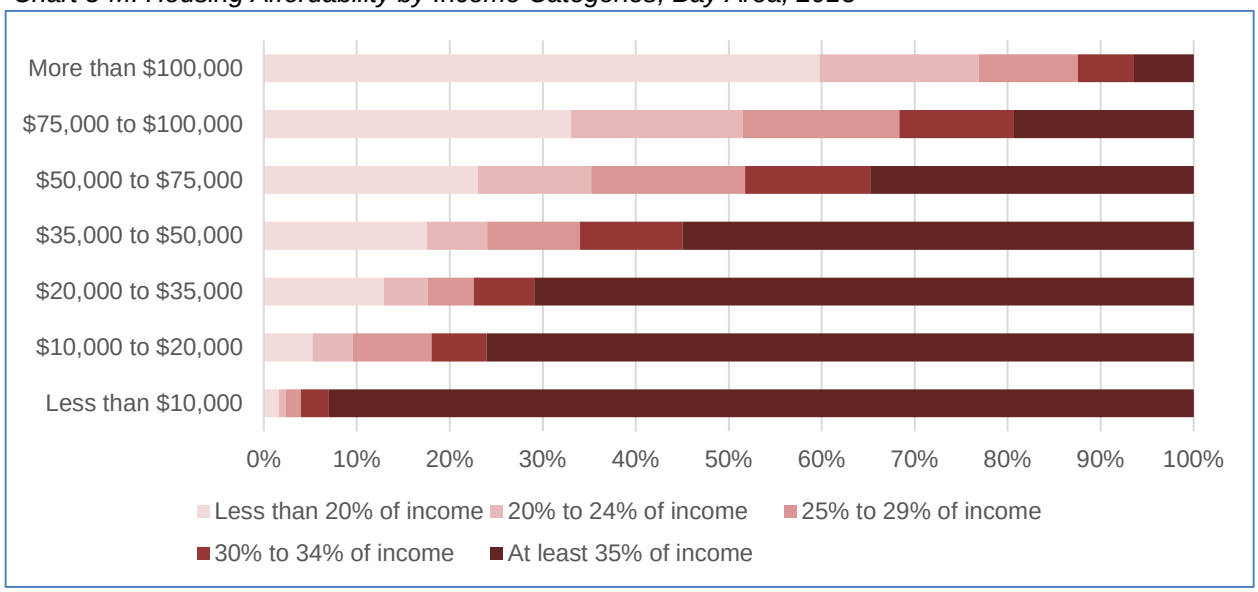
Source: MTC Vital Signs, using US Census and American Community Survey data

Affordable homes in the rental market have also grown scarcer, with rents across the region much closer to the regional average than ever before. In the North Bay, both Napa and Sonoma counties experienced the fastest growth in rents between 1970 and 2015, which exceeded rent increases even in high-cost San Francisco. Solano County, traditionally the most affordable place for Bay Area renters, saw a 64 percent

[63] Families that earn a median income in a metropolitan area are considered middle class.
[64] MTC Vital Signs.
[65] RealFacts, LLC, 2015 2nd Quarter Report.

spike in rents. These rapid increases partially reflect the relative affordability of North Bay communities in 1970 and partly the lack of affordability in other parts of the region.

Chart 3-M: Housing Affordability by Income Categories, Bay Area, 2013



Source: MTC Vital Signs, using US Census and American Community Survey data

While almost every household in the Bay Area is experiencing high housing costs, these conditions have an oversized impact on low-income populations. In 2013, more than half the households in the Bay Area earn less than $50,000 per year experienced an excessive housing cost burden (they spent more than a third of their income on housing), regardless of where they lived in the region. Only when household incomes exceed $100,000 does the region seem marginally more affordable.[66]

The share of Bay Area households who spend more than a third of their incomes on housing has also steadily increased in the last few decades. Between 2000 and 2010, the share of cost-burdened households in the Bay Area increased from 27 to 36 percent.[67] High housing costs and stagnated wages have both contributed to severe overcrowding in the Bay Area and in the state (overcrowding in California is now nearly four times the national average).[68]

Addressing housing affordability and neighborhood stability in the Bay Area is critical to ensuring that all residents have access to decent and safe living conditions and access to jobs, transit and essential services.

Jobs-Housing Fit

According to a study conducted by the University of California Davis in 2015,[69] the lack of affordable housing close to low- and moderate-wage jobs, which usually co-locate with high-wage jobs, creates an even bigger imbalance for low- and moderate-income households. This jobs-housing mismatch is one of the primary drivers of high displacement risk, and higher housing and transportation costs for the region's lower-wage workers. The impact of low housing supply in location-efficiency areas is more traffic congestion and delays, lower worker productivity, and higher environmental and health impacts.

---

[66] MTC Vital Signs.
[67] Ibid.
[68] Special Report on Overcrowding, California Housing Partnership Corporation, 2014. http://chpc.net/wp-content/uploads/2015/11/12-ContraCostaHousingNeed2015.pdf.
[69] "Regional Opportunity Index." Center for Regional Change, University of California Davis, 2015. See: http://interact.regionalchange.ucdavis.edu/roi/.

The study notes that a desirable jobs-to-housing ratio is a little less than 2 (or about two jobs or less for every home) in a community. A higher ratio often creates a tight housing market, and a lower ratio reflects a weak jobs market. Neither condition is ideal, but the impacts are greatest on low- and moderate-wage workers. By 2015, local jurisdictions had permitted only about 28 percent of the units needed to meet state projections for very-low-, low- and moderate-income housing between 2007 and 2014, a shortfall of over 90,000 units.[70]

Most of the Bay Area has a jobs-housing ratio higher than 4 (see Map 31), though San Francisco provides more housing opportunities for its low- and moderate-wage workers compared to the rest of the region. Other neighborhoods in the region that perform well on this measure include East San Jose; West and Downtown Oakland; central Richmond; the cities of Alameda, Pittsburg and Oakley; and parts of Solano county. With the exceptions of San Francisco and Oakland, many of these communities have a lower jobs-housing ratio due to a lack of job opportunities.

On the other hand, neighborhoods that have a jobs-to-housing ratio higher than 2 include most of the North Bay, almost all the communities along Highway 680 and 580 in east Alameda and Contra Costa counties, the entire Peninsula area, almost the entire South Bay, and the cities of Fremont, Newark, Union City and Hayward.

Transportation

Low-income and minority populations have somewhat similar travel behaviors compared to the broader population. But there are still some notable differences. The needs of transportation- disadvantaged populations, such as youth, seniors and people with disabilities, vary substantially from the rest of the population, irrespective of income and race/ethnicity. This section describes the travel patterns of low-income and minority populations, with an emphasis on commute to work and neighborhood walkability. For additional details on travel needs of seniors and people with disabilities, see MTC's San Francisco Bay Area Coordinated Public Transit-Human Services Transportation Plan.[71]

Mode of Travel

Low-income populations in the region account for 25 percent of the total population but 53 percent of all transit trips, indicating not just their higher propensity to use transit but also a greater dependence on that mode. Low-income populations also account for 27 percent of all roadway trips, which makes up the vast majority of all their trips (88 percent), indicating continued reliance on the private vehicle for mobility needs, despite the relatively higher costs of car ownership and operations.

Table 3-11: Share of Bay Area Population and Mode of Transportation, 2014

Population Subgroup	Share of Population	Share of Transit Trips	Share of Roadway Trips	Share of All Trips
Low-Income Population	25%	53%	27%	28%
Minority Population	59%	61%	52%	52%

Source: U.S. Census American Community Survey 2010-2014, 2012/2013 California Household Travel Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys

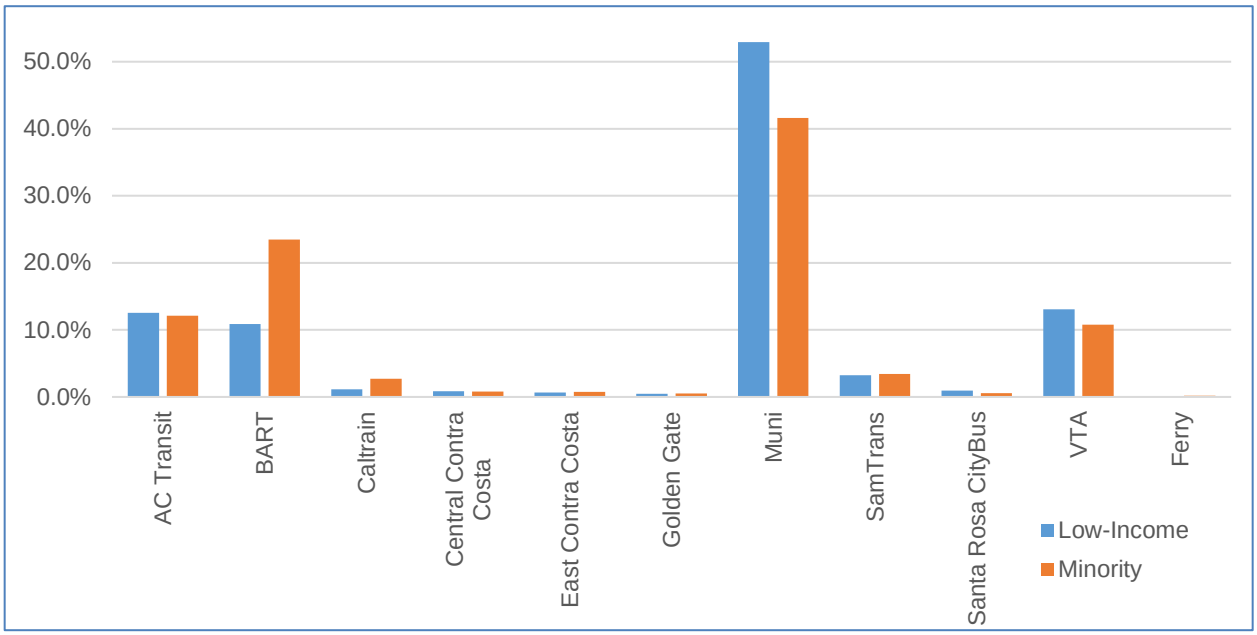
Similarly, minority populations in the region account for 59 percent of the total population, 61 percent of transit trips and 52 percent of roadway trips. Transit trips are a smaller share of trips taken by minorities (8 percent), compared to low-income populations (12 percent). It is unclear why the total number of trips taken by minority populations is lower than their share of the total population, but some

[70] Data compiled by the Association of Bay Area Government from local jurisdictions. Regional Housing Needs Allocation for the Bay Area was 125,258 units for very-low, low- and moderate-income housing, of which only 35,165 were permitted.
[71] The full report can be downloaded here: http://mtc.ca.gov/sites/default/files/Coord_Plan_Update.pdf.

of the difference is a result of using multiple data sources. While the demographic data is derived from the U.S. Census Bureau, roadway trips are summarized from the California Household Travel Survey and transit trips from both MTC's transit passenger survey and previous data collected by each transit operator.

While low-income and minority populations have a higher reliance on transit, this dependence varies widely between different operators and counties. Of the 27 transit operators in the Bay Area, AC Transit, BART, San Francisco Muni and Santa Clara Valley Transportation Authority (VTA) account for around 90 percent of all transit trips in the region, for both population groups. Notably, Muni accounts for about 53 percent of all transit trips for low-income and 42 percent for minority populations, confirming the role of land use (higher-density, mixed-use, walkable communities) in supporting not just higher transit ridership but also access and mobility for transit-dependent populations.

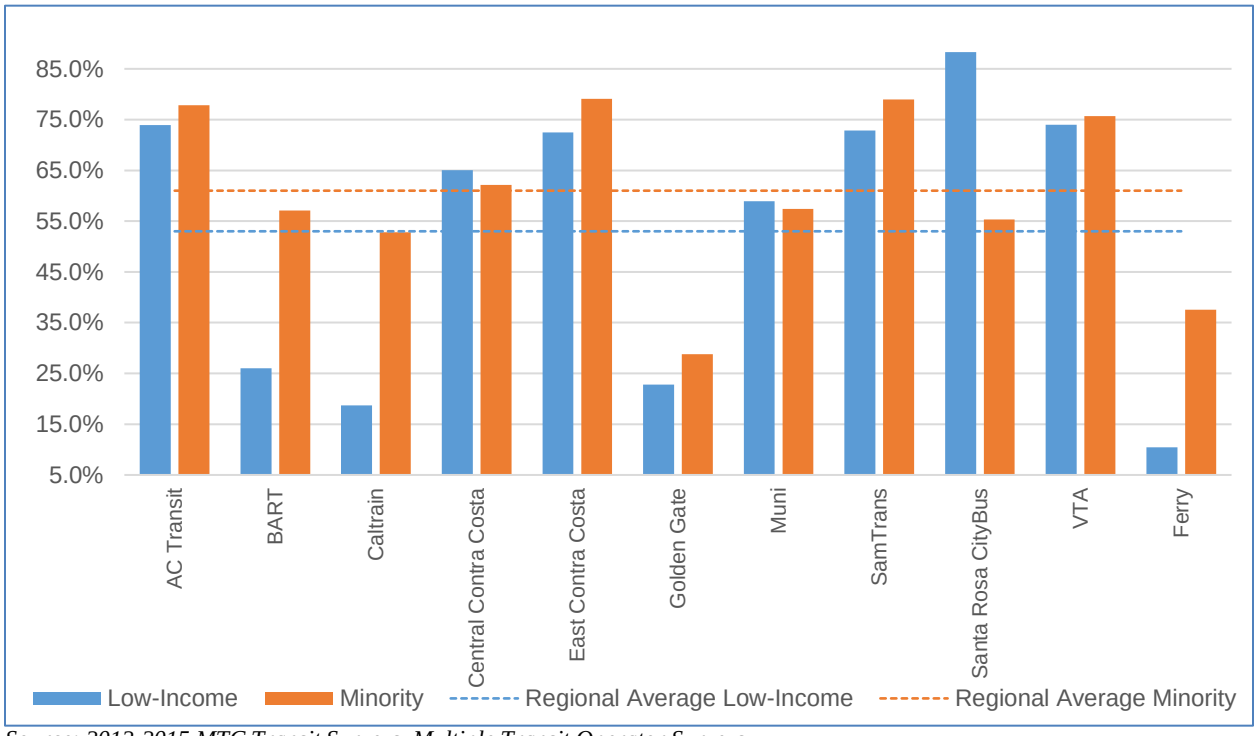
Chart 3-N: Share of Transit Ridership for Minority and Low-Income Populations, Bay Area



Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys

AC Transit and VTA also carry some of the highest shares of low-income and minority populations in the region. About 75 percent of AC Transit's riders are low-income and 78 percent are minorities. Similarly, 75 percent of VTA's riders are low-income and 76 percent are minorities. Of the larger transit operators, BART, Caltrain, Golden Gate Transit (Marin County) and the ferry service have the smallest share of low-income riders, at 26 percent, 19 percent, 23 percent and 11 percent, respectively. Golden Gate Transit and the ferry service also have the smallest shares of minority riders, at 29 and 38 percent, respectively.

Chart 3-O: Share of Minority and Low-Income Riders by Transit Operator, Bay Area



Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys

Commute

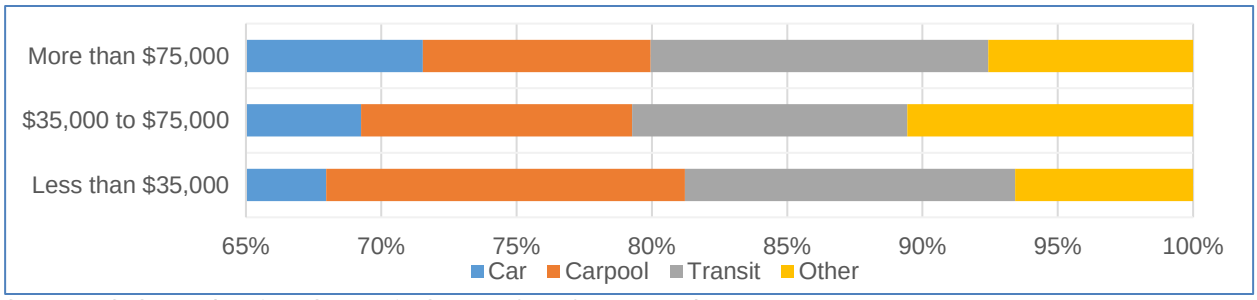
Commute trips for low-income and minority populations vary by distance, time and mode in each county. For this section, low-wage workers earn less than $36,500 per year, or $18 per hour. Given the relatively dispersed development pattern across the Bay Area, most low-wage workers above the age of 16 years drive to work (81 percent). They also tend to have shorter commutes (56 percent of low-wage workers have commutes of less than 20 minutes, compared with 43 percent for higher-wage workers), work in the county where they reside[72] (between 67 percent and 90 percent), and are more likely to walk (nearly 7 percent compared with less than 3 percent of higher-wage workers) and take transit to work (12 percent). Additionally, nearly 10 percent of the lowest-wage workers (those earning less than $12 per hour) take the bus to work, compared to 4 percent of the entire workforce.[73]

Means of transportation to work also varies by county. In Sonoma, Solano and Napa counties, more than 80 percent of low-wage workers drive alone or carpool to work, compared to a little more than 30 percent in San Francisco, which has the highest share of transit trips, at more than 40 percent of total trips region-wide. Alameda County has the second highest share of low-wage workers taking transit to work, at 18 percent, followed by San Mateo County, at 12 percent. San Francisco also has the highest share of low-wage workers walking to work, at 16 percent, followed by Alameda County, at 9 percent, and Marin County, at 8 percent.

Lower-wage jobs and workers are located throughout the region, removing the incentive for them to travel farther for a job that does not pay substantially more. On the other hand, higher-wage workers may be more willing to commute longer distances to access a higher-paying job. Improved and cost-effective regional transit service may be one way to better connect lower-wage workers with middle-wage opportunities across the region.

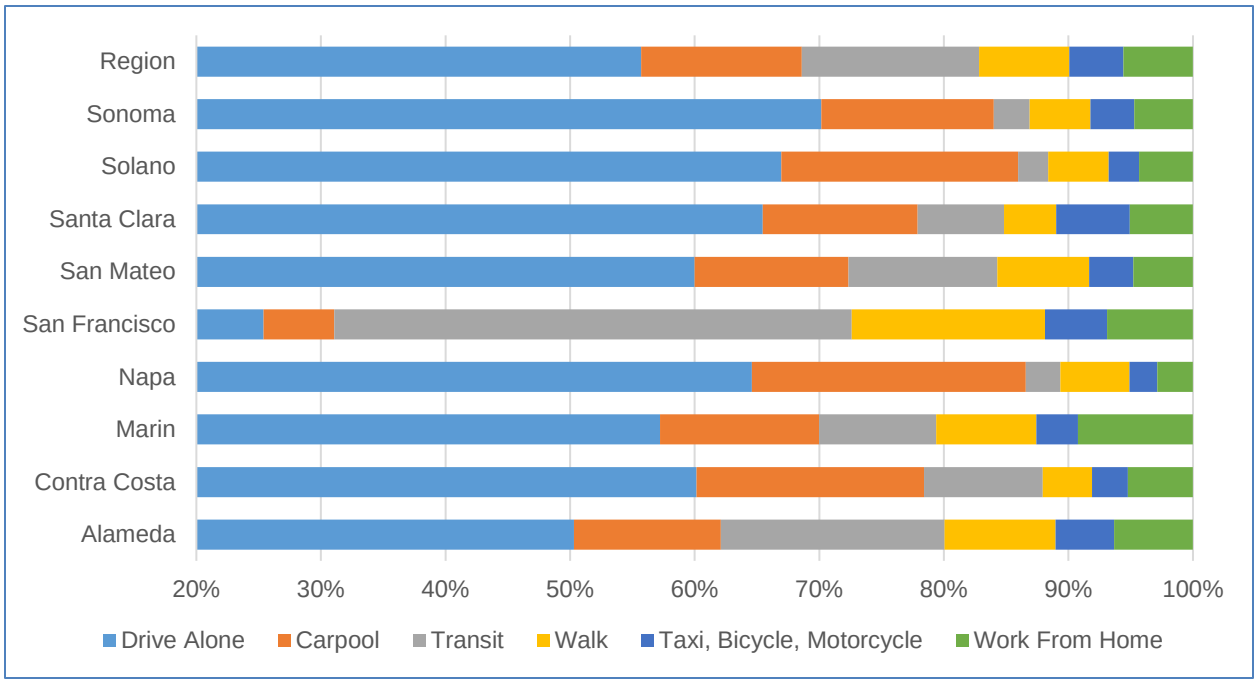
[72] U.S. Census American Community Survey, 2011-2015, 5-Year Average
[73] Economic Prosperity Strategy, 2014, SPUR: http://www.spur.org/publications/spur-report/2014-10-01/economic-prosperity-strategy.

Chart 3-P: Means of Transportation to Work, Workers (16 Years and Over), by Income, Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Chart 3-Q: Means of Transportation to Work, Low-Income Workers (16 Years and Over), Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average
Note: 150 percent of federal poverty line for 2015 is less than $36,500 per year for a family of four.

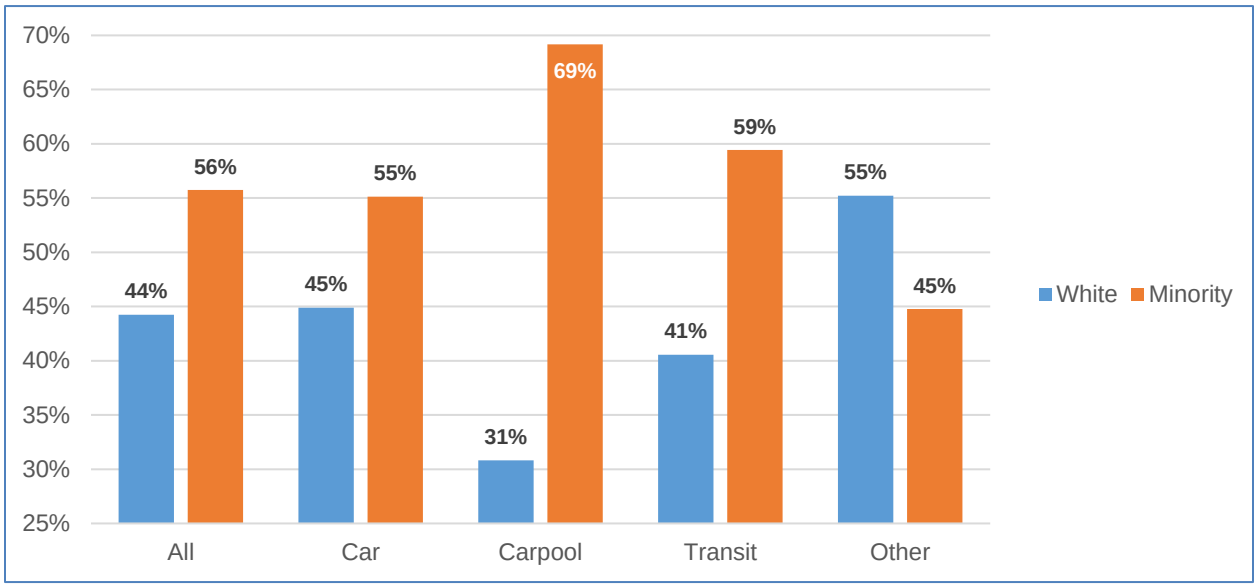
Among lower-wage workers who lack their own vehicles, transportation is the single largest barrier to middle-wage work, and transit is often inadequate in many parts of the region. The cost of car ownership can be prohibitive for some lower-wage workers, which limits their future employment opportunities. The three North Bay counties—Napa, Solano and Sonoma—have the highest percentages of both lower-wage residents and lower-wage jobs (in 2011, over 50 percent of employed residents were lower-wage, and over 54 percent of jobs in these counties paid lower wages). These counties are also the least connected to the rest of the region by transit, and commuters within these counties are more car-dependent than in other parts of the region.[74]

Travel behavior for minorities also varies by mode and county of residence. While minorities are 56 percent of the workforce, they comprise 69 percent of workers who carpool to work and 59 percent who take transit. These shares vary somewhat among various racial/ethnic groups. Ten percent of Hispanic/Latino and White workers take transit to work, compared to 13 percent for Asians and 17 percent for African Americans/Blacks. About 80 percent of Asian and Hispanic/Latino workers drive

[74] Analysis conducted by SPUR, U.S. Census, Longitudinal Household Dynamics (LEHD, 2011): http://lehd.ces.census.gov.

alone or carpool to work, compared to about 74 percent for African Americans/Blacks and Whites. With 12 and 14 percent of workers who carpool to work, Asian and Hispanic/Latino workers have the highest rates of carpooling.

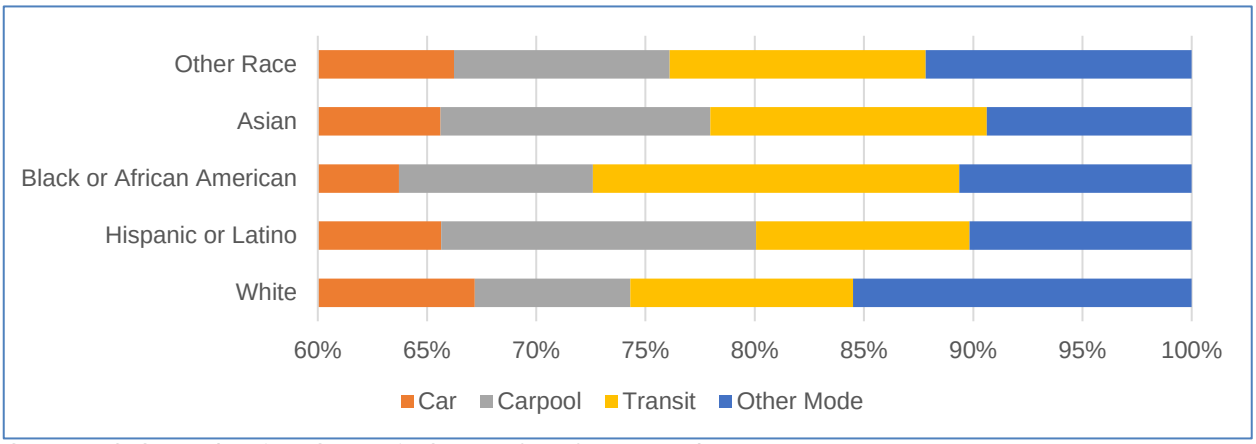
Chart 3-R: Means of Transportation to Work, (16 Years and Over), White and Minority, Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

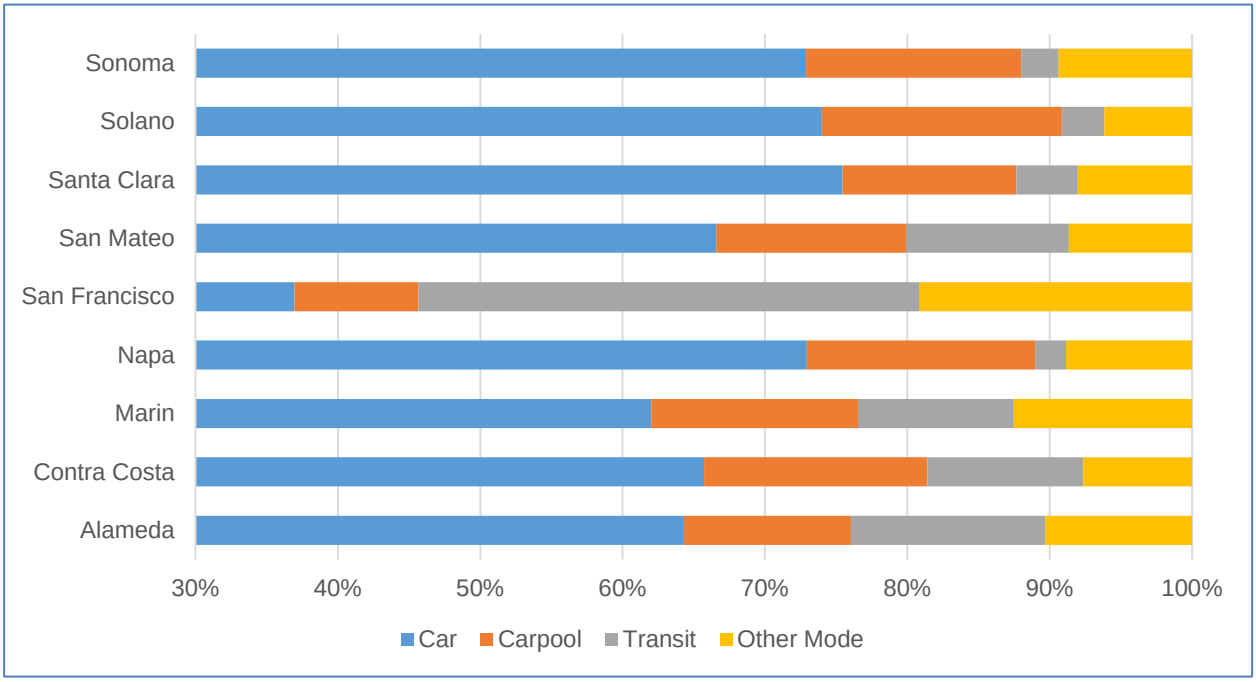
Only 46 percent of minority workers in San Francisco drive alone and carpool, a much lower rate than in any other county. In comparison, 88 percent of the minority workers in Sonoma, 91 percent in Solano, 87 percent in Santa Clara and 89 percent in Napa drive alone or carpool to work. The share of minority residents who ride transit was highest in San Francisco, at 35 percent, followed by Alameda at 14 percent and San Mateo, Marin and Contra Costa counties at 11 percent each in.

Chart 3-S: Means of Transportation to Work, (16 Years and Over) by Race/Ethnicity, Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Chart 3-T: Means of Transportation to Work, Minority Workers (16 Years and Over), Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Cost and Affordability

Transportation costs are the third largest expense for a low-income household in the Bay Area, after housing and food. According to a report published by the Center for Housing Policy[75] in 2006, families in the region that earned under $70,000 annually spent a combined average of 61 percent of their earnings on housing (39 percent) and transportation (22 percent). The national average of the combined housing and transportation cost is about 10 percentage points lower, reflecting the high cost of living in the Bay Area. In 2013, MTC estimated that the combined cost of transportation and housing for low-income households would increase to 64 percent by 2040. MTC now estimates that this share will grow to 67 percent.

Of the two components of the combined cost, housing accounts for the vast majority of current and future cost burden on Bay Area residents. While the cost of transportation will also increase over time, it is anticipated to be in line with the increase in the cost of fuel. Of the 13 percent projected increase in the combined cost of transportation and housing by 2040, just 1 percentage point is contributed by transportation.

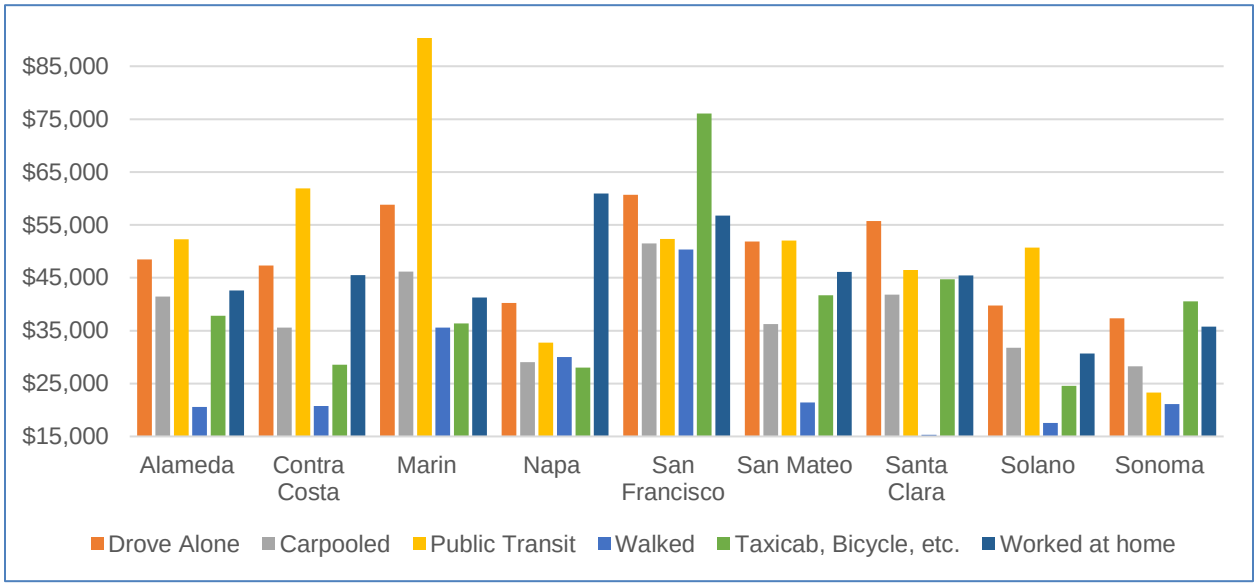
However, the two components of the combined cost are interrelated, and they vary significantly among different population groups in the Bay Area. Low-income households that are unable to afford to live near transit and job centers commute further from less urbanized areas, thereby increasing the amount of time and household budget they spend on transportation. In addition to a lower quality of life, this results in an increase in emissions from cars and light trucks, which undermines the ability of the region to meet its greenhouse gas emission reduction targets.

In terms of median earnings of workers who use different modes of travel to work. For example, transit riders have the highest earnings in Alameda, Contra Costa, Marin, San Mateo and Solano counties. In San Francisco and Sonoma counties, workers who used a taxicab or rode their bicycles and motorcycles to work had the highest earnings. But most notably, the median earnings of workers who walked to

[75] Lipman, Barbara J. October 2006. "A Heavy Load: The Combined Housing and Transportation Burdens of Working Families." Center for Housing Policy. http://www.reconnectingamerica.org/assets/Uploads/pubheavyload1006.pdf.

work are the lowest in every county, by a wide margin, except in San Francisco. The other exception is Napa County, where median earnings of workers who walked to work is not the lowest, but closely tied for last place with those who carpooled, used a taxicab, and rode their bicycles or motorcycles. Mode choice for workers in different counties is most likely governed by local land use (both where workers live as well as where they work), the robustness of first- and last-mile connections, transit frequency and reliability, congestion on roadways, and distance to the place of work.

Chart 3-U: Median Earnings by Mode of Travel, Bay Area, 2015



Source: U.S. Census, American Community Survey, 2011-2015, B08121 (workers 16 years and over with earnings)

For a discussion of walkable neighborhoods, as outlined in Resolution 4217, see Chapter 4, Additional Research Focus Areas.

This page left intentionally blank.

Chapter 4. Additional Research Focus Areas

This chapter summarizes findings from additional research on exposure to contamination and pollutants, access to opportunity, poverty in the suburbs, concentration of poverty, and proximity to services and amenities as outlined in MTC's Resolution 4217.[76] The discussion of these additional research topics, while not exhaustive, illuminates key challenges facing the region's low-income and/or minority communities. Each topic includes findings from national research and information specific to the Bay Area. The environment section summarizes information on exposure to contaminated sites and air pollution in disadvantaged communities, while the economy section describes how low-income and minority populations fare in terms of access to opportunity, growing poverty in the suburbs, concentration of poverty, employment opportunities, and access to goods and services.

Environment

As described in Chapter 1, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was enacted in February 1994 to ensure that minority and low-income populations, including tribal populations, do not suffer disproportionately high and adverse human health or environmental effects due to any federal program, policy or activity.

However, low-income people of color in the United States experience higher cancer rates,[77] asthma rates[78] and mortality rates[79] and overall poorer health outcomes compared to affluent and White populations.[80] The presence of higher concentrations of environmental pollution in these communities is one of the many causes of the health disparity.[81] Exposure to contaminants and pollutants can occur in the home due to the presence of lead and asbestos, as well as in the neighborhood due to proximity to major roadways, rail corridors, contaminated sites and toxic releases from industry. This section looks at three types of contaminants and pollutants that affect human health: toxic sites, fine particulate matter

[76] MTC Resolution 4217: https://mtc.legistar.com/View.ashx?M=F&ID=4216456&GUID=42E0CBF3-9490-4A6D-A6A6-B04003451057.

[77] Ward, Elizabeth et al. "Cancer Disparities by Race/Ethnicity and Socioeconomic Status." *CA: A Cancer Journal for Clinicians* 54, no. 2 (2004): 78-93. ("For all cancer sites combined, residents of poorer counties [those with greater than or equal to 20 percent of the population below the poverty line] have 13 percent higher death rates from cancer in men and 3 percent higher rates in women compared with more affluent counties [less than 10 percent below the poverty line]. Even when census tract poverty rate is accounted for, however, African American, American Indian/Alaskan Native, and Asian/ Pacific Islander men and African American and American Indian/Alaskan Native women have lower five-year survival than non-Hispanic Whites.")

[78] Gray, Lolita D. and Glenn S. Johnson. "A Study of Asthma as a Socio-Economic Health Disparity Among Minority Communities." *Race, Gender & Class* 22, no. 1-2 (2015): 337-357.

[79] McLaughlin, Diane K. and C. Shannon Stokes. "Income Inequality and Mortality in US Counties: Does Minority Racial Concentration Matter?" *American Journal of Public Health* 92, no. 1 (2002): 99-104. ("Higher income inequality at the county level was significantly associated with higher total mortality. Higher minority racial concentration also was significantly related to higher mortality and interacted with income inequality.")

[80] See, e.g., Centers for Disease Control and Prevention. "CDC Health Disparities and Inequalities Report — United States, 2013." *Morbidity and Mortality Weekly Report* 62, suppl no. 3 (2013): 1-187. https://www.cdc.gov/mmwr/preview/ind2013_su.html#HealthDisparities2013.

[81] Bay Area Air Quality Management District. Improving Air Quality & Health in Bay Area Communities: Community Air Risk Evaluation Program Retrospective & Path Forward (2004-2013): http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/CARE_Retrospective_April2014.ashx

and diesel particulate matter. Data used in this section is reported by the California Environmental Protection Agency (EPA) and the Bay Area Air Quality Management District (BAAQMD).

Contaminated Sites

National Studies

Land that has suffered environmental degradation due to the presence of hazardous substances poses significant health risks.[82] Exposure to contaminants is the primary concern for such "brownfields," which are often located in active or former industrial and military zones. Hazardous substances from these sites can also migrate off-site and impact surrounding communities through volatilization, groundwater plume migration or windblown dust. Studies have found levels of organochlorine pesticides in blood[83] and toxic metals in house dust[84] that were correlated with residents' proximity to contaminated sites.

A study in New York City found an association between prevalence of liver disease and the number of Superfund sites per 100 square miles.[85] Research also indicates that the relationship between pollutant exposure, stress and health outcomes can vary based on the race and ethnicity of a population. Multiple studies provide evidence that social stressors play a role in determining vulnerability to the health impacts of environmental exposures.

A study of socioeconomic factors in communities in Florida found that census tracts with Superfund sites had significantly higher proportions of African Americans, Latinos and people employed in "blue collar" occupations.[86] Other studies have shown that maternal exposure to particulate pollution results in a greater reduction in infant birth weight among African American mothers than White mothers.[87] A study of the effect of blood lead level on blood pressure found there are significant racial and ethnic disparities, with the strongest association occurring in African Americans with symptoms of depression.[88]

Differences have also been observed in the effect of PM 2.5 exposure on emergency room visits for asthma among patients of different races. The effect was found to be significant and greater in African American populations compared to Whites.[89] Among children, a study on the effects of nitrogen dioxide (NO2) on children without health insurance in Phoenix found that Hispanic/Latino children had twice the risk of hospitalization for asthma from NO2 exposure as White children. African American children showed about twice the risk of asthma hospitalization from NO2 exposure as Hispanic/Latino children, regardless of insurance status.[90]

---

[82] These sites also have the potential to degrade nearby wildlife habitats, resulting in potential ecological impacts as well as threats to human health.

[83] Gaffney, S.H. et al. "Influence of geographic location in modeling blood pesticide levels in a community surrounding a U.S. Environmental protection agency superfund site." *Environmental Health Perspectives* 113, no. 12 (2005): 1712-6.

[84] Zota, A.R. et al. "Metal sources and exposures in the homes of young children living near a mining-impacted Superfund site." *Journal of Exposure Science and Environmental Epidemiology* 21, no. 5 (2011): 495-505.

[85] Ala, Aftab et al. "Increased prevalence of primary biliary cirrhosis near Superfund toxic waste sites." *Hepatology* 43, no. 3 (2006): 525-31.

[86] Kearney Greg and Gebre-Egziabher Kiros. "A spatial evaluation of socio demographics surrounding National Priorities List sites in Florida using a distance-based approach." International Journal of Health Geographics 8, no. 33 (2009): https://ij-healthgeographics.biomedcentral.com/articles/10.1186/1476-072X-8-33.

[87] Bell, Michelle L., Keita Ebisu, and Kathleen Belanger. "Ambient air pollution and low birth weight in Connecticut and Massachusetts." *Environmental Health Perspectives* 115, no. 7 (2007): 1118-24.

[88] Hicken, Margaret T. "Black-white blood pressure disparities: depressive symptoms and differential vulnerability to blood lead." *Environmental Health Perspectives* 121, no. 2 (2013): 205-9: https://ehp.niehs.nih.gov/1104517/.

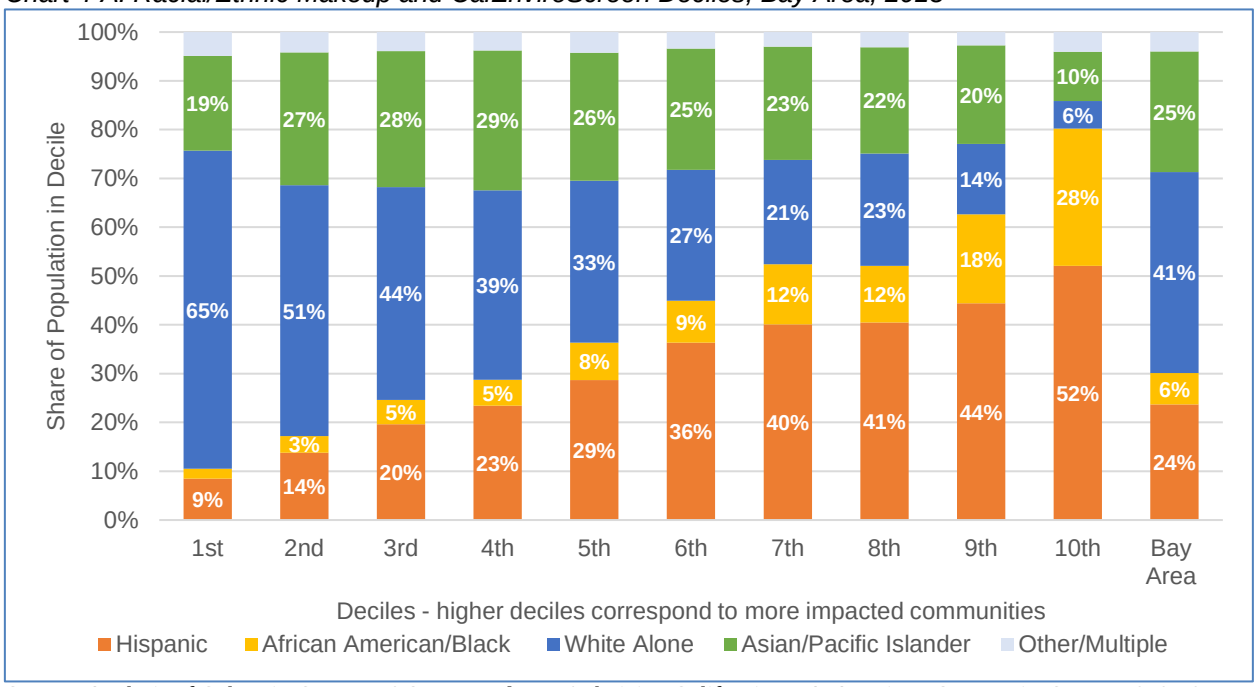
[89] Glad, Jo Ann et al. "The relationship of ambient ozone and PM2. 5 levels and asthma emergency department visits: Possible influence of gender and ethnicity." *Archives of Environmental & Occupational Health* 67, no. 2 (2012): 103-108.

[90] Grineski, Sara E. et al. "Children's asthma hospitalizations and relative risk due to nitrogen dioxide (NO2): Effect modification by race, ethnicity, and insurance status." *Environmental Research* 110, no. 2 (2010): 178-88.

Bay Area Trends

Chart 4-A shows the breakdown of population by race/ethnicity in the Bay Area by the level of exposure to pollutants (the data is divided into ten categories, with the tenth decile representing areas that are the most burdened by environmental pollution and risk factors). EPA's data confirms the findings of national studies – that minority populations have higher exposure to pollutants and contaminants compared to the White population. The findings are most concerning for African American/Black and Hispanic populations.

Chart 4-A: Racial/Ethnic Makeup and CalEnviroScreen Deciles, Bay Area, 2015



Source: Analysis of CalEnviroScreen 3.0 Scores and Race/Ethnicity, California EPA, American Community Survey 2010-2014 5-year average, MTC analysis.

African Americans/Blacks make about 6 percent of the regional population and Hispanics about 24 percent, but both subgroups represent a higher share of the people who live in more impacted areas (from the sixth to tenth decile).[91] About 40 percent of the population that resides in areas in the sixth to tenth decile is Hispanics, about 12 percent is African Americans/Blacks and 22 percent is Whites.

In the most affected areas (ninth and tenth deciles), the concentration of minorities is even higher. Only a little more than 1 percent of all Whites in the region reside in these highly impacted communities, compared to about 13 percent of all African Americans/Blacks. About 46 percent of the population that resides in areas in the ninth and tenth deciles is Hispanic, 20 percent is African American/Black, and 19 percent is Asian/Pacific Islander.

The reverse is also true for both population subgroups. Both African Americans/Blacks and Hispanics are underrepresented in areas that are the least impacted. Both Whites and Asians fare much better in comparison. Whites are the majority in the least disadvantaged areas (the first and second deciles) and a small minority in the most disadvantaged areas. EPA also estimates that, in the Bay Area, about 45 percent of the low-income population resides in impacted areas (from the sixth to the tenth decile).[92]

[91] American Community Survey 2010-2014 5-year average.
[92] Residents in households that earn less than 200 percent of the federal poverty level in 2014.

Particulates

National Studies

Exposure to particulate matter can result in long-term negative health outcomes as well as environmental degradation, which compounds the effects on human health. People who experience higher exposure due to physical proximity or extended exposure face higher risks. Children, the elderly, pregnant women and those who are already sick are especially vulnerable.

PM 2.5, or fine particulate matter, refers to particles that have a diameter of 2.5 micrometers or less. Particles of this size can have adverse effects on the heart and lungs, including lung irritation, exacerbation of existing respiratory disease, and cardiovascular effects.

These particles are emitted from many sources, including cars and trucks, industrial processes, wood burning, and other activities involving combustion. The smaller the particle size, the more deeply the particles can penetrate into the lungs. Some fine particles have also been shown to enter the bloodstream.

Children, the elderly, and persons suffering from cardiopulmonary disease, asthma, and chronic illness are most susceptible to the effects of PM exposure.[93]

Diesel particulate matter (diesel PM) is emitted from both on-road and off-road sources. Major sources of diesel PM include trucks, buses, cars, ships and locomotive engines. Diesel PM is therefore concentrated near ports, rail yards and freeways, where many such sources exist. Exposure to diesel PM has been shown to have numerous adverse health effects, including irritation to eyes, throat and nose; cardiovascular and pulmonary disease; and lung cancer.[94]

Bay Area Trends

While EPA data confirm that no census tract in the Bay Area suffers from high exposure to PM 2.5,[95] the EPA estimates that 47% of Bay Area residents of a low-income census tract (i.e., where 30 percent or more of the residents are low-income) are exposed to high levels of diesel PM. Residents in very low-income census tracts (i.e., where the poverty rate is 50 percent or more) are even more impacted, with almost two thirds (64 percent) exposed to high levels of diesel PM.

Map 32 shows the spatial distribution of major truck routes in the region and the location of CoCs. A visual analysis of the map shows that almost all CoCs in the region are exposed to some truck traffic, and thereby to emissions such as diesel PM. The Bay Area Air Quality Management District's (BAAQMD) analysis indicates that reductions in cancer risk can be expected as new statewide emissions rules come online.[96] In the meantime, BAAQMD's Community Air Risk Evaluation (CARE) Program seeks to further reduce health impacts in communities with disproportionate exposure to air pollution, which overlap with CoCs (see Map 33).

Economy

This section summarizes two regional trends that impact not only low-income communities but also the economic competitiveness of the entire region. One of these trends is the growing gulf between residents who have access to opportunities such as jobs, transit, parks, schools and grocery stores and those that have little, if any, access to these amenities near their neighborhoods. The other trend is the slow but

---

[93] U.S. EPA. December 2012. "The National Ambient Air Quality Standards for Particle Pollution: Particle Pollution and Health." http://www.epa.gov/pm/2012/decfshealth.pdf.
[94] Ibid.
[95] CalEnviroScreen, California EPA; see next page for more information on the state program.
[96] Bay Area Air Quality Management District. Improving Air Quality & Health in Bay Area Communities: Community Air Risk Evaluation Program Retrospective & Path Forward (2004-2013): http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/CARE_Retrospective_April2014.ashx.

consistent decline in the number of middle-wage jobs in the Bay Area. High cost of living and a lack of job opportunities have pushed many families looking for affordable housing into adjacent regions such as the Central Valley, or even across state lines. This section briefly describes both trends.

Access to Opportunity

National Studies

A recent study conducted at Harvard University[97] found that social and economic mobility for low-income residents depends largely on the quality of their neighborhoods. Residents of a neighborhood that provides good schools, safe streets, healthy food options, quality parks and community facilities, safe housing, and multiple transportation options are more likely to do well on a broad range of social, economic and health indicators. Conversely, the lack of access to these amenities is likely to hinder mobility and opportunity, especially among children.

According to the study, a low-income child (at age eight on average) who grew up in a high-poverty neighborhood would earn up to $302,000 less over his or her lifetime[98] compared to a low-income child who lives in a low-poverty neighborhood. The study based its findings on data from 741 "community zones"[99] across the country. The authors of the study conclude that any effort to integrate low-income families with children into mixed-income communities is likely to reduce the persistence of inter-generational poverty.

Neighborhood characteristics that are strongly correlated with low inter-generational mobility include: a high share of minority population (the study cites the share of African Americans[100]), which is also a measure of segregation;[101] a high rate of poverty and income inequality[102] (measured as the Gini coefficient); a low-performing K-12 school system[103] (measured as lower test scores, higher dropout rates and large class sizes); low social capital indices (measured as the strength of social networks and community involvement[104]); and a high share of single-parent families (measures of family structure are the strongest predictors of upward mobility).[105]

Another study conducted at Stanford University[106] found that differences in life expectancy among the poor are less associated with a lack of access to health care or levels of income inequality, and more dependent on whether the poor lived in affluent cities with a highly educated population and high levels of local government expenditures such as New York and San Francisco. Both studies use "big data" to test the hypothesis that place matters – i.e., where you grow up affects your health outcomes as well as the persistence of inter-generational poverty. Mere physical access (transportation links) to higher opportunity areas was not found to correlate with these outcomes.

---

[97] The Health Inequality Project (https://healthinequality.org/); Chetty, R., Stanford, Principal Investigator, Corresponding Author; Cutler, D., Harvard, Principal Investigator; Stepner, M., MIT, Senior Researcher.
[98] This is equivalent to a gain of $99,000 per child in present value at age 8, discounting future earnings at a 3 percent interest rate.
[99] The study defines community zones as geographical aggregations of counties that are similar to metro areas but which also cover rural areas.
[100] Areas with larger black populations tended to be more segregated by income and race, which could have an adverse effect on both white and black low-income individuals.
[101] The study clarifies that racial shares matter at a community rather than individual level.
[102] The study confirms that factors that erode the middle class hamper inter-generational mobility more than the factors that lead to income growth for the wealthy.
[103] Areas with high taxes, which are predominantly used to finance public schools, have higher rates of mobility.
[104] Areas with high upward mobility tend to have greater participation in local civic organizations.
[105] As with race, parents' marital status does not matter purely through its effects at the individual level. Children of married parents also have higher rates of upward mobility if they live in communities with fewer single parents.
[106] The Health Inequality Project (https://healthinequality.org/); Chetty, R., Stanford, Principal Investigator, Corresponding Author; Cutler, D., Harvard, Principal Investigator; Stepner, M., MIT, Senior Researcher.

What are high-opportunity areas?

For an individual or household, opportunity means having access to quality education, well-paying jobs, community amenities, a safe home and a healthy living environment. High-Opportunity Areas (HOAs) therefore offer their residents access to services and amenities such as good schools, safe and walkable neighborhoods, multiple transportation options, quality parks and open space, grocery stores and fresh food markets, and better public services such as police, fire and street cleaning, among others.

As a result, high-opportunity areas – or "desirable neighborhoods" – typically have high housing costs, both for renters and homeowners. For the purpose of this report, high-opportunity areas are defined using the Kirwan Institute's* composite index of opportunity, which includes the following indicators:

- **Education –** reading and math proficiency; class size; share of students on free or reduced lunch; and adult education attainment.
- **Economics and Mobility –** proximity to jobs (within 5 miles); share of residents on public assistance; unemployment rate; commute time; and transit access.
- **Neighborhood and Housing Quality –** median home value; residential vacancy rate; neighborhood poverty rate; median gross rent; crime risk index; proximity to waste sites and toxic releases; and proximity to parks and open space.

Based on this definition, MTC and ABAG have identified 339 census tracts as low- and very-low-opportunity areas and 430 tracts as high- and very-high-opportunity areas in the region (see Map 5m). Large parts of San Francisco, San Mateo and west Santa Clara counties, along with inland Contra Costa and Alameda counties, can be classified as high-opportunity areas. Portions of Marin and Sonoma counties also rank among high opportunity areas. The inner East Bay (including the cities of Richmond, Oakland and unincorporated Alameda County), East Contra Costa County and East San Jose can be classified as low-opportunity areas.

** The Kirwan Institute for the Study of Race and Ethnicity, Columbus, OH (see: http://kirwaninstitute.osu.edu/)*

Bay Area Trends

A study conducted by the Association of Bay Area Governments[107] (ABAG) found that access to High-Opportunity Areas (HOAs) in the Bay Area is mostly a function of housing cost, which is a bigger barrier for lower-income households. According to the study, Whites and Asians are more likely to live in census tracts with higher access to opportunity than the population overall, whereas Hispanic and Black residents are more likely to live in census tracts with lower access to opportunity. Further, poor Hispanic and Black residents are worse off compared to poor Whites and Asians as they are more likely to live in areas of *low or very low* access to opportunity.

In 2014, of the 1.8 million low-income residents in the Bay Area, just 8 percent lived in an HOA.[108] Similarly, just 12 percent of the 4.3 million people with a minority status lived in an HOA. The share for the African American/Black population was even lower, at 5 percent. In comparison, of the 3 million

[107] The Fair Housing and Equity Assessment (FHEA) of the San Francisco Bay Area – Enhancing Regional Economic Opportunity, 2014: http://www.planbayarea.org/sites/default/files/pdf/prosperity/research/FHEA_BAY_AREA_and_Appendices.pdf.

[108] Over 1.13 million people in the Bay Area lived in HOAs in 2014, of which 54 percent were White, 2 percent Black, and 12 percent low-income. While the share of minority populations in HOAs has risen significantly between 2000 and 2014, from 30 percent to 46 percent, 88 percent of people of color still live outside HOAs. (2010-2014 American Community Survey 5-year average.)

Whites in the region, 21 percent lived in an HOA.[109] The ABAG study concludes that segregation persists in the region, particularly for Blacks and Hispanics. Historically, this segregation was most prominent in city centers, where many low-income people of color were concentrated. As more low-income households continue to disperse geographically in the region, the pattern of segregation is being replicated in the suburbs, where these communities face lower access to opportunity. Black residents continue to leave historically Black neighborhoods in San Francisco, Oakland and Richmond, where they had relatively good access to transit and social services, to suburban communities such as East Contra Costa County, where transit as well as social services are relatively scarce.[110]

In Alameda County, 43 percent of the low-income population and 31 percent of the minority population lives in areas that are considered to have *higher* levels of disadvantage. That share is 23 and 14 percent respectively in the *highest* disadvantaged areas. In comparison, in Sonoma and Napa counties, these shares are close to zero percent.

This data highlights multiple related but distinct challenges: one, Sonoma County does not have any *higher and highest* disadvantaged areas; two, Napa County may have *highest* disadvantaged areas, but a very low share of the County's low-income population lives in these areas; three, Alameda County has many *higher and highest* disadvantaged areas, and a high share of the county's large low-income population lives in these areas; and four, a large share of this low-income population in Alameda County lives in concentrated areas of poverty (see Map 2).

Table 4-1: Share of Low-Income and Minority Population by Level of Disadvantage, Bay Area, 2014

County	Higher Disadvantage Areas		Highest Disadvantage Areas	
	Low-Income	Minority	Low-Income	Minority
Alameda	43%	31%	23%	14%
Contra Costa	32%	25%	14%	11%
Marin	16%	16%	11%	10%
Napa	1%	1%	1%	1%
San Francisco	33%	25%	17%	13%
San Mateo	32%	21%	9%	7%
Santa Clara	30%	20%	16%	10%
Solano	19%	15%	3%	3%
Sonoma	0%	0%	0%	0%

Source: American Community Survey 2010-2014, Kirwan Institute, MTC Analysis

In San Francisco and San Mateo counties, 27 percent of the low- income population lives in *high- or very-high*-opportunity areas, which is a larger share than the regional average of 17 percent. In Napa and Solano counties, this share drops to two and one percent respectively. This data also highlights multiple related but distinct challenges: one, Napa and Solano counties have very few *high- and very-high*-opportunity areas; two, in San Francisco, twice as many low-income residents live in *high- and very-high*-opportunity areas (27 percent) as do in low-and very-low opportunity areas (12 percent); and three, even in San Francisco, most of the *high- and very-high*-opportunity areas do not overlap with CoCs (see Map 34).

[109] In 2014, low-income people were 25 percent of the total population, minorities 59 percent, African Americans or Blacks 6 percent and Whites 41 percent. The total number of African American or Black population in the Bay Area was 474,069. (2010-2014 American Community Survey 5-year average.)

[110] Contra Costa Health Services. May 2013. "Health Indicators and Environmental Factors Related to Obesity for Antioch, Bay Point and Pittsburg." http://cchealth.org/prevention/pdf/Health-Indicators-and-Environmental-Factors-Related-to-Obesity-2013.pdf.

Table 4-2: Low-Income and Minority Population by Type of Opportunity Area, Bay Area, 2014

County	High- and Very-High-Opportunity Areas				Low- and Very-Low-Opportunity Areas			
	Low-Income		Minority		Low-Income		Minority	
Alameda	65,283	15%	205,302	20%	140,380	33%	281,267	27%
Contra Costa	16,252	6%	43,688	8%	110,458	42%	204,223	35%
Marin	9,217	19%	16,218	23%	9,583	19%	14,470	21%
Napa	720	2%	1,015	2%	6,787	18%	9,592	16%
San Francisco	62,254	27%	150,279	31%	28,784	12%	52,122	11%
San Mateo	40,476	27%	160,639	37%	36,015	24%	78,542	18%
Santa Clara	98,728	23%	391,414	32%	87,167	21%	228,432	19%
Solano	1,265	1%	3,545	1%	54,184	47%	111,553	45%
Sonoma	17,716	12%	18,551	11%	65,924	46%	75,054	44%
Bay Area	311,911	17%	990,651	23%	539,282	29%	1,055,255	25%

Source: American Community Survey 2010-2014, Kirwan Institute, MTC Analysis

Poverty in the Suburbs

National Studies

In 1999, large U.S. cities and their suburbs had roughly equal numbers of poor residents. But by 2008, the number of suburban poor exceeded the poor in central cities by 1.5 million.[111] Although the poverty rate remained higher in central cities than in suburbs (18.2 percent versus 9.5 percent in 2008), it continues to rise at a faster pace in the suburbs.[112] In part, this is due to sustained population growth outside cities; a majority of all Americans now live in the suburbs. The two economic recessions that bracketed the past decade, however, have also contributed to the changing mix of opportunity in urban and suburban areas.

More than in previous recessions, suburban communities have experienced rates of unemployment comparable to those in cities.[113] And increasingly, urban and suburban poor are becoming more similar in terms of their household structure and educational attainment.[114] The vast majority of urban and suburban poor are working families, have a high school diploma or less, and live in deep poverty (with incomes less than half the federal poverty level, or around $24,250 for a family of four in 2015).

Bay Area Trends

A study conducted by the Federal Reserve Bank of San Francisco in 2012[115] mapped the extent of growing poverty in the suburbs in the Bay Area. The study concluded that several push and pull factors contributed to the trend: The housing boom of the mid-2000s offered affordable homeownership in outer suburbs, while rising home prices in the urban core encouraged homeowners to sell their houses for larger homes farther from the central city; when the housing bubble burst in 2007, these suburban areas

[111] Kneebone, Elizabeth, and Alan Berube. *Confronting Suburban Poverty in America*. Washington: Brookings Institution Press, 2013.
[112] Kneebone, Elizabeth and Emily Garr. January 2010. "The Suburbanization of Poverty: Trends in Metropolitan America, 2000 to 2008" Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/06/0120_poverty_paper.pdf.
[113] Roth, Benjamin and Scott W. Allard. October 2010. "Strained Suburbs: The Social Service Challenges of Rising Suburban Poverty." Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/06/1007_suburban_poverty_allard_roth.pdf.
[114] Berube, Alan et al. 2010. "The State of Metropolitan America: On the Front Lines of Demographic Transformation" Metropolitan Policy Program, Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/07/metro_america_report1.pdf.
[115] Soursourian, Matthew. January 2012. "Community Development Research Brief: Suburbanization of Poverty in the Bay Area." Federal Reserve Bank of San Francisco. http://www.frbsf.org/community-development/files/Suburbanization-of-Poverty-in-the- Bay-Area2.pdf.

saw home values plummet furthest; and the frenzy of housing construction had largely supported many of these local economies, which collapsed when demand dried up, leading to further job losses and increased poverty in suburban communities.

The number of census tracts in the region with 20 percent or more people living in poverty (those earning below 100 percent federal poverty level) jumped by 168 percent between 2000 and 2012, and the number of poor who live in these tracts jumped by 171 percent. This shift was accelerated in part by new immigration patterns, the continued outward shift of employment, and the growing prevalence of low-wage jobs, and the loss of millions of manufacturing and construction jobs in the Bay Area.[116]

Table 4-3: Population in Households Earning Below 100 percent FPL, Bay Area, 2000-2012

Bay Area	2000		2012		*Change[117] 2000-2012*	
	Poor Tracts[118]	Poor[119] Population	Poor Tracts	Poor Population	Poor Tracts	Poor Population
Metropolitan	108	122,534	182	212,234	69%	73%
Cities	86	94,500	123	136,193	43%	44%
Suburbs	**22**	**28,034**	**59**	**76,041**	**168%**	**171%**

Source: Brookings Institution, using tabulation of 2000 Decennial Census and 2012 American Community Survey 1-year data

The study also found that, between 2000 and 2009, while household poverty rates rose across the region in both urban and suburban areas, the population in poverty rose faster in suburban census tracts (16 percent in the suburbs, compared to 7 percent in urban areas), and the share of the poor living in suburban tracts increased across all racial groups, even though the change was the highest among African Americans/Blacks (with a 7 percent increase). On the other hand, poverty rates did not increase among Asians and foreign-born immigrants living in the suburbs.

Previous studies conducted by the University of California Berkeley[121] and ABAG[122] have found that the growing poverty in suburbs is a consequence of indirect displacement, as some landlords converted rental units to condominiums and tenancy in common, or raised rents to the upper limit of what was allowed by local regulations.

The Federal Reserve study presents another explanation for rising poverty in the suburbs. Low-income residents in the urban core may have moved to the suburbs seeking safer neighborhoods with less crime and more opportunities. And since employment had become more decentralized, with job growth occurring fastest outside central cities,[123] some workers followed job opportunities to the suburbs to shorten their commutes. In the late 2000s, as the economy began to contract, many of the same people who moved outside the central city to seek employment may have found themselves without jobs, and in jurisdictions that had no capacity to deal with high poverty and unemployment.

---

[116] Kneebone, Elizabeth, and Alan Berube. *Confronting Suburban Poverty in America*. Washington: Brookings Institution Press, 2013.

[117] Significant at the 90 percent confidence level per: Kneebone, Elizabeth. July 2014. "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012." Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/interactives/the-growth-and-spread-of-concentrated-poverty-2000-to-2008-2012/.

[118] Tracts with 20 percent of more concentration of poor; excludes both tracts with small populations and those with more than 50 percent of residents enrolled in college or graduate school.

[119] Population in households earning less than 100 percent of federal poverty level in 2012.

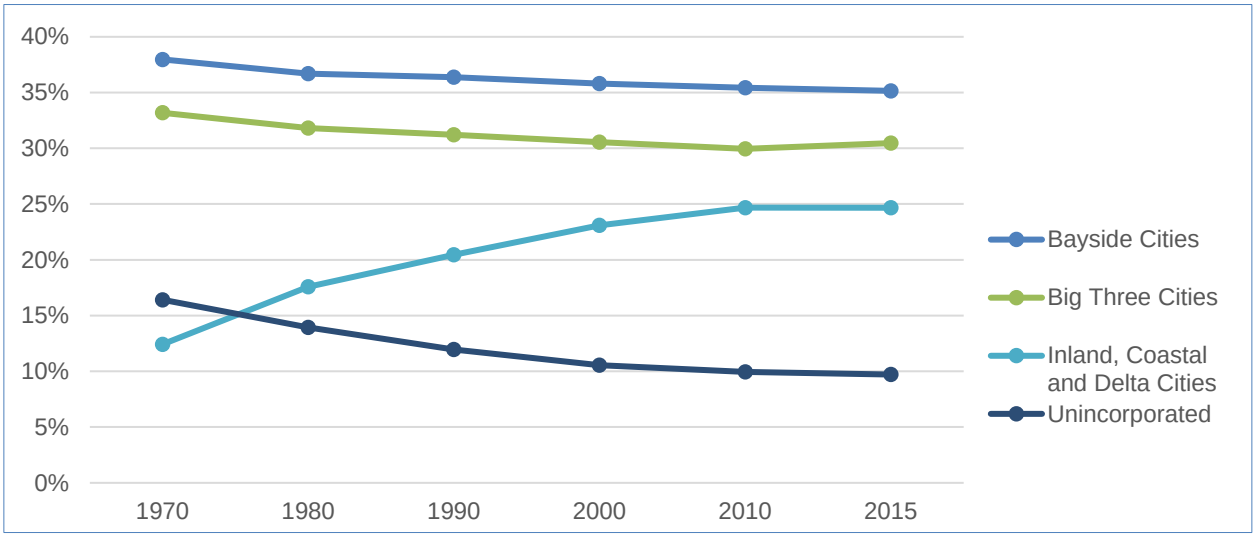
[120] Defined as the San Francisco-Oakland-Hayward and San Jose-Sunnyvale-Santa Clara metropolitan areas.

[121] Chapple, Karen. August 2009. "Mapping Susceptibility to Gentrification: The Early Warning Toolkit." The Center for Community Innovation at UC-Berkeley. http://communityinnovation.berkeley.edu/reports/Gentrification-Report.pdf.

[122] Cravens, Marisa et al. December 2009. "Development Without Displacement: Development With Diversity." Association of Bay Area Governments. http://abag.ca.gov/files/DevelopmentwithoutDisplacement.pdf.

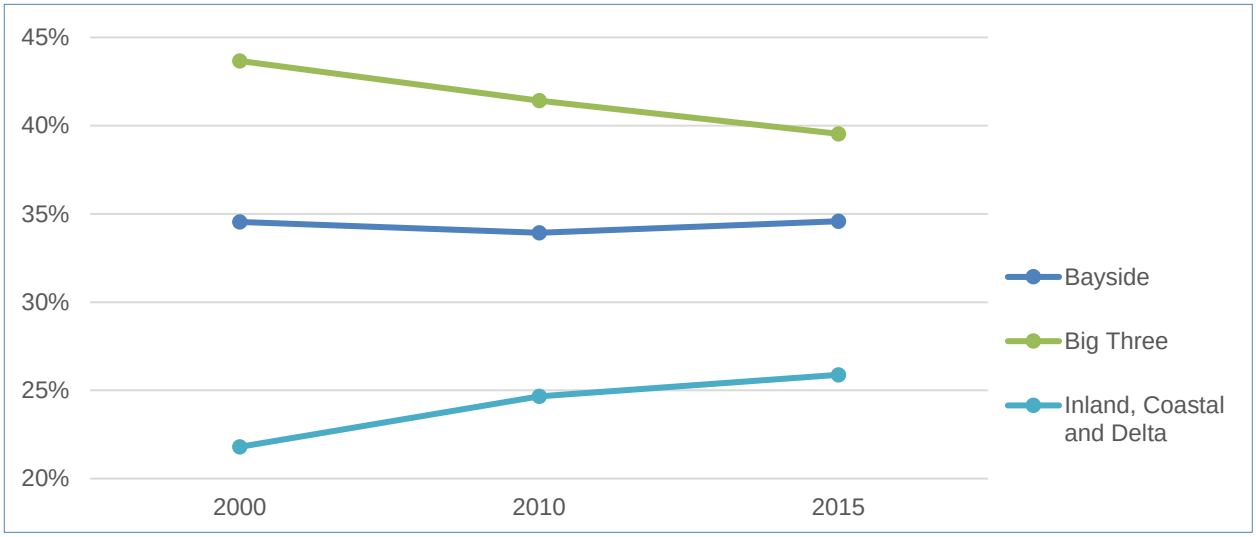
[123] Locally, San Francisco saw moderate employment decentralization from 1998 to 2006, as the number of jobs within three miles of downtown decreased by 2.6 percent.

Chart 4-B: Share of Population by Jurisdiction Type, Bay Area, 1970-2015



Source: MTC Vital Signs; U.S. Census Data, 1970, 1980, 1990, 2000, 2010, Decennial; 2011-2015 American Community Survey 5-Year Average; California Department of Finance, Population and Housing Estimates 1961-2016

Chart 4-C: Share of Low-Income Population by Jurisdiction Type, Bay Area, 2000-2015



Source: MTC Vital Signs; U.S. Census Data, 2000, 2010 Decennial; 2011-2015 American Community Survey 5-Year Average; California Department of Finance, Population and Housing Estimates 1961-2016

All three studies conclude that suburbs with growing poverty face a distinct set of challenges: They are more geographically isolated from job centers; they lack reliable and affordable transit options to better employment opportunities; they have limited and widely dispersed social services; they lack reserves to prevent layoffs in the public sector; and, finally, they have many failing schools.

Another way to look at poverty in the suburbs is to track the share of low-income residents within and outside the region's Priority Development Areas (PDAs) and Transit Priority Areas (TPAs). The results from this assessment reinforce the trend highlighted in the previous section (see Maps 35, 36 and 37). Between 2000 and 2014, the share of low-income residents living in PDAs decreased from 54 to 51 percent. In TPAs, that share decreased from 64 to 60 percent. Similarly, between 2000 and 2014, the share of minority population in PDAs decreased from 49 to 46 percent, and in TPAs from 64 to 59 percent. At the same time, the share of White population in PDAs grew from 30 to 31 percent and in

TPAs from 45 to 46 percent.[124] These trends are significant, since between 2000 and 2014, the low-income population in the Bay Area increased from 21 to 25 percent, the minority population increased from 50 to 59 percent, and the White population decreased from 50 to 41 percent. Even as the share of low-income and minority populations in the Bay Area is rising, their share of these populations living within PDAs and TPAs is declining.

Table 4-4: Share of Low-Income and Minority Population Outside TPAs and PDAs, Bay Area, 2016

	Region		Outside TPAs		Outside PDAs	
	Low-Income	Minority	Low-Income	Minority	Low-Income	Minority
Alameda	28%	67%	21%	27%	37%	46%
Contra Costa	25%	53%	51%	55%	61%	65%
Marin	19%	27%	62%	67%	83%	88%
Napa	27%	44%	83%	82%	83%	82%
San Francisco	28%	59%	0%	0%	29%	34%
San Mateo	20%	59%	26%	31%	58%	62%
Santa Clara	23%	66%	25%	30%	41%	49%
Solano	27%	59%	78%	83%	79%	85%
Sonoma	29%	35%	50%	50%	57%	57%

Source: American Community Survey 2010-2014, 5-year average, MTC Analysis.

Additionally, in very-low-income census tracts[125] outside PDAs and TPAs, the share of disadvantaged populations increased at an even faster rate. The low-income population grew by 333 percent outside PDAs and 351 percent outside TPAs. This share was 126 percent and 134 percent, respectively, for minority populations.[126] Poverty is not just growing in the suburbs in the Bay Area, it is also concentrating in a few neighborhoods.

At a county level, in 2014, the share of low-income and minority populations outside TPAs and PDAs varied widely. In San Francisco, almost no low-income or minority resident lived outside a TPA, whereas in Solano and Napa counties that share was around 80 percent. In San Francisco, the share of low-income and minority populations outside PDAs was similarly low, at 29 and 34 percent respectively, whereas in Marin, Napa and Solano counties, that share was between 79 and 88 percent.

Concentrated Poverty

National Studies

As mentioned in previous sections, low-income families face many challenges while living in poor neighborhoods, including higher crime rates, low-performing schools, worse health outcomes and fewer job opportunities. But as poverty concentrates in neighborhoods, the negative impacts magnify exponentially.[127] Low-income residents in areas of highly concentrated poverty face the "double burden" of not only their own poverty, but also the disadvantages of those around them. The heightened disadvantage affects not just low-income residents but entire communities, curtailing long-term

[124] U.S. Decennial Census, 2000, and American Community Survey, 2010-2014, 5-year average.
[125] Census tracts with 50 percent or more low-income population.
[126] More than 78,000 low-income and more than 16,500 minority people lived in high-poverty census tracts outside PDAs in 2014. Similarly, more than 86,500 low-income and 14,000 minority people lived in high-poverty census tracts outside TPAs in 2014.
[127] For a review of the literature on the effects of concentrated poverty, see: Berube, Alan et al. 2008. "The Enduring Challenge of Concentrated Poverty in America: Case Studies from Communities Across the U.S." Federal Reserve System and the Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/06/1024_concentrated_poverty.pdf. See also: Sharkey, Patrick. *Stuck in Place: Urban Neighborhoods and the End of Progress Toward Racial Equality*. Chicago: University of Chicago Press, 2013.

economic growth potential, limiting the impact of public investments and undermining efforts to sustain inclusive growth.

A study published by the Brookings Institution[128] notes that after two economic downturns and the subsequent periods of trepid recovery, which failed to improve conditions for all residents, the number of people living below the federal poverty line ($23,492 for a family of four in 2012)[129] reached record highs. The study concludes that, across the U.S., poverty became more concentrated in disadvantaged neighborhoods between 2000 and 2012.[130] And more of these low-income communities were now in the suburbs, marking a significant shift from 2000, when the number of poor was higher in urban areas.[131] This shift only adds to the growing number of challenges faced by suburban jurisdictions that may be ill- equipped to deal with a growing low-income population.[132]

At the same time that the share of low-income residents living in concentrated poverty is rising, the racial and ethnic makeup of low- and high-poverty neighborhoods is also changing. Lower-poverty neighborhoods have become somewhat more diverse since 2000, although residents of these neighborhoods remain largely White. In contrast, minority residents, who experience heightened disadvantage at higher rates than White residents, continue to make up a disproportionate share of residents in high-poverty neighborhoods.

A study conducted by Harvard University[133] finds substantial evidence that young children (ages four to 12) whose families move to lower-poverty neighborhoods are more likely to attend college, are less likely to become single parents, and have substantially higher incomes. The study analyzed data collected by the U.S. Department of Housing and Urban Development (HUD), starting in the 1990s, on 4,600 families who at the time lived in public housing.

The Harvard study confirms that children who moved to a better neighborhood when they were young enjoyed much greater economic success in adult life than similarly aged children who stayed behind in public housing. And the children who moved when they were older experienced no gains or perhaps worse outcomes, probably the result of a disruptive move, paired with few benefits from spending only a short time in a better neighborhood. The opposite effects are symmetric as well: Each extra year in a worse neighborhood led to worse long-term outcomes, and beyond age 23, any exposure to good neighborhoods had no effect. What mattered was not just the quality of the neighborhood, but also the number of childhood years spent growing up in it.

Bay Area Trends

There are many definitions of concentrated poverty, but research at Harvard University[134] suggests that social and economic mobility declines precipitously as the share of low-income residents in a neighborhood approaches 40 percent. In the Bay Area in 2014, 296 census tracts (or approximately 20 percent) met that threshold. About 38 percent of the region's low-income residents lived in these census

[128] Kneebone, Elizabeth. July 2014. "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012." Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/interactives/the-growth-and-spread-of-concentrated-poverty-2000-to-2008-2012/.

[129] For more information on the federal poverty level, see: https://www.federalregister.gov/documents/2016/01/25/2016-01450/annual-update-of-the-hhs-poverty-guidelines.

[130] As poverty has spread, it has also become more concentrated in distressed and high-poverty neighborhoods, eroding the brief progress made against concentrated poverty during the late 1990s (Kneebone, Elizabeth, "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012").

[131] Kneebone, Elizabeth, and Alan Berube. *Confronting Suburban Poverty in America*. Washington: Brookings Institution Press, 2013.

[132] Kneebone, Elizabeth. July 2014. "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012." Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/interactives/the-growth-and-spread-of-concentrated-poverty-2000-to-2008-2012/.

[133] Ibid.

[134] Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. May 2015. "Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." NBER Working Paper Series. National Bureau of Economic Research. http://www.nber.org/papers/w21156.

tracts, which increased from 25 percent in 2000 (see Map 14). At the regional level, more than a third of the low-income population (37 percent) lived in a concentrated area of poverty. At a county level, this share is the highest in Solano (46 percent), Alameda (44 percent), and Contra Costa (41 percent) counties.

Table 4-5: Share of Low-Income Population in Concentrated Areas of Poverty, Bay Area, 2014

	Population	Low-Income Population	Low-Income Population in Concentrated Poverty
Alameda	21%	28%	44%
Contra Costa	15%	25%	41%
Marin	3%	19%	22%
Napa	2%	27%	35%
San Francisco	11%	28%	37%
San Mateo	10%	20%	29%
Santa Clara	25%	23%	32%
Solano	6%	27%	46%
Sonoma	7%	29%	35%
Bay Area	100%	25%	37%

Source: American Community Survey 2010-2014 5-year average, MTC analysis

Wages and Middle-Wage Jobs

National Studies

A national study conducted by the University of California Berkeley and the Paris School of Economics[135] estimates that between 1962 and 2014, the bottom 50 percent of individual income earners in the U.S. gained only one percent in earnings, or $16,000 per adult after adjusting for inflation. In comparison, the top 10 percent of individual income earners gained 121 percent and the top one percent gained 205 percent between 1980 and 2014.[136] In addition, the median wage for moderate-income workers remains stagnant or has declined since 2000 when adjusted for inflation.

While wages have stagnated, opportunities for economic mobility have also declined. Middle-wage jobs lost during the two recessions in 2000 and 2008 have largely been replaced with lower-paying service sector jobs.

Bay Area Trends

Despite the job losses during the Great Recession, the regional economy is in the midst of a strong recovery. Employment expanded in the San Jose Metro Area by 23.7 percent from its lowest point in July 2009, and in San Francisco by 17.6 percent from its low in August 2010. Together, these two metro areas make the Bay Area one of the five fastest growing economic regions in the country – a product of the region's diverse technology-driven economy and strong global ties.[137]

Since 2009, job growth has been strongest in industries related to technology as well as in the service sectors like education, healthcare, and leisure and hospitality. Manufacturing has continued to decline, with total number of jobs at 32 percent below 1990 levels, reflective of a broader trend for blue-collar

[135] MTC Vital Signs.
[136] Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. December 2016. "Distributional National Accounts: Methods and Estimates for the United States." NBER Working Paper No. 22945. National Bureau of Economic Research. http://www.nber.org/papers/w22945. See also: http://gabriel-zucman.eu/files/PSZ2016.pdf.
[137] Bay Area Council Economic Institute. 2012. "A Roadmap for Economic Resilience: The Bay Area Regional Economic Strategy." http://www.bayareaeconomy.org/files/pdf/BACEI-RES-Report.pdf.

jobs in all U.S. metro areas.[138] Professional services jobs grew by double digits in the past two decades with most of this growth concentrated in Santa Clara, San Mateo and San Francisco counties. The East Bay has benefitted from some service-sector job growth, though its dominant industries are in government and logistics – two sectors that have seen relatively stagnant job growth.[139]

The benefits of the employment growth are therefore not evenly distributed among all workers. A recent study conducted for the Bay Area Regional Prosperity Plan (RPP)[140] found that, in 2014, more than 1.1 million workers in the region, or over one third of the total workforce, earned less than $18 per hour (or less than $36,000 per year for full-time work), with the majority earning less than $12 per hour.[141] The number of jobs that pay less than $18 per hour is expected to increase even more over the coming years.

Table 4-6: Job Growth Projections by Wage Level

Wage Levels	Share of Jobs 2010	Share of Job Growth 2010-2020	Share of Jobs 2020 Projections
Low- and Moderate-Wage (under $18 per hour)	36%	34%	35%
Middle-Wage ($18 to $30 per hour)	27%	22%	26%
Higher-Wage (Above $30 per hour)	38%	44%	39%

Source: Economic Prosperity Strategy: Improving Economic Opportunity for the Bay Area's Low- and Moderate-Wage Workers." http://mtc.ca.gov/sites/default/files/Economic_Prosperity.pdf. Note: nearly 36 percent of jobs pay less than $18 per hour, and the share of jobs in the middle is projected to decline relative to the proportions of jobs at the top and bottom of the wage spectrum. This limits opportunities for current lower-wage workers to move into higher-paying jobs.[142]

To put earnings and wages into perspective, a household with two adults and two children in Alameda County would need to earn over $65,000 per year (or more than $30 per hour) just to cover basic expenses.[143] Using this same self-sufficiency standard, a four-person household would need to earn close to $60,000 per year in Solano County and over $75,000 in San Francisco. There are many more lower-wage jobs relative to middle-wage jobs, and as a result, too many of the region's workers remain in lower-wage jobs, lacking clear pathways for advancement. For location of major employment centers in the Bay Area see Maps 38 and 39.

Walkability: Access to Neighborhood Goods and Services

National Studies

There are three primary benefits to living in a walkable neighborhood. The first is safety. Research confirms that a built environment that is conducive to safe walking increases the likelihood that residents will walk or bicycle more often, at all times of the day.[144] As residents spend more time outside their homes, on streets or in neighborhood parks, they provide more "eyes on the street," which has been shown to reduce criminal activity.[145] Traffic collisions are also lower in walkable communities, as

[138] MTC Vital Signs.
[139] Ibid.
[140] Terplan, Egon et al. October 2014. "Economic Prosperity Strategy: Improving Economic Opportunity for the Bay Area's Low- and Moderate-Wage Workers." http://mtc.ca.gov/sites/default/files/Economic_Prosperity.pdf.
[141] $18 per hour is equivalent to approximately 80 percent of the region's median wage. It represents the bottom end of the range of middle-wage jobs in the Bay Area. The Economic Prosperity Strategy defines middle-wage jobs as those that pay between $18 and $30 per hour.
[142] Terplan, Egon et al. October 2014. "Economic Prosperity Strategy: Improving Economic Opportunity for the Bay Area's Low- and Moderate-Wage Workers." http://mtc.ca.gov/sites/default/files/Economic_Prosperity.pdf.
[143] The earnings are based on the Family Economic Self-Sufficiency Standard, which covers expenses for housing, food, child care, transportation, health care and taxes. See: http://www.insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.
[144] Centers for Disease Control and Prevention. "Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities." https://www.cdc.gov/physicalactivity/walking/call-to-action/pdf/partnerguide.pdf.
[145] In her 1961 book *The Death and Life of Great American Cities*, Jacobs proposed the "eyes on the street" theory. Jacobs argues that increased street traffic, day and night, not only help communities flourish socially and economically, but also acts as self-

vehicles move slower and drivers are more mindful of pedestrians and bicyclists.[146]

The second benefit is improved health. For example, the average resident of a walkable neighborhood weighs 6 to 10 pounds less than the average residents of a sprawling neighborhood.[147] Multiple national and international studies confirm that increased physical activity through moderate exercise such as walking can reduce the risk of cardiovascular disease, type 2 diabetes and metabolic syndrome, as well as some cancers in children and adults. Regular physical activity also improves mental health and reduces morbidity and mortality due to chronic diseases.[148] Lastly, a lower reliance on the automobile for mobility reduces emissions from cars and light trucks, which improves air quality.

The third benefit of living in a walkable neighborhood is better access to amenities and services. According to WalkScore,[149] walkable neighborhoods generally have a main street with local businesses; high-quality public transit; parks and public places to gather and play; schools and workplaces; and streets that accommodate pedestrians, bicyclists and transit. The physical proximity to a diverse range of amenities and a built environment that promotes walking and bicycling together contribute to the residents' greater access to these daily goods and services.[150] Secondary benefits of walkable neighborhoods include reduced isolation and higher social capital,[151] which are critical for disadvantaged communities that include seniors, people with disabilities and low-income residents.[152]

Bay Area Trends

In the Bay Area, pre-1950 neighborhoods, which have connected street grids and small blocks, are generally more walkable than newer, suburban developments. The six decades following 1950 were dominated by conventional suburban development. Cities and suburbs built in this era are largely characterized by subdivisions, shopping centers, office parks and automobile-oriented thoroughfares. The average WalkScore of traditional cities in the US is 78—nearly double that of more sprawling cities.[153]

In the Bay Area, the average WalkScore for the entire region is 58.[154] About half the region's population and households reside in census tracts with a WalkScore higher than the regional average. A large share of low-income (60 percent), zero-vehicle households (80 percent), people with disabilities (50 percent), and rent-burdened households reside in these moderately walkable neighborhoods. Among Bay Area counties, San Francisco has the highest average WalkScore of 82, followed by Alameda, at 63. Sonoma and Napa counties have the lowest average WalkScore, at 46. Solano, Contra Costa and Marin counties

---

policing, which deters criminal and anti-social behavior. Jacob's theory holds that populated areas are less likely to have criminal activity if the criminal believes there is a greater likelihood of him/her being seen or caught by others.

[146] U.S. Department of Transportation, Federal Highway Administration. January 2015. "A Resident's Guide for Creating Safer Communities for Walking and Biking." FHWA-SA-14-099. http://safety.fhwa.dot.gov/ped_bike/ped_cmnity/ped_walkguide/residents_guide2014_final.pdf.

[147] "Communities." Natural Resources Defense Council. https://www.nrdc.org/issues/communities.

[148] "Physical Activity and Health." Centers for Disease Control and Prevention. https://www.cdc.gov/physicalactivity/basics/pa-health/.

[149] WalkScore is a private company that provides walkability services and apartment search tools through a website and mobile applications. Its flagship product is a large-scale, public access walkability index that assigns a numerical walkability score to any address in the United States, Canada, and Australia: https://www.walkscore.com/.

[150] Accessibility is often expressed as a measure of people's ability to reach destinations within a certain period of time by a certain travel mode. It measures both whether the means to access destinations exists (such as a road, highway, or transit route) as well as the number of destinations reachable within a certain travel time from trip's origin. Thus, good accessibility results from having both a large number of destinations within a reasonable distance as well as the means available to get to them.

[151] "Social capital is a measure of an individual's or group's networks, personal connections, and involvement. Like economic and human capital, social capital is considered to have important values to both individuals and communities" -Rogers, Shannon H. et al. "Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales." *Applied Research in Quality of Life* 6, No. 2 (2011): 201–213.

[152] Ibid.

[153] Steuteville, Robert. "Traditional cities are having a big decade." Public Square: A CNU Journal, December 5, 2016. https://www.cnu.org/publicsquare/2016/12/05/traditional-cities-are-having-big-decade.

[154] Data downloaded from WalkScore's website in January 2017 and analyzed by MTC.

perform only marginally better, at 48 (see Maps 40 and 41).

The average WalkScore in Priority Development Areas (PDAs) is 70, followed by communities of concern (CoCs) and Transit Priority Areas (TPAs), at 68, and High-Opportunity Areas (HOAs) at 60. Though higher than the regional average, WalkScores in PDAs, CoCs, TPAs and HOAs are far lower than in a traditional city in the US, at 78.

If the threshold for WalkScores is increased to 80, which represents a walkable neighborhood, the share of the region's population that resides in these areas drops to 12 percent. The majority of census tracts with an average WalkScore of 80 or higher are in San Francisco (57 percent), followed by Alameda (32 percent) and San Mateo (6 percent). Marin, Napa, Solano and Sonoma counties have one or no such census tracts. A little more than 30 percent of low-income residents and zero-vehicle households reside in walkable neighborhoods (with a WalkScore of 80 or higher).

Chapter 5. Analysis Results

This chapter summarizes the equity analysis results for the Draft Plan, incorporating relevant findings from related Title VI analyses (in the distribution of investment benefits and the spatial distribution of projects included in the plan, intended to satisfy federal nondiscrimination requirements) and environmental justice analyses (intended to address whether communities of concern [CoCs] are subject to disproportionately high and adverse effects). The complete results from the Title VI and EJ analysis are presented in Chapter 6.

The analysis presented in this chapter has two parts. The first uses the six equity measures described in Chapter 2 to evaluate the plan as well as four alternatives studied in the Draft Environmental Impact Report (EIR) for their relative benefits to CoCs and low-income populations. The EIR alternatives incorporate a range of land use and transportation policies, programs and projects to test their relative performance on the 13 performance targets, as well as other environmental indicators required by state law.[155] As described in Chapter 2, six of the 13 targets are also considered equity measures.

For a description of EIR scenario alternatives, see Chapter 2 of this report. For a description of the 13 performance targets, see the Draft Plan. For a description of all the environmental and equity topics studied in the EIR, see the Draft Plan Bay Area 2040 EIR report.

The second part of the equity analysis is conducted on the transportation investments included in the Draft Plan, to assess their relative benefits to low-income and minority populations compared to non-low- income and non-minority populations. This analysis is conducted using the population-based, use-based and project mapping methodologies, described in more detail in Chapter 2. Chapter 7 describes a range of proposed or adopted land use and transportation policies, programs and planning efforts that address many of the challenges identified throughout this chapter as well as in chapters 3 and 4.

Analysis of Equity Measures

To conduct the analysis of benefits and burdens on disadvantaged communities, MTC and ABAG adopted six quantitative performance targets, or *equity measures*, in January 2016. These six measures are a subset of 13 Performance Targets[156] for the entire plan. The equity measures for the plan include:

- *Healthy and Safe Communities* (Performance Target #3) – to measure the health benefits and burdens associated with air quality, road safety and physical inactivity for high- and low-income households;[157]
- *Equitable Access* (Performance Target #5) – to measure a lower-income household's share of income consumed by transportation and housing costs, compared to a higher-income household;[158]
- *Equitable Access* (Performance Target #6) – to measure the share of affordable housing in Priority Development Areas (PDAs), Transit Priority Areas (TPAs), or High-Opportunity Areas (HOAs),[159] within and outside CoCs;

[155] For more details on state requirements for environmental impact reports for regional transportation plans, see: http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_cfa_20070531_141448_sen_comm.html.
[156] Plan Bay Area 2040 Performance Targets; see: https://mtc.legistar.com/LegislationDetail.aspx?ID=2542165&GUID=D89FCABA-8814-4F0C-990D-B6803291A4D5.
[157] Households that earned more than $100,000 (in 2000 dollars) are considered high-income, and those that earn less than $30,000 (in 2000 dollars) are considered low-income for this analysis.
[158] Households that earned more than $60,000 (in 2000 dollars) are considered higher-income, and those that earn less than $60,000 (in 2000 dollars) are considered lower-income for this analysis.
[159] See the Fair Housing and Equity Assessment report, ABAG, 2015, for a definition of High-Opportunity Areas:

- *Equitable Access* (Performance Target #7) – to measure the share of low- and moderate-income households in PDAs, TPAs and HOAs that are at an increased risk of displacement, within and outside CoCs;
- *Economic Vitality* (Performance Target #8) – to measure the share of jobs that are accessible by auto and transit in congested conditions, within and outside CoCs; and
- *Economic Vitality* (Performance Target #9) – to measure the share of middle-wage jobs in the region, within and outside CoCs.

Table 5-1 summarizes the modeled results for each of the six measures as well as for the baseline year, No Project Alternative, Main Streets Alternative, Big Cities Alternative, Environment Equity and Jobs (EEJ) Alternative, and the Draft Plan. The Draft Plan performs better than or as well as the other EIR alternative for the six performance measures.

Table 5-1: Summary of Performance Results for EIR Alternatives

Equity Measures	Sub-Geography	Plan Target	Base Year	No Project	EIR Alternatives			
					Main Streets	Big Cities	EEJ	Draft Plan
3. Reduce Adverse Health Impacts	HI-HHs	-10%	204,593	-1%	-1%	-1%	-1%	-1%
	LI-HHs		**142,064**	**-0%**	**-0%**	**-1%**	**-1%**	**-1%**
5. Decrease H+T * Share for LI-HHs	HI-HHs	-10%	20%	+5%	+5%	+5%	+5%	+5%
	LI-HHs		**54%**	**+15%**	**+13%**	**+13%**	**+12%**	**+13%**
6. Increase Share of Affordable Housing	RoR **	+15%	8%	+0%	+3%	+2%	+3%	+3%
	CoCs		**23%**	**-2%**	**-1%**	**-2%**	**+3%**	**-0%**
7. Share of LI-HHs at Risk of Displacement	RoR	+0%	14%	+16%	+9%	+8%	+8%	+7%
	CoCs		**32%**	**+25%**	**-1%**	**+13%**	**-0%**	**+1%**
8. Increase Share of Jobs Accessible	RoR	+20%	17%	-3%	-1%	-1%	-1%	-0%
	CoCs		**20%**	**-1%**	**-2%**	**-2%**	**-0%**	**+0%**
9. Increase Middle-Wage Jobs	RoR	+38%	38%	+43%	+43%	+43%	+43%	+43%
	CoCs		**38%**	**+43%**	**+43%**	**+43%**	**+43%**	**+43%**

Source: MTC Analysis
Notes: For equity measure #3, low-income households (LI-HHs) earn less than $30,000, and high-income households earn more than $100,000, in year-2000 dollars. For equity measure #5, lower-income households earn less than $60,000, and higher-income households earn more than $60,000 in year-2000 dollars. For equity measures #6 and #7, the measures are specific to Priority Development Areas, Transit Priority Areas or High-Opportunity Areas. Note that communities of concern do not generally overlap with High-Opportunity Areas.
** Housing and Transportation (H+T)*
*** Remainder of the Region (RoR)*

The main finding of the equity analysis is that housing affordability remains the most significant challenge for the Bay Area. Some of these challenges are described in more detail in chapters 3 and 4. While there are a number of factors that contribute to the lack of housing affordability at the neighborhood and regional levels (most of which are beyond the direct control or influence of regional agencies), the outcomes negatively affect every equity measure adopted for the plan (see Table 5-1).

Public agencies have a role to play in solving this crisis. Regional agencies can support local jurisdictions and facilitate the construction of new housing units (both market rate and affordable) to

http://abag.ca.gov/files/1_FHEAFinalReport_3.13.15.pdf.
[160] Health outcomes are measures as DALYs, or disability-adjusted life years. For more information about this measure, see: http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/.

keep pace with job growth, and the plan can provide incentives and planning assistance to communities that are willing to adopt supportive policies and programs. Local jurisdictions can allow new high-density residential development and protect vulnerable populations, while the state can alter its tax policies and regulatory requirements to allow more housing to be built and preserved for working families, low-income populations, seniors, veterans, the homeless and people with disabilities.

Health Outcomes

For the health measure, the Draft Plan reduces negative health outcomes for households earning less than $30,000 per year by one percentage point over the 24-year planning horizon of Plan Bay Area (PBA) 2040. The benefit for households earning more than $100,000 per year is the same. While this may not seem like much, a reduction of even this magnitude is challenging given the predominantly dispersed nature of development in the region. Unless a large number of residents move to mixed-use, walkable communities, this benefit is unlikely to rise significantly, despite substantial investments in active transportation, road safety and public transit. Still, the role of transportation in improving health outcomes is well established, and the Draft Plan makes some progress in realizing this potential.

Housing and Transportation Costs

For the combined housing and transportation cost measure, the Draft Plan increases the total cost for households that earn less than $60,000 per year by 13 percentage points. Of this increase, 12 percentage points are attributable to rising housing costs and one percentage point to rising gas prices due to inflation. More than any other equity measure, the combined cost of housing and transportation accurately reflects the huge role that housing affordability plays in the everyday challenges faced by lower-income households in the region.

But while the Draft Plan performs as well as or better than other EIR alternatives for this measure, the outcome for higher-income households (those earning more than $60,000 per year) is relatively better, with a five percentage point increase over the 24-year period. The relatively modest increase for higher-income households is also from a much lower base of 19 percent (in combined housing and transportation costs) in the baseline year (2005). By 2040, the combined cost of housing and transportation for higher-income households will rise to 23 percent of income, and for lower-income households to 67 percent.

Affordable Housing

For the affordable housing measure, which estimates the share of affordable housing units in PDAs, TPAs and HOAs, the Draft Plan decreases the share of affordable housing units in communities of concern (CoCs) by less than one percentage point. Despite this shift in the wrong direction, the Draft Plan performs better than two of the other three EIR alternatives in CoCs. The exception is the EEJ scenario, which increases the share of affordable housing by 3 percentage points. The Draft Plan, however, performs better in the remainder of the region, which is the area outside CoCs but still within PDAs, TPAs and HOAs, by increasing the share of affordable units by 3 percentage points. This is better than or as good as the other EIR alternatives.

Even though the share of affordable units in the remainder of the region increases by 3 percentage points (from 8 percent in 2010 to 11 percent in 2040), the overall share of affordable units within CoCs is still much higher, at 20 percent (though down from 21 percent in 2010). The region must continue to build more affordable units in PDAs, TPAs and HOAs to accommodate lower-income households near amenities and services, irrespective of whether these units are within or outside CoCs, especially since concentrating low-income housing within existing disadvantaged communities raises fair housing concerns.

Risk of Displacement

For the displacement measure, the Draft Plan increases the risk for low-income households by one

percentage point within CoCs and 7 percentage points in the remainder of the region. The Draft Plan performs better within CoCs than the remainder of the region, and it performs marginally worse than the Main Streets and EEJ alternatives. Still, 37 percent of all low-income households in PDAs, TPAs and HOAs are at risk of displacement in 2040 within CoCs (up from 36 percent in 2010), and 21 percent in the remainder of the region (up from 14 percent in 2010).

By definition, the risk of displacement for this measure is higher in areas that accept more growth, especially if these areas also have existing low-income populations. This definition of risk does not account for communities that resist residential development and at the same time continue to add a significant number of jobs, which increases housing affordability pressures on neighboring communities, lower-income households and working families. Those who have fewer resources face limited choices – double up to stay in the same community, or move away.

In the Bay Area, this pattern of displacement has resulted in a significant shift of the lower-income population from urban to suburban and exurban areas that have limited access to transit, job opportunities and many other amenities and services (see Map 42). More choices for housing close to transit and job centers can relieve this pressure, but the Bay Area has a large deficit of housing production that dates back to the 1970s.

Solving the region's housing affordability crisis will require a significant push to build more housing at all income levels, to build these units closer to transit and jobs, and to build them at a much faster pace than even in the current economic cycle.

Job Access

For the job access measure, the Draft Plan increases the share of jobs that are accessible by auto or transit in congested conditions by less than one percentage point within CoCs, compared to no change in the remainder of the region. Of all the EIR scenarios, only the Draft Plan moves the CoCs in the right direction. The accessibility measures for all the other scenarios is negative, reflecting the anticipated rise in traffic congestion across the region in 2040.

Middle-Wage Jobs

For the middle-wage jobs measure, the Draft Plan increases the share of well-paying jobs in high-growth industries by 43 percentage points, thereby exceeding the target set at 38 percentage points. All the EIR scenarios, however, increase the share of middle-wage jobs by 43 percentage points, since the growth projections for middle-wage jobs are independent of the land use and transportation policies studied in the plan development process.

The Draft Plan does not meet the performance targets for most equity measures (except for the middle-wage jobs measure), and in three instances, moves in the opposite direction. This outcome is not entirely unexpected in a built-out region such as the Bay Area. Not only are the plan targets ambitious, but meeting or exceeding them requires sustained commitment for action from multiple stakeholders and public agencies at numerous levels over a long period of time. By recognizing, measuring and prioritizing the housing challenge in the Bay Area, the Draft Plan lays the foundation for a more informed and collaborative regional discussion regarding effective policy solutions and implementation.

Transportation Investment Analysis

This section summarizes the results from an analysis of Draft Plan investments for their relative impact on minority and low-income populations, compared to non-minority and non-low-income populations. The methodology for conducting the investment analysis is described in more detail in Chapter 2. The legal and policy context for the analysis is provided in Chapter 1.

The transportation investment analysis includes the following two components:

- *A population/use-based analysis* – which quantifies the benefits of the region's transportation investments, and assigns these benefits to low-income and minority populations based on their share of system usage for both roadway and transit modes of travel. This share of benefits is then compared to the overall share of minority and low-income populations in the region.
- *A mapping analysis* – which relies on a qualitative assessment of the spatial distribution of major roadway and transit projects in relation to the location of minority and low-income populations.

Population/Use-Based Analysis

The population/use-based investment analysis is conducted in four distinct steps, described below.

Step 1: Determine the Share of Population and System Usage

For the population/use-based analysis, as a first step, the region's total population and total trips are assigned to four subgroups: low-income, non-low-income, minority and non-minority populations (see Table 5-2 below). The trip data includes both transit and roadway trips calculated as average daily trips for the entire region. Note that the minority subgroup's share of average daily trips is lower than its share of the regional population. Some of this difference is attributable to the fact that demographic numbers in the 2010-2014 American Community Survey dataset differ slightly from those in the 2012/2013 California Household Travel Survey datasets.[161]

Table 5-2: Share of Population and System Usage by Subgroup

	Population		Average Daily Trips	
	#	% of Total	#	% of Total
Low-Income Status *	**1,837,830**	**25%**	**6,730,534**	**28%**
Non-Low-Income Status	5,501,132	75%	17,059,291	72%
Minority Status **	**4,305,728**	**59%**	**12,803,815**	**54%**
Non-Minority Status	3,033,234	41%	11,098,119	46%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey
** Low-income status includes population in households with incomes below $50,000 per year in 2006 dollars*
*** Minority status includes populations that are not White*

Relative to their share of the regional population, minority and low-income populations have different travel behaviors. Low-income populations comprise 25 percent of the regional population but take 28 percent of all trips in the region (average daily trips). Minority populations, on the other hand, comprise 59 percent of the regional population but account for only 54 percent of all trips. When factoring in the mode of travel (transit ridership and roadway trips, see Table 5-3 below), the variations are even more significant. Low-income populations account for the majority of transit trips in the region, at 52 percent, which is more than twice their regional share of the population, and minority populations account for 62 percent of transit trips.

Though low-income populations account for a disproportionately large share of transit ridership in the region, 88 percent (or a little less than 6 million trips out of a total of about 6.7 million trips) still drive alone or carpool to their destinations. That share is even higher for minority populations, at 92 percent (or about 11.5 million out of a total of 12.5 million trips). The dependence on non-transit modes of travel for both low-income and minority populations may in large part be a function of the dispersed development pattern in the region, where a majority of jobs and homes are not transit-accessible.

[161] The differences in the share of trips and population are primarily due to differences in overall regional demographics from the 2012/2013 California Household Travel Survey (which was weighted according to the region's 2010 Census population), used to allocate funding on the basis of usage, and the 2014 Census data, used for the overall regional population comparison.

Table 5-3: Share of System Usage by Mode by Subgroup

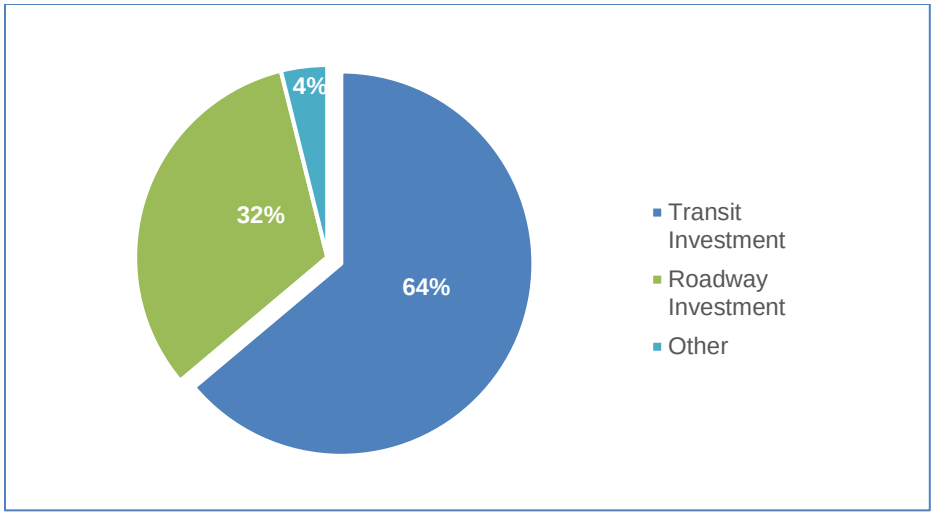
	Transit Ridership (All Operators)		Roadway Trips (All Counties)	
	#[162]	% of Total	#	% of Total
Low-Income Status	**782,633**	**52%**	**5,947,902**	**27%**
Non-Low-Income Status	720,325	48%	16,338,965	73%
Minority Status	**998,992**	**62%**	**11,506,128**	**53%**
Non-Minority Status	616,075	38%	10,482,044	47%

Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey

Step 2: Determine the Share of Plan Investments by Mode

The next step in the analysis is to determine how much of the total investment in the Draft Plan is allocated to the following two travel modes: transit (which includes investments in operations and capital improvements) and roadways (which includes investments in roads, highways and bridges). The largest share of the investment in the Draft Plan is in public transit, at 64 percent, followed by roadways, at 32 percent (see Chart 5-A below). A portion of the investment is excluded from the analysis, in cases where investments had no modal component or otherwise could not be assigned to a particular county or transit operator (such as regional planning funds, Climate Program funds, etc.).

Chart 5-A: Share of Plan Bay Area 2040 Investments by Mode



Source: MTC

The total investment included in the Draft Plan is around $303.45 billion (year-of-expenditure) over a 24- year period. See the Draft Plan for more information on the investment strategy.

Step 3: Assign Investment Benefit by Mode to Population Subgroups

Next, investments for each mode are allocated to the four population subgroups—minority, non-minority, low-income and non-low-income—based on their level of usage of that particular mode. For example, if the Draft Plan invests $100 in System A, if half of their users are low-income and three-quarters are minority, then the "benefit" of the $100 investment is allocated as follows: $50 to low-income and $75 to minority populations.

This is a multi-step process that is different for each mode. For transit, investments are first aggregated

[162] Note that the total transit rides by low- and non-low-income population equals about 1.5 million, whereas the total for minority and non-minority population equals about 1.6 million. These numbers are inconsistent in the transit surveys.

by transit operator (which may include expenditures for operations, capital improvement, modernization, etc.). Then, a share of this investment is allocated to low-income and minority riders based on their share of use (by operator). Once all investments are allocated to the four population subgroups, the total for each subgroup determines how much they benefit from the Draft Plan's investments in transit relative to the other subgroups.

A similar approach is used to assign roadway investments to low-income and minority populations, but instead of assigning investments to transit operators, they are assigned to each county. Again, based on their relative usage of roadways in each county, each population subgroup is allocated a share of the county's investment in roadways. These allocations, once aggregated for all nine counties, determine how much each subgroup benefits from the Draft Plan's investments in roadways relative to the other subgroups. The results of this assessment by mode by subgroup is summarized in Table 5-4 below.

Table 5-4: Share of Investment by Mode by Subgroup

	Transit Investment		Roadway Investment	
	$ millions	% of Total	$ millions	% of Total
Low-Income Status	**$92,240**	**48%**	**$26,591**	**27%**
Non-Low-Income Status	$101,704	52%	$73,146	73%
Minority Status	**$117,386**	**61%**	**$51,736**	**52%**
Non-Minority Status	$76,557	39%	$48,001	48%
Total	$193,944	100%	$93,717	100%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey, MTC analysis of Draft Plan investments

Step 4: Compare the Share of Investment Benefit to the Share of Population and System Usage

The final step involves combining the investment benefits for both modes into one metric for each subgroup. This data, along with shares of population, trips by mode and investments by mode, are summarized in Table 5-5 below.

Table 5-5: Summary of Population/Use-Based Analysis Results

	Share of People	Share of Trips			Share of Investments		
		Transit + Roadway	Transit	Roadway	Transit + Roadway	Transit	Roadway
Low-Income Status *	**25%**	**28%**	**52%**	**27%**	**40%**	**48%**	**27%**
Non-Low-Income Status	75%	72%	48%	73%	60%	52%	73%
Minority Status **	**59%**	**54%**	**62%**	**53%**	**58%**	**61%**	**52%**
Non-Minority Status	41%	46%	38%	47%	42%	39%	48%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey, MTC Analysis

As noted before, in the Bay Area, transit investments provide higher benefits to low-income and minority populations relative to their share of the region's population. This is primarily due to their propensity for using transit. Conversely, because minority populations are underrepresented in the share of regional roadway usage (53 percent) relative to their share of the region's population (59 percent), investments in roads, highways and bridges provide relatively lower benefits to minority populations.

Equally important is the finding that investments in roads, highways and bridges also provide relatively higher benefits to low-income populations, though not as much as transit investments, compared to non-low-income populations in the Bay Area. In summary, any investment in improving transportation infrastructure and services regardless of mode will benefit low-income populations, but the higher the

investment in transit, the greater the benefits to both low-income and minority populations.

Overall, across both modes, low-income populations receive a higher share of the Draft Plan investment benefits (40 percent) relative to their overall share of the region's population (25 percent) and trips (28 percent). Minority populations across both modes receive a slightly lower share of the Draft Plan investments benefits (58 percent) relative to their overall share of the region's population (59 percent) and trips (54 percent).

As noted earlier in this chapter, there is a small but not insignificant margin of error in these calculations, because of both the nature of the analysis and the fact that data for this analysis is derived from multiple sources. For example, demographic data in the 2010-2014 American Community Survey (ACS) dataset differs slightly from those in the 2012/2013 California Household Travel Survey datasets. The same is true for trip data from ACS and transit passenger surveys conducted by operators and MTC.

In addition, since the analysis is conducted at a regional, aggregate level, there are bound to be factors such as system reliability, user cost and location of transportation services that are not captured here. Lastly, the distribution of the four population subgroups varies by county, so it is safe to assume that an investment in a county does not benefit all populations that live there, but this level of data is not currently available. Given all these limitations with the analysis methodology and data, it is prudent to look at the orders of magnitude rather than the exact percentages when determining whether low-income and minority populations benefit significantly less or more than non-low-income and non-minority populations from the Draft Plan.

Project Mapping

The second part of the investment analysis is to map the location of transit and roadway projects included in the Draft Plan, overlaid with census tracts that are designated as CoCs and have a higher-than-regional-average (>59 percent) concentration of minority populations. The purpose of this analysis is to qualitatively assess the spatial distribution of projects for any apparent systematic exclusion of CoCs or minority populations at a regional level, or for any apparent systematic imbalances between the distribution of projects between CoCs and the remainder of the region, or between minority and non-minority populations. This assessment is intended to provide a regional-level analysis of the Draft Plan's investments. Individual projects will be subject to their own Title VI and environmental justice analyses during implementation, as required under federal and state laws.

Results for Communities of Concern

Transit and Roadway projects that can be mapped are included in Maps 43 and 44. For a list of all transit and roadway projects, see the Draft Plan. Each map is also overlaid with CoCs. Projects that represent transit stations or freeway interchange are mapped as dots, and transit routes or roadway corridors as lines.

Since the Draft Plan emphasizes a focused growth approach that calls for a majority of future housing and jobs growth to be located in transit-accessible areas, and since a majority of all CoCs are located in the region's urban core, with the exception of CoCs in Napa, Solano and Contra Costa counties, there is significant overlap between the projects included in the Draft Plan and the region's CoCs.

Based on this limited and qualitative assessment, there does not appear to be any systematic exclusion of CoCs from the benefits of the Draft Plan, nor imbalance in the spatial distribution of projects in the region. It is important to note that a significant number of projects could not be mapped, even when they represent a significant share of the funding in the Draft Plan, such as maintenance and operation of the region's transportation system. The maps also do not distinguish between the relative magnitudes of investments in terms of project costs.

Results for Minority Populations

For the analysis of minority populations, the project layers from maps 43 and 44 are overlaid with census tracts in the region that have a higher-than-regional-average (>59 percent) concentration of minority populations. As with the CoC analysis, there is a significant overlap between the spatial distribution of investments in the Draft Plan and minority tracts. Based on this assessment, there does not appear to be any systematic exclusion of communities from Plan investments on the basis of minority status, or imbalances in the distribution of projects between minority and non-minority communities.

This page left intentionally blank.

Chapter 6. Title VI and Environmental Justice

This chapter summarizes the results of the Title VI and Environmental Justice analyses. While both of these analyses are part of the overall equity analysis framework (see Chapter 2 for more details on the equity framework), they are called out separately in this chapter since this report is in part intended to satisfy federal requirements related to nondiscrimination and environmental justice in the metropolitan planning process. For more information on the legal, regulatory and policy framework underlying these analyses, see Chapter 1.

Title VI Analysis and Results

The purpose of this analysis is for MTC to demonstrate compliance with federal laws and regulations related to Title VI of the Civil Rights Act of 1964. The U.S. Department of Transportation's (DOT's) Title VI regulations prohibit recipients of federal transportation funds from utilizing criteria or methods of administration that have the effect of subjecting persons to discrimination based on their race, color or national origin. As an operating entity within DOT, the Federal Transit Administration (FTA) provides more specific guidance to metropolitan planning organizations on how to demonstrate Title VI compliance (see Chapter 1 for more details).

The first step in the analysis is to identify the combined share of federal and state transit investments in Plan Bay Area (PBA) 2040 (see Table 6-1). The investments included in the plan total $303.5 billion over a 24- year period, for a wide range of projects that include express lanes, freight improvements, active transportation programs and transit operations. Of the total plan investments, $203.5 billion are allocated to transit operations, maintenance, modernization and expansion. Transit is by far the largest investment made in PBA 2040. Of the total transit investments, 18 percent (or $53.4 billion) comes from various federal and state sources (see Chapter 2 for a list of sources). The Title VI analysis in this report is conducted on this amount (i.e., $53.4 billion).

Table 6-1: Sources of Funding by Mode of Transportation, Plan Bay Area 2040

	Total	Federal and State		Local / Other	
	$ million	$ million	%	$ million	%
Roadway / Bridge	$88,701	$29,220	33%	$59,482	67%
Bicycle and Pedestrian	$5,150	$1,325	26%	$3,825	74%
Freight	$2,743	$1,938	71%	$805	29%
Other Programs	$3,401	$1,072	32%	$2,329	68%
Public Transit	**$203,449**	**$53,362**	**26%**	**$150,087**	**74%**
Plan Bay Area 2040 Investments	$303,445	$86,917	29%	$216,528	71%

Source: MTC Analysis of Plan Bay Area 2040 Investments

Since this analysis relies on ridership data by race/ethnicity for each transit operator,[163] the assessment is further limited to only those operators for whom this information is available through a transit passenger survey (either conducted by the transit operator or MTC). This subset of the total federal and state transit funding for which data is available is $43.6 billion, or 82 percent of the total.

Next, federal and state investments in transit are allocated to minority and non-minority populations using the same methodology used in the transportation investment analysis (the population/use-based analysis) outlined in Chapter 5. Essentially, federal and state investments are broken out by transit operator and allocated to minority or non-minority populations based on their respective shares of ridership on that particular transit system. The allocations by transit operator are then added to provide the total federal and state funding that is allocated to minority and non-minority populations. This allocation of funding to minority and non-minority populations based on their use of various transit systems constitutes "benefit." The results for each subgroup are compared to estimate the relative benefit accrued to minority and non- minority populations (see Table 6-2).

Table 6-2: Summary of Population/Use-Based Analysis for Federal and State Transit Funding

Population	Share of Population	Share of Transit Ridership	Investments ($ million)		Share of Investments (%)	
			PBA 2040	Federal/State Transit	PBA 2040	Federal/State Transit
Minority	**59%**	**62%**	**$117,386**	**$25,797**	**61%**	**59%**
Non-Minority	41%	38%	$76,557	$17,850	39%	41%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, MTC's Analysis of Plan Bay Area Investments

Finally, investments are distributed on a per capita and a per-rider basis, so that investment benefits allocated to the region's minority populations and riders can be compared to investment benefits allocated to the region's non-minority populations and riders. The results from this analysis are summarized in Tables 6-3 and 6-4 below.

Following FTA guidance, MTC's disparate impact analysis of plan investments reveals that, on a per-capita basis, minority populations in the region would receive 59 percent of PBA 2040's investment benefits for public transit using federal and state sources, compared to 41 percent for non-minority populations. The share of investment benefits based on a per capita basis is proportional to the share of minority (59 percent) and non-minority (41 percent) populations in the region. On a transit-ridership basis, minority transit riders would again receive 59 percent of the benefit, compared to 41 percent for non-minority transit riders. The share of investment benefits based on a per-rider basis is proportional to the share of minority (62 percent) and non-minority (38 percent) transit ridership.

Table 6-3: Disparate Impact Analysis Results, Population-Based

	Population (2014)		Federal and State Transit Investments		Per capita Benefit
	#	%	$ millions	%	$
Minority	**4,305,728**	**59%**	**$25,797**	**59%**	**$5,991**
Non-Minority	3,033,324	41%	$17,850	41%	$5,885

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, MTC investment analysis

[163] Ridership data by race/ethnicity is available for 24 of the 27 transit operators in the Bay Area. Data is not available for Amtrak ($92 million), City of Dixon ($17 million) and the Sonoma-Marin Area Rail Transit (SMART) ($623 million). Data is also not available for the California High Speed Rail project ($8.5 billion). These amounts are therefore not included in the population/use-based analysis.

Table 6-4: Disparate Impact Analysis Results, Ridership-Based

	Ridership		Federal and State Transit Investments		Per-Rider Benefit
	#	%	$ millions	%	$
Minority	**998,992**	**62%**	**$25,797**	**59%**	**$25.82**
Non-Minority	616,075	38%	$17,850	41%	$28.97

Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, MTC investment analysis

Based on the results presented in Tables 6-3 and 6-4, MTC concludes that the Draft Plan is in compliance with Title VI of the Civil Rights Act of 1964 for the distribution of federal and state transit funds.

Environmental Justice Analysis and Results

Under Executive Order 12898 and the associated DOT Order on Environmental Justice, MTC must assist DOT, FTA and the Federal Highway Administration (FHWA) in their mission "to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects" on environmental-justice (EJ) populations. For this analysis, adverse effects are determined using the results for the six equity measures, described in Chapter 2. EJ populations are either low-income households or communities of concern (CoCs), also described in Chapter 2. The analysis must determine if EJ populations share in the benefits of the plan's investments without bearing a disproportionate share of the burdens.

As noted in Chapter 2, to make this determination, this report uses the DOT definition of a "disproportionately high and adverse effect," which relies on meeting the following two conditions:

- An adverse impact is predominately borne by minority and/or a low-income populations, and
- An adverse impact on minority and/or low-income populations is significantly more severe or greater in magnitude than the adverse effect on non-minority and/or non-low-income populations.

Table 6-5 below summarizes the EJ analysis results for each of the six equity measures. Although none of the measures analyzed found both a disproportionately high *and* adverse effect on EJ populations, this analysis confirms broad regional trends related to housing affordability for lower-income households in PDAs, TPAs and HOAs. Chapter 7 identifies a number of policies and programs that address these concerns, though fully recognizing that solving the housing affordability crisis in the Bay Area requires a more concerted effort on behalf of local governments as well as state and federal agencies, and stronger partnerships and collaboration between the public and private sectors. MTC finds no disproportionately high and adverse impact on EJ populations from the Draft Plan for any of the six equity measures.

Table 6-5: Summary of Environmental Justice Analysis Results for the Draft Plan

Equity Measures	Does the Draft Plan have an Adverse Effect on EJ Populations? *	Is the Adverse Effect Disproportionately High? **
	Draft Plan vs. No Project Alternative for Low-Income and CoCs (see Table 5-1)	Low-Income and CoCs vs. Non-Low-Income and Remainder of the Region (see Table 5-1)
3. Reduce adverse health impacts (+)	Same	Same
5. Decrease H+T *** for lower-income households (+)	No	No[164]
6. Increase the share of affordable housing	No	No[165]
7. Do not increase the risk of displacement	No	No[166]
8. Increase share of jobs accessible in congested conditions	No	No
9. Increase jobs in middle-wage industries	Same	Same

Notes:
(+) Compares results for lower-income vs. higher-income households instead of communities of concern vs. remainder of the region. Low- and lower-income households, as well as communities of concern, are considered EJ populations for this analysis.
** Compares the analysis results for the No Project Alternative and the Draft Plan to determine whether the measure is moving in the right direction for EJ populations (low-income households or communities of concern).*
*** Compares the analysis results for the Draft Plan relative to EJ and non-EJ populations. An EJ population is determined to experience "disproportionately high adverse effect" when the Draft Plan has an adverse effect on EJ populations AND when the adverse impact from the Draft Plan is greater than the adverse impact of the No Project Alternative.*
**** Housing and transportation costs*

Cumulative Benefits of the Draft Plan

Though not a federal requirement for Title VI or EJ compliance, or mandated by other state or local laws, MTC has conducted a qualitative analysis that tests whether the Draft Plan contributes to a *reduction in existing disparities* between communities of concern and the remainder of the region. A similar analysis was also conducted in the equity report for Plan Bay Area 2013.

[164] The Draft Plan does not have a disproportionately high adverse effect on EJ populations since the second of the two conditions is not met (see ** notes under Table 6-5 for more detail). While for the Draft Plan, the share of household income spent in the combined cost of housing and transportation for low-income residents increases by 13 percentage points for low-income households and 5 percentage points for higher income households, the impact is still smaller when compared to the No Project Alternative, which would increase the share by 15 percentage points

[165] The Draft Plan does not have a disproportionately high adverse effect on EJ populations since the second of the two conditions is not met (see ** notes under Table 6-5 for more detail). While for the Draft Plan, the share of affordable units remains about the same within CoCs and increases by 3 percentage points in the remainder of the region, the impact is less when compared to the No Project Alternative. Also, overall, the share of affordable units within CoCs remains almost twice as high as in the remainder of the region in 2040 (23 percent compared to 11 percent).

[166] The Draft Plan does not have a disproportionately high adverse effect on EJ populations since the second of the two conditions is not met (see ** notes under Table 6-5 for more detail). While the risk of displacement for the Draft Plan increases by one percentage point within CoCs and by 7 percentage points in the remainder of the region, the impact is still smaller when compared to the No Project Alternative, which would increase the risk of displacement by 25 percentage points within CoCs.

Table 6-6 below summarizes the results of this analysis, which answers the following two questions:

- Do disparities currently exist between communities of concern and the remainder of the region; and
- Does the Draft Plan reduce any existing disparity?

Table 6-6: Summary of Cumulative Benefits Analysis Results for the Draft Plan

Equity Measures	Do disparities currently exist between CoCs and the RoR? *	Does the Draft Plan reduce any existing disparity? **
3. Reduce adverse health impacts (+)	Yes	Marginally[167] Reduces
5. Decrease H+T for lower-income households (+)	Yes	Increases
6. Increase share of affordable housing	Yes	Marginally Increases
7. Do not increase the risk of displacement	Yes	Marginally Increases
8. Increase share of jobs accessible in congested conditions	Yes	Marginally Reduces
9. Increase jobs in middle-wage industries	No (++)	Reduces

Notes:
See Table 5-1 in Chapter 5 for more detailed results for the Baseline, No Project Alternative and EIR Alternatives. (+) Compares results for lower-income vs. higher-income households instead of CoCs and remainder of the region.
(++) The measure does not lend itself to a spatial or population-based assessment of disparate impacts. For example, both the location of middle-wage jobs and lower-income workers is dispersed across the region. In addition, an increase in the number of middle-wage jobs will largely benefit lower-income workers.
** Compares low-income households or CoCs with high-income householdsor remainder of the region in the baseline year (2005/2010).*
*** Compares the Base Year to the Draft Plan for low-income households or CoCs.*

Existing Disparities

Five of the six equity measures show existing disparities in the region between low-income households or CoCs and high-income households or the remainder of the region. These measures include adverse health impacts; combined cost of housing and transportation; share of affordable housing in PDAs, TPAs and HOAs; risk of displacement; and share of jobs accessible in congested conditions. None of these findings should be surprising.

Household income is the strongest predictor of individual and family health outcomes,[168] so it follows that lower-income households in the region will experience worse health outcomes compared to higher-income households. High housing costs are also more burdensome on lower-income households, who spend a much higher share of their income on rent or the cost of owning a home compared to higher-income households. This has direct implications for both a household's budget and its vulnerability to being priced out of a neighborhood as costs rise faster than wages.

It is important to note that a lack of existing disparity is not a sign of prosperity for disadvantaged populations in the Bay Area. For example, by definition, there is a higher concentration of low-income

[167] The impact on low-income households or CoCs is considered marginal if the Draft Plan results in a change of up to + or – one percentage point compared to the Base Year.
[168] For more information on the social determinants of health, see: http://www.acphd.org/media/144727/lduc-part1.pdf or http://publichealth.lacounty.gov/epi/docs/socialdterminants_final_web.pdf.

and minority populations within a CoC compared to the rest of the region (even though a larger share of all low-income and minority populations live in the remainder of the region). CoCs are therefore likely to have a high share of lower-priced homes, both renter- and owner-occupied. This is likely the primary reason why the share of affordable housing in CoCs is higher than the remainder of the region.

CoCs are also more likely to be located in the urban core, where transit and access to a broad range of services and amenities is better than in the suburbs. And even though a growing share of low-income populations are now living in suburban communities, the relative concentration of poverty is still higher in urban cores like Richmond, East Oakland, East Palo Alto and East San Jose. The same factors that increase the risk of displacement, i.e., proximity to transit and jobs, also increase the access for low-income and minority populations to job centers. This is likely the primary reason why the share of jobs accessible in congested conditions is higher in CoCs.

Benefits of the Draft Plan

When compared to base year conditions, the Draft Plan improves or marginally improves conditions for low-income households or CoCs for three equity measures. These measures include: Adverse health impacts, share of jobs accessible in congested conditions and middle-wage jobs. For two of these measures (health and job access), disparities currently exist between low-income households or CoCs and high-income households or remainder of the region.

These results suggest that the land use and transportation policies included in the Draft Plan are contributing to a reduction in some existing disparities in the region. An emphasis on transit, transit-oriented development and active transportation in the Draft Plan is contributing to improving health outcomes for lower-income households, by increasing opportunities for physical activity. More investment in affordable housing in the urban core, close to transit and jobs, is contributing to improved access to jobs and potentially other services.

On the other hand, the Draft Plan may cause worse or marginally worse conditions for low-income households or CoCs on three measures, including the combined cost of housing and transportation; share of affordable housing in PDAs, TPAs and HOAs; and risk of displacement. For each of these measures, disparities currently exist between low-income or CoCs and high-income or remainder of the region.

Despite small gains, much more work is needed to make real progress in improving health outcomes, housing and transportation affordability, and neighborhood stability for disadvantaged communities in the Bay Area.

Chapter 7. Next Steps

This chapter summarizes some of the next steps for MTC and ABAG, which build upon the findings from the equity analysis. These next steps refer to implementation of the Draft Plan as well as refinements to the equity analysis for the next update.

Transportation Plans, Programs and Investments

The Draft Plan allocates almost 64% of the total plan revenue, or about $194 billion of $303 billion,[169] to transit operations, modernization and expansion over a 24-year period. This investment reflects the region's commitment to transit sustainability and transit-oriented development, which has the potential to deliver significant environmental and economic benefits. This investment also supports the region's commitment to equity.

Low-income residents were about 25% of the region's total population in 2014,[170] but they accounted for about 52% of all transit trips in the region. Transit investments therefore disproportionately benefit low-income populations in the Bay Area. Similarly, minority residents are about 59% of the region's population and take 62% of all transit trips. They too, like low-income populations, benefit from transit investments. The agency's commitment to meeting the mobility and access needs of low-income, minority and other transportation-disadvantaged populations such as seniors and people with disabilities is reflected in MTC's programs and planning efforts, listed below.

Community-Based Transportation Planning Program

In 2002, MTC created the Community-Based Transportation Planning (CBTP) Program to provide planning grants for low-income communities to identify and prioritize transportation projects, programs and services that would best meet residents' mobility and access needs. Funding is provided to county congestion management agencies (CMAs) to implement a collaborative planning process involving residents, community- and faith-based organizations, transit operators, local jurisdictions, and MTC, among other stakeholders.

As of December 2016, more than 35 CBTP plans have been completed across the region.[171] The second round of the One Bay Area Grant (OBAG) program, adopted in 2016, includes $1.5 million to develop plans for new CoCs identified in the Draft Plan and to update the plans that are no longer current.

Lifeline Transportation Program

In 2005, MTC created the Lifeline Transportation Program (LTP) to fund projects and programs that meet mobility and access needs of low-income populations in the region. Since 2005, MTC has awarded over $255 million in LTP funds to more than 280 projects, across all nine counties. LTP projects are administered by CMAs and involve determining the eligibility of grant proposals and appointing local review teams to evaluate outcomes. LTP projects must address transportation gaps or barriers identified in CBTP or other local planning efforts in low-income neighborhoods.[172]

---

[169] The total plan revenue does not include project costs and funding that occurred before fiscal year 2016-2017. The amounts are in year-of-expenditure dollars.
[170] 2010-2014 American Community Survey 5-year average.
[171] For a list of completed Community-Based Transportation Plans, see: http://mtc.ca.gov/our-work/plans-projects/other-plans/community-based-transportation-plans.
[172] For more information about the Lifeline Transportation Program, see: http://mtc.ca.gov/our-work/plans-projects/equity-accessibility/lifeline-transportation-program.

The type of projects funded through LTP include: fixed-route bus service, transit stop improvements, pedestrian and bicycle access improvements, transportation services for seniors and children, community shuttles, and auto loan programs.

Regional Means-Based Transit Fare Study

In 2015, MTC launched a study to evaluate the feasibility and effectiveness of implementing a transit fare subsidy program based on household income. The Regional Means-Based Transit Fare Study includes three main objectives: make transit more affordable for low-income residents, move toward a more consistent regional standard for fare discounts, and avoid worsening transit operators' service levels or financial performance. MTC formed a technical advisory committee, composed of transit operators, community groups, and other stakeholders, to advise staff on the scope and methodology for the analysis.

Key areas of focus for the study include identifying the following: possible fare structures and payment methods, eligible recipients, overall program costs, potential funding sources, impact on transit agencies' fare revenue, relationships to existing discounts, and any anticipated technical challenges. The final report is expected to be completed by mid-2017.[173]

Coordinated Public Transit–Human Services Transportation Plan

MTC's Coordinated Public Transit–Human Services Transportation (Coordinated) Plan seeks to improve transportation coordination in the region to address the mobility needs of low-income populations, seniors, persons with disabilities and veterans. Consistent with requirements established by the Fixing America's Surface Transportation (FAST) Act[174], MTC is currently updating the Coordinated Plan to coincide with the adoption of Plan Bay Area 2040. MTC's current Coordinated Plan was last adopted in 2013.[175]

Federal law requires that projects selected for funding under the Elderly Individuals and Individuals with Disabilities (Section 5310)[176] be derived from a locally developed, coordinated public transit-human services transportation plan. Federal law also requires that the plan be developed through a process that includes representatives of public, private, and non-profit transportation and human services providers. Participation by members of the public is additional requirement. Plans must identify the transportation needs of low-income populations, seniors and persons with disabilities; provide strategies for meeting these needs; and prioritize transportation services for funding and implementation.

This report is consistent with the 2013 Coordinated Plan as well as the current update, which is anticipated to be adopted at the same time as Plan Bay Area 2040.

One Bay Area Grant Program

MTC's OBAG program supports California's smart-growth goals (as defined by Senate Bill 375) by incentivizing local agencies to fund transportation projects in Priority Development Areas (PDAs)—areas designated by local jurisdictions for higher-density, walkable and mixed-use communities.[177] OBAG funds may be used by local jurisdictions for complete streets projects, including: stand-alone bicycle and pedestrian paths, bicycle lanes, pedestrian bulb-outs, lighting, new sidewalks, and Safe Routes to Transit and Safe Routes to School projects.

---

[173] For more information on the Means-Based Transit Fare Subsidy Study, see: http://mtc.ca.gov/our-work/plans-projects/other-plans/means-based-fare-study.
[174] For more details on the FAST Act, see: https://www.fhwa.dot.gov/fastact/legislation.cfm.
[175] For more information about the Coordinated Plan, see: http://mtc.ca.gov/our-work/plans-projects/other-plans/coordinated-public-transit-human-services-transportation-plan.
[176] Formula funding to states for the purpose of assisting private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities. See: https://www.transit.dot.gov/grants.
[177] For more information on the OBAG Program, see: http://mtc.ca.gov/our-work/invest-protect/focused-growth/one-bay-area-grants.

To be eligible for OBAG funds, each jurisdiction in the region is required to adopt a complete streets policy and obtain state-certification for its housing element, consistent with state law. Many low-income households, seniors and people with disabilities reside within PDAs and will benefit from street improvements that expand access and mobility. But the same communities set to benefit from such projects may also be at risk of displacement, especially in the absence of tenant protections and investments in affordable housing. The program provides an incentive to local jurisdictions to produce more housing (including affordable housing) by including it as a funding criteria. These requirements were strengthened in the recently adopted OBAG program.

Bay Area Transit-Oriented Affordable Housing Fund

In 2011, MTC committed $10 million in seed funding to the Transit-Oriented Affordable Housing (TOAH) fund, which provides flexible, affordable loans to developers for the purchase of properties near transit for the development of affordable housing, retail space, and other critical services such as child care centers, fresh food outlets and health clinics. By supporting growth along transit corridors in Priority Development Areas, TOAH promotes compact land use patterns, which aligns with the region's Sustainable Community Strategy. MTC committed an additional $10 million to the fund in 2014.[178]

Active Transportation, Complete Streets and Safe Routes to School Programs

MTC's bicycle and pedestrian planning program supports multiple initiatives. These include: bike to work, complete streets, Bay Area Bike Share, the Bay Trail, and connectivity across the region's bridges. PBA 2040 commits $5.1 billion to bicycle and pedestrian improvements in the region over the plan period. PBA 2040 also makes a significant commitment to improving bicycle and pedestrian safety by supporting complete streets policies. MTC's complete streets efforts include regular trainings and workshops for residents as well as the development of an online checklist. Bicycle and pedestrian networks and safety improvements could benefit transportation-disadvantaged communities that rely on this mode for a higher share of essential trips.[179]

The Bay Area Bike Share will offer a $5 first-year membership and cash transactions for low-income residents, and will broaden community outreach when the expansion program launches in spring 2017. After the first year, low-income members will pay only $5 per month to keep riding. The Safe Routes to School (SRTS) program, part of OBAG, provides ~$5 million annually in grants to cities, counties and congestion management agencies to fund projects such as: bicycle and pedestrian paths to schools; on-street bike lanes; bicycle racks or other secure parking facilities; traffic calming on streets around schools; bike safety training; and education and outreach for students and families. Bicycle and pedestrian networks and safety improvements around neighborhood schools could benefit transportation-disadvantaged communities by encouraging more active lifestyles and reducing road-traffic injuries.

San Francisco Bay Area Goods Movement Plan

In early 2016, MTC published the San Francisco Bay Area Goods Movement Plan, which is closely integrated with the Alameda County Transportation Commission's countywide planning efforts. The plan identifies five key goals, many of which benefit communities of concern. These include: increasing economic growth and prosperity; reducing environmental and community impacts and improving the quality of life in communities most affected by goods movement; providing safe, reliable, efficient and well-maintained freight movement facilities; promoting innovative technology strategies to improve efficiency; and preserving and strengthening the multi-modal transportation system that supports freight movement.[180]

---

[178] For more information on the TOAH Program, see: http://bayareatod.com/.

[179] For more information on the region's active transportation program, see: http://mtc.ca.gov/our-work/invest-protect/investment- strategies-commitments/protect-our-climate/active-transportation.

[180] For more information on the Bay Area Goods Movement Plan, see: http://mtc.ca.gov/our-work/plans-projects/economic-

Regional Climate Initiatives

The Draft Plan commits $794 million for climate initiatives to reduce greenhouse gas emissions and other pollutants. Examples of initiatives include: commuter benefits (a pre-tax commute program), car-sharing, vanpooling, a Clean Vehicle Feebate Program, smart driving strategies, a vehicle buy-back and purchase incentive program, a regional electric vehicle charger network, and the climate initiatives innovative grants. Since low-income people of color may be most vulnerable to impacts of climate change. If structured well, efforts to reduce emissions could benefit all residents in the region, including vulnerable populations.[181]

Other Federal Programs

FTA's Section 5307 program funds up to 80 percent of project costs for a wide range of transit investments, including: operating assistance; construction of maintenance and passenger facilities; vehicle replacement and rehabilitation; rehabilitation of tracks, signals, communications and computer systems; planning, engineering design and project evaluation; and crime prevention and security equipment.

Funding through Section 5307 is based on formulas established by Congress that incorporate population, transit ridership, revenue-service mileage and other factors. Section 5307 funds can be used to cover up to 90 percent of costs for bicycle-related projects and investments to comply with the Americans with Disabilities Act (ADA) and the Clean Air Act.

MTC sets aside 10% of Section 5307 funds for ADA paratransit service. The program provides approximately $20 million annually to eligible paratransit service in urbanized areas. In addition to 5307 funds, State Transit Assistance (STA) Program sets aside 15.6% of its population-based formula allocations for paratransit service. STA provides approximately $8 million annually to eligible paratransit service.

MTC partners with Caltrans to administer the Section 5310 funds to meet the mobility needs of seniors and people with disabilities in the Bay Area. The program provides approximately $4.5 million annually to eligible projects in the region. Section 5310 funds are distributed to states to provide grants for nonprofit agencies that provide transportation services to seniors and people with disabilities. In the last cycle of funding (fiscal years 2013 and 2014), 56% of Section 5310 funding was used for mobility management, 32% for purchasing vehicles, and 12% for operations.

Section 5311 provides funds for transit capital projects and operations in non-urbanized areas. These funds are also eligible for paratransit service. The program provides approximately $1.5 million annually to eligible projects in rural communities.

State and Federal Support

In order to meaningfully address the region's key challenges such as housing affordability, displacement and underfunded transit needs, ABAG and MTC will continue to advocate for legislative changes at both the state and federal levels. These initiatives, detailed further in the Draft Plan, include:

- *Local funding tools and mechanisms* – MTC and ABAG will continue to advocate for a replacement for redevelopment funding that was lost in 2011. Redevelopment Agencies (RDAs) had the authority to assemble parcels and pay for infrastructure improvements necessary to promote infill development. RDAs were the largest source of funding and financing for these improvements as well as affordable housing in the state. With the demise of RDAs, the Bay Area lost about $1 billion in annual tax-increment financing for affordable housing projects, critical infrastructure improvements, and economic development projects in designated areas.

vitality/san-francisco-bay-area-goods-movement-plan.

[181] For more information on the Regional Climate Initiatives, see: http://mtc.ca.gov/our-work/plans-projects/climate-change-clean- vehicles/climate-initiatives-program.

- *Federal funding for housing and community development programs* – MTC and ABAG will continue to advocate for stabilizing and potentially growing housing-related programs and funding at the federal level, including the HOME Investment Partnership Program and the Community Development Block Grants, which help local jurisdictions increase the supply of a variety of workforce housing opportunities. In recent decades, though, funding for both programs has fallen drastically.
- *State funding for transportation* – MTC will continue to urge the Bay Area's state delegation to create new permanent revenue sources for transportation to achieve PBA 2040's financial assumptions, increase funding to sustain transit service, and increase the efficiency of the existing network.

Next Equity Analysis

In response to input received from the Regional Equity Working Group (REWG), MTC and ABAG will continue to refine the methodology, data collection and modeling capabilities for the equity analysis.

Some of the enhancements suggested by the REWG include:

- Revisiting the criteria for designating communities of concern (CoCs) – the current definition is based in part on the presence of a significant concentration of both low-income and minority populations. Since many low-income areas in the North Bay do not satisfy the minority criteria, these communities are underrepresented in the regional designation;
- Revisiting the geography for analysis – the current analysis is conducted at a census tract level, which may not capture the neighborhood level variations, especially in suburban communities;
- Refining the methodology for estimating displacement risk – the current approach does not directly account for the loss of low-income residents in PDAs, TPAs, and HOAs between the baseline and plan horizon years to estimate the share of low-income residents at displacement risk. Instead, the methodology uses this information only to identify at risk zones, relying instead on the presence of the remaining low-income residents in PDAs, TPAs, and HOAs in the plan horizon year to estimate the risk of displacement;
- Developing a new methodology for the middle-wage jobs measure – the current performance target does not capture sub-regional variability in the distribution of middle-wage jobs across the region;
- Developing a new methodology for designating high-opportunity areas (HOAs) – the current methodology and designations were developed by the Kirwan Institute in 2010-2011 using data that was available at the time. The methodology also does not disaggregate the measure into its three sub-categories: education, economics and neighborhood quality;
- Developing county-specific profiles that can be used by the respective congestion management agencies when conducting an equity analysis for sub-regional planning (county transportation plans); and
- Investigating key regional trends that affect low-income and minority communities in greater detail.

Specific to FTA requirements for Title VI analysis, MTC will continue to assess the feasibility of upgrading future regional transportation plan project databases to allow for mapping transit projects that receive state or federal funds, and developing modeling sub-networks to be able to use the regional travel model for Title VI analysis.

This page left intentionally blank.

Plan BayArea 2040

Map 1

Communities of Concern

American Community Survey 2014

Communities of Concern

The Communities of Concern (tract geography) dataset is based upon eight demographic variables:

1. Minority (70% threshold)
2. Low-Income (less than 200% of Fed. poverty level, 30% threshold)
3. Limited English Proficiency (20% threshold)
4. Elderly (10% threshold)
5. Zero-Vehicle Households (10% threshold)
6. Single Parent Families (20% threshold)
7. Disabled (25% threshold)
8. Rent-Burdened Households (15% threshold)

If a tract exceeds both threshold values for Low-Income and Minority shares OR exceeds the threshold value for Low-Income AND also exceeds the threshold values for three or more variables (#3 to #8), it is a COC.

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

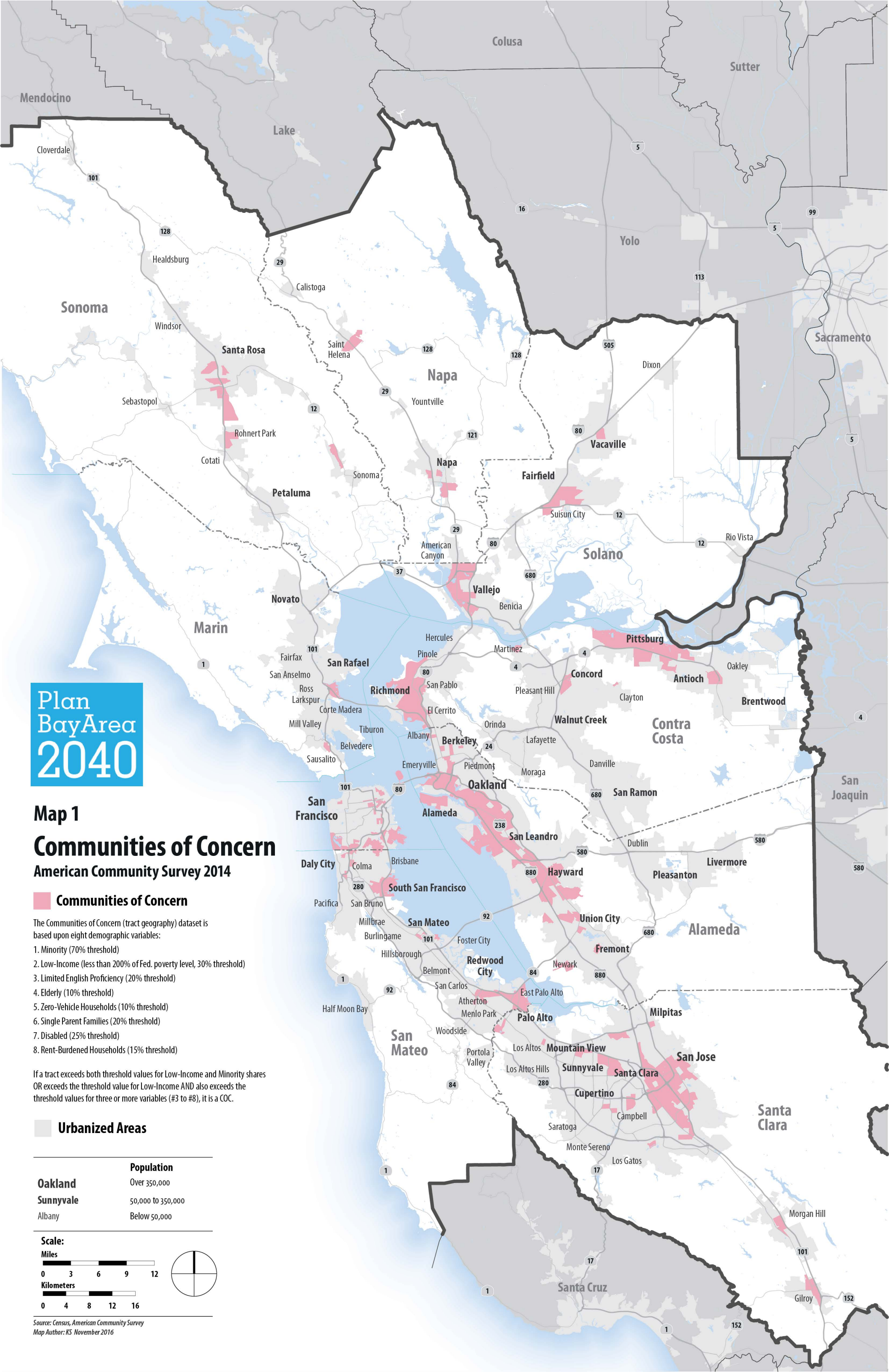
Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey

Map Author: KS November 2016



Plan BayArea 2040

Map 2

Communities of Concern

American Community Survey 2010 - 2014

Level of Disadvantage

- **High**
- **Higher**
- **Highest**

The "High" Level of Disadvantage identifies those Census Tracts that are designated as Communities of Concern (COCs). The "Higher" and "Highest" Levels of Disadvantage identifies those Census Tracts that have an even higher concentration of disadvantaged populations.

- **Communities of Concern**
- **Urbanized Areas**

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey

Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
San Mateo
Santa Clara
Santa Cruz
Alameda
Cloverdale
Healdsburg
Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Calistoga
Saint Helena
Yountville
Napa
Sonoma
American Canyon
Vallejo
Benicia
Fairfield
Suisun City
Vacaville
Dixon
Rio Vista
Novato
San Rafael
Fairfax
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
San Pablo
Richmond
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Half Moon Bay
Pittsburg
Antioch
Oakley
Concord
Pleasant Hill
Clayton
Brentwood
Walnut Creek
Orinda
Lafayette
Moraga
Danville
San Ramon
Dublin
Pleasanton
Livermore
Hayward
Union City
Fremont
Newark
Milpitas
Alameda
Santa Cruz

Plan BayArea 2040

Map 3

Low-Income and Minority Population

Decennial Census 2000

Low-Income Tracts

Includes tracts with a share of low-income population at or above the Regional Mean (21%)

Minority Tracts

Includes tracts with a share of minority population at or above the Regional Mean (48%)

Low-Income and Minority Tracts

Communities of Concern

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey

Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Alameda
Santa Clara
Santa Cruz
San Mateo
Cloverdale
Healdsburg
Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Calistoga
Saint Helena
Yountville
Vacaville
Dixon
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Antioch
Oakley
Brentwood
Concord
Pleasant Hill
Clayton
Walnut Creek
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Orinda
Lafayette
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Oakland
Alameda
San Leandro
Hayward
Union City
Fremont
Newark
Milpitas
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Half Moon Bay

Plan BayArea 2040

Map 4

Low-Income and Minority Population

American Community Survey 2014

Low-Income Tracts

Includes tracts with a share of low-income population at or above the Regional Mean (26%)

Minority Tracts

Includes tracts with a share of minority population at or above the Regional Mean (57%)

Low-Income and Minority Tracts

Urbanized Areas

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey

Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Mateo
Santa Clara
San Joaquin
Santa Cruz
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Concord
Brentwood
Pleasant Hill
Clayton
Walnut Creek
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Orinda
Lafayette
Moraga
Danville
San Ramon
Emeryville
Piedmont
Oakland
Alameda
San Leandro
Dublin
Pleasanton
Livermore
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
Palo Alto
East Palo Alto
Half Moon Bay
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Milpitas
Newark
Fremont
Union City
Hayward
Morgan Hill
Gilroy

Plan BayArea 2040

Map 5

Minority Population

Decennial Census 2000

Tracts Within Urban Area

Percent of Minority Population by Tract

- Less than 15%
- Between 15 to 30%
- Between 30 to 50%
- Between 50 to 70%
- More than 70%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 6

Minority Population

American Community Survey 2014

Tracts Within Urban Area

Percent of Minority Population by Tract

- Less than 15%
- Between 15 to 30%
- Between 30 to 50%
- Between 50 to 70%
- More than 70%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 7

Change in Minority Population

American Community Survey 2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community

Note: Tracts with population below 500 not shown.

Map Author: KS November 2016

Plan BayArea 2040

Map 8

Change in White Population

2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population beloww 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 9

Change in African American or Black Population

2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population beloww 500 not shown
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Santa Clara
San Mateo
Alameda
Santa Cruz
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Sonoma
Napa
American Canyon
Vallejo
Benicia
Suisun City
Fairfield
Vacaville
Dixon
Rio Vista
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Richmond
San Pablo
Pleasant Hill
Martinez
Concord
Clayton
Pittsburg
Antioch
Oakley
Brentwood
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
Hayward
Union City
Fremont
Newark
San Leandro
Half Moon Bay
San Carlos
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
Cupertino
San Jose
Milpitas
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
1
5
12
16
17
24
29
37
80
84
92
99
101
113
121
128
152
180
238
280
505
580
680
880

Plan BayArea 2040

Map 10

Change in Asian and Pacific Islander Population

2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November

Plan BayArea 2040

Map 11

Change in Hispanic or Latino Population

2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
San Mateo
Santa Clara
Santa Cruz
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Dixon
Sebastopol
Rohnert Park
Cotati
Petaluma
Sonoma
Yountville
Vacaville
Fairfield
Suisun City
Napa
American Canyon
Rio Vista
Vallejo
Benicia
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Albany
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Richmond
San Pablo
Pleasant Hill
Concord
Clayton
El Cerrito
Orinda
Walnut Creek
Brentwood
Lafayette
Berkeley
Emeryville
Oakland
Moraga
Danville
San Ramon
Alameda
Dublin
Livermore
San Francisco
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Pacifica
San Mateo
Hayward
Pleasanton
Millbrae
Burlingame
Foster City
Union City
Fremont
Hillsborough
Redwood City
Newark
Half Moon Bay
San Carlos
East Palo Alto
Atherton
Menlo Park
Palo Alto
Milpitas
Mountain View
Woodside
Los Altos
Portola Valley
Sunnyvale
Santa Clara
San Jose
Los Altos Hills
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 12

Low Income Population

Decennial Census 2000

Tracts Within Urban Area

Percent of Low Income Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 13

Low Income Population

American Community Survey 2014

Tracts Within Urban Area

Percent of Low Income Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
San Francisco
San Mateo
Contra Costa
Alameda
Santa Clara
Santa Cruz
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Brentwood
Clayton
Concord
Pleasant Hill
San Pablo
Richmond
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Union City
Fremont
Newark
Hayward
San Leandro
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Foster City
Hillsborough
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
Cupertino
San Jose
Milpitas
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 14

Change in Low-Income Population

American Community Survey 2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community

Note: Tracts with population below 500 not shown.

Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
San Francisco
San Mateo
Santa Clara
Alameda
San Joaquin
Santa Cruz
Sacramento
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Richmond
San Pablo
Pleasant Hill
Concord
Clayton
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Brentwood
Dublin
Livermore
Pleasanton
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Milpitas
Morgan Hill
Gilroy

Plan BayArea 2040

Map 15

Senior Population

Decennial Census 2000

Tracts Within Urban Area

Percent of Senior Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 16

Senior Population

American Community Survey 2014

Tracts Within Urban Area

Percent of Senior Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 17

Change in Senior Population

American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Santa Clara
Santa Cruz
San Mateo
Alameda
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Yountville
Dixon
Vacaville
Sebastopol
Rohnert Park
Cotati
Petaluma
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Mill Valley
Corte Madera
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Pleasant Hill
Concord
Clayton
San Pablo
Richmond
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Brentwood
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
San Francisco
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
Millbrae
Burlingame
Hillsborough
San Mateo
Foster City
Redwood City
Half Moon Bay
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Milpitas
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 18

Single Parent Families

Decennial Census 2000

Tracts Within Urban Area

Percent of Single Parent Families by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 19

Single Parent Families

American Community Survey 2014

Tracts Within Urban Area

Percent of Single Parent Families by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
San Francisco
San Mateo
Santa Clara
Contra Costa
Alameda
San Joaquin
Santa Cruz
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Pittsburg
Oakley
Antioch
Brentwood
Clayton
Concord
Pleasant Hill
Martinez
Hercules
Pinole
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Albany
Berkeley
Emeryville
Oakland
Alameda
Richmond
El Cerrito
San Pablo
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Hayward
San Leandro
Union City
Fremont
Newark
Milpitas
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 20

Change in Single Parent Families

American Community Survey 2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
San Francisco
San Mateo
Santa Clara
Santa Cruz
Alameda
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Richmond
San Pablo
Pleasant Hill
Concord
Clayton
El Cerrito
Orinda
Walnut Creek
Brentwood
Albany
Berkeley
Lafayette
Moraga
Danville
Emeryville
Oakland
San Ramon
Alameda
Dublin
Livermore
Pleasanton
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Pacifica
San Mateo
Millbrae
Burlingame
Foster City
Hillsborough
Redwood City
Newark
Half Moon Bay
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Milpitas
Mountain View
Woodside
Los Altos
Portola Valley
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 21

Zero Vehicle Households

Decennial Census 2000

Tracts Within Urban Area

Percent of Households with Zero Vehicles by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Santa Clara
Santa Cruz
San Mateo
Alameda
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Dixon
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Vacaville
Fairfield
Suisun City
American Canyon
Rio Vista
Vallejo
Benicia
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Pleasant Hill
Concord
Clayton
San Pablo
Richmond
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Brentwood
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
San Francisco
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
Half Moon Bay
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Milpitas
Morgan Hill
Gilroy

Plan BayArea 2040

Map 22

Zero Vehicle Households

American Community Survey 2014

Tracts Within Urban Area

Percent of Households with Zero Vehicles by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
San Mateo
Santa Clara
Santa Cruz
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Sebastopol
Yountville
Rohnert Park
Cotati
Petaluma
Sonoma
Napa
Fairfield
Suisun City
Vacaville
Dixon
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Pleasant Hill
Concord
Clayton
San Pablo
Richmond
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Brentwood
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
San Leandro
Hayward
Union City
Fremont
Newark
Alameda
Milpitas
Mountain View
Los Altos
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Daly City
Colma
Brisbane
South San Francisco
San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
San Carlos
Half Moon Bay

Plan BayArea 2040

Map 23

Change in Zero Vehicle Households

American Community Survey 2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
San Francisco
San Mateo
Santa Clara
Santa Cruz
Alameda
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Pittsburg
Oakley
Antioch
Brentwood
Clayton
Concord
Pleasant Hill
Martinez
Pinole
Hercules
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Union City
Fremont
Newark
Hayward
San Leandro
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
Cupertino
San Jose
Milpitas
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 24

Limited English Proficiency Population

Decennial Census 2000

Tracts Within Urban Area

Percent of Population with Limited English Proficiency by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 25

Limited English Proficiency Population

American Community Survey 2014

Tracts Within Urban Area

Percent of Population with Limited English Proficiency by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 26

Change in Limited English Proficiency Population

American Community Survey 2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Santa Clara
San Mateo
Santa Cruz
Alameda
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Napa
Sonoma
American Canyon
Vallejo
Benicia
Suisun City
Rio Vista
Dixon
Vacaville
Fairfield
Pittsburg
Oakley
Antioch
Brentwood
Clayton
Concord
Pleasant Hill
Martinez
Pinole
Hercules
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
San Francisco
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Milpitas
1
4
5
12
16
17
24
29
37
80
84
88
92
99
101
113
121
128
152
180
237
238
280
505
580
680
880

Plan BayArea 2040

Map 27

Severely Rent-Burdened Households

Decennial Census 2000

Tracts Within Urban Area

Percent of Households with Severe Rent Burden by Tract

Severely rent-burdened households are definied as households that spend more than 50% of their income on housing

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Alameda
San Mateo
Santa Clara
Santa Cruz
Cloverdale
Healdsburg
Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Calistoga
Saint Helena
Yountville
Sonoma
Napa
American Canyon
Vallejo
Benicia
Suisun City
Fairfield
Vacaville
Dixon
Rio Vista
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Belvedere
Sausalito
Tiburon
Albany
Berkeley
Emeryville
Oakland
Alameda
Hercules
Pinole
Richmond
San Pablo
El Cerrito
Martinez
Pleasant Hill
Concord
Clayton
Pittsburg
Antioch
Oakley
Brentwood
Orinda
Lafayette
Moraga
Walnut Creek
Danville
San Ramon
Dublin
Livermore
Pleasanton
Union City
Fremont
Newark
Hayward
San Leandro
Ashland
Cherryland
Castro Valley
San Lorenzo
Alameda
Bay Farm Island
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Foster City
Hillsborough
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Sunnyvale
Santa Clara
Cupertino
Mountain View
Milpitas
San Jose
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Santa Cruz

Plan BayArea 2040

Map 28

Severely Rent-Burdened Households

American Community Survey 2014

Tracts Within Urban Area

Percent of Households with Severe Rent Burden by Tract

Severely rent-burdened households are definied as households that spend more than 50% of their income on housing

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
Sacramento
San Joaquin
San Mateo
Santa Clara
Alameda
Santa Cruz
Cloverdale
Healdsburg
Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Calistoga
Saint Helena
Yountville
Napa
Sonoma
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Pleasant Hill
Concord
Clayton
Richmond
San Pablo
El Cerrito
Orinda
Walnut Creek
Brentwood
Lafayette
Moraga
Danville
Berkeley
Albany
Emeryville
Oakland
Alameda
San Ramon
Dublin
Livermore
Pleasanton
San Francisco
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
San Mateo
Millbrae
Burlingame
Foster City
Hillsborough
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
East Palo Alto
Palo Alto
Milpitas
Mountain View
Woodside
Portola Valley
Los Altos
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
1
5
16
99
113
505
12
29
37
80
680
101
128
121
24
84
92
238
580
880
280
4
17
152

Plan BayArea 2040

Map 29

Change in Severely Rent-Burdened Households

American Community Survey 2000 - 2014

Tracts Within Urbanized Areas

(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (± 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Francisco
San Mateo
Santa Clara
San Joaquin
Santa Cruz
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Suisun City
Fairfield
American Canyon
Vallejo
Benicia
Rio Vista
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Mill Valley
Corte Madera
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Richmond
San Pablo
Pleasant Hill
Concord
Clayton
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Brentwood
Dublin
Livermore
Pleasanton
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
Cupertino
Milpitas
San Jose
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 30

Disabled Population

American Community Survey 2014

Tracts Within Urban Area

Percent of Disabled Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea 2040

Map 31

Jobs Housing Fit Ratio

Ratio of Low-wage Jobs to Affordable Housing Units

University of California Davis 2014

Tracts Within Urbanized Areas

Jobs Housing Fit Indicator Ratio

- Less than 1
- 1 to 2
- 2 to 4
- Greater than 4

About this Data:
http://mappingregionalchange.ucdavis.edu/roi/data.html

- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles
0 3 6 9 12

Kilometers
0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
San Francisco
San Mateo
Alameda
Santa Clara
Santa Cruz
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Calistoga
Saint Helena
Yountville
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
Hercules
Pinole
Martinez
Pleasant Hill
Concord
Pittsburg
Antioch
Oakley
Brentwood
Clayton
Walnut Creek
Orinda
Lafayette
Moraga
Danville
San Ramon
Dublin
Pleasanton
Livermore
Fairfield
Suisun City
Vacaville
Rio Vista
Dixon
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
Half Moon Bay
Woodside
Portola Valley
East Palo Alto
Palo Alto
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Saratoga
Monte Sereno
Los Gatos
Campbell
Milpitas
Newark
Fremont
Union City
Hayward
San Leandro
Morgan Hill
Gilroy
Woodland
Davis
West Sacramento
Winters
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
Benicia
Vallejo
Napa
Yountville
Calistoga
Saint Helena
Sonoma
Petaluma
Rohnert Park
Cotati
Sebastopol
Windsor
Healdsburg
Cloverdale
Novato
San Rafael
Richmond
Oakland
Alameda
San Leandro
Hayward
Fremont
Pleasanton
Livermore
Dublin
San Ramon
Concord
Pittsburg
Antioch
Brentwood
Walnut Creek
Danville
Milpitas
San Jose
Morgan Hill
Gilroy
Santa Clara
Sunnyvale
Mountain View
Palo Alto
Redwood City
South San Francisco
Daly City
San Francisco
Marin
Solano
Yolo
Sutter
Colusa
Lake
Mendocino
Napa
Sonoma
Contra Costa
Alameda
Santa Clara
San Mateo
Santa Cruz
San Joaquin
Sacramento

Plan BayArea 2040

Map 32

Estimated Daily Truck Volume and Communities of Concern

Trucks per Day by Route

- Less than 2000
- 2,000 to 5,000
- 5,000 to 10,000
- 10,000 to 15,000
- more than 15,000

Source: USDOT Freight Analysis Framework

- Communities of Concern
- Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey, U.S. Dept. of Trans.
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Francisco
San Mateo
Santa Clara
Santa Cruz
Sacramento
San Joaquin
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
Sebastopol
Rohnert Park
Cotati
Petaluma
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Concord
Pleasant Hill
Clayton
Brentwood
Walnut Creek
Lafayette
Orinda
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Leandro
Hayward
Union City
Fremont
Newark
Milpitas
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
San Mateo
Burlingame
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Half Moon Bay
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
Cupertino
San Jose
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy

Plan BayArea 2040

Map 33

Other Disadvantaged Areas

Tracts Within Urbanized Areas

- **CARE Communities**
  (Bay Area Air Quality Management District)
- **Health Disadvantaged Areas**
  (California Public Health Alliance)
- **Disadvantaged Communities**
  (EPAs CalEnviroScreen 3.0)
- **Communities of Concern**
- **Urbanized Areas**

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
San Mateo
Santa Clara
Santa Cruz
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Dixon
Sebastopol
Yountville
Vacaville
Rohnert Park
Cotati
Sonoma
Napa
Fairfield
Petaluma
Suisun City
American Canyon
Rio Vista
Vallejo
Benicia
Novato
Hercules
Pittsburg
Fairfax
Martinez
Pinole
Oakley
San Rafael
Antioch
San Anselmo
San Pablo
Pleasant Hill
Concord
Clayton
Ross
Richmond
Larkspur
El Cerrito
Brentwood
Corte Madera
Orinda
Walnut Creek
Mill Valley
Tiburon
Albany
Belvedere
Berkeley
Lafayette
Sausalito
Emeryville
Moraga
Danville
Oakland
San Ramon
San Francisco
Alameda
Dublin
Daly City
Colma
Brisbane
San Leandro
Livermore
South San Francisco
Pacifica
Hayward
Pleasanton
San Mateo
Millbrae
Union City
Alameda
Burlingame
Foster City
Redwood City
Fremont
Hillsborough
Newark
East Palo Alto
San Carlos
Atherton
Half Moon Bay
Menlo Park
Palo Alto
Milpitas
Woodside
Mountain View
Portola Valley
Los Altos
Sunnyvale
Santa Clara
San Jose
Los Altos Hills
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
1
5
16
99
113
505
29
12
121
80
37
680
84
92
101
280
24
4
17
152
880
238
580

Plan BayArea 2040

Map 34

High Opportunity Areas

Neighborhood Health & Housing, Education, Economic and Mobility Opportunity Indicators

Kirwan Institute for the Study of Race and Ethnicity 2010

Tracts Within Urbanized Areas

Comprehensive Opportunity Index

- High Opportunity Areas
- Very High Opportunity Areas

Represents 18 different indicators in the following categories:
Neighborhood Health & Housing
Education
Economic and Mobility

About this Data:
http://kirwaninstitute.osu.edu/researchandstrategicinitiatives/

- Communities of Concern
- Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Alameda
San Mateo
Santa Clara
Santa Cruz
Cloverdale
Healdsburg
Calistoga
Windsor
Santa Rosa
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Napa
Sonoma
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Concord
Pleasant Hill
Clayton
Brentwood
Walnut Creek
Orinda
Lafayette
Danville
Moraga
San Ramon
Dublin
Pleasanton
Livermore
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Francisco
Daly City
Colma
Brisbane
South San Francisco
San Bruno
Pacifica
San Leandro
Hayward
Union City
Newark
Fremont
Milpitas
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Half Moon Bay

Plan BayArea 2040

Map 35

Low Income and Minority Areas within Transit Priority Areas in 2009

American Community Survey 2009
Tracts Within Urbanized Areas

Transit Priority Area

Defined as half-mile buffer around the following geographies:
Existing rail stations
Planned rail stations in an adopted RTP
Existing ferry terminals with bus or rail service

Low-Income Tracts

Includes tracts with a share of low-income population at or above the Regional Mean (19%)

Minority Tracts

Includes tracts with a share of minority population at or above the Regional Mean (42%)

Low-Income and Minority Tracts

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles
0 3 6 9 12

Kilometers
0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
San Francisco
San Mateo
Santa Clara
Santa Cruz
Alameda
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
American Canyon
Rio Vista
Vallejo
Benicia
Novato
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Brentwood
San Pablo
Pleasant Hill
Concord
Clayton
Richmond
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
Orinda
Lafayette
Walnut Creek
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Daly City
Colma
Brisbane
South San Francisco
San Leandro
Hayward
Union City
Fremont
Newark
Pacifica
San Mateo
Millbrae
Burlingame
Foster City
Redwood City
Hillsborough
San Carlos
Half Moon Bay
Atherton
Menlo Park
East Palo Alto
Palo Alto
Mountain View
Los Altos
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Milpitas
Woodside
Portola Valley
Saratoga
Campbell
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
1
5
16
99
113
505
4
24
80
680
37
29
12
121
92
84
101
280
880
238
580
152
17

Plan BayArea 2040

Map 36

Low Income and Minority Areas within Transit Priority Areas in 2016

American Community Survey 2014
Tracts Within Urbanized Areas

Transit Priority Area

Defined as half-mile buffer around the following geographies:
Existing rail stations
Planned rail stations in an adopted RTP
Existing ferry terminals with bus or rail service

Low-Income Tracts

Includes tracts with a share of low-income population at or above the Regional Mean (26%)

Minority Tracts

Includes tracts with a share of minority population at or above the Regional Mean (57%)

Low-Income and Minority Tracts

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles
0 3 6 9 12

Kilometers
0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
San Mateo
Santa Clara
Santa Cruz
Alameda
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Pittsburg
Oakley
Antioch
Brentwood
Clayton
Concord
Pleasant Hill
Martinez
Pinole
Hercules
Novato
Fairfax
San Rafael
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Oakland
Alameda
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Mateo
Millbrae
Burlingame
Hillsborough
Foster City
Redwood City
San Carlos
Half Moon Bay
Atherton
Menlo Park
Palo Alto
East Palo Alto
Woodside
Portola Valley
Los Altos
Los Altos Hills
Mountain View
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
Milpitas
Fremont
Newark
Union City
Hayward
San Leandro
Pleasanton
Livermore
Dublin
San Ramon
Danville
Moraga
Lafayette
Orinda
Walnut Creek
Foster City
Redwood City
Tiburon
Belvedere
Sausalito
Corte Madera
Larkspur
Ross
Mill Valley
Fairfax
San Anselmo
Novato
Marin
Sonoma
Napa
Solano
Yolo
Sacramento
Contra Costa
San Joaquin
Santa Clara
Santa Cruz
Alameda
San Mateo

Plan Bay Area 2040

Map 37

Communities of Concern within Transit Priority Areas in 2016

- Transit Priority Area
- Communities of Concern
- Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey

Map Author: KS November 2016

Plan BayArea 2040

Map 38

Bay Area Employment Centers in 2006

Jobs per Square Mile

- Less than 2,000
- Between 2,000 and 5,000

Employment Centers

- Between 5,000 and 8,000
- Between 8,000 and 10,000
- Greater than 10,000

Defined as areas with an Employment Density greater than 5,000 Jobs per square mile. Employment data is Summarized from the Employment Development Dept. using business location data from January 2006.

- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Plan BayArea 2040

Map 39

Bay Area Employment Centers in 2016

Jobs per Square Mile

- Less than 2,000
- Between 2,000 and 5,000

Employment Centers

- Between 5,000 and 8,000
- Between 8,000 and 10,000
- Greater than 10,000

Defined as areas with an Employment Density greater than 5,000 Jobs per square mile. Employment data is Summarized from data obtained from ESRI's business location data for December of 2015.

- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Plan BayArea 2040

Map 40

Walkability in 2006

Weighted By Business Categories and Distance to Destinations

Tracts Within Urbanized Areas

Walkability Index

- No Businesses within 1 mile Walking Distance
- 1 to 2 (Less Walkable)
- 2 to 3
- 3 to 4
- 4 to 5 (Moderately Walkable)
- 5 to 15
- 15 to 30
- Greater than 30 (More Walkable)

Note:
This map shows the density of attractions in five categories: 1. Religious, Educational Institutions and Libraries, 2. Health Services, 3. Other Services, 4. Parks, and 5. Retail, Dining, and Entertainment. Each interesection is ranked by the number of businesses within a network distance of one mile. The number of businesses that are within one half mile of an intersection is weighted more heavily than the number of businesses that are between one half and one mile. The type of businesses are also weighted by category.

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Plan BayArea 2040

Map 41

Walkability in 2017

Mean Walkscore Within 2010 Census Tracts

Tracts Within Urbanized Areas

Mean Walkability

- 0 to 40
- 40 to 50
- 50 to 60
- 60 to 70
- 70 to 80
- 80 to 90
- 90 to 100

Note:
This map shows the mean walkscore for selected census tracts. Mean walkscore was calculated by joining walkscore data acquired for select Bay Area Intersections to census tracts, then calculating the average walkscore of intersections within a given census tract.

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey, http://api.walkscore.com
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Mateo
Santa Clara
Santa Cruz
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Petaluma
Calistoga
Saint Helena
Yountville
Napa
Sonoma
Vacaville
Fairfield
Suisun City
Rio Vista
Dixon
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Concord
Brentwood
Clayton
Pleasant Hill
Walnut Creek
Fairfax
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Orinda
Lafayette
Moraga
Danville
San Ramon
Dublin
Pleasanton
Livermore
Emeryville
Piedmont
Oakland
Alameda
San Leandro
Hayward
San Francisco
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
San Mateo
Millbrae
Burlingame
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Half Moon Bay
Portola Valley
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Saratoga
Campbell
Monte Sereno
Los Gatos
Union City
Newark
Fremont
Milpitas
Morgan Hill
Gilroy
101
80
580
880
280
92
84
680
505
113
99
5
16
12
29
37
121
128
4
24
17
238
1

Plan BayArea 2040

Map 42

Displacement Risk

Gentrification and Displacement in the Bay Area

University of California Berkeley
American Community Survey 2009 - 2013
Tracts Within Urbanized Areas

Lower Income Tracts

Greater than 39% of Households are considered Low Income.

- Not losing LI Households, or Very Early Stages
- At Risk of Gentrification or Displacement
- Undergoing Displacement
- Advanced Gentrification

Moderate to High Income Tracts

Less than 39% of Households are considered Low Income.

- Not Losing LI Households, or Very Early Stages
- At Risk of Displacement
- Undergoing Displacement
- Advanced Exclusion

About this Data:
http://www.urbandisplacement.org/

- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey, U.C. Berkeley
Map Author: KS November 2016

Colusa
Sutter
Mendocino
Lake
Yolo
Sacramento
Sonoma
Napa
Solano
Marin
Contra Costa
San Joaquin
Alameda
San Mateo
Santa Clara
Santa Cruz
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Napa
Sonoma
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
American Canyon
Vallejo
Benicia
Novato
Fairfax
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
San Rafael
Hercules
Pinole
Martinez
Pittsburg
Antioch
Oakley
Brentwood
Concord
Pleasant Hill
Clayton
Walnut Creek
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Orinda
Lafayette
Moraga
Danville
San Ramon
Piedmont
Emeryville
Oakland
San Francisco
Alameda
San Leandro
Dublin
Pleasanton
Livermore
Hayward
Union City
Fremont
Newark
Daly City
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Half Moon Bay
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Saratoga
Monte Sereno
Los Gatos
Campbell
Milpitas
Morgan Hill
Gilroy

Plan BayArea 2040

Map 43

Transit Projects and Communities of Concern

Transit Projects

General location of specific Plan Bay Area 2040 Transit projects.

Communities of Concern

Minority Tracts

Includes tracts with a share of minority population at or above the Regional Mean (59%)

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Mateo
Santa Clara
Santa Cruz
San Joaquin
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Yountville
Dixon
Vacaville
Fairfield
Suisun City
Rio Vista
Sebastopol
Cotati
Rohnert Park
Petaluma
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Concord
Pleasant Hill
Clayton
Brentwood
Walnut Creek
Lafayette
Orinda
Moraga
Danville
San Ramon
Dublin
Livermore
Pleasanton
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Oakland
San Francisco
Alameda
San Leandro
Hayward
Union City
Fremont
Newark
Milpitas
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
1
4
5
12
16
17
24
29
37
80
84
92
99
101
113
121
152
238
280
505
580
680
880

Plan BayArea 2040

Map 44

Roadway Projects and Communities of Concern

Roadway Projects

General location of specific Plan Bay Area 2040 Roadway projects.

Communities of Concern

Minority Tracts

Includes tracts with a share of minority population at or above the Regional Mean (59%)

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles: 0 3 6 9 12

Kilometers: 0 4 8 12 16

Source: Census, American Community Survey

Map Author: KS November 2016

Mendocino
Lake
Colusa
Sutter
Yolo
Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Joaquin
Santa Clara
San Mateo
Santa Cruz
Sacramento
Cloverdale
Healdsburg
Windsor
Santa Rosa
Calistoga
Saint Helena
Sebastopol
Rohnert Park
Cotati
Petaluma
Yountville
Napa
Vacaville
Fairfield
Suisun City
Rio Vista
Dixon
American Canyon
Vallejo
Benicia
Novato
Hercules
Pinole
Martinez
Pittsburg
Oakley
Antioch
Concord
Brentwood
Pleasant Hill
Clayton
Walnut Creek
Lafayette
Orinda
Moraga
Danville
San Ramon
Fairfax
San Anselmo
San Rafael
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Emeryville
Piedmont
Oakland
San Francisco
Alameda
San Leandro
Hayward
Dublin
Pleasanton
Livermore
Union City
Fremont
Newark
Milpitas
Colma
Brisbane
South San Francisco
Pacifica
San Bruno
Millbrae
Burlingame
San Mateo
Foster City
Hillsborough
Belmont
Redwood City
San Carlos
Atherton
Menlo Park
East Palo Alto
Palo Alto
Woodside
Portola Valley
Los Altos
Mountain View
Los Altos Hills
Sunnyvale
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
Monte Sereno
Los Gatos
Morgan Hill
Gilroy
5
16
99
113
505
80
12
29
121
37
680
84
92
280
880
580
4
24
17
152
1
101

APPENDIX A – 8

Regional Policies: Long-Range Planning / Plan Bay Area

Performance Assessment Report



PERFORMANCE ASSESSMENT REPORT



Plan BayArea 2040

FINAL SUPPLEMENTAL REPORT



Metropolitan Transportation Commission

Association of Bay Area Governments

JULY 2017

Metropolitan Transportation Commission

Jake Mackenzie, Chair
Sonoma County and Cities

Scott Haggerty, Vice Chair
Alameda County

Alicia C. Aguirre
Cities of San Mateo County

Tom Azumbrado
U.S. Department of Housing and Urban Development

Jeannie Bruins
Cities of Santa Clara County

Damon Connolly
Marin County and Cities

Dave Cortese
Santa Clara County

Carol Dutra-Vernaci
Cities of Alameda County

Dorene M. Giacopini
U.S. Department of Transportation

Federal D. Glover
Contra Costa County

Anne W. Halsted
San Francisco Bay Conservation and Development Commission

Nick Josefowitz
San Francisco Mayor's Appointee

Jane Kim
City and County of San Francisco

Sam Liccardo
San Jose Mayor's Appointee

Alfredo Pedroza
Napa County and Cities

Julie Pierce
Association of Bay Area Governments

Bijan Sartipi
California State Transportation Agency

Libby Schaaf
Oakland Mayor's Appointee

Warren Slocum
San Mateo County

James P. Spering
Solano County and Cities

Amy R. Worth
Cities of Contra Costa County

Association of Bay Area Governments

Councilmember Julie Pierce
ABAG President
City of Clayton

Supervisor David Rabbitt
ABAG Vice President
County of Sonoma

Representatives From Each County

Supervisor Scott Haggerty
Alameda

Supervisor Nathan Miley
Alameda

Supervisor Candace Andersen
Contra Costa

Supervisor Karen Mitchoff
Contra Costa

Supervisor Dennis Rodoni
Marin

Supervisor Belia Ramos
Napa

Supervisor Norman Yee
San Francisco

Supervisor David Canepa
San Mateo

Supervisor Dave Pine
San Mateo

Supervisor Cindy Chavez
Santa Clara

Supervisor David Cortese
Santa Clara

Supervisor Erin Hannigan
Solano

Representatives From Cities in Each County

Mayor Trish Spencer
City of Alameda / Alameda

Mayor Barbara Halliday
City of Hayward / Alameda

Vice Mayor Dave Hudson
City of San Ramon / Contra Costa

Councilmember Pat Eklund
City of Novato / Marin

Mayor Leon Garcia
City of American Canyon / Napa

Mayor Edwin Lee
City and County of San Francisco

John Rahaim, Planning Director
City and County of San Francisco

Todd Rufo, Director, Economic and Workforce Development, Office of the Mayor
City and County of San Francisco

Mayor Wayne Lee
City of Millbrae / San Mateo

Mayor Pradeep Gupta
City of South San Francisco / San Mateo

Mayor Liz Gibbons
City of Campbell / Santa Clara

Mayor Greg Scharff
City of Palo Alto / Santa Clara

Mayor Len Augustine
City of Vacaville / Solano

Mayor Jake Mackenzie
City of Rohnert Park / Sonoma

Councilmember Annie Campbell Washington
City of Oakland / Alameda

Councilmember Lynette Gibson McElhaney
City of Oakland / Alameda

Councilmember Abel Guillen
City of Oakland / Alameda

Councilmember Raul Peralez
City of San Jose / Santa Clara

Councilmember Sergio Jimenez
City of San Jose / Santa Clara

Councilmember Lan Diep
City of San Jose / Santa Clara

Advisory Members

William Kissinger
Regional Water Quality Control Board

Plan BayArea 2040

Plan Bay Area 2040:

Final Performance Assessment Report

July 2017

METROPOLITAN TRANSPORTATION COMMISSION

Association of Bay Area Governments

Bay Area Metro Center 375 Beale Street
San Francisco, CA 94105

(415) 778-6700	*phone*	(415) 820-7900
info@mtc.ca.gov	*e-mail*	info@abag.ca.gov
www.mtc.ca.gov	*web*	www.abag.ca.gov

Project Staff

Ken Kirkey
Director, Planning

Matt Maloney
Assistant Director, Planning

David Vautin
Principal Planner

Vikrant Sood
Principal Planner

Kristen Villanueva
Associate Planner

Stephanie Mak
Associate Planner

Casey Osborn
Associate, Cambridge Systematics

Table of Contents

Plan Bay Area 2040: **1**

Executive Summary **5**

Methodology 5

Key Findings 5

Conclusions 6

Purpose of Performance Assessment **7**

Identification of Performance Targets & Methodologies **8**

Criteria and Process for Performance Targets 8

Adopted Goals and Targets 10

Baseline and Horizon Years for Target Assessment 11

Target Descriptions and Methodologies 11

Performance Target #1: Climate Protection 11

Performance Target #2: Adequate Housing 12

Performance Target #3: Healthy and Safe Communities 13

Performance Target #4: Open Space and Agricultural Preservation 14

Performance Target #5: Equitable Access (Affordability) 15

Performance Target #6: Equitable Access (Affordable Housing) 16

Performance Target #7: Equitable Access (Displacement Risk) 17

Performance Target #8: Economic Vitality (Access to Jobs) 19

Performance Target #9: Economic Vitality (Jobs/Wages) 20

Performance Target #10: Economic Vitality (Goods Movement) 21

Performance Target #11: Transportation System Effectiveness (Mode Share) 22

Performance Target #12: Transportation System Effectiveness (State of Good Repair for Roads) 23

Performance Target #13: Transportation System Effectiveness (State of Good Repair for Public Transit) 23

Scenario & EIR Alternative Performance Targets Analysis **25**

Defining the Scenarios and EIR Alternatives 25

Scenarios Evaluated in the Planning Process and as EIR Alternatives 25

Scenarios Only Evaluated in the Planning Process 26

Scenarios Only Evaluated as EIR Alternatives 26

Overall Results for Final Scenarios/EIR Alternatives 26

Target-by-Target Discussion of Results 27
Performance Target #1: Climate Protection 27
Performance Target #2: Adequate Housing 28
Performance Target #3: Healthy and Safe Communities 28
Performance Target #4: Open Space and Agricultural Preservation 28
Performance Target #5: Equitable Access (Affordability) 28
Performance Target #6: Equitable Access (Affordable Housing) 29
Performance Target #7: Equitable Access (Displacement Risk) 29
Performance Target #8: Economic Vitality (Access to Jobs) 29
Performance Target #9: Economic Vitality (Jobs/Wages) 30
Performance Target #10: Economic Vitality (Goods Movement) 30
Performance Target #11: Transportation System Effectiveness (Mode Share) 30
Performance Target #12: Transportation System Effectiveness (State of Good Repair for Roads) 31
Performance Target #13: Transportation System Effectiveness (State of Good Repair for Public Transit) 31
Project Performance Assessment 33
Approach to Project Performance Assessment 33
Targets Assessment 35
Benefit-Cost Assessment 37
Modeling Approach to Estimate Benefits 37
Approach to Estimate Project Costs 38
Evaluation of Modernization and Expansion Investments 38
Evaluation of State of Good Repair Investments 38
Key Findings of Project Performance 40
Modal and Geographical Performance Differences 42
Combining Cost-Effectiveness and Targets Results 42
High and Low Performers 42
Performance Thresholds 42
High-Performers 47
Low-Performers 47
Supplemental Assessments 49
Confidence Assessment 49
Sensitivity Testing 50
Project-Level Equity Considerations 50

Appendix Table of Contents..... 52

List of Tables

Table 1. Technical criteria for selecting performance targets. 9

Table 2. Technical criteria identifying a set of targets. 9

Table 3. Final adopted goals and performance targets for Plan Bay Area 2040. 11

Table 4. Final scenario/EIR alternative analysis for Plan Bay Area 2040 performance targets. 32

Table 5. State of good repair investments in project-level performance assessment. 34

Table 6. Targets assessment methodology. 35

Table 7. Lifecycle cost assumptions. 40

Table 8. Benefit-cost ratios and ranks across two Plans for select projects. 41

Table 9. Compelling case criteria. 47

Table 10. Low-performing projects. 48

List of Figures

Figure 1. Diagram of regional housing forecast methodology. 13

Figure 2. Project performance components. 33

Figure 3. Overall results by project type. 44

Figure 4. Results for road projects. 45

Figure 5. Results for transit projects. 46

Executive Summary

Performance-based planning is at the core of Plan Bay Area 2040, incorporating performance targets, project-level evaluation, and scenario assessment to better inform policy decisions and the public at large. As part of the performance-based planning process for Plan Bay Area 2040, MTC and ABAG developed a set of regional performance targets to evaluate both planning scenarios and individual transportation projects. Building on the framework established as part of Plan Bay Area, the work for Plan Bay Area 2040 featured an expanded emphasis on equity and sustainability, while at the same time conducting new performance analyses on state of good investments.

Methodology

Thirteen performance targets, based on seven regional goals, were developed collaboratively with state, regional, and local public agencies, as well as stakeholder groups. The adopted targets addressed a broad spectrum of issues including climate change, housing, health and safety, open space, equity, economic vitality, and transportation efficiency. While all of the goals and a handful of targets were carried over from Plan Bay Area, new targets were added on topics such as displacement risk and access to jobs that gained greater emphasis than in prior plans.

Performance assessment was a critical component throughout the development of Plan Bay Area 2040. After establishing the performance targets in late 2015, scenarios combining various land use patterns and transportation investments were quantitatively evaluated to determine how strongly they supported the adopted targets. In order to refine these scenarios and develop the Preferred Scenario, MTC also evaluated individual transportation projects to prioritize high-performers and to reconsider the efficacy of low-performers. This project-level assessment examined major projects' qualitative support for the Plan targets, in addition to quantitatively evaluating major projects' cost-effectiveness via a benefit-cost analysis. Finally, most scenarios were carried over into the EIR analysis as alternatives, alongside a new alternative added as a response to scoping comments. The ultimate scenario target results highlight where the Plan has succeeded in meeting the targets and where it falls short, as well as what alternative approaches or strategies might strengthen the Preferred Scenario or future long-range planning efforts.

Key Findings

Identification of Performance Targets: New issues emerged as priorities in this cycle of performance-based planning. As noted above, new targets were created on emerging issues like displacement risk and middle-wage jobs that had not previously been included in Plan Bay Area. In the end, five targets were carried over from the last Plan, and eight new targets were added to the mix, for a total of thirteen performance targets. Equitable Access and Economic Vitality, which each had one target in Plan Bay Area, were expanded to feature three targets each – an indication of a broader array of interests related to those two goals this cycle.

Scenario Targets Assessment: As with Plan Bay Area, scenarios often fell short of the adopted targets due to the ambitious nature of the targets selected by the Commission and by ABAG. This being said, many, if not all, scenarios made notable progress on issues like open space preservation, greenhouse gas reduction, middle-wage job growth, and congestion reduction on freight corridors. Serious challenges remained across all scenarios, though. Despite which land use pattern or transportation

investment strategy was pursued, target results related to affordability and displacement risk consistently pointed in the wrong direction.

Project Performance Assessment: Results of the project-level assessment revealed the high cost-effectiveness and strong support of Plan Bay Area 2040 targets for maintaining public transit and state highways. Fully investing in state of good repair for these modes, when compared with medium-performing local streets & roads maintenance, would generate approximately $7 billion in annual benefit compared to $5 billion in annual benefit for the sum of the remaining 63 non-maintenance investments. Additionally, the assessment reinforced the positive effect of a focused growth land use pattern on performance, particularly for transit projects that would serve densifying PDAs in the South bay. Generally, modernization projects (which focus on improving existing transportation assets) typically performed better on both components of the project assessment than expansion projects (which emphasize widening highways or extending fixed transit guideways to new service areas)

The assessment identified 11 high-performing projects, for which staff subsequently prioritized future regional discretionary revenues. The assessment also identified 18 low-performing projects that were further screened before inclusion in Plan Bay Area 2040. Of the low-performing projects, 7 were approved with minor changes, 7 were re-scoped to a lower-cost phase or environmental/planning phases, and 4 were dropped via a compelling case process.

Conclusions

While the Preferred Scenario moves in the right direction on many of the region's important performance targets, the targets analysis revealed that the region's mature development pattern and extensive transportation system lead to challenges in changing the status quo and achieving aggressive adopted goals. Limited policy levers related to key equity and affordability challenges further constrain the ability of MTC and ABAG, in concert with local jurisdictions, to "move the needle" and reverse historical trends. In order to achieve the aspirational goals established in the Plan targets, much more aggressive action from multiple levels of government will be required after the adoption of this Plan.

Purpose of Performance Assessment

Plan Bay Area 2040 relied upon a performance-based planning approach, utilizing quantifiable metrics to evaluate the outcomes of integrated transportation investments and land use policies. By leveraging analytical tools to identify measureable outcomes of policy decisions, we can make more informed decisions and better understand the impacts of Plan Bay Area 2040.

Performance-based transportation planning is not a new approach for the Bay Area – over a period spanning nearly two decades, MTC's long-range transportation plans have been developed using performance measures to evaluate their support for regional goals. Starting with the 2001 Regional Transportation Plan (RTP), transportation investment packages were compared using a set of performance measures. Since then, qualitative and quantitative evaluations have been added to assess the impacts of individual transportation projects proposed for inclusion in RTPs.

This report provides documentation of the three-year-long effort to evaluate and improve the performance of Plan Bay Area 2040. These efforts have helped craft and guide the Plan from a series of vision scenarios to the Final Preferred Scenario, while examining how integrated transportation and land use planning efforts can help the region address long-term environmental, equity, and economic challenges. The remainder of this report is organized into the following chapters, which reflect the various phases of performance assessment during the planning process:

- **Identification of Performance Targets and Methodologies**
- **Scenario & EIR Alternative Performance Targets Analysis**
- **Project Performance Assessment** *(including State of Good Repair Performance)*

Identification of Performance Targets & Methodologies

Performance targets form the foundation of a performance-based planning approach – that is, one must start by defining the region's objectives before assessing the performance of various alternatives. Given that Plan Bay Area 2040 was a limited and focused update to the initial Plan adopted in 2013, the sustainability-focused goals – built on the 3 "E's" framework (equity, environment, economy) – were preserved. These goals – climate protection, adequate housing, healthy and safe communities, open space and agricultural protection, equitable access, economic vitality, and transportation system effectiveness – reflect the wide spectrum of sustainability objectives for this long-range planning effort. While the goals were carried over from Plan Bay Area, the performance measures and associated targets were updated to better reflect the priorities of the region today. These targets then provided a framework that allowed us to better understand how different projects and policies might affect the region's future.

Each target was designed to compare conditions over the life of the Plan – that is, measuring the change between the baseline year (2005 or 2010) and the planning horizon year (2035 or 2040). Importantly, the targets were crafted to focus on desirable regional outcomes that did not prescribe a specific mode or investment type to reach the target. For example, a potential target might focus on health outcome improvements, which can be addressed through a wide variety of investments such as new or improved transit services, changes in land use patterns to encourage walking and biking, increased incentives for adoption of electric vehicles, or reduced speed limits to address fatalities from collisions.

Criteria and Process for Performance Targets

In order to evaluate potential performance targets and to help advise staff on which targets should be recommended to MTC and ABAG for approval, staff assembled a Performance Working Group. Open to the public, Performance Working Group meetings were attended by local and regional government staff (including county congestion management agencies), Policy Advisory Council members, and non-governmental organization representatives (from groups focused on social equity, the environment, and the economy).

To guide the process, MTC staff developed a set of criteria (as shown in Table 1) to make the targets as meaningful as possible in measuring the Plan's success. The criteria utilized in this process primarily focused on ensuring the targets could be forecasted using available analytical tools and could be influenced by the Plan's investments and policies.

#	Criterion
1	**Targets should be able to be forecasted well.** A target must be able to be forecasted reasonably well using MTC's and ABAG's models for transportation and land use, respectively. This means that the target must be something that can be predicted with reasonable accuracy into future conditions, as opposed to an indicator that can only be observed.
2	**Targets should be able to be influenced by regional agencies in cooperation with local agencies.** A target must be able to be affected or influenced by policies or practices of ABAG, MTC, BAAQMD and BCDC, in conjunction with local agencies. For example, MTC and ABAG

	policies can have a significant effect on accessibility of residents to jobs by virtue of their adopted policies on transportation investment and housing requirements.
3	**Targets should be easy to understand.** A target should be a concept to which the general public can readily relate and should be represented in terms that are easy for the general public to understand.
4	**Targets should address multiple areas of interest.** Ideally, a target should address more than one of the three "E's" – economy, environment, and equity. By influencing more than one of these factors, the target will better recognize the interactions between these goals. Additionally, by selecting targets that address multiple areas of interest, we can keep the total number of targets smaller.
5	**Targets should have some existing basis for the long-term numeric goal.** The numeric goal associated with the target should have some basis in research literature or technical analysis performed by MTC or another organization, rather than being an arbitrarily determined value.

Table 1. Technical criteria for selecting performance targets.

Furthermore, staff established criteria for identifying the set of targets, seeking to ensure a reasonable number of distinct and quantifiable metrics. This focused the process on the most important issues for Plan Bay Area 2040 stakeholders. The criteria established for the overall set of targets is shown below in Table 2.

#	Criterion
A	**The total number of targets selected should be relatively small.** Targets should be selected carefully to make technical analysis feasible within the project timeline and to ensure that scenario comparison can be performed without overwhelming decision-makers with redundant quantitative data.
B	**Each of the targets should measure distinct criteria.** Once a set of targets is created, it is necessary to verify that each of the targets in the set is measuring something unique, as having multiple targets with the same goal unnecessarily complicates scenario assessment and comparison.
C	**The set of targets should provide some quantifiable metric for each of the identified goals.** For each of the seven goals identified, the set of performance measures should provide some level of quantification for each to ensure that that particular goal is being met. Multiple goals may be measured with a single target, resulting in a smaller set of targets while still providing a metric for each of the goals.

Table 2. Technical criteria identifying a set of targets.

Over a period of five months, the Performance Working Group discussed potential performance measures affecting a broad range of regional issues, debating which metrics reflected the most important objectives for this planning process. Incorporating this feedback, staff developed a proposal for the Commission and ABAG to review in September 2015. Both agencies approved nine performance

targets at that time and asked for further review and refinement of four additional performance targets. The remaining four targets were approved in November 2015 by the Commission and by ABAG.

Adopted Goals and Targets

As discussed above, MTC Resolution 4204, Revised was adopted in fall 2015 and identified seven goals and thirteen performance targets for Plan Bay Area 2040. Accompanying the resolution were approved methodologies to be used in evaluating the performance measures as part of the scenario planning process (discussed later in this section). Like Plan Bay Area, the Plan Bay Area 2040 performance targets went well beyond the traditional mobility targets from past RTPs. The targets focused on broad outcomes – such as public health, displacement risk, and access to opportunity – that could be achieved by a variety of transportation and land use policies. This outcome-oriented approach to performance targets expanded the focus of the planning effort, emphasizing the societal benefits derived from implementing transportation projects or changing land use patterns.

One significant shift in the performance targets for Plan Bay Area 2040 was an increased emphasis on social equity and affordability, reflecting growing regional challenges associated with adverse impacts from the current economic boom. Ultimately, six of the targets had an equity nexus (public health, affordability, affordable housing, displacement risk, middle-wage job creation, and access to jobs) and were used as metrics in the equity analysis process; more information on that effort is available in the Equity Assessment Report.

Goal	#	Target
Climate Protection	**1**	Reduce per-capita CO_2 emissions from cars and light duty trucks by **15%**
Adequate Housing	**2**	House **100%** of the region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year
Healthy & Safe Communities	**3**	Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by **10%**
Open Space & Agricultural Preservation	**4**	Direct **all** non-agricultural development within the urban footprint (existing urban development and UGBs)
Equitable Access	**5**	Decrease the share of lower-income residents' household income consumed by transportation and housing by **10%**
	6	Increase the share of affordable housing in PDAs, TPAs, or high-opportunity areas by **15%**
	7	**Do not increase** the share of low- and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at risk of displacement
Economic Vitality	**8**	Increase by **20%** the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit in congested conditions
	9	Increase by **38%** the number of jobs in predominantly middle-wage industries
	10	Reduce per-capita delay on the Regional Freight Network by **20%**

Transportation System Effectiveness	**11**	Increase non-auto mode share by **10%**
	12	Reduce vehicle operating and maintenance costs due to pavement conditions by **100%**
	13	Reduce per-rider transit delay due to aged infrastructure by **100%**

Table 3. Final adopted goals and performance targets for Plan Bay Area 2040.

Baseline and Horizon Years for Target Assessment

Baseline and horizon years for each target were identified in the methodology documentation associated with MTC Resolution 4204. In general, the Plan relies on a baseline year of 2005 and a horizon year of 2040; however, in some cases, specific rationale justified slight alterations to these assumptions due to data availability, consistency with land use forecasts, or state requirements under Senate Bill 375. A summary of the baseline and horizon years by target is shown below.

- Target 1: baseline year of 2005, horizon year of **2035** *[due to SB 375/CARB target]*
- Target 2: baseline year of **2010**, horizon year of 2040 *[due to control total timeframe]*
- Target 3: baseline year of 2005, horizon year of 2040
- Target 4: baseline year of **2010**, horizon year of 2040 *[per MTC Resolution No. 3987]*
- Target 5: baseline year of 2005, horizon year of 2040
- Target 6: baseline year of **2010**, horizon year of 2040 *[due to land use forecast constraint]*
- Target 7: baseline year of **2010**, horizon year of 2040 *[for consistency with land use targets]*
- Target 8: baseline year of 2005, horizon year of 2040
- Target 9: baseline year of **2010**, horizon year of 2040 *[due to control total timeframe]*
- Target 10: baseline year of 2005, horizon year of 2040
- Target 11: baseline year of 2005, horizon year of 2040
- Target 12: baseline year of 2005, horizon year of 2040
- Target 13: baseline year of 2005, horizon year of 2040

Target Descriptions and Methodologies

Performance Target #1: Climate Protection

Reduce per-capita CO_2 emissions from cars and light duty trucks by 15%

Background Information

Under California Senate Bill 375, major metropolitan areas in the state are required to develop a Sustainable Communities Strategy as part of their Regional Transportation Plan. This means that the adopted Plan must achieve per-capita greenhouse gas reduction targets as established by the California Air Resources Board (CARB). CARB established two climate protection targets for the San Francisco Bay Area in 2010, which have been incorporated into both Plan Bay Area and Plan Bay Area 2040:

- Per-capita reduction of greenhouse gas emissions by 7 percent by year 2020
- Per-capita reduction of greenhouse gas emissions by 15 percent by year 2035

This is a statutory target and therefore must be reflected in the set of Plan performance targets. Under Senate Bill 375, the Plan must meet state-identified greenhouse gas reduction targets to comply without the adoption of a separate Alternative Planning Strategy (APS).

Past Experience

This target is fully consistent with Plan Bay Area; no changes have been made to the target as originally adopted in 2011. Before the passage of Senate Bill 375, previous MTC long-range plans, including Transportation 2035, included non-statutory targets to reduce greenhouse gas emissions.

Plan Bay Area exceeded the greenhouse gas emissions target, achieving a 16 percent reduction for year 2035 and an 18 percent reduction in emissions between 2005 and 2040, while at the same time also exceeding its 2020 interim target. The target performance results incorporate both the emissions reduction from transportation, land use and demographics (from Travel Model One and EMFAC), in addition to the emissions reductions associated with the Regional Climate Program (based on off-model assessments).

Evaluation Methodology

The statutory Climate Protection target reflects greenhouse gas emissions reductions, focusing specifically on carbon dioxide emissions per statewide modeling guidance. Travel Model One – the region's activity-based travel demand model – was used to forecast emissions reductions as a result of various scenarios. Travel Model One analyzes daily travel patterns as a result of scenarios' transportation investments and land use patterns, making possible the calculation of vehicle miles traveled (VMT) and speed of travel. The California Air Resources Board's EMFAC air quality model was then used to calculate the pounds of carbon dioxide emissions associated with the forecasted levels of regional travel.

For off-model Climate Initiatives, which may include efforts like regional electric vehicle incentives, greenhouse gas emissions reductions were calculated by estimating the direct greenhouse gas emissions reduction of specific funded programs, rather than forecasting travel impacts in the model. This is appropriate, as many of the programs are not designed to necessarily reduce VMT, but instead reduce emissions through cleaner vehicles and improved driving habits. These greenhouse gas emission reductions were added to the model calculations, resulting in combined greenhouse gas emission reductions from the Plan as a whole. Reductions were normalized based on relevant population forecasts developed by ABAG. Refer to additional information on the forecasting methodology in the Plan Bay Area 2040 Travel Model One Data Summary.

Note that the target relies upon a horizon year of 2035 instead of the standard 2040 horizon year used for other performance targets to ensure consistency with the CARB target.

Performance Target #2: Adequate Housing

House 100% of the region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year

Background Information

Similar to the greenhouse gas reduction target, California Senate Bill 375 requires Plan Bay Area to house all of the region's growth. This is an important regional issue given that long interregional trips – which typically have above-average emission impacts – can be reduced by planning for sufficient housing in the region.

The Adequate Housing target relates to a Regional Housing Control Total per the 2014 settlement agreement signed with the Building Industry Association (BIA), which increases the housing forecast by

the housing equivalent to in-commute growth. The forecast of households, jobs, population, and in-commute will remain as established by the approved forecast methodology and best practices.

Past Experience

A similar version of this target was included in Plan Bay Area adopted in 2013, although Plan Bay Area 2040 incorporates language clarifying how the regional housing control total was calculated, as agreed to by MTC, ABAG, and the Building Industry Association as part of a 2014 legal settlement. In 2013, Plan Bay Area housed 100% of the region's projected growth as defined under the adopted language from 2011.

Evaluation Methodology

Evaluation of this performance target utilized the methodology relating to the Regional Forecast agreed to by both agencies. The regional housing control total estimated the total number of units needed to accommodate all of the residents in the region plus the number of housing units that correspond to the in-commute increase. The number of units included a reasonable vacancy level for circulation of units among movers. The figure below diagrams the overall regional forecast process that led to a regional housing control total.

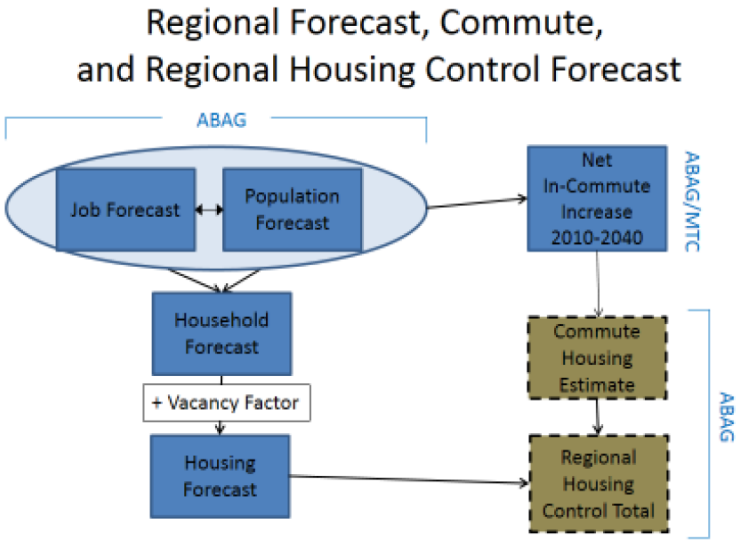


Figure 1. Diagram of regional housing forecast methodology.

Performance Target #3: Healthy and Safe Communities

Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by 10%

Background Information

This target focuses on the issue of public health by evaluating the net impacts of air quality, road safety and physical activity improvements. By creating a unified target that directly measures the net health impact of scenarios, Plan Bay Area 2040 elevated this issue when compared to prior planning cycles. Rather than adopting separate targets for air quality, road safety and physical activity, this proposed target focuses on the combined impact of the transportation and land use policies that move the region towards a common goal of improved health outcomes. Adverse health impacts are measured in disability-adjusted life-years of impact (DALYs) on a per-capita basis.

The numeric target was selected based on an analysis by Neil Maizlish, et al. entitled "Health Cobenefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the San Francisco Bay Area", published in the American Journal of Public Health. In this paper, Maizlish et al. conducted an analysis of the Bay Area to see how an aggressive scenario focused on increased bicycle and pedestrian mode shares might move the needle for public health. When the net impact of such a policy (versus a business-as-usual scenario) is compared to the total disability-adjusted life-year impacts to the region from MTC model runs, the region yielded a reduction of just over five percent. While active transportation is the largest component of health benefits, road safety and air quality focused investments in the Plan can also move the needle. Given that analysis, a slightly more aggressive target of 10 percent reduction was recommended for this performance target.

Past Experience

This is a new target for Plan Bay Area 2040 that incorporates components of multiple Plan Bay Area targets into a single integrated target. It reflects one of the top priorities of the Performance Working Group in terms of advancing public health as a key element of the long-range planning process.

Evaluation Methodology

To calculate the health impacts of a given scenario, staff ran the Integrated Transportation and Health Impact Model (ITHIM), which was calibrated for the Bay Area by the California Department of Public Health. The run requires inputs from Travel Model One, which include travel activity patterns for walking and biking as well as rates related to collisions and air quality. ITHIM then translates those inputs into a detailed suite of health impact measures, including disability-adjusted life-year impacts. The impacts were normalized based upon population to take into account the overall growth expected in the region between 2005 and 2040.

Performance Target #4: Open Space and Agricultural Preservation

Direct all non-agricultural development within the urban footprint (existing urban development and UGBs)

Background Information

This performance target is focused very specifically on the protection of open space and agricultural lands. In order to move towards this goal, the target seeks to limit development to publicly-defined urban areas. SB 375 legislation asks regions to consider the best available data on resource lands. Special resource lands and farmland are specifically defined in SB 375 and include:

- Publicly owned parks and open space;
- Open space and habitat areas protected by natural resource protection plans;
- Species habitat protected by federal or state Endangered Species Acts;
- Lands subject to conservation or agricultural easements by local governments, districts, or non-profits
- Areas designated for open space/agricultural uses adopted in elements of general plans;
- Areas containing biological resources described in CEQA that may be significantly affected by a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS);
- Areas subject to flooding as defined by the National Flood Insurance Program; and
- Lands classified as prime/unique/state-significant farmland or lands classified by a local agency meeting or exceeding statewide standards that are outside of existing city spheres of influence/city limits.

One key difference between this target and the Adequate Housing target is that this measure is not statutory and therefore some scenarios may fall short in achieving the target.

Past Experience

This target is fully consistent with Plan Bay Area, which was the first regional plan in the Bay Area to include such a target related to greenfield protection. Plan Bay Area met the target with 100% of non-agricultural development focused in the urban footprint.

Evaluation Methodology

Using the localized development pattern forecasted by the UrbanSim land use model for each scenario, staff calculated the number of acres of new development, as well as significant redevelopment, across the entire region. Once identified, staff identified each development as occurring within the urban footprint or outside the 2010 urban footprint. The number of acres of development within the urban footprint was divided by the total acres of development across the region to calculate this target.

Note that the target relies upon the 2010 urban footprint instead of the standard year 2005 baseline used for other performance targets, per policy action taken during the adoption of Plan Bay Area targets in 2011.

Performance Target #5: Equitable Access (Affordability)

Decrease the share of lower-income residents' household income consumed by transportation and housing by 10%

Background Information

As an affordability target, decreasing the combined costs of housing and transportation for lower-income residents as a share of their income addresses a key challenge for these residents when they consider where to live and how far to travel to get to work, services and amenities. Often low-income households are not able to afford housing close to where they currently work, or where they may have access to a range of job opportunities and amenities. Being priced out of these high-opportunity areas may result in lower household income (as opportunity costs rise) and higher travel costs.

In the end, a household that can afford to live close to work and use transit or other affordable transportation options, may spend a similar or even lower share of its household income on the combined cost of housing and transportation. Reducing these costs across the region will increase affordability and boost economic opportunities for lower-income residents.

The numeric target was adapted from a 2006 report by the Center for Housing Policy ("A Heavy Load: The Combined Housing and Transportation Burdens of Working Families"). According to that report, Bay Area families with annual incomes under $70,000 spend a combined average of 61% of earnings on housing (39%) and transportation (22%). This share of 61% of earnings is approximately 10% above the national average share spent by lower-income households. Therefore, this target is set to improve transportation and housing affordability to approximately match the national average by 2040.

Past Experience

This target was included in Plan Bay Area, but the methodology for estimating housing costs has been improved as described below. Under Plan Bay Area, the region was forecasted to move in the opposite direction of this target, with housing and transportation costs as a share of income rising by 3% between 2005 and 2040. This reflects the difficulty of increasing affordability in an economically vibrant region, particularly given the forecasted future costs of housing.

Evaluation Methodology

The share of household income consumed by both transportation and housing will be forecasted by combining results from the transportation model (for future transportation costs) and land use model (for future housing costs). Both models are adjusted to identify costs for low-income households. Note that lower-income households are defined as households earning less than $60,000 in year 2000 dollars, roughly reflecting the lower two quartiles of the income spectrum.

For the transportation model, user costs account for the cost of maintaining and owning an automobile, purchasing transit fares and passes, and paying bridge and roadway tolls, etc. These costs are forecasted using Travel Model One using observed travel behavior for low-income and lower-middle-income residents; and assumptions about gas prices, toll fees, and transit fares, etc. For more information on the travel model and details on assumptions, refer to the Plan Bay Area 2040 Travel Model One Data Summary.

Housing costs for lower-income households were estimated using a combination of UrbanSim model output and a national cross-sectional model. Overall size and growth in regional population, regional income and wealth, and housing market leakage beyond the nine counties are all expected to influence housing prices in the long run. Therefore, median market-rate housing costs were estimated using a national cross-sectional model that relates housing prices to changes in population, income, and other region-specific factors. For lower-income households exposed to market-rate housing costs (i.e., the majority of lower-income households), their future costs are estimated by taking current housing costs and increasing those costs linearly at the same percent growth rate as the median home price.

Two other types of lower-income households exist as well; these households are not directly exposed to market-rate housing cost growth. First, deed-restricted housing residents are assumed to continue paying 27 percent of their income on housing, with the number of households falling into this category identified by UrbanSim model output (based on policy inputs to a given scenario). Second, lower-income households living in rent-controlled units are assumed to continue to pay roughly 85 percent of the market-rate housing costs, but households protected by rent control are forecast to continue to decline based on recent rates. Because rent control cannot be explicitly modeled at this time, these assumptions regarding rent control are the same across all scenarios analyzed. For more information on the land use model and details on assumptions, refer to the Plan Bay Area 2040 Land Use Model Data Summary.

Performance Target #6: Equitable Access (Affordable Housing)

Increase the share of affordable housing in PDAs, TPAs, or high-opportunity areas by 15%

Background Information

The provision of affordable housing is one of the Bay Area's most pressing issues. This target addresses the region's need to increase its overall share of housing that is affordable to lower-income households, focusing particularly on communities with strong transit access and communities with high levels of opportunity. The target has a nexus with anti-displacement efforts, as preservation and expansion of affordable housing in these communities helps to mitigate the risk of displacement for lower-income households.

As of 2010, approximately 15 percent of housing units in these communities have been identified as affordable; the proposed performance target would double this share to approximately 30 percent of housing units, an increase of 15 percentage points. Relying upon ballpark calculations using Plan Bay

Area growth forecasts, this would be the equivalent of locating all affordable housing in PDAs, TPAs or high opportunity areas while still allowing for 80 percent of all market-rate housing to be constructed in these zones as well.

Several definitions are critical for the evaluation of this target:

- Affordable Housing: refers to housing that is affordable to lower income households (moderate income making 80-120% AMI, low income making 50%-80% AMI, very low income making 0-50% AMI) that is either deed-restricted or produced by the market (non-deed-restricted).
- Priority Development Areas (PDAs): refers to locally-designated areas that are planned to accommodate the vast majority of regional housing and job growth.
- Transit Priority Areas (TPAs): refers to an area within a ½-mile of high quality transit (i.e., rail stop or a bus corridor that provides or will provide at least 15-minute frequency service during peak hours by the year 2040).
- High-Opportunity Areas: refers to areas that score highly in a composite score of 18 indicators, developed by the Kirwan Institute of Race and Ethnicity, pertaining to education, economic mobility, and neighborhood and housing quality.

Past Experience

This target was not included in Plan Bay Area and represents an expansion of Equitable Access targets to focus specifically on affordable housing development.

Evaluation Methodology

Baseline and future performance for this target were calculated using UrbanSim, the regional land use model, which will evaluate housing costs to identify affordable units available. UrbanSim incorporates deed restrictions into its analysis and thus reflects both deed-restricted and non-deed-restricted units in its calculations. GIS layers pertaining to PDAs, TPAs, and high-opportunity areas were then merged and overlaid on top of that baseline to determine the existing share of housing affordable to moderate to very low-income households in the Bay Area residing in those respective geographies.

Performance Target #7: Equitable Access (Displacement Risk)

Do not increase the share of low- and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at risk of displacement

Background Information

Displacement has consistently been identified as a major concern for low-and-moderate-income households, who are most vulnerable to rising costs in the Bay Area's housing market. As households relocate to more affordable areas within and outside the region, they may lose not only their homes but also their social networks and support systems. The scale of displacement across the Bay Area has triggered major concerns among the region's elected officials who requested that displacement be directly addressed in Plan Bay Area.

The region's strong economy has brought many benefits such as employment growth, innovative technologies, and tax revenues for infrastructure improvements and public services. However, since housing production usually lags job creation, especially in a booming economy, there has been upward pressure on housing costs which is most keenly felt by households with the least resources. The working definition of displacement in this document is: Displacement occurs when a household is forced to move

from its place of residence due to conditions beyond its ability to control. These conditions may include unjust-cause eviction, rapid rent increase, or relocation due to repairs or demolition, among others.

While there is currently no precise tool available to predict which and what number of households would be displaced from a given neighborhood, current research allows planners to measure existing and future displacement risk. The methodology used is based on work by the Regional Early Warning System for Displacement (REWS) study by the Center for Community Innovation at UC Berkeley (www.urbandisplacement.org). It is important to note that this approach highlights areas where lower-income households are potentially vulnerable to displacement; however, this study does not "predict" which specific neighborhoods will experience displacement, or how many households will be displaced in the future.

With a numeric target for ensuring displacement risk does not increase between the baseline and horizon years, ABAG and MTC are signaling the importance of this issue at the regional level. At the same time, regional agencies and stakeholders recognize that more specific local strategies will be needed beyond the scope of the Plan. The broader trend of risk is a function of job growth and wage disparities without an equal or greater expansion of adequate affordable housing at all income levels.

The performance target relies upon a consistent geography as target #6 (affordable housing), emphasizing minimization of displacement risk for low- and moderate-income renters who live in PDAs, TPAs (transit priority areas, per Senate Bill 375), or high-opportunity areas (as defined under target #6). This ensures consistency between the region's goals for affordable housing and minimization of displacement risk.

Past Experience

This target is not new to Plan Bay Area 2040, although it represents a more refined version of a displacement risk measure that was based on overburdened renters in the initial Plan Bay Area Equity Analysis. Overburdened renters served as a proxy for vulnerable populations. Using this methodology, the Equity Analysis conducted in 2013 estimated that the Plan increased the risk of displacement by 36% in Communities of Concern and by 8% everywhere else.

Evaluation Methodology

Displacement risk was calculated by measuring the decline of low and moderate-income households in PDAs, TPAs, or high-opportunity areas between the target baseline year and 2040. In order to forecast the risk of displacement in 2040 relative to conditions in the baseline year, the analysis compared the following data points [note that "lower-income" is defined as including both low- and moderate-income households; i.e., quartiles 1 and 2 for household income]:

- Number of lower-income households in the target baseline year in each TAZ; and
- Number of lower-income households in each TAZ in 2040 based on UrbanSim output (land use model)

Due to model limitations which make it impossible to identify household tenure by income level, all lower-income households are included in the target calculation. Only zones designated as PDAs, TPAs, or high-opportunity areas that lost lower-income households are included in the target calculation per the adopted language.

The analysis estimated which zones (i.e., TAZs) gained or lost lower-income households; those zones that lost lower-income households over the time period would be flagged as being "at risk of

displacement." The share of lower-income households at risk of displacement would be calculated by dividing the number of lower-income households living in TAZs flagged as PDAs, TPAs, or high-opportunity areas with an increased risk of displacement by the total number of lower-income households living in TAZs flagged as PDAs, TPAs, or high-opportunity areas in 2040.

The relative risk of displacement for each Plan scenario was estimated using this methodology, comparing to trends between year 2000 and year 2010 to establish baseline risk levels. Relative risk is varied between scenarios, since each scenario allocated households across the region based on different growth patterns.

Performance Target #8: Economic Vitality (Access to Jobs)

Increase by 20% the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit in congested conditions

Background Information

Given that economic forecasts for the Plan are consistent across scenarios, the Plan's greatest potential to affect the region's economic vitality can be measured via access to jobs. The general consensus amongst economists is that a higher number of jobs a worker can access within a reasonable commute shed leads to greater prospects for employment and greater potential for economic advancement. This performance measure is designed to capture the ability of workers to get to jobs in congested conditions, reflecting the economic impact of traffic congestion on the region's economy. Rather than a "pure" measure of congestion (such as minutes of delay), which primarily captures the benefit of highway projects and fails to recognizes the underlying economic justification for projects that tackle this regional issue, this performance measure reflects the full suite of policy tools that can be used to improve access to jobs during congested times of day. These include highway expansion, highway operational improvements, transit expansion, transit operational improvements, and land use strategies to bring workers and jobs closer together (i.e., jobs-housing balance).

Congested conditions are defined as the AM peak period, the most common time of day for commuting to work. The 30-minute and 45-minute thresholds for each mode of transport approximately reflect the average regional door-to-door commute time for each mode per Vital Signs data originally tabulated by the U.S. Census Bureau in 2013. The performance target focuses on all residents connecting to all jobs, given that this is a measure of the region's overall economy (rather than a specific industry or economic class). It is not possible to measure jobs-housing fit as ABAG does not forecast jobs by income level, making it impossible to link residents and jobs based on income classification for future years (e.g. year 2040).

The numeric target was developed relative to the baseline conditions in 2005, at which point roughly one in five regional jobs was accessible to the average Bay Area resident within the time and congestion criteria identified above. The numeric target represents an approximate doubling of this level of jobs access by year 2040; this is reflected in the target as an increase in jobs access by 20 percentage points. The target was inspired by research incorporated in the "Access to Destinations" report produced by the University of Minnesota Center for Transportation Studies, which cites a 2012 Transportation Research Board paper on productivity effects from accessibility (Melo et al., 2012). The report identified that doubling jobs access correlates to real average wage growth of 6.5 percent for the average U.S. metro area. This linkage between the target and wage growth highlights how improved access to jobs can result in real-world economic benefits for workers.

Past Experience

This target is new to Plan Bay Area 2040. However, long-range plans developed by MTC in the past have used access to jobs as an economic performance target. The proposed target expands upon this past work by specifically incorporating congestion into the target to highlight the importance of congestion reduction as a regional economic concern. The prior Plan's economic target of gross regional product was removed as a performance target as it will not differ between scenarios, making it a poor yardstick by which to compare scenarios focused on differing transportation investments and land use patterns.

Evaluation Methodology

This performance target relies upon the Travel Model One "skims" for zone-to-zone congested travel times both for single-occupant vehicles and public transit. Using a Python script developed to evaluate accessibility, the "skim" matrices are loaded into the script, which then calculates for each zone which other zones it can reach either within 30 minutes by auto or within 45 minutes by transit. It is assumed that auto users are single-occupant vehicle drivers who decline the use of Express Lanes; the job access target looks specifically at the AM peak period, when the greatest share of the region's residents are commuting to work. By focusing on the AM peak, both auto and transit travel times reflect the impact of congestion on job access. Once the script has calculated which zones are accessible, the number of jobs accessible for the zone is summed and divided by the total jobs in the region. Using the share of jobs accessible for each zone, a regional share is calculated using a weighted average of all 1454 zones based on the number of residents in each zone. The result is a reflection of the average share of jobs accessible to the average number in the Bay Area.

Performance Target #9: Economic Vitality (Jobs/Wages)

Increase by 38% the number of jobs in predominantly middle-wage industries

Background Information

As home to some of the world's most innovative and successful businesses, the Bay Area boasted a gross regional product of $631 billion in 2013, making it one of the world's largest economies. However, the region's economic prosperity is unevenly felt, as 36% of the region's 1.1 million workers earn less than $18 per hour – with the majority of these workers earning even less than $12 per hour. As the Bay Area's cost of living (particularly housing costs) continues to skyrocket, a decent quality of life is becoming increasingly out of reach for hundreds of thousands of workers, particularly those without higher education.

This performance target acknowledges the importance of middle-wage jobs in the Bay Area's economy. The numeric target is based on a goal to preserve the target baseline year share of middle-wage jobs - by growing middle-wage jobs at the same rate as the region's overall growth in total jobs. The exact numeric target was updated in early 2016 to make it fully consistent with the overall job growth rate forecast from the finalized control totals, consistent with adopted direction from the Commission and ABAG Board.

Past Experience

This target is new to Plan Bay Area 2040, as the issue of middle-wage jobs was not specifically addressed in Plan Bay Area.

Evaluation Methodology

The number of jobs in predominantly middle-wage industries was forecast using ABAG's Forecast of Housing, Population and Jobs. This target seeks to achieve proportional growth of jobs in predominantly

middle-wage industries to the region's overall growth in jobs; forecasts show overall job growth of 38% between the target baseline year and 2040.

Given that some industries have a higher proportion of middle-wage jobs than others, ABAG used the number of jobs in predominantly middle-wage industries as a proxy for the number of middle-wage jobs. Presently, forecasting limitations do not allow us to project the number of jobs in individual occupations (i.e., how many nurses there will be in 2040); however, ABAG could project the sectoral makeup of jobs within different industries. The share of middle-wage jobs within each industry was identified using baseline data for wage breakdowns by industry; the share of middle-wage jobs in a given industry today was assumed to be the same in 2040 for the purpose of target forecasting.

Notably, this target does not differ between scenarios, typically a requirement for performance targets. All regional forecast totals are held constant throughout the Plan process in order to focus on the Plan's different transportation investments and land use patterns and to assure consistency within the EIR analysis. In this sense, this performance target is more of an aspirational target, rather than a measure that can be compared across scenarios.

Performance Target #10: Economic Vitality (Goods Movement)

Reduce per-capita delay on the Regional Freight Network by 20%

Background Information

This target reflects the importance of goods movement as a component of the region's overall economy. In addition to ensuring access to and from the Port of Oakland – a major economic engine for the Bay Area – goods movement is critical in supporting agricultural and industrial sectors in the region. This proposed target focuses specifically on how trucks – the primary mode for goods movement – are affected by traffic congestion. While truck traffic cannot be forecasted with a high level of precision, this performance target captures the delay on high-volume truck corridors already identified by the Regional Goods Movement Plan.

The numeric target, reflecting a goal of reducing per-capita delay on these corridors by 20 percent, was based on Transportation 2035 (adopted in 2009). That plan was the most recent long-range regional plan to incorporate a delay target, as Plan Bay Area did not have a specific target related to goods movement. While Transportation 2035 focused on delay across the entire network, this performance target is slightly refined to focus in on goods movement corridors under the overarching goal of Economic Vitality.

Past Experience

This target is similar to a performance target used in Transportation 2035; however, no targets related to congestion reduction or goods movement were included in Plan Bay Area. In Transportation 2035, per-capita congestion increased as a result of capacity-constrained infrastructure (combined with robust pre-recession employment forecasts). Plan Bay Area congestion forecasts, included in the Environmental Impact Report (EIR), also showed a significant increase in congestion between baseline year and horizon year conditions.

Evaluation Methodology

In addition to calculating total delay, Travel Model One outputs vehicle hours of delay for specific corridors. To calculate this target, the appropriate corridors were flagged for analysis based on the Regional Freight Network from the Regional Goods Movement Plan; these include segments of the

following highway corridors: I-880, I-80, I-580, US-101, I-680, SR-12/SR-37, SR-152 and SR-4. Vehicle hours of delay on this network were calculated for a typical weekday and were based on the differential between forecasted and free-flow speeds. The total vehicle hours of delay accrued on the network identified above were then divided by the regional population to calculate the per-capita delay along these freeway segments. Note that rail freight delay – which is a relatively small component of both overall goods movement and goods movement delay in the Bay Area – was not reflected in the target due to travel model limitations.

Performance Target #11: Transportation System Effectiveness (Mode Share)

Increase non-auto mode share by 10%

Background Information

This target reflects the overall efficiency of the transportation system by capturing the share of trips taken by non-auto modes – public transit, walking and bicycling. By aiming to increase the share of trips taken without a car by 10 percentage points, the target reflects a given scenario's ability to make non-auto modes more convenient and accessible for all. While this target is in many ways a proxy for the benefits associated with sustainable modes of transport, it reflects key policy goals related to modal shift in support of sustainable communities and transport efficiency.

Unlike other performance targets, there was not a strong foundation for this specific target at the time of its identification in Plan Bay Area, as it was a result of target modifications after initial adoption by MTC/ABAG in 2011. The initial target was related to non-auto travel time reduction, which proved problematic given that modal shift tended to increase rather than decrease travel times. However, the performance target does align to a certain extent with the aggressive targets established by the California Department of Transportation (Caltrans) in 2015, which seek to double mode shares for walking and public transit and triple mode share for target. The Plan Bay Area 2040 target would nearly double non-auto mode share, albeit over a more achievable time period (between 2005 and 2040) when compared to Caltrans' goal to increase mode shares between 2010 and 2020.

Past Experience

This target is fully consistent with Plan Bay Area; no changes have been made to the target as originally adopted in 2011. Plan Bay Area fell short on this performance target, achieving only a 4 percentage point increase in non-auto mode share (an increase from 16% non-auto mode share in 2005 to 20% non-auto mode share in 2040). This reflects the difficulty of achieving significant modal shifts in a mature region without more aggressive transportation and land use interventions. While non-auto mode share is particularly strong in the center of the region, a significant share of Bay Area residents live in lower-density communities without time-competitive alternatives to the automobile.

Evaluation Methodology

Non-auto mode share is a direct output of Travel Model One. The region's mode share is based on all trips made by Bay Area residents, rather than a narrow focus on commute trips. To calculate non-auto mode share, all non-auto trips (transit, bicycle and pedestrian) trips were first summed. They were then divided by the total number of regional trips (which includes the aforementioned modes but also adds in single-occupant and multi-occupant vehicle trips), which resulted in the percentage of trips utilizing non-auto modes.

Performance Target #12: Transportation System Effectiveness (State of Good Repair for Roads)

Reduce vehicle operating and maintenance costs due to pavement conditions by 100%

Background Information

This target focuses on the user impacts as a result of road maintenance for the region's freeways, arterials, and local streets. In a reflection of the region's "Fix It First" policy, the performance target seeks to bring all roads to a state of good repair and thus reduce the extra vehicle operating and maintenance costs associated with rough roads to zero. This would result in a 100% decrease in such costs between 2005 and 2040.

The target combines two separate targets from Plan Bay Area into a single target, while still respecting the importance of preserving all streets and continuing MTC's long-standing commitment to infrastructure preservation as a top priority. The target incorporates the monetary impacts to drivers, regardless of the facility type in question. Furthermore, it reflects the miles traveled on each type of road – the greater the traffic volumes, the greater the impact on vehicle operating and maintenance costs.

Past Experience

This target is new to Plan Bay Area 2040, as it was not included as a performance target in Plan Bay Area. However, every long-range transportation plan adopted by MTC over the past decade has included some measure of road and/or freeway state of good repair as a performance target, reflecting the high-priority nature of this transportation issue area. The target works to quantify the impacts of road maintenance funding levels in terms an average citizen can understand – additional vehicle maintenance costs as a result of system condition – regardless of the facility type the driver chooses to use to get from point A to point B.

Evaluation Methodology

This performance target was calculated using MTC's StreetSaver tool, Caltrans pavement forecasts, and Travel Model One. The specific methodology is detailed both in the 2015 Transportation Research Board Annual Meeting Compendium of Papers (Paterson and Vautin, 2015) and in the road state of good repair methodology (found later in this document). The methodology relies upon pavement condition index and international roughness index to calculate increased vehicle operating and maintenance costs as a result of rough roads. In general, roads with a PCI greater than 60 and freeways with IRI less than 95 are considered to be in fair, good, or excellent condition, moving us towards the regional goal of bringing our road infrastructure to a state of good repair. The target was calculated by calculating extra vehicle operating and maintenance costs in Travel Model One for both baseline and horizon year conditions to determine whether cost burdens on drivers increase or decrease over this period. The methodology incorporates all motor vehicles, including trucks; while it does not capture bike or pedestrian impacts, it serves as a useful proxy for potential safety disbenefits on these users due to potholes or other impacts of disrepair.

Performance Target #13: Transportation System Effectiveness (State of Good Repair for Public Transit)

Reduce per-rider transit delay due to aged infrastructure by 100%

Background Information

MTC has consistently prioritized a "Fix It First" policy in regional transportation plans, in which preservation of the existing system takes priority over expansion projects. In the past, transit asset condition has been measured with an index known as PAOUL (percent of transit assets over their useful life) – with a goal of replacing all transit assets on time. For Plan Bay Area 2040, the performance target focuses on the impacts of replacing (or not replacing) transit assets on time, with a goal of replacing delay impacts on riders due to aged assets by 100 percent (e.g., achieve zero delays due to aged buses, trains, tracks, etc. failing and thus affecting transit riders).

The numeric target was selected to align the target with the Plan Bay Area PAOUL target (same goal of replacing assets on time) and to reflect the "Fix It First" policy. Given that objective, it seems appropriate to set this aggressive target to bring the entire transit system to a state of good repair. Note that per-rider transit delay was measured in minutes for Bay Area transit riders.

Past Experience

This target is new to Plan Bay Area 2040, as it was not included as a performance target in Plan Bay Area. However, every long-range transportation plan adopted by MTC over the past decade has included some measure of transit state of good repair as a performance target, reflecting the high-priority nature of this transportation issue area. The target works to quantify the impacts of transit maintenance funding levels in terms an average citizen can understand – minutes of delay impacting their commute (or non-commute) onboard public transit as a result of system condition.

Evaluation Methodology

This performance target was calculated using the Regional Transit Capital Inventory, the Federal Transit Administration's TERM-Lite transit asset prioritization tool, and Travel Model One. This methodology is detailed both in the 2015 Transportation Research Board Annual Meeting Compendium of Papers (Paterson and Vautin, 2015) and in the transit state of good repair methodology (found later in this document). These failure rates are translated into per-boarding and per-mile delay rates that affect passengers. To calculate a regional impact, the delays for each system will be weighted by the number of passengers experiencing such delay to identify the average delay for the typical transit rider in the Bay Area as a whole. Delays from assets still within their useful life were not reflected in the performance target, as the target focuses specifically on "aged infrastructure" – that is, infrastructure past its useful life.

Scenario & EIR Alternative Performance Targets Analysis

The primary purpose of the performance targets is to evaluate scenarios – combinations of different land use growth patterns aligned with complementary transportation investment packages. The performance targets help planners, policymakers, and the public at large to understand the benefits and drawbacks of each, in addition to identifying areas where more effort may be needed in future planning cycles to achieve ambitious targets. The section discusses the scenarios and EIR alternatives that were evaluated the process, the overall key findings of the performance targets analysis, and specific outcomes on a target-by-target basis.

Defining the Scenarios and EIR Alternatives

As part of the scenarios analysis process, four scenarios were developed in early 2016, designed to look at a range of alternative visions for transportation and land use. Ultimately, three of these scenarios were carried over to the Environmental Impact Report (EIR), alongside a Preferred Scenario that pulled the strongest elements from each of the previously evaluated scenarios. In addition, a fifth scenario known as Equity, Environment, and Jobs 2.0 was added to the mix in response to EIR scoping comments. The following sub-sections briefly describe each scenario's key concepts; refer to the Environmental Impact Report and Investment Strategy Report for more detailed descriptions of the scenarios.

Scenarios Evaluated in the Planning Process and as EIR Alternatives

Four scenarios were evaluated during the planning process, including the Preferred which was adopted in November 2016 by MTC and ABAG. The scenarios were evaluated using final year 2040 model runs during the EIR process; these final results are discussed below.

- **No Project:** No new growth strategies would be implemented (upzoning, office caps, CEQA streamlining, etc.), meaning that future growth would likely follow historic trends. Urban growth boundaries would be allowed to expand at historical rates, while only committed transportation projects (e.g., those under construction) would be allowed to proceed.
- **Main Streets:** Select suburban Priority Development Areas would be upzoned to increase residential and commercial development capacity, while urban growth boundaries would be allowed to expand at faster rate. In addition to limited affordable housing requirements on new development, transportation investments would be focused on service frequency increases and highway capacity expansion, as well as increased funding for state of good repair.
- **Big Cities:** To encourage growth the three largest cities, upzoning would be focused in areas with significant transit access. Development caps would be eliminated in urban areas, and urban growth boundaries would not be allowed to expand. Additional inclusionary zoning policies and development fees on high-VMT areas would be applied. Transportation investments would focus on public transit and other alternatives to the car, including core capacity investments, expansion projects linking to the three largest cities, and cordon pricing.
- **Preferred:** The Preferred Scenario, also referred to as the Draft Plan, would upzone Priority Development Areas across the region and keep existing urban growth boundaries in place to focus regional growth. Additionally, it assumes 10 percent of new housing units would be deed-restricts and that a development fee on high-VMT areas would be implemented. Transportation investments would be balanced between modes, emphasizing "Fix It First", modernization of roads and transit systems, and high-performing expansion projects.

Scenarios Only Evaluated in the Planning Process

One scenario was studied in the planning process but did not move forward to the EIR, primarily due to the fact that it was most similar to the Preferred Scenario. As such, performance results for this scenario are not shown below as preliminary (year 2035) target results for this scenario cannot be accurately and consistently compared to the final (year 2040) target results for all other scenarios.

- **Connected Neighborhoods:** Similar to the Preferred Scenario, upzoning, fees, and related policies would be applied to encourage growth in PDAs, especially those well served by transit. Transportation investments would be balanced across roads and public transit, with an emphasis on maintenance, operations, and modernization.

Scenarios Only Evaluated as EIR Alternatives

One scenario was added to the mix based on comments received during the EIR Notice of Preparation (NOP) process – an updated version of the Equity, Environment, and Jobs (EEJ) scenario from the Plan Bay Area EIR. This scenario has the same control total and transportation revenue total as the other scenarios, but focuses more growth in high-opportunity suburban communities and prioritizes transit and non-motorized projects over road expansion.

- **Equity, Environment, and Jobs 2.0:** Upzoning would be implemented in select PDAs but also high-opportunity TPAs as well; job caps and urban growth boundaries today would be preserved through 2040. A significantly higher 20 percent inclusionary requirement for affordable housing would be applied in all cities with PDAs, and development fees on high-VMT areas would be applied to encourage growth in transit-served locations. Transportation investments would focus on improved service frequencies for transit (especially buses) as well as similar transit expansion projects to the Preferred Scenario. A VMT tax of 2 cents per mile would be applied and uncommitted highway expansion projects would not be constructed.

Overall Results for Final Scenarios/EIR Alternatives

- **The Preferred Scenario achieves five performance targets, moves in the right direction on four performance targets, and moves in the wrong direction on the remaining four performance targets.** While notable successes exist relating to climate protection, open space preservation, and goods movement exist, the Preferred fails to slow rising unaffordability, mitigate growing displacement risk, increase access to opportunity, or provide sufficient funding to maintain aging freeways and local streets. The Equity, Environment, and Jobs 2.0 alternative performs slightly better on several targets, such as greenhouse gas emissions reduction and housing + transportation affordability, but results in significantly greater traffic congestion on freight corridors.
- **While all scenarios except the No Project alternative achieve the greenhouse gas target, lower levels of driving in Big Cities and Equity, Environment, and Jobs 2.0 result in stronger performance.** Compared to the more dispersed land use pattern in Main Streets, these two scenarios have higher non-auto mode shares that yield additional greenhouse gas benefits and build upon the foundation of the Climate Initiatives Program (which is included in all scenarios except the No Project scenario). The Preferred Scenario also achieves the targets but performs slightly worse due to its greater investment in capacity-increasing highway projects.
- **The region's ambitious public health target remains stubbornly out of reach across all scenarios.** Much higher levels of walking and bicycling, combined with significant reductions in

traffic collisions, would be needed to improve residents' health outcomes. Transformative shifts, ranging from highly-focused development patterns and generational shifts in public perceptions of biking and walking modes to widespread deployment of automated electric vehicles, would be necessary to reach this goal.

- **Strict urban growth boundaries are effective in focusing growth within the existing urban footprint.** The Preferred Scenario, Big Cities, and Equity, Environment, and Jobs alternatives achieve the Open Space and Agricultural Preservation target due to their inclusion of strict urban growth boundaries, while No Project and Main Streets fare worse on this target.
- **Significant housing affordability challenges exist in all scenarios.** Challenges related to affordability and displacement risk increase in all scenarios, with the No Project alternative resulting in the greatest adverse impacts. Despite various housing and land use strategies included across all the scenarios to make the region more affordable, housing costs continue to rise, reflecting an increasingly expensive Bay Area housing market. Of the scenarios analyzed, the Equity, Environment, and Jobs 2.0 alternative performs slightly better than its peers in this regard, thanks to expanded inclusionary zoning and associated housing subsidies.
- **Freight flows benefit from regional transportation investments and smart land use decisions.** Main Streets, Big Cities, and the Preferred Scenario exceeded the congestion reduction target for freight corridors using different strategies. Main Streets and the Preferred Scenario both relied on an expanded express lane network to reduce congestion on truck corridors, while Big Cities succeeded in improving goods movement by focusing growth in the urban core and encouraging use of non-auto modes through new transportation options. Conversely, the lack of capacity-increasing highway projects, combined with a more suburban land use pattern, results in higher levels of traffic congestion in Equity, Environment, and Jobs 2.0 and No Project.
- **Increasing funding to "Fix It First" leads to much smoother streets and more reliable transit.** Main Streets' funding brings state highway pavement to ideal conditions while improving local streets as well, saving residents a significant amount of money each year. Other scenarios prioritize local streets – where funding has a lower bang-per-buck – but lack sufficient funding to even keep local pavement from declining from today's conditions. Turning to transit, boosted funding levels compared to Plan Bay Area mean that all scenarios make substantial progress, reducing delays from aged infrastructure by roughly 75 percent by 2040.

Target-by-Target Discussion of Results

Similar to color scheme used in the table below, **green** dots indicate that the scenario achieved the target, **yellow** dots indicate that the scenario is moving in the right direction (but falling short) on the target, and **red** dots indicate that the scenario is moving in the wrong direction on the target. The Preferred Scenario is consistently marked in **bold** for reference purposes.

Performance Target #1: Climate Protection

- No Project: -2%
- Main Streets: -14%
- Big Cities: -17%
- **Preferred: -16%**
- Equity, Environment, and Jobs 2.0: -17%

Scenarios with a greater investment in public transit and non-motorized alternatives performed marginally better than Main Streets and ultimately met or exceeded this performance target. No Project lacked the Climate Initiatives Program investment and performed markedly worse than all other

scenarios evaluated. Big Cities and Equity, Environment, and Jobs 2.0 performed the best – with a 17 percent per-capita reduction in GHG emissions – thanks to transportation investments that were more effective in reducing vehicle miles traveled.

Performance Target #2: Adequate Housing

- No Project: 100%
- Main Streets: 100%
- Big Cities: 100%
- **Preferred: 100%**
- Equity, Environment, and Jobs 2.0: 100%

All scenarios met this performance target as they all rely on consistent control totals for population and housing growth. Plan Bay Area 2040 control totals incorporate additional growth to plan for no growth in in-commuting from outside the Bay Area.

Performance Target #3: Healthy and Safe Communities

- No Project: -0%
- Main Streets: -1%
- Big Cities: -1%
- **Preferred: -1%**
- Equity, Environment, and Jobs 2.0: -1%

Ultimately, the Healthy and Safe Communities target proved too ambitious to achieve in the absence of more aggressive policies and strategies. As shown above, all of the scenarios except for No Project achieved roughly similar performance results when rounded (1% reduction in adverse health impacts for the typical resident). Looking at results using a single decimal point precision, Equity, Environment, and Jobs 2.0 and Big Cities had a very slight edge (-0.7%) over and Preferred (-0.6%) thanks to their greater investment in healthier transportation modes and reduced vehicle miles traveled (which reduces safety impacts from crashes). Much more aggressive policies would be needed to achieve this visionary target, ranging from slower speed limits and additional fees to discourage driving to extremely robust bicycle/pedestrian infrastructure investments and an even more highly focused land use pattern.

Performance Target #4: Open Space and Agricultural Preservation

- No Project: 84%
- Main Streets: 98%
- Big Cities: 100%
- **Preferred: 100%**
- Equity, Environment, and Jobs 2.0: 100%

Three scenarios achieved the open space preservation target – Big Cities, Preferred, and Equity, Environment, and Jobs 2.0 – thanks to their inclusion of strict urban growth boundaries through year 2040. While the other two scenarios – No Project and Main Streets – still put the vast majority of growth in non-greenfield locations, both convert rural lands outside of existing growth boundaries (including farmlands and open space) to urbanized uses. Main Streets would do so for roughly 1,300 acres and No Project would allow nearly 16,000 acres of greenfield development. Note that all scenarios do include some greenfield development within urban growth boundaries, which is not reflected in this target as it allows for growth within year 2010 boundaries (many of which have been approved by voters).

Performance Target #5: Equitable Access (Affordability)

- No Project: +15%
- Main Streets: +13%

- Big Cities: +13%
- **Preferred: +13%**
- Equity, Environment, and Jobs 2.0: +12%

No scenario evaluated was able to reduce the already-high cost of living in the Bay Area and all move in the wrong direction on this important target. That being said, strategies boosting housing production in transportation-efficient locations generates more naturally-affordable and deed-restricted housing in all scenarios except for No Project. Furthermore, Big Cities, Preferred, and Equity, Environment, and Jobs 2.0 all reduce dependence on automobiles, the most expensive mode for system users – encouraging transit, walking, and bicycling instead through multimodal investments. Combined, these policies reduce the rise of combined housing & transportation costs by several percentage points. Equity, Environment, and Jobs 2.0 does the best in this regard, primarily due to housing strategies like a greater inclusionary requirement for new developments.

Performance Target #6: Equitable Access (Affordable Housing)

- No Project: -0%
- Main Streets: +2%
- Big Cities: +1%
- **Preferred: +3%**
- Equity, Environment, and Jobs 2.0: +3%

Similar to some targets discussed above, the goal of doubling the share of affordable housing in identified locations was remarkably ambitious given limited resources on the housing front. That being said, all scenarios except for No Project made progress towards the target – which means the number of affordable units grew faster than housing growth overall. Main Streets, Big Cities, and Preferred all boosted the number of deed-restricted units in PDAs, TPAs, and HOAs – but Equity, Environment, and Jobs 2.0 resulted in 40,000 additional units more than the runner-up (Main Streets with 119,000 units). However, in terms of naturally-affordable units, Preferred performs the strongest of the scenarios evaluated, with Equity, Environment, and Jobs 2.0 only outperforming No Project. Ultimately, Preferred and Equity, Environment, and Jobs 2.0 tied for strongest performance on this target. Additional affordable housing production policies and subsidies would be required to achieve stronger performance on this target.

Performance Target #7: Equitable Access (Displacement Risk)

- No Project: +18%
- Main Streets: +6%
- Big Cities: +9%
- **Preferred: +5%**
- Equity, Environment, and Jobs 2.0: +5%

Displacement risk was highest in the No Project scenario as it lacked any substantive policies – such as inclusionary zoning – to help mitigate the displacement crisis. Furthermore, it produces more housing at the periphery and less in the region's core, where housing is most needed to alleviate the imbalance between supply and demand. Preferred and Equity, Environment, and Jobs 2.0 performed the best on this target. While neither achieved the goal of mitigating all growth in displacement risk, they performed better than the Big Cities scenario which funneled a greater level of growth into the urban core with a more limited inclusionary zoning policy.

Performance Target #8: Economic Vitality (Access to Jobs)

- No Project: -3%

- Main Streets: -1%
- Big Cities: -1%
- **Preferred: -0%**
- Equity, Environment, and Jobs 2.0: -1%

All scenarios saw some slippage in the share of regional jobs accessible to the typical Bay Area resident between 2005 and 2040, although the Preferred did the best job in this regard. The Preferred Scenario did the best due to its investment in all modes, which mitigated some of the rising congestion expected in a growth scenario while also providing a robust suite of transit options. In addition, it focused growth in existing job centers well-served by transit, rather than distributing jobs across the region. The No Project scenario performed the worst – it was hobbled by its lack of transportation investments, both in terms of highways and transit.

Performance Target #9: Economic Vitality (Jobs/Wages)

- No Project: +43%
- Main Streets: +43%
- Big Cities: +43%
- **Preferred: +43%**
- Equity, Environment, and Jobs 2.0: +43%

As noted in the target methodology section, all of the scenarios saw the same performance for this target, which relies on the regional control totals and associated forecasts. The target results highlight relatively good news on this front – indicating that jobs in middle-wage industries are expected to grow at a rate faster than overall job growth. This bodes well for reversing the trend of declining middle-wage jobs in the Bay Area in recent decades. However, as there is no guarantee that middle-wage industries will continue paying decent wages in the future, ongoing monitoring will be a more important avenue forward.

Performance Target #10: Economic Vitality (Goods Movement)

- No Project: +38%
- Main Streets: -25%
- Big Cities: -33%
- **Preferred: -29%**
- Equity, Environment, and Jobs 2.0: -16%

Of all the performance targets, the results for this one showed the greatest variance across scenarios – perhaps speaking to the greater policy levers at our disposal to tackle traffic congestion and goods movement. While No Project performs the worst due to only committed projects advancing in that scenario, Big Cities outperformed all other scenarios, thanks to its urban-focused land use pattern and investment in alternative modes. These policies reduced auto demand for long-distance freight corridors, smoothing flow for trucks and remaining motorists. Equity, Environment, and Jobs 2.0 struggled on this target, falling short due to increased congestion due to greater suburb-to-suburb commuting and elimination of all highway expansion projects. Preferred Scenario was in the middle of the pack, with slightly better results than Main Streets and slightly worse results than Big Cities, but all of these scenarios met the 20 percent per-capita reduction target.

Performance Target #11: Transportation System Effectiveness (Mode Share)

- No Project: +2%
- Main Streets: +2%
- Big Cities: +4%
- **Preferred: +3%**

- Equity, Environment, and Jobs 2.0: +4%

All scenarios made limited but notable progress in terms of increasing the regional mode share by 10 percentage points by 2040. Big Cities and Equity, Environment, and Jobs 2.0 performed the best with a 4% increase due to their denser land use patterns (which result in greater competitiveness for non-auto modes) and greater investments in bus and rail networks across the Bay Area. Bike and walk mode shares are relatively consistent across all scenarios; increased transit ridership forecasts accounted for the bulk of the non-auto mode share growth.

Performance Target #12: Transportation System Effectiveness (State of Good Repair for Roads)

- No Project: +53%
- Main Streets: -59%
- Big Cities: +8%
- **Preferred: +6%**
- Equity, Environment, and Jobs 2.0: +10%

While the No Project scenario performs the worst due to the lack of regional discretionary dollars being put towards highway and road maintenance, the notable result for this target is the significant improvement in the Main Streets scenario. This was one area where Main Streets far outperformed its peers, and it was primarily driven by a focus on highway maintenance; regional discretionary funds were only allocated towards state highway maintenance in this scenario. While local street maintenance was also funded, it was the heavily-used highway network where funding allowed the region to achieve ideal conditions and make very significant progress towards the target. The other scenarios were relatively similar in terms of impacts on drivers from highway and road maintenance, with the Preferred seeing a slight uptick not evident in draft model runs (due to failure of select ballot measures and updates to reflect year 2040 pavement conditions).

Performance Target #13: Transportation System Effectiveness (State of Good Repair for Public Transit)

- No Project: -57%
- Main Streets: -77%
- Big Cities: -78%
- **Preferred: -75%**
- Equity, Environment, and Jobs 2.0: -76%

Thanks to the strategic priorities set in the MTC's Transit Capital Prioritization (TCP) policy – which prioritize vehicles and other critical infrastructure first – all of the scenarios make significant strides in reducing delay due to vehicle and non-vehicle system breakdowns from aged assets. Marginal differences exist across scenarios due to slight variation in funding levels, as well as the ridership levels of each system. For example, the transportation and land use pattern in Equity, Environment, and Jobs 2.0 results in higher levels of BART ridership (a system where not all SGR funding needs for assets with operational impacts are met), resulting in slightly weaker performance than in Big Cities.

Goal	#	Target	%	No Project	Main Streets	Big Cities	Preferred	EEJ2*
Climate Protection	**1**	Reduce per-capita CO_2 emissions from cars and light duty trucks	-15%	-2%	-14%	-17%	-16%	-17%
Adequate Housing	**2**	House region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year	100%	100%	100%	100%	100%	100%
Healthy & Safe Communities	**3**	Reduce adverse health impacts associated with air quality, road safety, and physical inactivity	-10%	-0%	-1%	-1%	-1%	-1%
Open Space & Agricultural Preservation	**4**	Direct non-agricultural development within the urban footprint (existing urban development and UGBs)	100%	84%	98%	100%	100%	100%
Equitable Access	**5**	Decrease the share of lower-income residents' household income consumed by transportation and housing	-10%	+15%	+13%	+13%	+13%	+12%
	6	Increase the share of affordable housing in PDAs, TPAs, or high-opportunity areas	+15%	-0%	+2%	+1%	+3%	+3%
	7	Do not increase the share of low- and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at risk of displacement	+0%	+18%	+6%	+9%	+5%	+5%
Economic Vitality	**8**	Increase the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit in congested conditions	+20%	-3%	-1%	-1%	-0%	-1%
	9	Increase the number of jobs in predominantly middle-wage industries	+38%	+43%	+43%	+43%	+43%	+43%
	10	Reduce per-capita delay on the Regional Freight Network	-20%	+38%	-25%	-33%	-29%	-16%
Transportation System Effectiveness	**11**	Increase non-auto mode share	+10%	+2%	+2%	+4%	+3%	+4%
	12	Reduce vehicle operating and maintenance costs due to pavement conditions	-100%	+53%	-59%	+8%	+6%	+10%
	13	Reduce per-rider transit delay due to aged infrastructure	-100%	-57%	-77%	-78%	-75%	-76%

Table 4. Final scenario/EIR alternative analysis for Plan Bay Area 2040 performance targets.

** = Targets shown in **green** were achieved. Targets shown in **orange** fell short but moved in the right direction. Targets shown in **red** are moving in the wrong direction. Underlined text indicates which alternative performed the best for a given target. Note that EEJ2 is the acronym for the Equity, Environment, and Jobs 2.0 alternative.*

Project Performance Assessment

One of the primary methods for prioritizing long-term regional investments when crafting the Preferred Scenario was an evaluation of the largest, capacity-increasing projects that transportation agencies submitted during the Call for Projects in 2015. These projects were assessed individually to determine their support of the Plan's performance targets and to determine their cost-effectiveness. This assessment goes beyond the scenario-level analysis, which evaluated packages of projects tied to different land use strategies. The project performance assessment evaluated individual major investments in more detail than in the scenario analysis and informed creation of the Preferred Scenario. Because the transportation plan is fiscally constrained, not all projects evaluated could ultimately be included. Conducting project performance assessment was critical to help MTC and county staff determine which projects to prioritize.

Approach to Project Performance Assessment

The performance assessment was designed to identify high-performing investments among the variety of potential investments to prioritize for regional funding and to flag low-performing investments that might merit further review through a follow-on process. For medium-project projects, congestion Management Agencies (CMAs) ultimately prioritized those investments on a county-by-county basis, subject to fiscal constraint.

Projects were evaluated using two primary distinct assessments – one quantitative and one qualitative – that were used to define performance. Methodologies for both assessments were similar to the methodologies developed in Plan Bay Area, with several notable improvements and changes.

The targets assessment illustrated which projects would help the region reach the Plan's ambitious targets. Projects received a score for each target and the combined targets score provided a basis for determine which projects were most supportive (or least supportive) of the Plan's targets. The second assessment was a benefit-cost assessment that provided a basis for determining which projects yielded the highest regional benefit and, when divided by annual cost, which would generate benefits beyond the annual costs.

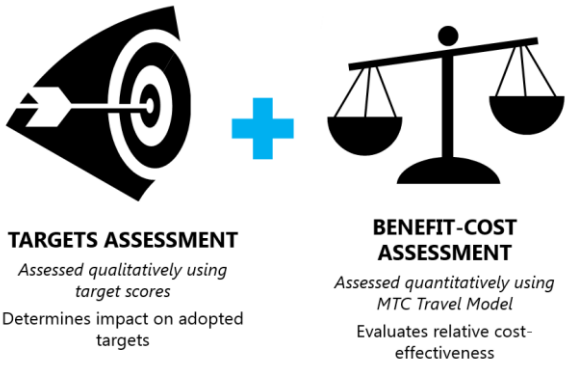


Figure 2. Project performance components.

Of the projects submitted for consideration in the long-range Plan, Projects that were fully committed, meaning having either a full funding plan or designated as committed by the MTC Commission, were not evaluated individually. Committed projects and programs, as defined by MTC Resolution No. 4182, were

either fully funded by local/committed sources or had a certified environmental document by September 2015. Resolution 4182 also stated that committed programs such as Clipper and 511 were not subject to evaluation. These projects automatically were included in Plan Bay Area 2040.

Of the remaining, non-committed projects, MTC staff evaluated projects that met the following criteria:

1. The project impacts could be captured in the regional travel demand model (i.e., able to be modeled and either capacity-increasing or improving state of good repair). The following are examples of projects in this category:

    - Transit expansion projects (e.g., BART to Silicon Valley Phase 2)
    - Transit modernization projects (e.g., AC Transit Frequency Improvements)
    - Transit state of good repair investments (e.g., Muni Metro Maintenance)
    - Road expansion projects (e.g., SR-152 Widening)
    - Road modernization projects (e.g., Columbus Day Initiative)
    - Road state of good repair investments (e.g., Local Streets & Roads Maintenance)

2. The total project costs were at least $100 million (as measured in 2017 dollars), taking into account both capital and O&M costs through year 2040.

Using these criteria, staff evaluated 63 projects and 6 state of good repair investments. Unlike the modernization and expansion projects, state of good repair, or maintenance, investments were not submitted by transportation agencies through the Call for Projects process. Instead, MTC developed different state of good repair scenarios based on funding levels from the various modal Needs Assessments to evaluate against the traditional expansion projects under consideration for the Plan. One of the key questions in developing the Plan was how much future funding to direct toward operations and maintenance compared to modernizing and expanding the existing transportation system. Understanding the cost-effectiveness of different investment levels and across modes helped inform this decision.

State of good repair investments were grouped into four modes – highways, local streets, rail transit, and bus transit. Costs and resulting asset conditions were forecast for three different scenarios – ideal conditions, preservation of existing asset condition, and a no funding scenario. For maintenance of local streets and roads, costs and pavement condition were also determined if only local funding was available. Benefits were then evaluated in the context of moving from one condition to the next. Table 5 presents the six state of good repair packages evaluated in this assessment. The assessment determined the cost-effectiveness of different investment levels in maintenance and across different modes.

Table 5. State of good repair investments in project-level performance assessment.

State of Good Repair Investment		Description
Highway Pavement Maintenance	1	Preserve **existing** highway pavement conditions vs. **no future funding** for highway pavement

State of Good Repair Investment		Description
	2	**Ideal** highway pavement condition vs. preserve **existing** highway pavement conditions
Local Streets and Roads Maintenance	1	Preserve **existing** local streets and roads pavement conditions vs. **no future funding** for local streets and roads maintenance
	2	Preserve **existing** local streets and roads pavement conditions vs. **only local future funding** for local streets and roads maintenance
Public Transit Maintenance	1	Preserve **existing** rail asset condition (vehicles, fixed-guideway, etc) vs. **no future funding** for rail maintenance
	2	Preserve **existing** bus asset condition (primarily vehicles) vs. **no future funding** for bus maintenance

Targets Assessment

The first half of the project assessment was the qualitative targets assessment. As with the original Plan Bay Area, staff qualitatively evaluated the project's support for each of the targets on a 5-point scale, ranging from 1 to -1, in increments of 0.5. A project received a "+1" for a particular target if it strongly supported the target and a "-1" if it had a strong adverse impact on the target. The final target score is a sum across targets with the maximum possible score of a +13 and the lowest possible score of a -13. Ultimately though, target scores ranged from -1.5 to 9.5, with no project having adverse impacts across the board and no project advancing every target to the maximum extent.

Table 6 summarizes the criteria used to assess projects in this qualitative assessment; more detailed information, along with example projects evaluated as part of the targets assessment, can be found in Appendix A.

Table 6. Targets assessment methodology.

#	Target	General Methodology
1	Reduce per-capita CO_2 emissions from cars and light duty trucks by 15%	**Positive Score:** Likely to reduce VMT **Negative Score:** Likely to increase VMT
2	House 100% of the region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year	**Positive Score:** Serves jurisdictions that approved high shares of RHNA for majority of income levels and planned to grow in Plan Bay Area **Negative Score:** Serves jurisdictions that approved low shares of RHNA across income categories and did not plan to grow in Plan Bay Area

#	Target	General Methodology
3	Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by 10%	**Positive Score:** Likely to cause moderate to large shift to non-auto modes **Negative Score:** Likely to moderately to significantly increase auto mode share or auto trips *Bonus 0.5 point if the project improves safety*
4	Direct all non-agricultural development within the urban footprint (existing urban development and urban growth boundaries)	**Positive Score:** Promotes infill development within urban growth boundaries or increases access to agricultural land **Negative Score:** Requires construction through open space or agricultural land or worsens access to agricultural land
5	Decrease by 10% the share of lower-income residents' household income consumed by transportation and housing	**Positive Score:** Transit project that improves service for an operator with significant low-income ridership or that serves a large share of the region's low-income riders **Negative Score:** Reduces transportation choices for low- and middle-income residents or increases transportation costs
6	Increase the share of affordable housing in PDAs, TPAs, or high-opportunity areas by 15%	**Positive Score:** Serves jurisdictions that permitted high share of affordable housing in the last two cycles of RHNA **Negative Score:** Serves jurisdictions that permitted low share of affordable housing in the last two cycles of RHNA
7	Reduce the share of low- and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at an increased risk of displacement to 0%	**Positive Score**: No project is anticipated to reduce the risk of displacement **Negative Score:** Serves jurisdictions that plan to growth significantly in the most recently adopted long-range plan (Plan Bay Area) and are currently undergoing displacement
8	Increase the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit by 20**%** in congested conditions	**Positive Score**: Decreases travel time during commute hours and serves a regional or sub-regional job center **Negative Score:** Increases travel time
9	Increase by 38% the number of jobs in predominantly middle-wage industries)	**Positive Score**: Directly adds short-term and long-term jobs to the region (construction and operations) **Negative Score:** Reduces the number of transportation-related jobs required
10	Reduce per-capita delay on the Regional Freight Network by 20%	**Positive Score**: Reduces congestion or improves reliability on freight corridors **Negative Score:** Increases travel time or decreases reliability on freight corridors
11	Increase non-auto mode share by 10%	**Positive Score:** Likely to cause moderate to large shift to non-auto modes **Negative Score:** Likely to moderately to significantly increase auto mode share or auto trips
12	Reduce vehicle operating and maintenance costs due to pavement conditions by 100%	**Positive Score:** Improves roadway surface condition **Negative Score:** No project would be anticipated to generate an adverse impact by worsening pavement quality.
13	Reduce per-rider transit delay due to aged infrastructure by 100%	**Positive Score:** Improves transit asset condition **Negative Score:** No project would be anticipated to generate an adverse impact by worsening transit asset condition.

Several of the targets for Plan Bay Area 2040 have a housing focus. To evaluate individual transportation projects against housing targets, staff first determined a service area for each transportation project. Service areas varied by the scale of the transportation project. For example, the service area for the express lane network was the full nine-county Bay Area, whereas the service area for a BRT project is only the jurisdictions through which the project passes. Housing performance was then calculated for each jurisdiction, relying either on the last two RHNA cycles for a sense of past performance or the most recently adopted land use plan at the time of the assessment for a sense of future performance.

Benefit-Cost Assessment

The second half of the project assessment was a benefit-cost assessment. The assessment quantified as many benefits as technically feasible, relying heavily on the methodology developed in the benefit-cost assessment from the original Plan Bay Area. Benefits included changes in accessibility (travel time and cost), reliability, emissions, physical activity, and noise. All benefits were monetized with the benefit valuations found in Appendix B.

Modeling Approach to Estimate Benefits

For all projects and state of good repair investments, a project's benefit was estimated using the regional travel demand model, Travel Model One. Each project was coded as its own "Build" scenario and compared to a "No Build" scenario. Both the Build and No Build used the same land use assumptions in the most recently adopted land use projection at the time of the assessment, Plan Bay Area (2013), for the horizon year, 2040. MTC ran the full travel model through three iterations to estimate project benefits. MTC developed a tool known as COBRA to difference the build and no build metrics and monetize the metrics appropriately. The script is open source and available here: https://github.com/MetropolitanTransportationCommission/travel-model-one/tree/master/utilities/PBA40/metrics

Modeling Update

Due to modeling constraints in Plan Bay Area (2013), only half of the model was run for each project. As a consequence, some of the more long-term decisions in the model, like where to live or whether to purchase of a vehicle, were held constant between the build and no build runs. For Plan Bay Area 2040, staff ran the full travel model through three iterations to estimate project benefits. For example, a project with significant transit benefits might allow residents to own one fewer car. The cost savings associated with owning fewer cars is a benefit for the transit projects in the benefit-cost assessment. With this modeling, no benefit categories required post-model adjustments.

User Benefits

Typically, the primary benefits of transportation projects are for the user in the form of travel time and cost savings. The assessment for Plan Bay Area (2013) estimated user benefits of a project by calculating travel time savings and cost savings by mode and monetizing the change. This method was inconsistent with the behavior assumptions in the travel model and required post-model adjustments. For example, a project that encourages shifting from driving to transit would have a negative impact in the previous methodology, because transit is typically slower.

The assessment for Plan Bay Area 2040 applied a methodology developed by the Federal Transit Administration to estimate user benefits. The methodology monetizes the accessibility benefits of projects, which are estimated through the change in the "composite utility" of all travel models after a project is constructed. In the Travel Model, composite utility is estimated through the logsum term. By measuring the change in utility (or satisfaction) of travel models, the logsum term is also a measure of consumer surplus, or the economic value of a transportation project. With this method, everyone should be better off with a project that improves access, with the degree varying by the level of impact of a project. Projects that remove access (e.g. consolidate stations or remove travel lanes) might have overall negative impacts if there are not enough compensating benefits.

Mechanically, user benefits are estimated with the destination-choice logsum, which is the generalized cost of all modes weighted by the attractiveness of each destination. Generalized cost is the sum of the monetary and non-monetary costs of a journey. Since all modes are reflected in the logsum term and not just the traveler's chosen mode, a project may benefit a traveler even if they do not choose to use a particular mode because they value having more choices. The units of the logsum metric are in minutes so this metric is converted to economic value by multiplying by an assumed value of time.

Approach to Estimate Project Costs

To complete the assessment, a project's monetized annual benefits in year 2040 were divided by a project's annualized total cost using 2017 dollars throughout. Annualized total cost was calculated by taking capital costs and dividing by the expected life of the capital investment (as shown in Table 3) and then adding one year of net operating and maintenance costs in 2040. For roadway projects, MTC staff estimated annual operations and maintenance costs using average per-mile road maintenance costs. For transit projects, the operating costs reflect potential revenues from fares, approximated with each operator's farebox recovery ratio[1]. For tolling projects, staff assumed the tolls would cover the operations and maintenance costs.

Evaluation of Modernization and Expansion Investments

The majority of projects in the assessment were either modernization or expansion projects. Modernization projects involve upgrading existing assets with infrastructure that provides more service or more capacity. Expansion projects involve physically extending a rail line or adding lanes to a roadway. To forecast the benefits of these two types of projects, staff worked with project sponsors on understanding the new service patterns for transit or capacity increases for road projects. Since these projects may not be well defined at the time they are seeking inclusion in the long-range plan, project sponsors submitted information on one project alternative knowing that project definitions may evolve over time. After working with sponsors, MTC translated the project definitions into inputs for Travel Model One. For transit projects, this information included routing, frequencies by time of day, locations of bus stops or rail stations, fares, and availability of parking at stations. For roadway projects, this information included number of lanes, facility type, speed limit, and extents of the project.

Evaluation of State of Good Repair Investments

In addition to more traditional transportation projects, staff evaluated six state of good repair investment scenarios. This evaluation was one of the significant differences between the assessments in

[1] Based on the operators' FY13 farebox recovery ratio (most recent fully-audited data point at the time of this assessment) – from the Statistical Summary of Transit Operators.

Plan Bay Area and Plan Bay Area 2040. The original Plan Bay Area (2013) evaluated different types of maintenance investments using a sketch-level methodology that monetized different benefits than what were included in the benefit-cost evaluation for the other projects. Since adoption of the last Plan, staff developed methodologies for evaluating the benefits of local streets and roads and transit state-of-good repair using the same metrics as for expansion projects. Brief descriptions of the new methodologies are listed below:

Local Streets and Roads – The methodology involves the connection between pavement condition and vehicle operating costs. Staff forecasts pavement conditions for cities and counties based on funding levels and facility prioritizations using MTC's asset-management software, StreetSaver. A separate model translates pavement condition into vehicle maintenance and fuel consumption costs by type of vehicle, based on the findings in NCHRP Report 720.[2] These costs are incorporated into the vehicle operating cost in the travel demand model, which effectively makes trips more expensive if drivers are traveling on roadways in poor condition. This affects auto mode choice and travel costs.

Transit – The methodology involves the connection between asset age and travel times associated with aging infrastructure. Staff forecasts transit asset conditions for transit operators using FTA's TERM-Lite software. A separate model estimates in-vehicle and out-of-vehicle transit delay as a function of failure frequencies based on TCRP Report 157.[3] Delay varies by transit operator and mode. For example, the impact of a Caltrain failure often leaves a rider with fewer options than if the breakdown occurred on a Muni bus with available parallel routes, but a Muni breakdown might affect a larger number of customers in the travel model. Delay is then input into travel demand model, which effectively increases the travel time on transit modes in poor condition. This affects transit mode choice and travel times.

Appendix C includes more detailed methodologies for the state of good repair assessments.

[2] National Cooperative Highway Research Program (NCHRP) Report 720: Estimating the Effects of Pavement Condition on Vehicle Operating Costs

[3] Transit Cooperative Research Program (TCRP) Report 157: State of Good Repair – Prioritizing the Rehabilitation and Replacement of Existing Capital Assets and Evaluating the Implications for Transit

Table 7. Lifecycle cost assumptions.

Capital Component	Expected Useful Life (in years)
Local bus	14
Express bus	18
Bus rapid transit (BRT) system	20
Rail infrastructure (majority of ROW in tunnel)	80
Rail infrastructure (all other)	30
Ferry	25
Technology/operations	20
Roadway	20
Roadway (majority tunnel)	80

Key Findings of Project Performance

This section highlights several of the key findings from the project performance assessment. Tables with the final results are in Appendix D.

1. **Maintaining regional transit infrastructure ranks as the top priority, given its high level of cost-effectiveness and strong support of adopted targets.**

When considering the projects with the largest total benefits, maintaining the region's highways, local streets and roads and rail assets generated significantly higher benefits than the benefits from all uncommitted expansion and modernization projects combined. Fully investing in state of good repair of all modes would generate approximately $7 billion in annual benefit compared to $5 billion in annual benefit for the non-maintenance investments. The largest maintenance benefit – at roughly $3 billion in annual benefit – would come from improving highway pavement condition. The primary benefit from these investments are reductions in vehicle operating costs that would arise from driving on smoother pavement. Maintaining rail assets would generate $1.4 billion in annual benefit, primarily from reducing maintenance-related delays across the system. Conversely, if the region did not invest in maintaining rail assets, travelers would take between 270,000 and 320,000 fewer transit trips, leading to increasing congestion or just less travel overall. Benefit-cost ratios for these three maintenance investments vary from 11 for highways to 4 for local streets and roads. The annual benefits for rail maintenance are seven times the annual cost.

2. **The two largest benefits for transportation projects were either increases in access or increases in health benefits.**

The most commonly understood benefits for transportation projects are decreases in travel time and travel cost. This evaluation combined these two metrics into a single measure of access[4], which evaluated the ease of reaching destinations after a project is constructed. When monetized by half of the regional wage, access benefits typically comprised at least 40% of a project's benefits. Projects that connected a large number of people to dense activity centers had the largest access benefits. Examples

[4] The estimate of access is primarily a function of destination-choice logsums of the travel model, an estimate of freeway reliability, and an estimate of truck travel time and cost.

include Highway Pavement Maintenance, which would decrease travel costs for the majority of Bay Area residents who continue to drive in the future, and increases in regional transit access, which would connect many people to dense jobs throughout the region (e.g. increasing service on BART and extending Caltrain to downtown San Francisco).

For smaller scale projects that would yield predominantly neighborhood-level benefits, the primary benefit came from health and lower vehicle ownership rates. This assessment evaluated health benefits of both the morbidity and mortality effects of an active lifestyle, with the research supporting the claim that walking and biking leads to longer lifespans (and thus fewer deaths overall). The World Health Organization developed a methodology for this association that staff applied for the first time in this assessment[5]. By valuing a life at $10.8 million and estimating how many lives would be saved from people becoming more active, projects like light rail extensions and bus rapid transit projects in Priority Development Areas would generate significant health benefits. Interestingly, these projects were also more likely to lead to lower vehicle ownership rates than the large-scale transit projects, which would still require driving to stations and for the rest of trips on a given work day.

3. Land use matters – projects that support Plan Bay Area growth patterns showed strong performance.

Because the performance assessment informs the ultimate Plan's transportation investments, it uses the most recently adopted land use pattern available at the time of analysis, which is typically from the previous Plan. The project assessment for this Plan used the adopted, focused growth pattern from Plan Bay Area and is thus the first performance assessment of a Sustainable Communities Strategy. Table 9 presents benefit-cost ratios and ranks of several transit projects that were only moderately cost-effective in Plan Bay Area that were among the most cost-effective projects in Plan Bay Area 2040. Several of these transit projects in the South Bay would increase transit service within San Jose and Sunnyvale's planned focused growth corridors, leading to significant benefits from active transportation and reductions in vehicle ownership.

Table 8. Benefit-cost ratios and ranks across two Plans for select projects.

Project	Plan Bay Area		Plan Bay Area 2040	
	B/C[1]	B/C – Rank[2]	B/C[1]	B/C – Rank[2]
BART to Silicon Valley	**5**	23	**8**	6
VTA El Camino BRT	**2**	36	**7**	9
Geary BRT	**2**	44	**6**	10
Capitol Light Rail Extension	**0.5**	68	**6**	11
Vasona Light Rail Extension	**0.0**	77	**3**	30

1. **In both Plans, the highest B/C was "infinite." In Plan Bay Area, the second highest B/C was 59 and in Plan Bay Area 2040, the second highest B/C was 17.**
2. **In Plan Bay Area, benefit-cost assessment included 78 projects. In Plan Bay Area 2040, benefit-cost assessment included 69 projects.**

[5] Source: World Health Organization's Health Economic Assessment Tool, available online: http://www.heatwalkingcycling.org/

Modal and Geographical Performance Differences

Modernization projects (which focus on improving existing transportation assets) typically performed better on both components of the project assessment than expansion projects (which emphasize widening highways or extending fixed transit guideways to new service areas). Implementation of ITS technologies – such as ramp metering and signal coordination – through programs like MTC's Columbus Day Initiative[6] performed better than freeway widening projects; this is due to the cost-effectiveness of efficiency projects in comparison to capital-intensive construction and the location of investments. Modernization projects in the core of the region, where most congestion is projected to occur in the future, were among the most cost-effective. Additionally, value pricing projects, including a proposal to implement congestion pricing in San Francisco's central business district and on Treasure Island, were shown to be highly cost-effective and particularly supportive of the Plan's targets, given their ability to reduce congestion and fund transit service and bicycle and pedestrian improvements with net revenues.

Transit modernization projects also performed very well, demonstrating a high level of cost-effectiveness and strong support for the targets, particularly when servicing high-growth Priority Development Areas of East Bay and South Bay. Projects such as bus rapid transit systems in San Francisco, Oakland, and San Jose (Geary BRT, Stevens Creek BRT, and San Pablo BRT) emphasized high-demand corridors where dedicated lanes and bus signal priority achieve substantial benefits at a relatively low cost. Additionally, modernization of the BART system would increase service along several of the most congested corridors in the region – leading to significant access benefit with the additional service.

Combining Cost-Effectiveness and Targets Results

For both Plan Bay Area and this update, a project's performance is a function of both cost-effectiveness and support for targets. The best performing projects would score high across both metrics. Figures 3 through 5 present a series of bubble charts that illustrate a project's performance on cost-effectiveness (vertical axis) and target score (horizontal axis). The size of the bubble represents the magnitude of benefits. Among the highest performing projects, regional transit maintenance scored the highest on targets and medium-high on cost effectiveness. Extending BART to San Jose and constructing BRT along Geary Boulevard were also projects with high targets score and medium-high benefit-cost ratios.

High and Low Performers

To apply the results of the performance assessment, staff defined performance thresholds that placed projects in three buckets – high, medium, and low. Staff subsequently prioritized regional funding like New Starts/Small Starts/Core Capacity funding and STP/CMAQ on the highest performing projects. For projects in the low-performing category, sponsors were required to submit a compelling case, detailing reasons these projects should still be considered as candidates for Plan Bay Area 2040.

Performance Thresholds

At their May 2016 meeting, the MTC Planning Committee approved thresholds that created 11 high-performing projects, 40 medium-performing projects, and 18 low-performing projects. As shown in the thresholds below, high-performing projects could have either a high benefit-cost ratio and a medium

[6] The Draft Plan now refers to Columbus Day Initiative as Bay Area Forward.

targets score or a high targets score and a medium benefit-cost ratio. Low-performing projects could have either a negative targets score or a benefit-cost ratio less than 1.

- High-performer Thresholds:
    - Benefit-Cost Ratio $\geq$ 7 and Targets Score $\geq$ 3 **OR**
    - Targets Score $\geq$ 7 and Benefit-Cost Ratio $\geq$ 3
- Low-performer Thresholds:
    - Benefit-Cost Ratio $<$ 1 **OR**
    - Targets Score $<$ 0
- Medium-performer Thresholds: *all other projects*

Staff used the results of the performance thresholds to give priority to high-performing projects in the investment strategy of Plan Bay Area 2040 and work with sponsors to determine if medium and low performing projects should be included within the fiscal constraint of the Plan.

Figure 3. Overall results by project type.

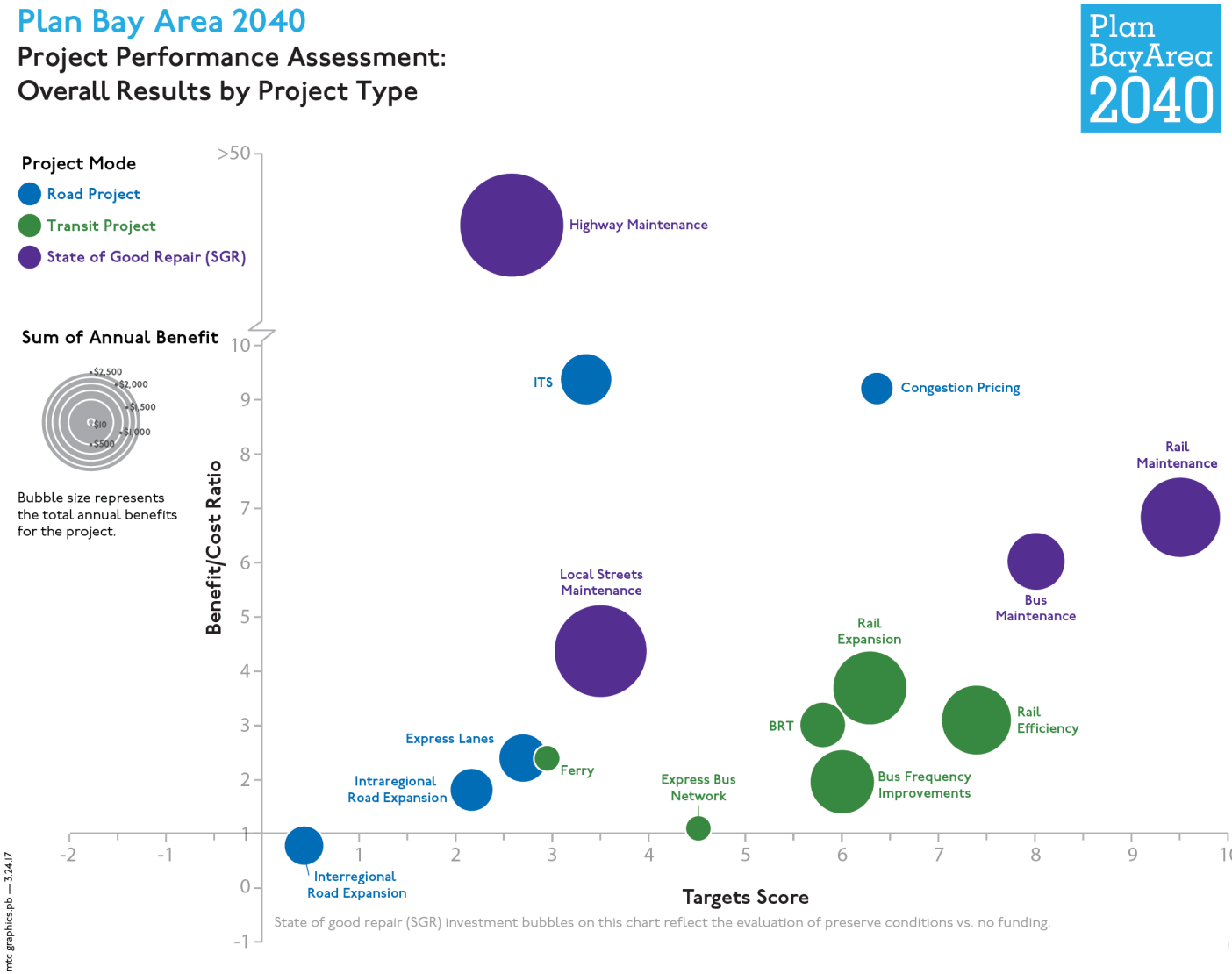


Figure 4. Results for road projects.

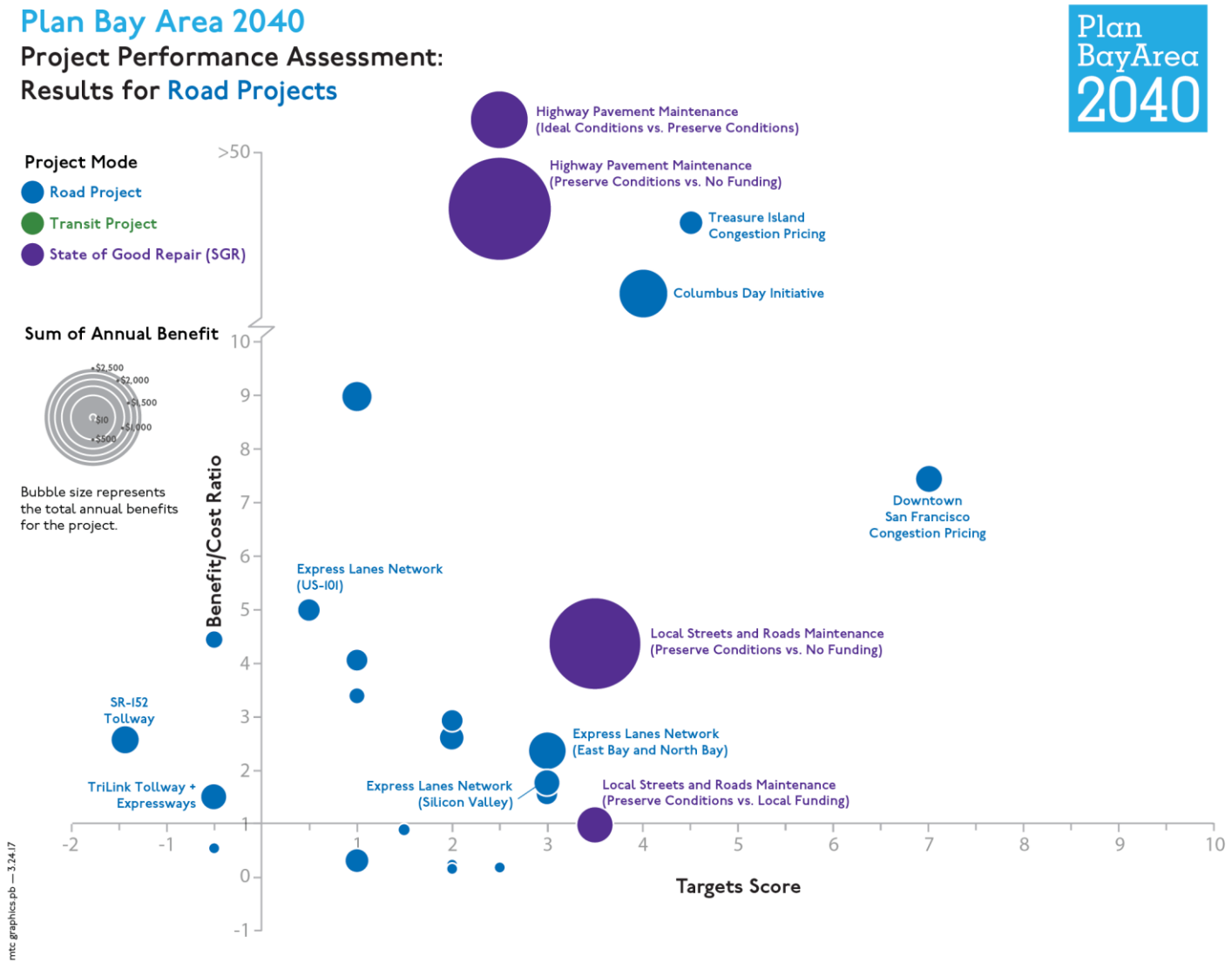
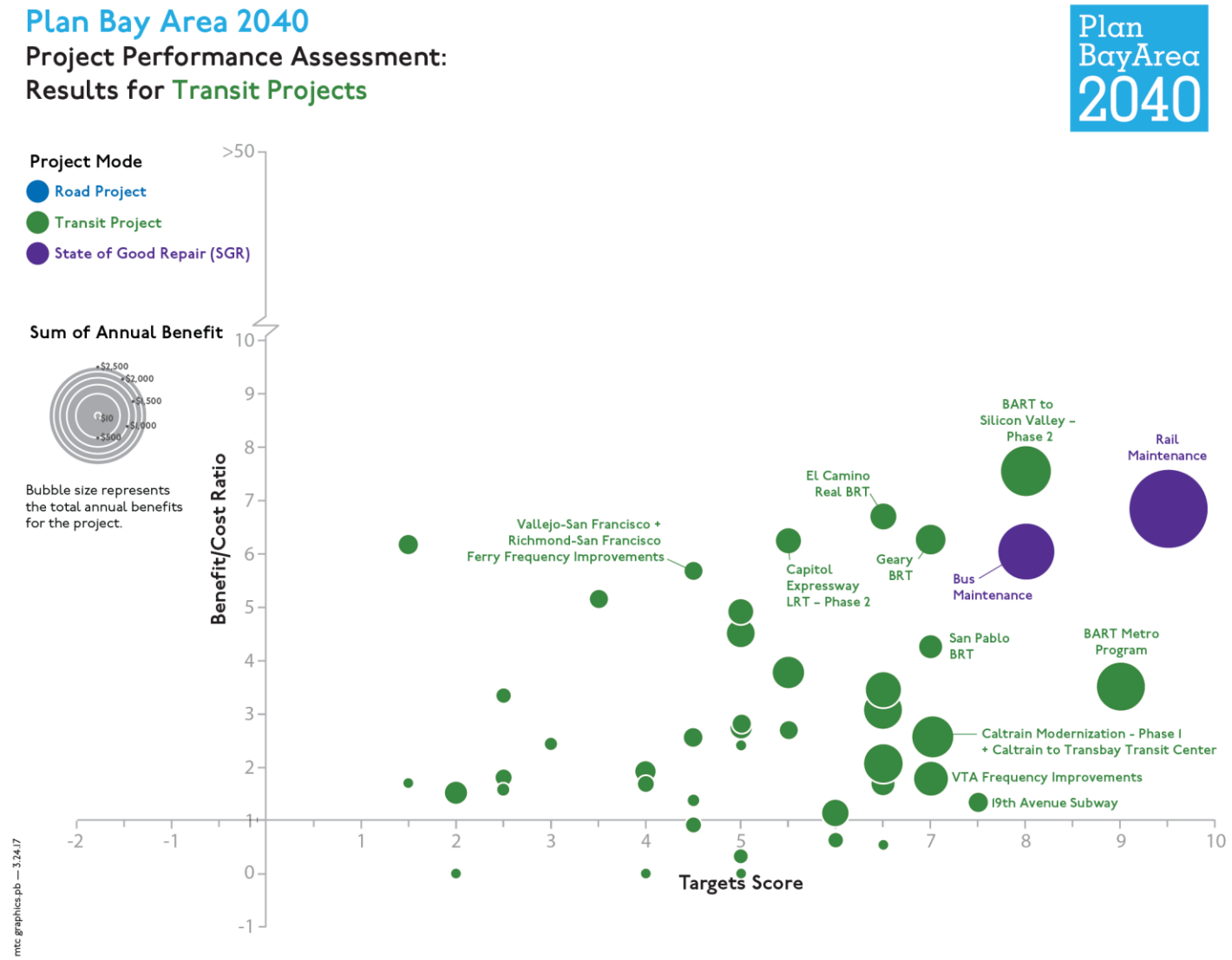


Figure 5. Results for transit projects.



High-Performers

The performance threshold created two categories of high-performing projects – those with strong cost effectiveness and those with strong support for the Plan's targets. Projects with the highest cost-effectiveness and medium support for the targets included the Treasure Island Congestion Pricing Project, Columbus Day Initiative, BART to Silicon Valley (Phase 2), Downtown San Francisco Congestion pricing, Public Transit Maintenance – Rail Operators, and El Camino BRT.

Projects with the highest targets score and medium cost-effectiveness included Geary BRT, San Pablo BRT, Public Transit Maintenance – Bus Operators, BART Metro Program, and Caltrain Modernization + Downtown Extension.

Staff used these results to prioritize future regional discretionary revenues for the 11 high-performing projects. All of the high-performing transit projects reflect the region's latest FTA Section 5309 New Starts/Small Starts/Core Capacity priorities. Columbus Day Initiative and San Francisco's two congestion pricing projects have been prioritized for future regional discretionary funding. Staff have also prioritized almost 30% of regional discretionary funding (approximately $22 billion) to make significant progress on funding transit maintenance needs. For more information on transportation funding priorities in the Plan, see the Investment Strategy Supplemental Report.

Low-Performers

The performance thresholds also created two categories of low-performing projects – those that were not cost-effective and those that affected the region's ability to meet the Plan's targets. Of the latter case, only three projects received negative targets score. These included two major extensions of roadway into open space and one road facility upgrade in an area with poor land use performance. The fifteen remaining projects had benefit cost ratios less than 1.0. These included two express bus projects, tunneling Highway 17 through Santa Cruz Mountain, constructing a bike path on the west span of the Bay Bridge, extending SMART to Cloverdale, running ferry service to Redwood City, and constructing a contraflow bus lane on the Bay Bridge.

Because cost-effectiveness and targets score are not the only two considerations for inclusion in the Plan, staff set up a process for upgrading low-performing to medium-performing status based on more nuanced information. Similar to the original Plan Bay Area process, MTC approved a set of criteria under which a compelling case could be made. These criteria reflect either a short-coming in the benefit-cost methodology or an over-riding consideration related to federal policy initiatives. Table 10 displays the specific criteria and Table 11 presents the list of low-performing projects and outcomes for each project.

Table 9. Compelling case criteria.

CATEGORY 1: Benefits Not Captured by the Travel Model	CATEGORY 2: Federal Requirements
A. **Serves an interregional or recreational corridor** B. **Provides significant goods movement benefits** C. **Project benefits accrue from reductions in weaving, transit vehicle crowding or other travel behaviors not well represented in the travel model** D. **Enhances system performance based on complementary new funded investments**	A. Cost-effective means of reducing CO2, PM, or ozone precursor emission (on cost per ton basis) B. Improves transportation mobility/reduces air toxics and PM emissions in communities of concern

Rather than go through the compelling case process, sponsors for ten of the eighteen low-performing projects decided to drop the project or convert them to a project type that was exempt from the evaluation. Two projects were converted to environmental studies, two projects were reduced in scope and funded completely with a local sales tax, and six projects were ultimately dropped.

Two additional projects provided updated cost or scope data that sufficiently demonstrated they could achieve a benefit-cost ratio greater than one, thus allowing staff to designate them as medium-performing projects.

For the remaining seven projects that did submit a compelling case, staff recommended approving four projects, most of which fell under criterion 2A (improving air quality in a cost-effective manner) or criterion 2B (improving mobility or air quality in Communities of Concern). The 80/680/12 interchange project provided several model-based reasons for justifying the project and staff approved their arguments under 1A, 1B, and 1C. The remaining three projects – totaling $1.2 billion – did not successfully receive approval of their cases based on evaluation against the six adopted criteria. These three projects were either down-scoped to environmental funding or scaled back.

All in all, the compelling case process removed billions of dollars of low-performing projects from Plan Bay Area 2040 and boosted the cost-effectiveness of the overall Plan. A summary of all low-performing projects and their outcomes is shown below.

Table 10. Low-performing projects.

Project Title	Low-Performing Reason	Outcome
Downtown San Jose Subway (Japantown to Convention Center)	Low B/C	Dropped
SR-17 Tollway + Santa Cruz LRT (Los Gatos to Santa Cruz)	Low B/C	Dropped
Bay Bridge West Span Bike Path	Low B/C	Rescoped to environmental
VTA Express Bus Frequency Improvements	Low B/C	Dropped
Express Bus Bay Bridge Contraflow Lane	Low B/C	Rescoped to environmental
TriLink Tollway + Expressways (Brentwood to Tracy/Altamont Pass)	Low Targets Score	Rescoped to only include Airport Connector arterial segment near Byron for a cost less than $100 million
Lawrence Freeway	Low B/C	Rescoped to Tier 1 elements only and funded with local sales tax
Antioch-Martinez-Hercules-San Francisco Ferry	Low B/C	Costs updated to reflect smaller-scale privately-operated ferries, bringing B/C above 1
I-680 Express Bus Frequency Improvements	Low B/C	Costs updated to reflect standard hourly rate for express bus service, bringing B/C above 1
SR-4 Widening (Antioch to Discovery Bay)	Low B/C	Dropped
I-80/I-680/SR-12 Interchange Improvements	Low B/C	Compelling case 1A, 1B, and 1C approved
SR-262 Connector (I-680 to I-880)	Low Targets Score	Compelling case 2A approved

Project Title	Low-Performing Reason	Outcome
East-West Connector (Fremont to Union City)	Low B/C	Compelling case 2B approved
Southeast Waterfront Transportation Improvements	Low B/C	Compelling case 2B approved
Geneva-Harney BRT (Phase 1)	Low B/C	Compelling case 2B approved
San Francisco-Redwood City + Oakland-Redwood City Ferry	Low B/C	Compelling case considered but ultimately included as environmental
SR-152 Tollway (Gilroy to Los Banos)	Low Targets Score	Compelling case considered but ultimately included as environmental
SMART – Phase 3 (Santa Rosa Airport to Cloverdale)	Low B/C	Compelling case considered but ultimately included as an extension to Cloverdale and environmental funding for the remaining segment

Supplemental Assessments

In addition to the targets assessment and benefit-cost assessment for all major projects, three supplemental assessments were conducted. The three supplemental assessments included:

Confidence assessment – this analysis identified the primary shortcomings of the quantitative assessment approach, including limitations in travel model specificity or calibration, completeness of benefit estimation, and the horizon-year approach.

Sensitivity testing – this analysis documented the impact of benefit valuations on the estimate of cost-effectiveness by varying key components of the B/C calculation and evaluating the effects on project ranking.

Equity considerations – this analysis calculated an equity targets score and overlaid projects on the region's Communities of Concern.

Confidence Assessment

The confidence assessment described potential limitations of the benefit-cost assessment. Disclosure of these limitations informed the project prioritization process for Plan Bay Area 2040 and is included in Appendix D. Staff qualitatively assessed confidence in the benefit-cost ratios based on the following criteria:

Travel Model Output

- Does the travel model have limitations in understanding a particular type of travel behavior (e.g. merging and weaving at interchanges)?
- Does the travel model lack an understanding of smaller-scale project travel changes relative to the region (e.g. single infill station, expressway improvements)?

Framework Completeness

- Does the travel model output capture all of the primary benefits of the project (e.g. the value of relieving transit crowding or primarily recreational or tourism benefits)?

Timeframe Inclusiveness

- Is the project an “early winner” (i.e. can be implemented quickly and provides key benefits in the short term)?
- Is the project a “late bloomer” (i.e. benefits will not be realized until the final years of the planning horizon)

Sensitivity Testing

Sensitivity testing was used to understand how benefit valuations and project cost assumptions affected the cost-effectiveness estimates across projects. The sensitivity test included three types of tests: one on a project’s costs, one on the valuation of travel time, and one on the valuation of life. The test on cost increased a project’s annual cost depending on project type, acknowledging that capital-intensive rail projects have historically experienced significant cost increases over several years of planning. The second test on the valuation of travel time reduced this valuation by 50% to assess which projects would have higher “social benefits” (e.g. safety and health) relative to user benefits. The third test on the valuation of life reduced this valuation by 50%. After these three tests, staff evaluated the new benefit/cost ratios and rankings for the projects.

Changing the valuation on travel time had a significant effect on the project rankings. Many of the projects with a high share of travel time benefits and that already were at the border of cost-effectiveness fell below the benefit-cost ratio threshold of 1. Examples include the Express Lane Network, US-101 Marin Sonoma Narrows Phase 2, TriLink Tollway, Golden Gate Transit Frequency Improvements and Muni Service Frequency Improvements. Additionally, benefit-cost ratios for Rail Maintenance and the Columbus Day Initiative decreased enough to drop their rankings by at least 4 projects. With this lower valuation, the resulting benefit-cost distribution would be more uniform, implying that the final performance outcomes (e.g. high, medium, low) might have relied more heavily on the targets score.

Increasing annual costs based on project type had the largest effect on rail projects. This is the type of project that has historically experienced the highest amount of cost increase of the period of project development. This sensitivity test mostly moved rail projects out of the top 10 and moved maintenance projects higher on the list. Changing the valuation of life did not generate significant changes in project ranking nor did any project’s B/C ratio fall from above 1 to below 1.

Appendix F includes detailed results for the sensitivity test.

Project-Level Equity Considerations

The third supplemental assessment evaluated a project’s ability to support the equity issue areas of Plan Bay Area 2040 and the degree to which they would serve a Community of Concern (CoC). This equity assessment first isolated each project’s scores on the six equity related targets for Plan Bay Area 2040 – healthy and safe communities, housing and transportation costs, affordable housing, displacement risk, access to jobs, and middle-wage jobs creation. Next, the assessment considered how each project would increase access for the region’s Communities of Concern. Projects that would not increase access for these populations did not receive a score in the equity assessment. Projects that would increase access were ranked according to their score on the subset of targets that have an equity nexus.

Every project with a high benefit-cost ratio and a strong support rating for regional targets would improve access to at least one Community of Concern in the Bay Area. The notable result reflects the strong equity nexus in the adopted performance targets, with six of the thirteen targets having a clear nexus with social equity. While the highest possible equity targets score possible was six, the three highest-performers only

received a score of four. This is in part due to the many “Moderate Adverse” scores on the displacement target. The same inner urban areas that have the potential to increase access for a number of Communities of Concern, are also the areas with some of the highest risks for displacement.

Additionally, 19 projects would not increase access for a Community of Concern. These include ferry projects without an access point in a Community of Concern and light rail projects in the South Bay with stations outside Community of Concerns.

Appendix G includes more detailed methodology and results.

Appendix Table of Contents

Appendix A: Targets Criteria

Appendix B: Benefit Valuations

Appendix C: State of Good Repair Performance Assessment – Objectives and Methodology

Appendix D: Project Performance Assessment – Final Results

Appendix E: Confidence Assessment

Appendix F: Sensitivity Testing – Final Memorandum

Appendix G: Equity Analysis – Final Memorandum

Appendix A: Targets Criteria

This section describes the methodology used to assign targets scores during the project-level assessment. The methodology includes example projects that received a range of target ratings, as well as common reasons for rating projects in a given way. This qualitative assessment is designed to complement the purely quantitative evaluation of cost-effectiveness.

As a reminder, the score for a particular target ranges from -1 to +1 and can be one of five categories: strong support, moderate support, minimal support (0), moderate adverse impact, and strong adverse impact. The final targets score is the straight sum of the 13 individual scores.

Target 1: Reduce per-capita CO2 emissions from cars and light-duty trucks by 15%.

Projects supported the target if they were likely to reduce VMT; provide an alternative to driving alone; or advance clean fuel vehicles. Projects that were likely to lead to an increase VMT are assumed to have an adverse impact on the target.

Guidelines for Applying Criteria

Transit, bicycle and pedestrian projects were expected to reduce VMT and were rated as supportive of the target. Larger projects, those likely to serve a large number of trips or serve longer trips, were rated as strongly supportive. Smaller projects, those likely to serve fewer trips or shorter trips, were rated as moderately supportive.

Projects that increased roadway capacity or were expected to increase VMT were generally rated as having a strong adverse impact on the target. Operational roadway projects, such as highway interchange projects, were not expected to increase VMT significantly since they did not add capacity and were generally rated as having minimal impact. Roadway projects that include transit, bicycle and pedestrian elements were given minimal or moderate support to recognize the impacts of these multi- modal elements.

Examples

Projects with the potential to reduce long car trips by attracting long-distance riders received strong support for this target. Example projects include BART Metro Program and Caltrain Electrification.

Projects that would expand a roadway, reducing congestion and making driving attractive received moderate to strong adverse impact scores. Example projects include SR-4 Auxiliary Lanes, TriLink, and SR-152 Alignment.

Target 2: House 100% of the region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year.

The assessment of a project's impact on housing was dependent upon two criteria: potential for housing growth in the jurisdictions affected and those jurisdictions' past track record on producing housing at multiple income levels. The strongest support was for projects that were located in jurisdictions that had above average production for at least three income categories and a high amount of housing planned in the future (at least 20%). Staff designed the performance thresholds such that regional performance would receive a "moderate support" rating.

Guidelines for Applying Criteria

To determine a project's potential support for adequate housing, a project's service area was first determined. Service areas varied by project type, location, and travel demand. An expansive, regional project would cover more jurisdictions whereas a project on smaller facilities would likely only serve one jurisdiction. As an example, the service area for BART to San Jose spans multiple jurisdictions in Santa Clara and Alameda counties whereas the service area for Geary BRT is San Francisco.

For each service area, staff evaluated RHNA performance across the previous two RHNA cycles – 1999-2006 and 2007-2014. RHNA performance is based on the share of housing units permitted for the four income categories (very low income, low income, moderate income, and above moderate income). A project in a service area where most of the jurisdictions permitted above average shares of RHNA category would receive stronger ratings for this target. For each service area, staff also evaluated anticipated growth in Plan Bay Area 2013. A project in a service area where jurisdictions planned to increase housing stock by at least 10% received moderate to strong support for this target.

The data tables used to score this target are included at the end of this Appendix.

Examples

Projects in eastern Contra Costa County and eastern San Clara County received strong support, because jurisdictions like Antioch, Brentwood, San Jose, Milpitas, and Sunnyvale have historically permitted housing across the income spectrum and accepted significant housing in Plan Bay Area 2013. Example projects include the SR-4 Operational Improvements, Capitol Expressway Light Rail Extension, and VTA Bus Service Increases.

Projects in San Mateo County and western Santa Clara County received minimal or moderate adverse results despite serving areas that plan to grow significantly in Plan Bay Area 2013. If a jurisdiction historically has only permitted housing for above-moderate incomes, the project serving that jurisdiction received a minimal score. Example projects include US-101 Express Lanes, Caltrain Electrification, and Stevens Creek BRT.

Target 3: Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by 10%

Projects supported the target if it was likely to cause large shifts to non-auto modes. A shift to non-auto modes leads to more active lifestyles, reduces the amount of emissions associated with driving, and could reduce the number of auto collisions by virtue of few people in vehicles. If a project is primarily a road safety project, staff increased the target score by half a point.

Guidelines for Applying Criteria

Projects generally received the same rating for this target as they did for CO_2 reduction (target 1)

Examples

BRT projects that received moderate support in Target 1 received strong support in this target due to their ability to not only improve air quality but significantly increase non-auto mode share. The benefit- cost results support this claim as the BRT projects were more likely to create mortality benefits and reduce vehicle ownership than regional rail extensions. Example BRT projects include Geary BRT, San Pablo BRT, and Stevens Creek BRT. Significant road expansion projects like TriLink and SR-152 received a moderate adverse score for this target due to their substantial safety components. These two projects received strong adverse scores for Target 1.

Target 4: Direct all non-agricultural development within the urban footprint (existing urban development and urban growth boundaries)

Projects that do not consume open space or agricultural lands support the target. Projects that improve access to agricultural lands support the target because they maintain economic viability of those lands; this is consistent with requirements in SB 375. Plan Bay Area must show how farmland is preserved from urban development and issues like access for farm to market are considered. Projects that directly consume open space or agricultural land have an adverse impact.

Guidelines for Applying Criteria

Projects that helped to promote infill development are given a supportive rating for this target, as developing or redeveloping existing urban areas reduced the demand for sprawling developments at the fringe of the region.

Support for the target was also given for improved access to agricultural lands. Highway projects that connected agricultural lands to urban areas were supportive of the target since these projects could foster improved goods movement by trucks to their destination. A project would receive an adverse score if it would require new right-of-way in previously undeveloped open space or agricultural land.

Examples

Staff evaluated transit projects that significantly increase access within Priority Development Areas while also not consuming open space as being strongly supportive of this target. Example projects include the BART Metro Program, BART to San Jose, Caltrain Electrification and Regional Transit State of Good Repair.

Staff evaluated road extension projects as having strong adverse impacts on achieving this target. Example projects include TriLink and SR-152 Alignment.

Target 5: Decrease by 10% the share of lower-income residents' household income consumed by transportation and housing

Projects supported the target if they included transit enhancements that provided a lower-cost transportation alternative to driving. The degree of support varied based on the operator's current low-income ridership. Road project with a significant low cost option such as HOV lanes, transit, bicycle, or pedestrian component AND that serves a Community of Concern could also receive a moderate support for this target.

Guidelines for Applying Criteria

Staff considered transit projects to be provide a lower-cost alternative to auto ownership and thus supported this target. The degree of support was based on the percentage of the region's total low- income riders and the proportion of low income riders served by the operator. The percentages of low- income riders were based on an MTC or Operator Survey conducted between 2013 and 2016. These data are included at the end of this Appendix.

Transit operators' projects received a strong support rating if low-income riders constitute over 40% of system ridership or if the operator serves more than 10% of the region's low-income transit riders. Transit operators' projects received a moderate support rating if the projects serves more than 0.5% of the region's low-income transit riders; transit projects for operators with less than this threshold received a minimal impact rating.

Examples

The projects that most strongly supported this target were VTA and AC Transit projects, two operators whose share of low-income riders is over 40%. Example projects include San Pablo BRT and El Camino BRT. Muni and BART projects also strongly support this target for serving more than 10% of the region's low-income riders. Example projects include Geneva BRT and BART Metro Program.

Although Treasure Island Value Pricing and Downtown San Francisco Cordon Pricing includes significant increases to transit service, these two projects remove a free drive alone option and thus were rated as having a minimal impact on this target. No projects received a moderate or adverse impact.

Target 6: Increase the share of affordable housing in PDAs, TPAs, or high-opportunity areas by 15%

Staff considered projects to be supportive of this target if they serve jurisdictions that permitted high shares of affordable units in the last two RHNA cycles (1999-2014), irrespective of transportation mode.

Guidelines for Applying Criteria

To determine a project's potential support for affordable housing, a project's service area was first determined. The service area is the same as the service area for Target 2. Staff then evaluated the share of affordable units each jurisdiction permitted relative to their RHNA target. Affordable units are based on very low, low, and moderate income levels. Project's that serve areas with jurisdictions that approved more than 50% of their affordable housing target received strong support for this target. Staff created the RHNA thresholds such that region-wide performance was moderately supportive of the target.

Examples

Most of the cities in Contra Costa County and many cities in Sonoma County permitted high shares of affordable housing over the last decade. Projects serving these areas that received strong support for this target include San Pablo BRT, Sonoma County Bus Service Increases, and the SMART extension to Cloverdale.

Projects that received moderate adverse scores for this target served low growth communities of San Mateo County and communities that have permitted significant housing but at higher income levels like Dublin and Fremont. Example projects in this category include Caltrain Electrification, US 101 Express Lanes, Irvington BART Station, and I-580 Integrated Corridor Management.

Target 7: Reduce the share of low- and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at an increased risk of displacement to 0%

Admittedly, the criteria for this target was the most difficult to develop and implement. Staff determined that no transportation project would reduce the risk of displacement. These criteria assume that any increase in access would increase the attractiveness of a neighborhood, potentially leading to displacement of existing residents. The target score is a function of project location – whether a project serves a high growth area and the level of existing displacement risk for low-income and moderate- income households. If a project is completely outside of Priority Development Areas, the project would have a minimal impact on this target.

Guidelines for Applying Criteria

To determine a project's potential support for displacement risk, a project's service area was first determined. The service area is the same as the service area for Target 2 and Target 6. Staff then evaluated

whether the service area had high growth jurisdictions, planned to grow more than 20%, or was in an area with high displacement risk. An area is currently undergoing displacement if it exhibits displacement typologies 2-4 for both lower income and moderate to high income tracts per the Regional Early Warning System definitions (REWS). For a map of displacement trends, see: http://www.urbandisplacement.org/map# Because the REWS typologies are for census tracts, staff assumed that if more than 75% of a jurisdiction's tracts are undergoing displacement then the jurisdiction is underdoing displacement.

Examples

Based on planned growth in Plan Bay Area 2013 and existing displacement trends, all San Francisco projects received a strong adverse impact score for this target. The two central bay ferry projects also received strong adverse impact for the displacement conditions in Oakland and Alameda.

Projects that received a minimal impact include projects in Contra Costa County like the 680/SR-4 Interchange and ferry expansion to Hercules, Martinez and Antioch. Additionally, projects in Solano and Marin counties, which are either low growth areas or are not experiencing displacement issues, would only minimally impact this target.

Target 8: Increase the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit by 20**%** in congested conditions

Supportive projects were those that significantly decrease travel times and connected many workers to the region's job centers. Rating was dependent on project location and degree of travel time improvement.

Guidelines for Applying Criteria

Projects serving the regional job centers of San Francisco, Silicon Valley, and Oakland and that significantly increased access to these job centers by virtue of major transit extensions or frequency increases strongly supported this target. Projects with moderate travel time savings like an interchange that are also relatively far from a sub-regional job center received minimal scores. If a project increased travel time, it would adversely impact the target.

Examples

Major transit extensions to existing and future job centers strongly supported this target. Example projects include BART to San Jose and the extension of Caltrain to downtown San Francisco. Service increases throughout San Francisco also strongly support this target.

Interchange and highway projects far from subregional job centers minimally supported this target. Example projects include the SR-152 alignment and SR-4 widening in Brentwood. Maintenance investments in highways and local streets and roads would have a minimal effect on travel times and received minimal scores for this target.

Target 9: Increase by 38% the number of jobs in predominantly middle-wage industries)

Supportive projects were those that through construction and an increase in service would add both short term and long term jobs to the regional economy. If a project reduces the number of transportation-related jobs, like automating an existing bus route, would adversely impact this target. Transportation-related jobs are typically middle-wage and supportive of the target.

Guidelines for Applying Criteria

All projects received moderate or strong support for this target as all projects either require constructing new infrastructure or operating new service. For example, increased maintenance funding would require additional long-term workers and a highway operational project would require short term construction workers. Transit and ITS projects that require both short term construction workers and long term operators strongly support this target.

Examples

Constructing and operating express lanes and integrated corridors received strong support for this target. Additionally, constructing and operating rail extensions also received strong support.

Examples of moderate support include service frequency increases and auxiliary lane projects.

Target 10: Reduce per-capita delay on the Regional Freight Network by 20%

Supportive projects were those that reduce congestion on the highest delay highway segments for truck activity. Projects would receive negative scores if they actually increased travel time on the regional freight network.

Guidelines for Applying Criteria

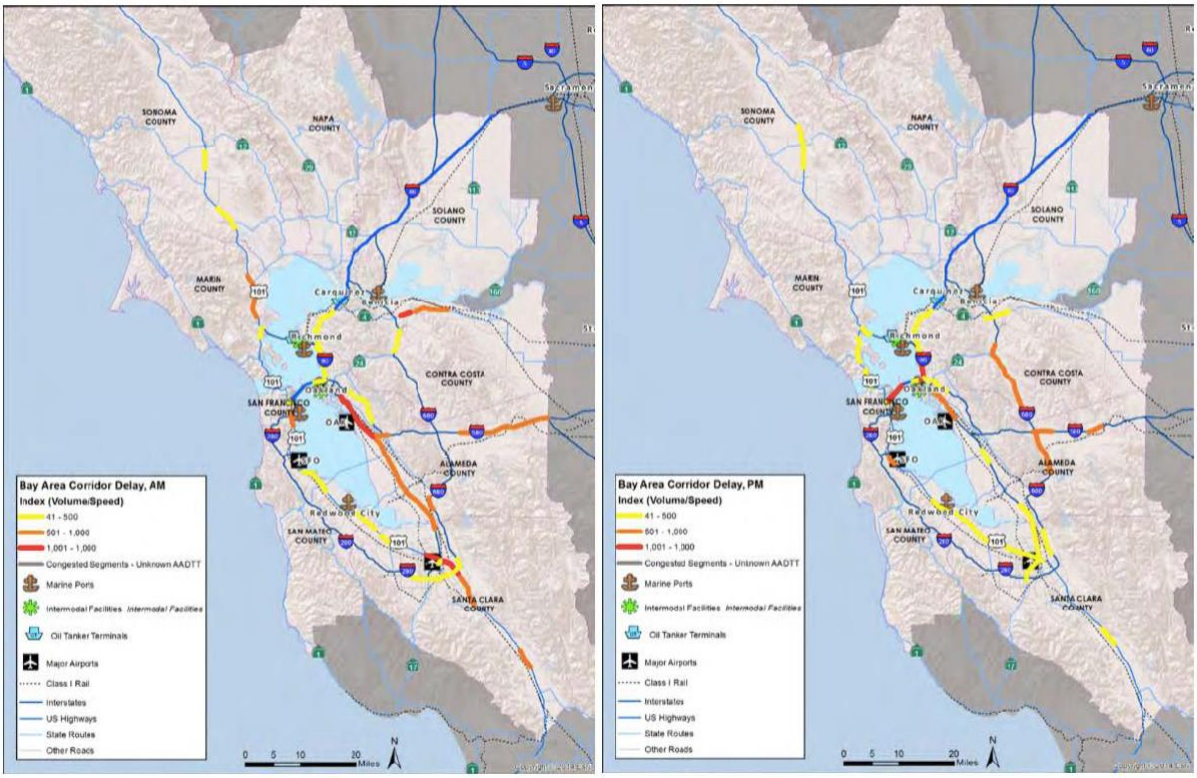
The MTC Regional Goods Movement Plan evaluated corridor delay and truck volumes. Projects that reduce congestion on segments with a medium or high corridor delay index would receive the highest score for this target. The corridor delay index is truck volume divided by speed so segments with high truck volumes and medium speed would receive the same index value as corridors with low truck volumes but significant congestion. The map is on the following page. Projects on the rest of the freight network or that would increase freight reliability would receive moderate scores and projects that do not affect the freight network would receive a minimal score.

Examples

The projects that received the strongest support were highway improvement projects on I-880 in Alameda County, US-101 in San Mateo, Marin, and Santa Clara counties, I-580 in Alameda County I-680 in Contra Costa and Alameda counties, and along the Bay Bridge. Example projects include US-101 Express Lanes, VTA Express Lane network, and the Columbus Day Initiative. Major transit projects that could remove driving trips from high-delay segments also received strong support. These projects include Regional Transit State of Good Repair and BART Metro Program.

No projects received negative scores for this target. Projects that minimally affected the goods movement network received a minimal score. These projects were mostly transit projects and included the Irvington

BART Station, Geary BRT, and El Camino BRT.



Source: Congested Segments from INRIX 2013; Truck Volumes data from Caltrans Truck Counts, 2012; Analysis by Cambridge Systematics, Inc.

Target 11: Increase non-auto mode share by 10%

Criteria for this target are similar to those for the CO_2 and PM targets. Projects that provide alternatives to the single occupant vehicle such as public transit or bicycling/walking are generally supportive of the target. Projects that would potentially increase the use of single occupancy vehicles received the lowest score.

Guidelines for Applying Criteria

Scoring for this target was very similar to the guidelines under Target 1. Transit projects were supportive of this target if they provided frequency or operational improvements that would make transit service more convenient and attractive. Highway projects could receive a moderate score if they were a managed lane project that would significantly benefit transit service along the corridor.

Examples

Projects with the strongest support were similar to the projects that received strong support in Target 1 but also included neighborhood bus projects that would increase walking and biking to transit. Example projects include AC Transit's San Pablo Avenue BRT and VTA's El Camino BRT.

Projects with the lowest score for this target were highway extension projects like TriLink and SR-152 Alignment due to their increase in auto accessibility without significant provisions for non-auto improvements.

Target 12: Reduce vehicle operating and maintenance costs due to pavement conditions by 100%

Projects that funded street resurfacing, either exclusively or part of an operational project, received moderate to strong support. Staff determined that no project would have an adverse impact to pavement condition by worsening pavement quality.

Guidelines for Applying Criteria

State of good repair investments in state highways and local streets and roads received the highest score for this target. Highway projects that either repaved existing pavement or replaced and existing facility received a moderate support.

Examples

Only two projects - Local Streets and Roads State of Good Repair and State Highways State of Good Repair - received strong support.

Projects like the 680/SR4 Interchange and TriLink received moderate support because they would replace and upgrade existing highway facilities.

Target 13: Reduce per-rider transit delay due to aged infrastructure by 100%

Projects that funded transit vehicle or asset replacement, either exclusively or part of an expansion project, received moderate to strong support. Staff determined that no project would have an adverse impact on transit asset condition by worsening asset quality.

Guidelines for Applying Criteria

State of good repair investments in transit systems received the highest score for this target. Transit service expansion projects that replaced existing vehicles received a moderate support score.

Examples

Regional Bus Maintenance and Regional Rail Maintenance were the only two projects that received a strong support for this target.

Caltrain Electrification and BART Metro Program received moderate support because these projects would replace and upgrade existing fleet and power systems. Caltrain Electrification would replace most of Caltrain's diesel vehicles with electric vehicles. BART Metro Program would replace and upgrade BART traction power system to support higher frequencies.

Target 2 Performance: Share of RHNA Allocation by Income Level for Bay Area Cities and Anticipated Growth in Plan Bay Area
Source: 1999-2014 RHNA and Plan Bay Area, 2013

Jurisdiction	County	1999-2014 RHNA Performance - Share of RHNA Allocation Permitted					Plan Bay Area Growth 2015-2040	Target 2 Performance
		Very Low	Low	Moderate	Above Moderate	# of Income Categories Above 40%		
Alameda	Alameda	41%	6%	12%	34%	1	16%	Moderate Adverse
Albany	Alameda	4%	21%	178%	47%	2	15%	Moderate Support
Berkeley	Alameda	47%	60%	14%	115%	3	17%	Moderate Support
Dublin	Alameda	24%	28%	21%	177%	1	45%	Minimal
Emeryville	Alameda	64%	25%	47%	244%	3	71%	Strong Support
Fremont	Alameda	23%	13%	22%	94%	1	21%	Minimal
Hayward	Alameda	26%	3%	63%	138%	2	23%	Moderate Support
Livermore	Alameda	14%	27%	41%	97%	2	27%	Moderate Support
Newark	Alameda	0%	0%	0%	37%	0	23%	Minimal
Oakland	Alameda	46%	35%	3%	91%	2	28%	Moderate Support
Piedmont	Alameda	84%	14%	71%	63%	3	2%	Minimal
Pleasanton	Alameda	10%	37%	18%	70%	1	22%	Minimal
San Leandro	Alameda	54%	227%	34%	124%	3	20%	Strong Support
Union City	Alameda	39%	18%	10%	153%	1	13%	Moderate Adverse
Unincorporated Alameda	Alameda	19%	40%	11%	78%	1	9%	Strong Adverse
Antioch	Contra Costa	31%	50%	179%	123%	3	14%	Moderate Support
Brentwood	Contra Costa	35%	32%	163%	331%	2	11%	Moderate Support
Clayton	Contra Costa	64%	26%	15%	54%	2	4%	Minimal
Concord	Contra Costa	16%	16%	8%	106%	1	38%	Minimal
Danville	Contra Costa	26%	64%	51%	101%	3	8%	Minimal
El Cerrito	Contra Costa	109%	52%	25%	135%	3	11%	Moderate Support
Hercules	Contra Costa	39%	50%	35%	330%	2	43%	Moderate Support
Lafayette	Contra Costa	43%	11%	7%	182%	2	13%	Moderate Support
Martinez	Contra Costa	9%	0%	1%	54%	1	8%	Strong Adverse
Moraga	Contra Costa	20%	0%	0%	41%	1	12%	Moderate Adverse

Target 2 Performance: Share of RHNA Allocation by Income Level for Bay Area Cities and Anticipated Growth in Plan Bay Area
Source: 1999-2014 RHNA and Plan Bay Area, 2013

Jurisdiction	County	1999-2014 RHNA Performance - Share of RHNA Allocation Permitted					Plan Bay Area Growth 2015-2040	Target 2 Performance
		Very Low	Low	Moderate	Above Moderate	# of Income Categories Above 40%		
Oakley	Contra Costa	96%	198%	226%	246%	4	41%	Strong Support
Orinda	Contra Costa	71%	30%	22%	169%	2	10%	Minimal
Pinole	Contra Costa	27%	8%	74%	41%	2	14%	Moderate Support
Pittsburg	Contra Costa	38%	98%	148%	173%	3	31%	Strong Support
Pleasant Hill	Contra Costa	36%	38%	83%	95%	2	8%	Minimal
Richmond	Contra Costa	32%	204%	32%	61%	2	24%	Moderate Support
San Pablo	Contra Costa	127%	66%	28%	110%	3	19%	Moderate Support
San Ramon	Contra Costa	20%	61%	84%	234%	3	17%	Moderate Support
Walnut Creek	Contra Costa	33%	21%	24%	148%	1	21%	Minimal
Unincorporated Contra Costa	Contra Costa	24%	19%	19%	184%	1	8%	Strong Adverse
Belvedere	Marin	33%	100%	67%	180%	3	2%	Minimal
Corte Madera	Marin	66%	55%	4%	147%	3	6%	Minimal
Fairfax	Marin	0%	0%	13%	33%	0	6%	Strong Adverse
Larkspur	Marin	22%	19%	8%	44%	1	6%	Strong Adverse
Mill Valley	Marin	81%	104%	52%	49%	4	6%	Minimal
Novato	Marin	49%	131%	64%	104%	4	5%	Minimal
Ross	Marin	9%	38%	30%	121%	1	6%	Strong Adverse
San Anselmo	Marin	21%	47%	2%	70%	2	5%	Minimal
San Rafael	Marin	8%	27%	46%	52%	2	13%	Moderate Support
Sausalito	Marin	37%	36%	4%	44%	1	6%	Strong Adverse
Tiburon	Marin	6%	17%	0%	122%	1	6%	Strong Adverse
Unincorporated Marin	Marin	43%	99%	61%	148%	4	4%	Minimal
American Canyon	Napa	29%	20%	11%	256%	1	28%	Minimal
Calistoga	Napa	28%	57%	3%	65%	2	2%	Minimal
Napa	Napa	23%	47%	60%	81%	3	11%	Moderate Support
St. Helena	Napa	20%	44%	62%	107%	3	2%	Minimal

Target 2 Performance: Share of RHNA Allocation by Income Level for Bay Area Cities and Anticipated Growth in Plan Bay Area
Source: 1999-2014 RHNA and Plan Bay Area, 2013

Jurisdiction	County	1999-2014 RHNA Performance - Share of RHNA Allocation Permitted					Plan Bay Area Growth 2015-2040	Target 2 Performance
		Very Low	Low	Moderate	Above Moderate	# of Income Categories Above 40%		
Yountville	Napa	54%	80%	86%	93%	4	2%	Minimal
Unincorporated Napa	Napa	7%	13%	23%	41%	1	7%	Strong Adverse
Atherton	San Mateo	44%	0%	0%	-2%	1	9%	Strong Adverse
Belmont	San Mateo	16%	21%	9%	105%	1	9%	Strong Adverse
Brisbane	San Mateo	4%	1%	7%	69%	1	12%	Moderate Adverse
Foster City	San Mateo	50%	30%	19%	113%	2	7%	Minimal
Half Moon Bay	San Mateo	0%	122%	0%	79%	2	6%	Minimal
Hillsborough	San Mateo	245%	132%	87%	147%	4	7%	Minimal
Colma	San Mateo	0%	384%	0%	30%	1	46%	Minimal
Daly City	San Mateo	16%	22%	7%	71%	1	12%	Moderate Adverse
Burlingame	San Mateo	0%	0%	29%	24%	0	25%	Minimal
Portola Valley	San Mateo	40%	18%	7%	54%	2	7%	Minimal
East Palo Alto	San Mateo	12%	62%	19%	89%	2	9%	Minimal
Menlo Park	San Mateo	16%	4%	8%	45%	1	14%	Moderate Adverse
Woodside	San Mateo	47%	50%	31%	410%	3	5%	Minimal
Millbrae	San Mateo	1%	3%	10%	211%	1	30%	Minimal
Mountain View	Santa Clara	28%	5%	9%	142%	1	24%	Minimal
Palo Alto	Santa Clara	39%	21%	27%	165%	1	22%	Minimal
Unincorporated San Mateo	San Mateo	16%	18%	0%	167%	1	19%	Moderate Adverse
Redwood City	San Mateo	12%	28%	11%	149%	1	25%	Minimal
San Bruno	San Mateo	52%	244%	94%	127%	4	24%	Strong Support
San Carlos	San Mateo	1%	4%	7%	76%	1	13%	Moderate Adverse
San Francisco	San Francisco	69%	34%	15%	127%	2	23%	Moderate Support
Pacifica	San Mateo	3%	10%	19%	78%	1	4%	Strong Adverse
San Jose	Santa Clara	47%	64%	7%	117%	3	34%	Strong Support
San Mateo	San Mateo	25%	19%	12%	103%	1	22%	Minimal

Target 2 Performance: Share of RHNA Allocation by Income Level for Bay Area Cities and Anticipated Growth in Plan Bay Area
Source: 1999-2014 RHNA and Plan Bay Area, 2013

Jurisdiction	County	1999-2014 RHNA Performance - Share of RHNA Allocation Permitted					Plan Bay Area Growth 2015-2040	Target 2 Performance
		Very Low	Low	Moderate	Above Moderate	# of Income Categories Above 40%		
Santa Clara	Santa Clara	27%	39%	31%	174%	1	26%	Minimal
Campbell	Santa Clara	15%	158%	44%	95%	3	15%	Moderate Support
Cupertino	Santa Clara	10%	10%	15%	103%	1	16%	Moderate Adverse
Gilroy	Santa Clara	18%	72%	38%	127%	2	16%	Moderate Support
Los Altos	Santa Clara	35%	44%	10%	674%	2	9%	Minimal
Los Altos Hills	Santa Clara	138%	67%	27%	411%	3	5%	Minimal
Los Gatos	Santa Clara	7%	84%	10%	178%	2	6%	Minimal
Milpitas	Santa Clara	62%	37%	46%	278%	3	49%	Strong Support
Monte Sereno	Santa Clara	78%	136%	75%	130%	4	6%	Minimal
Morgan Hill	Santa Clara	46%	83%	41%	163%	4	25%	Strong Support
So. San Francisco	San Mateo	35%	20%	17%	92%	1	26%	Minimal
Sunnyvale	Santa Clara	38%	117%	102%	106%	3	29%	Strong Support
Saratoga	Santa Clara	36%	13%	61%	126%	2	5%	Minimal
Unincorporated Santa Clara	Santa Clara	66%	158%	36%	167%	3	9%	Minimal
Benicia	Solano	25%	89%	83%	125%	3	11%	Moderate Support
Dixon	Solano	25%	1%	3%	115%	1	8%	Strong Adverse
Fairfield	Solano	3%	17%	40%	218%	2	26%	Moderate Support
Rio Vista	Solano	6%	66%	78%	187%	3	10%	Moderate Support
Suisun City	Solano	35%	63%	16%	164%	2	13%	Moderate Support
Vacaville	Solano	6%	77%	121%	89%	3	12%	Moderate Support
Vallejo	Solano	25%	26%	0%	97%	1	6%	Strong Adverse
Unincorporated Solano	Solano	0%	23%	0%	33%	0	18%	Strong Adverse
Cloverdale	Sonoma	64%	54%	85%	204%	4	21%	Strong Support
Cotati	Sonoma	41%	42%	30%	107%	3	15%	Moderate Support
Healdsburg	Sonoma	74%	107%	17%	105%	3	4%	Minimal
Petaluma	Sonoma	53%	53%	57%	132%	4	11%	Moderate Support

Target 2 Performance: Share of RHNA Allocation by Income Level for Bay Area Cities and Anticipated Growth in Plan Bay Area
Source: 1999-2014 RHNA and Plan Bay Area, 2013

Jurisdiction	County	1999-2014 RHNA Performance - Share of RHNA Allocation Permitted					Plan Bay Area Growth 2015-2040	Target 2 Performance
		Very Low	Low	Moderate	Above Moderate	# of Income Categories Above 40%		
Rohnert Park	Sonoma	41%	93%	63%	101%	4	19%	Moderate Support
Santa Rosa	Sonoma	30%	93%	86%	90%	3	21%	Strong Support
Sebastopol	Sonoma	41%	106%	36%	64%	3	11%	Moderate Support
Sonoma	Sonoma	69%	69%	37%	161%	3	6%	Minimal
Windsor	Sonoma	34%	57%	9%	142%	2	17%	Moderate Support
Unincorporated Sonoma	Sonoma	42%	36%	30%	85%	2	8%	Minimal

Target 5 Performance: Low Income Transit Ridership for Bay Area Operators
Source: MTC or Operator Survey, 2013-2016

Transit Operator	Share of Low Income Riders	Share of Regional Low Income Riders	Target 5 Performance
AC Transit	46%	15%	Strong Support
ACE	2%	0.0%	Minimal
BART**	21%	15%	Strong Support
Caltrain	9%	0.8%	Moderate Support
County Connection	31%	0.6%	Moderate Support
FAST**	33%	0.2%	Minimal
Golden Gate Transit (total)	15%	0.8%	Moderate Support
LAVTA	37%	0.3%	Minimal
Muni**	34%	46%	Strong Support
Napa Vine	38%	0.2%	Minimal
Petaluma	45%	0.1%	Strong Support
SamTrans	35%	3%	Minimal
Santa Rosa CityBus	52%	0.9%	Strong Support
SF Bay Ferry	4%	0.0%	Minimal
SolTrans	23%	0.4%	Minimal
Sonoma County	50%	0.4%	Strong Support
Tri-Delta	33%	0.6%	Moderate Support
Union City	36%	0.1%	Minimal
VTA**	55%	15%	Strong Support
WestCat**	32%	0.3%	Minimal
WETA	4%	0%	Minimal

**based on weekday ridership

Results are for weekday and weekend, except where noted.

Target 6 Performance: Share of RHNA Permitted for Very Low, Low, and Moderate Income Levels for Bay Area Cities
Source: 1999-2014 RHNA

Jurisdiction	County	1999-2014 Very Low + Low + Moderate RHNA Performance			Target 6 Performance
		RHNA Allocation	Permits Issued	Share Permitted	
Alameda	Alameda	2522	541	21%	Moderate Adverse
Albany	Alameda	333	251	75%	Strong Support
Berkeley	Alameda	2115	783	37%	Moderate Support
Dublin	Alameda	5174	1227	24%	Moderate Adverse
Emeryville	Alameda	1078	511	47%	Moderate Support
Fremont	Alameda	6640	1335	20%	Moderate Adverse
Hayward	Alameda	3623	1270	35%	Moderate Support
Livermore	Alameda	5141	1436	28%	Minimal
Newark	Alameda	1235	0	0%	Strong Adverse
Oakland	Alameda	12306	3144	26%	Minimal
Piedmont	Alameda	54	33	61%	Strong Support
Pleasanton	Alameda	4947	969	20%	Strong Adverse
San Leandro	Alameda	1426	1242	87%	Strong Support
Unincorporated Alameda	Alameda	5223	1070	20%	Moderate Adverse
Union City	Alameda	2418	550	23%	Moderate Adverse
Antioch	Contra Costa	3822	3623	95%	Strong Support
Brentwood	Contra Costa	3972	3205	81%	Strong Support
Clayton	Contra Costa	289	103	36%	Moderate Support
Concord	Contra Costa	2895	372	13%	Strong Adverse
Danville	Contra Costa	916	412	45%	Moderate Support
El Cerrito	Contra Costa	340	217	64%	Strong Support
Hercules	Contra Costa	648	257	40%	Moderate Support
Lafayette	Contra Costa	359	80	22%	Moderate Adverse
Martinez	Contra Costa	1334	52	4%	Strong Adverse
Moraga	Contra Costa	266	21	8%	Strong Adverse
Oakley	Contra Costa	1082	1819	168%	Strong Support
Orinda	Contra Costa	265	114	43%	Moderate Support
Pinole	Contra Costa	337	133	39%	Moderate Support

Target 6 Performance: Share of RHNA Permitted for Very Low, Low, and Moderate Income Levels for Bay Area Cities
Source: 1999-2014 RHNA

Jurisdiction	County	1999-2014 Very Low + Low + Moderate RHNA Performance			Target 6 Performance
		RHNA Allocation	Permits Issued	Share Permitted	
Pittsburg	Contra Costa	2367	2299	97%	Strong Support
Pleasant Hill	Contra Costa	754	408	54%	Strong Support
Richmond	Contra Costa	2639	1894	72%	Strong Support
San Pablo	Contra Costa	459	336	73%	Strong Support
San Ramon	Contra Costa	4584	2460	54%	Strong Support
Unincorporated Contra Costa	Contra Costa	5244	1097	21%	Moderate Adverse
Walnut Creek	Contra Costa	2034	548	27%	Minimal
Belvedere	Marin	17	11	65%	Strong Support
Corte Madera	Marin	244	98	40%	Moderate Support
Fairfax	Marin	92	5	5%	Strong Adverse
Larkspur	Marin	390	60	15%	Strong Adverse
Mill Valley	Marin	313	234	75%	Strong Support
Novato	Marin	2119	1523	72%	Strong Support
Ross	Marin	29	7	24%	Moderate Adverse
San Anselmo	Marin	150	28	19%	Strong Adverse
San Rafael	Marin	1971	558	28%	Minimal
Sausalito	Marin	212	50	24%	Moderate Adverse
Tiburon	Marin	156	10	6%	Strong Adverse
Unincorporated Marin	Marin	718	460	64%	Strong Support
American Canyon	Napa	1192	227	19%	Strong Adverse
Calistoga	Napa	162	43	27%	Minimal
Napa	Napa	3204	1386	43%	Moderate Support
St. Helena	Napa	163	68	42%	Moderate Support
Unincorporated Napa	Napa	1570	229	15%	Strong Adverse
Yountville	Napa	103	75	73%	Strong Support
San Francisco	San Francisco	31887	12600	40%	Moderate Support
Atherton	San Mateo	108	18	17%	Strong Adverse
Belmont	San Mateo	400	58	15%	Strong Adverse

Target 6 Performance: Share of RHNA Permitted for Very Low, Low, and Moderate Income Levels for Bay Area Cities
Source: 1999-2014 RHNA

Jurisdiction	County	1999-2014 Very Low + Low + Moderate RHNA Performance			Target 6 Performance
		RHNA Allocation	Permits Issued	Share Permitted	
Brisbane	San Mateo	496	22	4%	Strong Adverse
Burlingame	San Mateo	703	81	12%	Strong Adverse
Colma	San Mateo	85	73	86%	Strong Support
Daly City	San Mateo	1519	203	13%	Strong Adverse
East Palo Alto	San Mateo	1224	305	25%	Moderate Adverse
Foster City	San Mateo	600	192	32%	Moderate Support
Half Moon Bay	San Mateo	393	106	27%	Minimal
Hillsborough	San Mateo	81	128	158%	Strong Support
Menlo Park	San Mateo	1100	112	10%	Strong Adverse
Millbrae	San Mateo	453	23	5%	Strong Adverse
Pacifica	San Mateo	522	60	11%	Strong Adverse
Portola Valley	San Mateo	74	17	23%	Moderate Adverse
Redwood City	San Mateo	2534	384	15%	Strong Adverse
San Bruno	San Mateo	791	921	116%	Strong Support
San Carlos	San Mateo	537	22	4%	Strong Adverse
San Mateo	San Mateo	3175	584	18%	Strong Adverse
So. San Francisco	San Mateo	1724	421	24%	Moderate Adverse
Unincorporated San Mateo	San Mateo	1733	163	9%	Strong Adverse
Woodside	San Mateo	41	17	41%	Moderate Support
Campbell	Santa Clara	935	534	57%	Strong Support
Cupertino	Santa Clara	2067	254	12%	Strong Adverse
Gilroy	Santa Clara	3077	1105	36%	Moderate Support
Los Altos	Santa Clara	357	99	28%	Minimal
Los Altos Hills	Santa Clara	98	77	79%	Strong Support
Los Gatos	Santa Clara	580	150	26%	Minimal
Milpitas	Santa Clara	3746	1874	50%	Strong Support
Monte Sereno	Santa Clara	61	55	90%	Strong Support
Morgan Hill	Santa Clara	2110	1110	53%	Strong Support

Target 6 Performance: Share of RHNA Permitted for Very Low, Low, and Moderate Income Levels for Bay Area Cities
Source: 1999-2014 RHNA

Jurisdiction	County	1999-2014 Very Low + Low + Moderate RHNA Performance			Target 6 Performance
		RHNA Allocation	Permits Issued	Share Permitted	
Mountain View	Santa Clara	3467	520	15%	Strong Adverse
Palo Alto	Santa Clara	2598	771	30%	Minimal
San Jose	Santa Clara	34058	12033	35%	Moderate Support
Santa Clara	Santa Clara	6879	2144	31%	Moderate Support
Saratoga	Santa Clara	454	187	41%	Moderate Support
Sunnyvale	Santa Clara	4729	3824	81%	Strong Support
Unincorporated Santa Clara	Santa Clara	1811	1255	69%	Strong Support
Benicia	Solano	563	350	62%	Strong Support
Dixon	Solano	1302	138	11%	Strong Adverse
Fairfield	Solano	4416	913	21%	Moderate Adverse
Rio Vista	Solano	1485	701	47%	Moderate Support
Suisun City	Solano	946	330	35%	Moderate Support
Unincorporated Solano	Solano	1694	92	5%	Strong Adverse
Vacaville	Solano	4398	2987	68%	Strong Support
Vallejo	Solano	3634	586	16%	Strong Adverse
Cloverdale	Sonoma	487	343	70%	Strong Support
Cotati	Sonoma	490	180	37%	Moderate Support
Healdsburg	Sonoma	535	310	58%	Strong Support
Petaluma	Sonoma	1886	1029	55%	Strong Support
Rohnert Park	Sonoma	2143	1331	62%	Strong Support
Santa Rosa	Sonoma	8267	5533	67%	Strong Support
Sebastopol	Sonoma	257	141	55%	Strong Support
Sonoma	Sonoma	621	346	56%	Strong Support
Unincorporated Sonoma	Sonoma	4790	1723	36%	Moderate Support
Windsor	Sonoma	1686	481	29%	Minimal

Target 7 Performance: Share of Census Tracts with Displacement Risk for Bay Area Cities and Anticipated Growth in Plan Bay Area (2013)
Source: Urban Displacement Project, 2015; Plan Bay Area, 2013

Jurisdiction	County	Share of Tracts with Displacement Risk**	Plan Bay Area Growth	Target 7 Performance
Alameda	Alameda	81%	16%	Moderate Adverse
Albany	Alameda	100%	15%	Moderate Adverse
Berkeley	Alameda	73%	17%	Minimal
Dublin	Alameda	50%	45%	Moderate Adverse
Emeryville	Alameda	75%	71%	Moderate Adverse
Fremont	Alameda	23%	21%	Moderate Adverse
Hayward	Alameda	28%	23%	Moderate Adverse
Livermore	Alameda	28%	27%	Moderate Adverse
Newark	Alameda	0%	23%	Moderate Adverse
Oakland	Alameda	84%	28%	Strong Adverse
Piedmont	Alameda	50%	2%	Minimal
Pleasanton	Alameda	14%	22%	Moderate Adverse
San Leandro	Alameda	56%	20%	Moderate Adverse
Unincorporated Alameda	Alameda	50%	9%	Minimal
Union City	Alameda	20%	13%	Minimal
Antioch	Contra Costa	16%	14%	Minimal
Brentwood	Contra Costa	14%	11%	Minimal
Clayton	Contra Costa	0%	4%	Minimal
Concord	Contra Costa	30%	38%	Moderate Adverse
Danville	Contra Costa	0%	8%	Minimal
El Cerrito	Contra Costa	80%	11%	Moderate Adverse
Hercules	Contra Costa	17%	43%	Moderate Adverse
Lafayette	Contra Costa	40%	13%	Minimal
Martinez	Contra Costa	67%	8%	Minimal
Moraga	Contra Costa	50%	12%	Minimal
Oakley	Contra Costa	0%	41%	Moderate Adverse
Orinda	Contra Costa	0%	10%	Minimal

Target 7 Performance: Share of Census Tracts with Displacement Risk for Bay Area Cities and Anticipated Growth in Plan Bay Area (2013)
Source: Urban Displacement Project, 2015; Plan Bay Area, 2013

Jurisdiction	County	Share of Tracts with Displacement Risk**	Plan Bay Area Growth	Target 7 Performance
Pinole	Contra Costa	33%	14%	Minimal
Pittsburg	Contra Costa	38%	31%	Moderate Adverse
Pleasant Hill	Contra Costa	33%	8%	Minimal
Richmond	Contra Costa	65%	24%	Moderate Adverse
San Pablo	Contra Costa	17%	19%	Minimal
San Ramon	Contra Costa	0%	17%	Minimal
Unincorporated Contra Costa	Contra Costa	37%	8%	Minimal
Walnut Creek	Contra Costa	60%	21%	Moderate Adverse
Belvedere	Marin	0%	2%	Minimal
Corte Madera	Marin	50%	6%	Minimal
Fairfax	Marin	100%	6%	Moderate Adverse
Larkspur	Marin	50%	6%	Minimal
Mill Valley	Marin	33%	6%	Minimal
Novato	Marin	30%	5%	Minimal
Ross	Marin	0%	6%	Minimal
San Anselmo	Marin	67%	5%	Minimal
San Rafael	Marin	27%	13%	Minimal
Sausalito	Marin	0%	6%	Minimal
Tiburon	Marin	0%	6%	Minimal
Unincorporated Marin	Marin	19%	4%	Minimal
American Canyon	Napa	0%	28%	Moderate Adverse
Calistoga	Napa	100%	2%	Moderate Adverse
Napa	Napa	45%	11%	Minimal
St. Helena	Napa	50%	2%	Minimal
Unincorporated Napa	Napa	33%	7%	Minimal
Yountville	Napa	100%	2%	Moderate Adverse
San Francisco	San Francisco	88%	23%	Strong Adverse

Target 7 Performance: Share of Census Tracts with Displacement Risk for Bay Area Cities and Anticipated Growth in Plan Bay Area (2013)
Source: Urban Displacement Project, 2015; Plan Bay Area, 2013

Jurisdiction	County	Share of Tracts with Displacement Risk**	Plan Bay Area Growth	Target 7 Performance
Atherton	San Mateo	0%	9%	Minimal
Belmont	San Mateo	60%	9%	Minimal
Brisbane	San Mateo	100%	12%	Moderate Adverse
Burlingame	San Mateo	100%	25%	Strong Adverse
Colma	San Mateo	100%	46%	Strong Adverse
Daly City	San Mateo	61%	12%	Minimal
East Palo Alto	San Mateo	50%	9%	Minimal
Foster City	San Mateo	0%	7%	Minimal
Half Moon Bay	San Mateo	0%	6%	Minimal
Hillsborough	San Mateo	100%	7%	Moderate Adverse
Menlo Park	San Mateo	75%	14%	Minimal
Millbrae	San Mateo	67%	30%	Moderate Adverse
Pacifica	San Mateo	38%	4%	Minimal
Portola Valley	San Mateo	0%	7%	Minimal
Redwood City	San Mateo	53%	25%	Moderate Adverse
San Bruno	San Mateo	44%	24%	Moderate Adverse
San Carlos	San Mateo	44%	13%	Minimal
San Mateo	San Mateo	58%	22%	Moderate Adverse
So. San Francisco	San Mateo	100%	26%	Strong Adverse
Unincorporated San Mateo	San Mateo	50%	19%	Minimal
Woodside	San Mateo	0%	5%	Minimal
Campbell	Santa Clara	29%	15%	Minimal
Cupertino	Santa Clara	17%	16%	Minimal
Gilroy	Santa Clara	25%	16%	Minimal
Los Altos	Santa Clara	43%	9%	Minimal
Los Altos Hills	Santa Clara	50%	5%	Minimal
Los Gatos	Santa Clara	56%	6%	Minimal
Milpitas	Santa Clara	13%	49%	Moderate Adverse

Target 7 Performance: Share of Census Tracts with Displacement Risk for Bay Area Cities and Anticipated Growth in Plan Bay Area (2013)
Source: Urban Displacement Project, 2015; Plan Bay Area, 2013

Jurisdiction	County	Share of Tracts with Displacement Risk**	Plan Bay Area Growth	Target 7 Performance
Monte Sereno	Santa Clara	0%	6%	Minimal
Morgan Hill	Santa Clara	44%	25%	Moderate Adverse
Mountain View	Santa Clara	58%	24%	Moderate Adverse
Palo Alto	Santa Clara	67%	22%	Moderate Adverse
San Jose	Santa Clara	32%	34%	Moderate Adverse
Santa Clara	Santa Clara	39%	26%	Moderate Adverse
Saratoga	Santa Clara	17%	5%	Minimal
Sunnyvale	Santa Clara	63%	29%	Moderate Adverse
Unincorporated Santa Clara	Santa Clara	29%	9%	Minimal
Benicia	Solano	14%	11%	Minimal
Dixon	Solano	67%	8%	Minimal
Fairfield	Solano	19%	26%	Moderate Adverse
Rio Vista	Solano	100%	10%	Moderate Adverse
Suisun City	Solano	0%	13%	Minimal
Unincorporated Solano	Solano	0%	18%	Minimal
Vacaville	Solano	45%	12%	Minimal
Vallejo	Solano	29%	6%	Minimal
Cloverdale	Sonoma	0%	21%	Moderate Adverse
Cotati	Sonoma	50%	15%	Minimal
Healdsburg	Sonoma	100%	4%	Moderate Adverse
Petaluma	Sonoma	38%	11%	Minimal
Rohnert Park	Sonoma	11%	19%	Minimal
Santa Rosa	Sonoma	44%	21%	Moderate Adverse
Sebastopol	Sonoma	100%	11%	Moderate Adverse
Sonoma	Sonoma	67%	6%	Minimal
Unincorporated Sonoma	Sonoma	24%	8%	Minimal
Windsor	Sonoma	33%	17%	Minimal

**based on the following typologies: At risk of gentrification or displacement, undergoing displacement, and advanced gentrification for lower income and moderate to high income tracts

Appendix B: Benefit Valuations

	Benefit	Valuation ($2017)	What does this valuation represent?
Travel Time and Reliability	In-Vehicle Travel Time per Person Hour of Travel	$12.66	In-vehicle travel time for auto and transit users is set at 50% of the median regional wage rate ($25.32). [7] The valuation represents the discomfort to travelers of enduring transportation-related delay and the loss in regional productivity for on-the-clock travelers and commuters.
	Transit Out-of-Vehicle Travel Time per Person Hour of Travel	$27.85	This value is equal to 2.2 times the valuation of in-vehicle travel time.[8] The valuation represents the additional discomfort to travelers of experiencing uncertainty of transit arrival time, exposure to inclement weather conditions, and exposure to safety risks.
	Freight/Truck In-Vehicle Travel Time per Vehicle Hour of Travel	$33.69	The valuation is the total hourly compensation paid to truck drivers. This valuation represents the labor cost of transporting goods on the roadway network,[9] multiplied by a total compensation factor to estimate the total compensation cost.[10]
	Auto Travel Time Reliability per Person Hour of Non-recurring Delay	$12.66	The value is set equal to the value of in-vehicle travel time for autos. The valuation represents the additional traveler frustration of experiencing non-expected incident related travel delays.
	Freight/Truck Travel Time Reliability per Vehicle Hour of Non-recurring Delay	$33.69	The value is set equal to the value of in-vehicle travel time for trucks. The valuation represents the additional loss of regional productivity due to experiencing non-expected incident related travel delays.
Safety	Fatality Collisions (per fatality)	$10.8 million	The valuation includes the internal costs to a fatality collision victim (and their family) resulting from the loss of life, as well as the external societal costs. [11]
	Injury Collisions (per injury)	$124,000	The valuation includes the internal costs to an individual (and their family) resulting from the injury, as well as the external societal costs. [12]
	Property Damage Only Collision (per incident)	$4,590	The valuation includes the internal costs to a property damage collision victim (and their family) resulting from the time required to deal with the

[7] Valuation source: Plan Bay Area 2013, guidance from USDOT and Caltrans. Median wage is for the San Francisco-Oakland-Fremont MSA ($23.72), from the Bureau of Labor Statistics 2014 Metropolitan Area Occupational Employment and Wage and uprated to 2017 using a 2.2% expansion rate.

[8] Valuation source: FHWA Surface Transportation Economic Analysis Model (STEAM).

[9] Source: FHWA Highway Economic Requirements System. The wage value used is the weighted average of the mean wage rates for light and heavy truck drivers in the San Francisco-Oakland-Fremont MSA ($20.61), adjusted with a 2.2% escalation rate between 2014 and 2017.

[10] The total compensation factor is the national average total compensation divided by the national average wages, from the Bureau of Labor Statistics 2014 Employer Costs of Employee Compensation survey.

[11] Source: NHTSA May 2015 revision to The Economic and Societal Impact of Motor Vehicle Crashes

[12] See note 11.

Benefit		Valuation ($2017)	What does this valuation represent?
			collision, as well as the external societal costs from this loss of time. [13]
GHG Emissions	CO_2 per Metric Ton	$100	This valuation represents the full global social cost of an incremental unit (metric ton) of CO_2 emission from the time of production to the damage it imposes over the whole of its time in the atmosphere.[14]
Air Quality	Diesel $PM_{2.5}$ per Ton	$665,400	These valuations represent the negative health effects of increased emissions including[15] loss of productivity, direct medical costs, pain and anxiety that result from adverse effects, loss of enjoyment time, and adverse effects on others due to health impacts.
	Direct $PM_{2.5}$ per Ton	$658,800	
	NO_x per Ton	$6,000	
	Acetaldehyde per Ton	$5,100	
	Benzene per Ton	$15,200	
	1,3-Butadiene per Ton	$42,600	
	Formaldehyde per Ton	$5,900	
	All Other ROG per Ton	$4,300	
	SO_2 per Ton	$22,200	
Operating, Parking and Ownership Costs	Auto Operating Costs per Auto Mile Traveled	$0.3072	This valuation represents the variable costs (per mile) of operating a vehicle, including fuel, maintenance, depreciation (mileage), and tires. Fuel costs and efficiencies reflect 2040 forecasts.[16]
	Truck Operating Costs per Truck Mile Traveled	$0.8795	
	Parking Costs per Auto Trip	Model Output	This valuation is consistent with parking cost estimation in Travel Model One.
	Auto Ownership Costs per Vehicle (change in the number of autos)	$3,920	This valuation represents the annual ownership costs of vehicles, beyond the per mile operating costs. This valuation includes purchase/lease costs, maintenance, and finance charges.[17]
Health	Costs of Physical Inactivity: Morbidity and Productivity, per Active Adult	$1,341	This valuation represents the savings achieved by influencing an insufficiently active adult to engage in moderate physical activity five or more days per week for at least 30 minutes. It reflects annual Bay Area health care cost savings of $326 (2006 dollars), as well as productivity savings of $717 (2006 dollars).[18]

[13] See note 11

[14] Source: Interagency Working Group on Social Cost of Carbon and using the 2040 cost at a 2.5% discount rate, adjusted to 2017 dollars.

[15] Source: BAAQGM Multi-Pollution Evaluation Method (MPEM

[16] Source: 2014 California High Speed Rail Benefit-Cost Analysis.

[17] Source: 2011-2012 Consumer Expenditure Survey (Bureau of Labor Statistics, 2014).

[18] Source: "The Economic Costs of Overweight, Obesity, and Physical Inactivity Among California Adults", California Center for Public Health Advocacy/Chenweth and Associates, 2006,

	Benefit	Valuation ($2017)	What does this valuation represent?
	Costs of Physical Inactivity: Mortality, per Life Saved	$10.8 million	The value of life estimation from the fatality benefit is used again to determine the value of reducing life-threatening disease by becoming more active.[19]
Noise	Noise per Auto Mile Traveled	$0.0013	This valuation represents the property value decreases and societal cost of noise abatement.[20]
	Noise per Truck Mile Traveled	$0.0170	

[19] Source: World Health Organization's Health Economic Assessment Tool, available online: http://www.heatwalkingcycling.org/

[20] Source: May 2000 addendum to the FHWA federal Cost Allocation report.

Appendix C: State of Good Repair Performance Assessment – Objectives and Methodology

Assessment Objectives

In order to integrate state of good repair and to allow it to be assessed on a level playing field with other investments, MTC staff developed and implemented new methodologies for evaluating roads and public transit maintenance. By quantifying the effects of asset condition on system users, these investments were analyzed for their cost-effectiveness and their support of regional performance targets, just like a traditional expansion project, using the regional travel demand model. The ultimate objective was to have "apples to apples" performance results, meaning that the scores could be easily compared between project performance and state of good repair performance to inform key policy decisions.

By evaluating state of good repair investments in the same manner as expansion and efficiency projects, staff sought to provide additional information for policymakers to address the following questions:

- How does system maintenance perform relative to expansion and efficiency investments – both in terms of cost-effectiveness and targets support?
- Within the realm of state of good repair, what differences exist between modes and operators when it comes to cost-effectiveness and targets support?
- Are certain state of good repair investments high-performing, and if so, should they be eligible for regional discretionary dollars?
- Are certain state of good repair investments low-performing, and if so, is there a compelling case for funding these investments regardless of this status?

Approach

As the state of good repair performance assessment is designed to complement both the existing project performance and needs assessments, it builds off of the existing frameworks used in prior Plans. Like the project performance assessment, state of good repair performance was evaluated based on two primary scores:

- **Benefit-cost ratio**. By exploring how asset conditions (forecasted by StreetSaver and TERM- Lite) affect system operations, Travel Model One simulates how system users respond to improved or degraded infrastructure. These benefits are monetized and compared to the costs of SGR investments as part of a benefit-cost assessment. For more information on the benefit-cost tool, COBRA, see this website: https://github.com/MetropolitanTransportationCommission/travel-model-one/tree/master/utilities/PBA40/metrics
- **Targets score.** State of good repair investments can also be evaluated qualitatively against performance targets in the same manner as expansion projects. This is consistent with the approach taken in Plan Bay Area, albeit with the new Plan Bay Area 2040 targets.
- **Other supplemental data.** Several supplemental assessments being conducted for the project performance assessment will also be made available for state of good repair, including an examination of equity impacts, a confidence assessment of benefit-cost results, and sensitivity testing of the final results.

Given the thousands of assets that need to be replaced over the course of the Plan cycle, it was not possible to conduct a performance assessment of each asset individually. Instead, MTC assessed performance at a modal and system level, looking at the impacts of different funding levels on operations and ultimately system users. For pavement maintenance on local streets and state highways, benefit-cost ratios and targets scores were produced for the following scenarios:

- For local streets and roads: Preservation of existing conditions vs. system degradation
- For local streets and roads: Preservation of existing conditions vs. local funding only
- For state highways: Preservation of existing conditions vs. system degradation
- For state highways: Achievement of ideal conditions vs. preservation of existing conditions

Benefit-Cost Methodology for Local Streets and Roads and State Highways

In the case of local streets & roads and state highways, it is important to note that the methodology focuses specifically on the benefits and costs for pavement preservation and does not address non-pavement assets. This is due to the fact that sufficient literature exists on the user benefits associated with pavement preservation, while benefits of non-pavement assets may be more difficult to quantify. That said, preserving pavements in the San Francisco Bay Area costs billions of dollars over the Plan lifecycle, playing a primary role in local streets and state highway needs over the coming decades. For the sake of simplicity, the term "road maintenance" in this document refers specifically to the pavement on the roads in question.

While the methodology has been finalized for this iteration of the Plan, future efforts could enhance and expand on this work to provide even more refined results. Further discussion of research opportunities in this area will be included in a document slated for release later this year.

Step 1: Forecast year 2040 pavement conditions by city and facility type using StreetSaver.

1. Before analyzing a given scenario for road state of good repair, it is necessary to identify the following characteristics:
    a. Geographic scope[21]
    b. Facility type(s)[22]
    c. Funding prioritization strategy[23]
    d. Horizon year for analysis[24]
2. A state of good repair scenario compares conditions and impacts to users and society for two different funding levels. Before running StreetSaver, it is necessary to identify:
    a. Baseline funding level for pavement preservation[25] or baseline PCI target
    b. "With-project"[26] funding level for pavement preservation or "with-project" PCI target

[21] For the purposes of this work, analysis was performed on the regional level. However, it would be possible to use this methodology to analyze benefits on a county or city level as well.
[22] For the purposes of this work, analysis was performed for the entire local streets and roads system and for the entire state highway system. However, it would be possible to use this methodology to study arterials in isolation, for example.
[23] Weighting factors for arterials, collectors, and residential streets in StreetSaver
[24] For the purposes of this work, the Plan has a horizon year of 2040.
[25] Regional funding for pavement preservation directed towards the geography and facilities in question
[26] Higher level of funding being analyzed in comparison to baseline

3. StreetSaver also requires an inventory or dataset of street conditions in the baseline year as a foundation for forecasting pavement conditions in a future year:
    a. For local streets and roads: this data is readily available for all jurisdictions in the San Francisco Bay Area via StreetSaver itself.[27]
    b. For state highways: Caltrans develops an inventory of pavement conditions every few years that can be converted into StreetSaver using the IRI[28]-to-PCI conversion formula discussed later this in document[29].
4. Run MTC's StreetSaver asset management model[30] to forecast pavement conditions in the horizon year for both the baseline and "with project" funding levels using the parameters identified above. If a PCI target seek forms the basis of this scenario instead of funding levels, run StreetSaver in that mode instead. (Note that this approach is consistent with the needs assessment process for Plan Bay Area 2040.)
    a. For each local streets and roads scenario, request that StreetSaver output pavement conditions by jurisdiction, facility type, and PCI bin in terms of lane-mileage.[31]
        i. Jurisdictions: 101 cities, 8 counties
        ii. Facility types: arterials, collectors, residential/local streets, other
        iii. PCI bins[32]: 25 or less, 26 to 30, 31 to 35, 36 to 40, 41 to 45, 46 to 50, 51 to 60, 61 or greater
    b. For each state highway scenario, request that StreetSaver output pavement conditions for three bins commonly used by Caltrans: good (IRI of 1 to 94), fair (IRI of 95 to 170), and poor (IRI greater than 170).[33] Unlike local streets, the state highway system was analyzed on the regional, rather than jurisdictional, level due to the coarseness of the Caltrans data.

Step 2: Convert pavement conditions into operational impacts for roadway users.

Note to readers: *In benefit-cost analysis, it is important to clearly delineate benefits to users and to society and costs to the system operator without double-counting any metrics in the process. For a more detailed explanation of the inclusion or exclusion of certain benefits, and an overarching literature*

[27] This analysis relied on the inventories as of late 2015, the most recent available at the time the analysis began.
[28] IRI stands for the International Roughness Index, an alternative measure of pavement conditions.
[29] This analysis relied on the latest iteration of that Caltrans dataset produced in late 2013.
[30] StreetSaver leverages inventories of local streets and state highways with pavement condition index (PCI) data for each segment. Note that PCI ranges from 0 to 100; higher index scores mean that roads are in better condition. StreetSaver operates using the principles of life-cycle cost assessment described above to maximize the cost effectiveness of pavement investments, factoring in the higher costs of repair as a result of deferred maintenance and mimicking the decision choices of pavement management professionals across the region. Funding level and prioritization inputs to StreetSaver affect its decisions about which pavements should get specific treatments, as it seeks to maximize pavement condition over time given resource constraints. In addition to being able to run StreetSaver with a given funding level, it can be run to seek to achieve a PCI and report back the funding level required.
[31] As there is not a one-for-one relationship between street segments in StreetSaver and Travel Model One, it is necessary to do some level of aggregation for local streets and state highways. Future upgrades to both tools will make it possible to link them directly on every street segment.
[32] As defined by MTC's StreetSaver team to provide more refined information between PCI of 25 and PCI of 60.
[33] These bins were designed to maximize consistency with Caltrans' historical reporting of pavement condition by district. As such, conditions and impacts for the state highway network are not geographically specific in the way local streets and roads are.

review, please refer to Paterson and Vautin (2015) in the TRB 94th Annual Meeting Compendium of Papers.[34]

1. Summarize cost outputs from the StreetSaver files for use in Step 4 below. Note that road maintenance costs to system operators – the basis for the cost side of the benefit-cost ratio – are relatively straightforward thanks to StreetSaver; they represent the difference between the two funding levels for the scenario in question, as the region's transportation agencies will be expending these dollars.[35]
2. In order to calculate benefits, it is necessary to focus on the impacts to system users and to society. Timely maintenance is known to reduce treatment costs over time, yielding greater marginal benefits by reducing deferred maintenance.[36] Travel Model One is used to forecast these benefits based on the operational impacts expected on roads across the network[37]. In the case of road maintenance, there are two primary direct[38]operational impacts demonstrated and quantified in literature[39]: **vehicle maintenance and repair costs** (for automobiles, trucks and buses) and **vehicle fuel costs** (for automobiles, trucks and buses).[40] Benefits derived from these operational impacts are calculated in Step 3 below and include time, cost, emissions, health, and safety impacts (among others)[41].
    a. Load the local streets and/or state highway StreetSaver output tables into the Operational Impact Calculator (OIC)[42]. OIC automatically calculates the share of lane-mileage in each jurisdiction and facility type combination that falls into each PCI bin.
    b. Given that StreetSaver outputs lane-mileage by jurisdiction, by facility type, and by PCI bin, and that Travel Model One requires vehicle operator costs by jurisdiction and by facility type, OIC makes the conversion to connect the two models, starting with a PCI to IRI conversion using a formula developed by Park, Thomas, and Lee.[43] While StreetSaver does not include data on segment IRI due to the unreliability of IRI data collection on lower-speed facilities, it is possible to estimate IRI based on observed PCI as shown

[34] See URL: http://trid.trb.org/view.aspx?id=1336990
[35] Funding levels can be either inputs or outputs of StreetSaver in Step 1B.
[36] While a lower level of pavement preservation funding may reduce the cost side of the B/C ratio, it will also worsen pavement conditions and thus reduce the benefit side of the ratio as well – capturing the adverse impacts of deferred maintenance (as the remaining dollars will stretched even thinner).
[37] Travel Model One, and the overall assessment framework, is focused on long-term benefits and disbenefits and does not incorporate the positive and negative impacts associated with construction activities.
[38] Expansion project example: faster travel time from a bus frequency boost; state of good repair project example: educed fuel costs from pavement preservation funding
[39] Refer to the TRB paper cited above for additional discussion on this particular topic.
[40] Several other smaller-scale benefits may exist but lack a quantifiable link between pavement condition and operational impacts. Both are related to non-motorized users – bicycle maintenance costs may increase as pavement condition worsens, and non-motorized users may be particularly susceptible to safety hazards as pavement conditions worsens. Additional research efforts could address these limitations and quantify these expected links. Other often-cited operational impacts are weak at best – air quality and travel time impacts from pavement condition are likely small or negligible, especially when compared to indirect effects from induced demand.
[41] More information on this can be found in the upcoming Plan Bay Area 2040 Performance Assessment Report, as well as the materials provided to the Performance Working Group.
[42] Spreadsheet tool developed by MTC to link StreetSaver and Travel Model One using national research as described below.
[43] Park, K., N. Thomas, and K. Lee. *Applicability of the International Roughness Index as a Predictor of Asphalt Pavement Condition*, 2007. Published in the *Journal of Transportation Engineering*.

below.[44] This calculation is not necessary for highway data, as it was converted to IRI under Step 1.

$$PCI = 100(IRI)^{-0.436}$$

c. Next, maintenance cost adjustment factors and fuel cost adjustment factors are calculated by OIC using NHCRP Report 720 formulas. For each PCI bin, the IRI upper bound is used to calculate the maximum percent increase in maintenance and fuel costs for each vehicle type (auto, small truck, heavy truck, and bus[45]) compared to ideal conditions. Given that speed limit data is unavailable for every road in the region, and many roads have congested speeds lower than their posted limits, local roads were assumed to have an average speed of 35 mph while state highways were assumed to have an average speed of 55 mph.[46]

d. Finally, for each jurisdiction, facility type, and vehicle type, OIC calculates weighted average adjustment factors were calculated based on the share of roads in each PCI bin. OIC's final output is a series of maintenance cost adjustment factors and fuel cost adjustment factors which can be applied across all roads of a given facility type in a given jurisdiction, specific to each vehicle type discussed above.

Step 3: Run Travel Model One using operational impacts to explore benefits & disbenefits.

1. Convert the output matrices from the two operational impact spreadsheets into a Cube-readable format.[47]
    a. For local streets and roads: update Matrix A, which reflects each jurisdiction's adjustment factors in a machine-readable line with its Travel Model One "cityname" field. Unincorporated areas are flagged with a -1 variable, triggering the model to apply the unincorporated county adjustment factors instead. The matrix can then be handed off to the modeling team.
    b. For state highways: update scalar B, which reflects the adjustment factors applied across the entire state highway network. These inputs are then translated into script text that can be handed off to the modeling team.

2. Run Travel Model One twice: once with baseline conditions and once with "with project" conditions to evaluate how travelers respond to changing asset conditions. While additional information on the model can be found in Travel Model One documentation[48], a rough and high-level summary of how the model applies the adjustment factors and associated costs for maintenance & fuel can be found below:
    a. The adjustment factor matrices are multiplied by the ideal maintenance costs and ideal fuel costs per mile; these values are then summed to create a vehicle operating cost for each jurisdiction, facility type, and vehicle type combination.

[44] Note that IRI in the formula above is output in meters per kilometer; IRI data from StreetSaver is output in inches per mile and then converted accordingly.
[45] Vehicle types from NHCRP 720 were correlated with MTC vehicle types as follows: auto = medium car, small truck = light truck, heavy truck = articulated truck, bus = heavy bus.
[46] To better reflect operating impacts on highly degraded streets, maintenance cost adjustment factors were capped between 2.0 and 3.0 (depending on vehicle class) and fuel cost adjustment factors were capped between 1.05 and 1.13 (depending on vehicle class).
[47] Cube is the travel model software used by Travel Model One for network coding.
[48] For more information: http://mtcgis.mtc.ca.gov/foswiki/Main/UsersGuide

b. Every link on the network is assigned specific attributes; one set of these attributes is the operating cost per mile for each vehicle type traversing the network. The operating cost attributes in the matrix above are assigned to the geography or jurisdiction in question. For example, all of the arterials in city X would be assigned four attributes, one for each vehicle type on the network.
c. The model then begins to simulate how travelers respond to the various vehicle operating costs on the links they decide to traverse, generating impacts to those travelers but also influencing their decisions. This approach is similar to what is done for expansion projects, insofar that new conditions are loaded on the network and benefits/disbenefits are a result of the input conditions.
d. Metrics calculated by Travel Model One are produced for the two runs, including the inputs to the COBRA benefit-cost script.

Step 4: Calculate benefit-cost ratio using Travel Model One outputs and funding levels from StreetSaver.

1. First, calculate the costs by subtracting the 24-year baseline StreetSaver treatment costs[49] from the "with-project" treatment costs. In order to compare to the annualized benefit, divide by 24 to calculate the expenditures in a single year.
2. Second, calculate the benefits by running the COBRA benefit-cost script using the Travel Model One output CSV files. The benefits associated with the scenario are calculated by COBRA using standard benefit monetizations[50] applied to all projects evaluated for Plan Bay Area 2040, which compares the "with-project" and baseline conditions.
3. Finally, COBRA outputs the benefit-cost ratio by dividing the annualized benefits by the annualized costs. The result is a B/C ratio that reflects the benefits to users and society from increasing maintenance funding as defined in the scenario.

Benefit-Cost Methodology for Transit

This section provides additional detail on the Plan Bay Area 2040 methodology used for the state of good repair benefit-cost assessments of public transit. In short, the methodology is designed to link the TERM-Lite asset management model[51] used for the needs assessment purposes to Travel Model One (the regional travel demand model used for performance assessment purposes). The end result is an "apples to apples" benefit-cost ratio that allows for the comparison of expansion and maintenance across modes based on impacts to system users and society at large.

In the case of public transit, it is important to note that the methodology focuses on operational impacts of asset condition – i.e., slow zones, stoppages, etc. – and how those impacts benefit or disbenefit existing and potential riders. Because safety is priority #1, it is assumed that operators would stop or delay service rather than risking harm to passengers. These sorts of time impacts – either from asset failures or from shutdowns or slowdowns associated with safety – have been quantified via significant research on the national and regional levels. However, improved asset condition may also affect the perception of a given mode – i.e., cleaner seats on new buses or brighter platforms at new/refreshed

[49] Adjusted to year 2017 dollars using a 2.2% inflation rate.
[50] Benefit categories include: travel time, non-transfer user cost, public health, air pollutants, greenhouse gas emissions, noise, etc.
[51] For more information on TERM-Lite, refer to the Federal Transit Administration's website: http://www.fta.dot.gov/13248_13251.html.

rail stations. Due to a lack of data on these types of aesthetic or non-operational impacts, the transit state of good repair analysis focuses primarily on assets with direct operational impacts, while recognizing that there may be smaller secondary benefits that cannot be easily quantified or monetized. Future efforts could enhance and expand on this work to provide even more refined results.

Step 1: Forecast year 2040 transit asset ages for a given operator(s) using TERM-Lite.

1. Before analyzing a given scenario for transit state of good repair, it is necessary to identify the following characteristics:
    a. Agency + mode combination(s) subject to analysis[52]
    b. Asset categories subject to analysis[53]
    c. Funding prioritization strategy[54]
    d. Horizon year for analysis[55]

2. A state of good repair scenario compares conditions and impacts to users and society for two different funding levels. Before running TERM-Lite, it is necessary to identify:
    a. Baseline funding level for transit asset preservation[56] or baseline PAOUL[57] target[58]
    b. "With-project"[59] funding level for transit asset preservation or "with-project" PAOUL target

3. TERM-Lite also requires an inventory or dataset of transit assets in the baseline year as a foundation for forecasting pavement conditions in a future year, generally collected every four years by MTC[60].

4. Run the TERM-Lite asset management model to forecast asset ages in the horizon year[61] for both the baseline and "with project" funding levels using the parameters identified above. If a PAOUL target seek (such as preserve current PAOUL or zero PAOUL) forms the basis of this scenario instead of funding levels, run TERM-Lite in that mode instead. (Note that this approach is generally consistent with the needs assessment process for Plan Bay Area 2040.)

[52] For the purposes of this work, analysis was performed for each of the region's seven major operators by bus and rail (when applicable) as well as the remaining small operators as a group. No national or regional methodology is currently available for ferries, meaning that ferries were not analyzed in this analysis; future work could involve regression analysis to identify coefficients for a ferry mode.
[53] For the purposes of this work, analysis was performed for the system as a whole, rather than calculating a benefit-cost ratio specifically for vehicle replacement (for example). However, the methodology could be used for that type of task in the future.
[54] For the purposes of this work, funding was prioritized using the same approach as the needs assessment – 90% based on the TCP score and 10% based on condition.
[55] For the purposes of this work, the Plan has a horizon year of 2040.
[56] Regional funding for transit asset preservation directed towards the operator and system in question
[57] PAOUL stands for the percent of transit assets past their useful lives – i.e., share of aged assets.
[58] When run in target mode that seeks to reduce the backlog, TERM-Lite needs to know the year by which the target needs to be achieved (and preserved thereafter). For this analysis, a year 10 assumption for target achievement is provided as an input in line with the Needs Assessment work.
[59] Higher level of funding being analyzed in comparison to baseline
[60] Refer to the Plan Bay Area 2040 Needs Assessment work for more information on this process.
[61] To minimize noise from asset replacement in the horizon year dataset, a five-year average age (with the horizon year as its midpoint) for each asset is output by TERM-Lite.

5. For each public transit scenario, request the following TERM-Lite output values for every asset in the relevant inventory:
    - Basic Information
        - TRS ID – transit operator ID code
        - Transit System – name of system
        - Asset Type Code – five-digit code identifying category & element across operator
        - Category, Sub-Category, Element, Sub-Element – associated text data for validation purposes
        - Operational Flag – binary variable identifying the asset has operational impacts[62]
    - Age Data
        - Useful Life
        - Date Built
        - Age – five-year average age in horizon year[63]
    - Quantity and Valuation Data
        - Quantity[64]
        - Units[65]
        - Valuation – value of the asset(s) in question
        - Investment Costs by Year – stream of rehabilitation and replacement costs by year for a given asset(s)

Step 2: Convert asset ages into failure rates and associated delays from vehicle and non-vehicle assets.

Note to readers: *In benefit-cost analysis, it is important to clearly delineate benefits to users and to society and costs to the system operator without double-counting any metrics in the process. For a more detailed explanation of the inclusion or exclusion of certain benefits, and an overarching literature review, please refer to Paterson and Vautin (2015) in the TRB 94th Annual Meeting Compendium of Papers[66] and the Journal of Public Transportation.[67]*

1. Begin this part of the process as a new iteration of the Operational Impact Calculator (OIC) for public transit state of good repair.[68] OIC takes the TERM-Lite customized outputs as input and calculates the delays for each transit system, which can be then input into Travel Model One for simulation.

[62] As defined by later formulas and data tables developed from TCRP Report 157.
[63] Five-year average age is used to minimize "lumpiness" from asset replacement cycles, especially in small operators; those operators are more likely to replace all of their vehicles at once, rather than on a rolling basis. This improves the accuracy of the future year forecast, especially given the horizon year approach. The five-year average is calculated using 2040 as the midpoint.
[64] Technically relies on AdjustedQNTY variable from TERM-Lite.
[65] For example, feet or miles of track – this variable is essential for later conversions to standardize across systems.
[66] See URL: http://docs.trb.org/prp/15-1207.pdf.
[67] See URL: http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1445&context=jpt.
[68] Spreadsheet tool developed by MTC to link TERM-Lite and Travel Model One using the formulas and methodologies highlighted below.

2. Gather key data inputs from the FTA National Transit Database[69] required for use of Transit Cooperative Research Program (TCRP) Report 157[70] by operator and by mode to establish baseline year conditions:
    a. Annual revenue vehicle miles
    b. Number of revenue vehicles[71]
    c. Major and minor vehicle failures per year
    d. Fuel consumption and fuel type[72]

3. Gather key data inputs from past Travel Model One (TMO) forecasts[73] by operator and by mode to establish baseline year and forecast year system-level conditions:
    a. Typical weekday passenger-miles
    b. Typical weekday revenue vehicle miles
    c. Typical weekday boardings
    d. Weighted-average[74] weekday headway[75]
    e. Weighted-average route length
    f. Fuel prices[76]

4. Calculate a series of key calibration values based on the NTD and TMO data above:
    a. Boardings per mile[77]
    b. Average vehicle loading[78]
    c. Average mileage on an individual vehicle[79]
    d. Average number of lines using a given segment of track or guideway[80]

5. Gather data from regional transit operators how they would respond to failures of different types of non-vehicle assets (due to the lack of failure formulas in national literature and the system-specific differences that exist across the United States). Key variables include whether the typical failure of a given asset[81]:

[69] NTD data is available online at: http://www.ntdprogram.gov/ntdprogram/.
[70] See URL: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_157.pdf.
[71] Used primarily to calculate consistent NTD rates below; RTCI asset inventory is primary source for this data when calculating impacts.
[72] Fuel consumption, type, and price data is used later in the analysis; however, for the sake of brevity, the data collection process is shown here instead.
[73] For the purposes of this analysis, model runs from the adopted Plan Bay Area (2013) were used to establish consistent historical and forecast data by operator.
[74] Weighted average is used to account for the fact that some lines on a given system are used more heavily than others; the weighted average headway reflects the user experience (passenger-mileage as weighting factor) while the weighted average route length reflects the bus or rail operator experience (vehicle-mileage as weighting factor).
[75] For rail operators with complex stopping patterns (such as Caltrain), slight adjustments were made to headways to better correspond to the user experience.
[76] In addition to Travel Model One data for gasoline prices, CNG and diesel prices were calculated using data from the Department of Energy.
[77] Calculated as typical weekday boardings divided by typical weekday revenue vehicle-miles.
[78] Calculated as typical weekday passenger-miles divided by typical weekday.
[79] Calculated as annual revenue vehicle miles divided by the number of revenue vehicles.
[80] Only for fixed-guideway systems.
[81] A data table of the merged and standardized failure operational impacts across operators is available by request.

a. Affects one or both directions of service?[82]
b. Causes a slow zone or a stoppage?[83]
c. Generates how many minutes of delay for the average rider?[84]
d. Requires how many hours for repair under regular conditions? [85]

Also, gather information about the availability of work crews to fix non-vehicle failures (i.e., the number of non-vehicle failures that can be fixed per day given current staffing) and the average amount of time required to clear tracks of a stalled train (for rail systems only)[86].

6. Start by calculating failure rates in order to forecast the frequency for which SGR-related events take place on an average weekday in the forecast year:

   a. TCRP Report 157 developed an exponential curve that calculates future vehicle failure rates of a given vehicle based on the vehicle's lifetime mileage, its "year zero" failure rate[87], and a mode-specific constant:

$$\mathrm{RM(LM)} = \mathrm{k_{r2}e^{k_{r1}*LM}}$$

   where:
   RM = road calls or failures per vehicle mile
   LM = lifetime mileage[88]
   k_{r1} = a constant reflecting the sensitivity of road calls or failures to lifetime mileage[89]
   k_{r2} = a system-specific constant set to match year zero road calls or failures

   b. For each system, calibrate the "year zero" failure rate constant using current failure rate data (both major and minor vehicle failures) per vehicle revenue mile in the formula above. Once the k_{r2} values are calibrated, it is then possible to forecast failures (i.e., road calls) per mile for the forecast year for each operational vehicle in the inventory.

   c. TCRP Report 157 developed a Weibull distribution curve that calculates future non-vehicle failure probability in a given year based on the asset age and asset type-specific shape and scale parameters:

$$\mathrm{PF} = 1 - \frac{\mathrm{e}^{-\left(\frac{\mathrm{t+1}}{\lambda}\right)^{\mathrm{k}}}}{\mathrm{e}^{-\left(\frac{\mathrm{t}}{\lambda}\right)^{\mathrm{k}}}}$$

[82] Based upon information submitted by transit operators.
[83] Based upon information submitted by transit operators; majority opinion used to standardize across region.
[84] Informed by ranges submitted by transit operators but generally scaled upwards by MTC.
[85] Informed by ranges submitted by transit operators but generally scaled upwards by MTC. This information is used later to scale up delay impacts in catastrophic scenarios when work crews would be overwhelmed by system failures.
[86] Based on operator input, geographic system scope (i.e., distance to rail yard), etc., we assumed 15 minutes for Muni, 20 minutes for VTA, 30 minutes for BART and Caltrain, and 60 minutes for ACE and SMART for the purposes of this analysis.
[87] "Year zero" failure rate would be the failure rate of the asset when first purchased (i.e., brand-new).
[88] Estimated based on FTA NTD year 2013 data multiplied by asset age.
[89] Constant k_{r1} was estimated in TCRP Report 157 to be 7.0×10^{-7} for heavy rail, 1.0×10^{-6} for light rail, and 1.98×10^{-6} for buses.

where:
PF = probability of asset failure in the forecast year[90]
t = asset age in the forecast year
k = asset-specific shape parameter[91]
λ = asset-specific scale parameter[92]

d. Using the formula above, for each non-vehicle asset in the inventory, calculate its probability of failure in the forecast year. Adjust all linear unit assets to track-mile or mile to align with TCRP Report 157 units, as well as operational impact assumptions discussed later on.

7. Now that the failure rates of each asset have been calculated, it is necessary to estimate the impacts of each failure in terms of minutes of delay for input to Travel Model One[93]. For both vehicles and non-vehicles, there are two primary direct operational impacts for a customer: **per-mile delays** (when on board a transit vehicle) and **per-boarding delays** (when waiting for a transit vehicle to arrive). For more information on formula derivations, refer to Paterson and Vautin (2015).

a. Starting with vehicle per-mile delays, calculate the passenger delays both on-board the vehicle and for other vehicles trapped behind the stalled vehicle[94]:

$$\mathrm{DWBT} = \mathrm{AWT} * \left(\frac{\mathrm{PM}}{\mathrm{VM}}\right)$$

$$\mathrm{AWT} = \frac{\sum_{\mathrm{i-NT}} \left(\frac{\mathrm{TC}}{\mathrm{H}}\right) - \mathrm{i}}{\mathrm{NT}} * \mathrm{H}$$

$$\mathrm{NT} = \mathrm{RoundDown}\left(\frac{\mathrm{TC}}{\mathrm{H}}\right)$$

where:
DWBT = delay from waiting behind stalled trains
AWT = average wait time in headways for trains stuck behind stalled train
PM = passenger miles
VM = revenue vehicle miles
i = each additional train
TC = average time it takes to clear tracks
H = headway
NT = the number of trains that are delayed due to a stalled train ahead

[90] Assumes the asset is functioning in the year prior to the forecast year.
[91] Identified for each asset type in TCRP Report 157 – Table E-1, pages 118 to 121.
[92] Identified for each asset type in TCRP Report 157 – Table E-1, pages 118 to 121.
[93] Travel Model One, and the overall assessment framework, is focused on long-term benefits and disbenefits and does not incorporate the positive and negative impacts associated with construction activities.
[94] Wait times are capped at 60 minutes. It is assumed that after that point, a passenger will give up on that operator and switch to another transit mode, use their personal automobile, join a carpool, use a bus bridge, or otherwise defer their trip.

$$\mathrm{IVED(V)} = \mathrm{RM} * \left(\mathrm{DWBT} + \left(\mathrm{EH} * \left(\frac{\mathrm{PM}}{\mathrm{VM}}\right)\right)\right)$$

where:
IVED(V) = in-vehicle expected delay from vehicle failures (onboard + upstream)
RM = road calls per mile from equation 3
EH = effective headway (incorporating crowding factor)[95]
PM = passenger miles
VM = revenue vehicle miles

b. Next, calculate the vehicle per-boarding delays, which are based on passengers waiting for the failed vehicle(s).

$$\mathrm{PWV} = \left(\frac{\mathrm{PT}}{\mathrm{VM}}\right) * \mathrm{MR}$$

where:
PWV = passengers waiting for the failed vehicle
PT = passenger trips
VM = revenue vehicle miles
MR = recovery miles (miles before another bus takes over the route)[96]

$$\mathrm{OVED(V)} = \frac{(\mathrm{EH} * \mathrm{PWV}) * (\mathrm{MR} * \mathrm{VM})}{\mathrm{PT}}$$

where:
OVED(V) = out-of-vehicle expected delay from vehicle failures
EH = effective headway (incorporating crowding factor)
MR = recovery miles
VM = revenue vehicle miles
PWV = passengers waiting for the failed vehicle
PT = passenger trips

c. Calculate the average non-vehicle per-mile delays using the following formulas to incorporate both slow zone delays from non-vehicle assets and stoppage delays from non-vehicle assets, making sure to convert from annual to daily failures in the process:

$$\mathrm{SZD} = \mathrm{PF} * \left(\frac{\mathrm{NT} * \mathrm{MD}}{\mathrm{VM} * 300}\right)$$

$$\mathrm{NT} = \mathrm{RoundDown}\left(\frac{(\mathrm{TR}) - \left(\frac{1}{2}\mathrm{H}\right)}{\mathrm{H}}\right) * \mathrm{LA}$$

[95] The crowding factor incorporates the reality that, when a vehicle breaks down, not all passengers will fit on board the next vehicle. Instead, the effective headway represents the average or typical number of headways a passenger would have to be wait (1.0 in normal conditions, 1.5 in crowded conditions, 2.0 in crush load conditions). Crowding factors are identified on a system level based on current and future daily ridership.
[96] Assumed to be half the length of the average route (i.e., on average case, bus breaks down halfway between its origin and destination). However, in catastrophic scenarios, recovery time – as well as recovery miles – increases due to the lack of availability of additional buses.

where:
SZD = expected delay arising from slow zones
PF = probability of failure in 2040
NT = number of trains affected by failure
MD = minutes of delay to the train caused by slow zone
VM = revenue vehicle miles
TR = time until repair or replacement of the failed asset in minutes[97]
H = headways
LA = average number of lines affected by failure

$$\mathrm{STD} = \mathrm{PF} * \left(\frac{\mathrm{NT} * \left(\frac{\mathrm{TR}}{2}\right)}{\mathrm{VM} * 300} \right)$$

where:
STD = expected delay from being on a stopped train due to a non-vehicle failure ahead
PF = probability of failure in 2040
NT = number of trains affected by failure
TR = time until repair or replacement of the failed asset in minutes[98]
VM = revenue vehicle miles

$$\mathrm{IVED(NV)} = \mathrm{SZD} + \mathrm{STD}$$

where:
IVED(NV) = in-vehicle expected delay from non-vehicle asset failures
SZD = expected delay arising from slow zones
STD = expected delay from being on a stopped train due to a non-vehicle failure ahead

d. Finally, calculate the non-vehicle per-boarding delays, which are primarily the result of system stoppages[99], making sure to convert from annual to daily failures in the process.

$$\mathrm{OVED(NV)} = \mathrm{PF} \frac{\mathrm{WT} * \mathrm{WN}}{\mathrm{WB} * 300}$$

$$\mathrm{WT} = \mathrm{TR} - \left(\frac{1}{2}\mathrm{H}\right)$$

$$\mathrm{WN} = \mathrm{BM} * \left(\frac{1}{2}\mathrm{ARL}\right) * \min(\mathrm{NT}, \mathrm{DT})$$

$$\mathrm{DT} = \mathrm{LA}\left(\frac{\mathrm{MOD}}{\mathrm{H}}\right)$$

where:
OVED(NV) = out-of-vehicle expected delay from non-vehicle asset failures

[97] Minutes needed to repair the asset are adjusted upwards in catastrophic scenarios to reflect that the maintenance crews would be overwhelmed, assuming that additional staff would be called in or that workers would be exhausted due to overtime.
[98] We cap the expected wait until for the stoppage to be resolved at TR/2 = 60 minutes, assuming that the operator would not leave passengers captive on-board for more than that amount of time. Instead, they would likely transition to a bus bridge or other alternative operating pattern.
[99] Impacts to headways from slow zones can generally be overcome by adding a small number of new train runs to preserve frequencies at a slightly slower origin-to-terminus speed.

WT = additional out-of-vehicle wait time when a vehicle is stopped by a non-vehicle asset failure[100]
WN = number of passengers waiting to board a vehicle stopped by a non-vehicle asset failure
TR = minutes until asset repair or replacement[101]
WB = average weekday boardings
BM = average boardings per mile
ARL = average route length
DT = number of trains passing through affected area in one day
NT = number of trains affected by failure
MOD = minutes of operation daily[102]
H = headways
LA = average number of lines affected by failure

e. Calculate the average per-mile delay by aggregating and averaging the vehicle and non-vehicle failure impacts across all rows of the inventory. Repeat for the average per-boarding impacts. Note that these values reflect the experience of average rider on the given system in the horizon year on a per-mile and per-boarding basis (i.e., they are time-based "friction factors" due to breakdowns which riders build into their daily schedule).

8. Summarize cost outputs from the TERM-Lite export files for use in Step 4 below; sum the replacement conditions for all assets flagged as having operational impacts between year 1 and the horizon year (24-year costs). Note that transit asset replacement costs for operators – the primary input on the cost side of the benefit-cost ratio – are relatively straightforward thanks to TERM-Lite; they represent the difference between the two funding levels for the scenario in question, as the region's transportation agencies will be expending these dollars.[103]

Step 3: Run Travel Model One using operational impacts to explore benefits & disbenefits.

1. Convert the Results tab of the OIC spreadsheet into a Cube-readable format by extracting the data in the combined per-mile delay and combined per-boarding delay columns.[104] When an individual operator is run, values will be null or zero for all other operators.
2. Paste the operational impact values into two BLOCK files, using the relevant Travel Model One mode codes to identify the rows to modify.
    a. When evaluating all operators in the region, start with blank BLOCK files for both per-mile and per-boarding delays.

[100] Wait times are capped at 60 minutes. It is assumed that after that point, a passenger will give up on that operator and switch to another transit mode, use their personal automobile, join a carpool, use a bus bridge, or otherwise defer their trip.
[101] Refer to the earlier comment about catastrophic failure scenarios.
[102] For example, 1080 minutes for a 6 AM to 12 AM service schedule.
[103] Funding levels can be either inputs or outputs of TERM-Lite in Step 1.
[104] Cube is the travel model software used by Travel Model One for network coding.

b. When evaluating one or more operators in isolation, use the year 2040 baseline delay BLOCK files[105] and swap out the per-mile and per-boarding for the operator(s) in question, leaving all other systems with status quo delays.

3. Run Travel Model One twice: once with baseline conditions and once with "with project" conditions to evaluate how travelers respond to changing asset conditions. While additional information on the model can be found in Travel Model One documentation[106], a rough and high-level summary of how the model applies the delay factors can be found below:
   a. For each line on each system, the per-mile travel time impacts are applied to the point-to-point travel times between stops (to simulate greater in-vehicle time), while the per-boarding travel time impacts are applied to the headways (to simulate greater out-of-vehicle time).
   b. The model then begins to simulate how travelers respond to the various levels of typical delay on the systems they decide to use in a given day, generating impacts to those travelers but also influencing their decisions. This will affect their access to destinations, as well as their travel behavior, generating secondary effects like emissions, collisions, etc. This approach is similar to what is done for expansion projects, insofar that new conditions are loaded on the network and benefits/disbenefits are a result of the input conditions.
   c. Metrics calculated by Travel Model One are produced for the two runs, including the inputs to the COBRA benefit-cost script. These metrics are leveraged in Step 4.4 below to calculate benefits, reflecting the forecasted behavioral impacts (both direct and indirect effects on riders and the region as a whole).

Step 4: Calculate benefit-cost ratio using Travel Model One outputs and funding levels from TERM-Lite.

1. First, calculate the costs[107] by subtracting the 24-year baseline TERM-Lite asset replacement costs[108] from the "with-project" asset replacement costs. In order to compare to the annualized benefit, divide by 24 to calculate the expenditures in a single year.
2. Second, adjust the gross cost differential by incorporating vehicle energy and maintenance cost impacts using the energy cost and maintenance cost models identified in TCRP Report 157. The formulas below rely upon exponential curves to calculate energy and maintenance costs based on a given vehicle's lifetime mileage, its "year zero" failure rate[109], and a mode-specific constant:

$$\mathrm{CME}(\mathrm{LM}) = \mathrm{k_{e2}} e^{\mathrm{k_{e1}} * \mathrm{LM}}$$

where:

CME = energy costs per mile

LM = lifetime mileage[110]

k_{e1} = a constant reflecting the sensitivity of energy consumption to lifetime mileage[111]

[105] Based on the 2015 inventory and 2040 operating conditions (i.e., assuming that asset conditions for all other operators are about the same as today).

[106] For more information: http://mtcgis.mtc.ca.gov/foswiki/Main/UsersGuide

[107] It is generally appropriate to focus on the costs of operational impact assets for consistency with road SGR methodology, which does not include sidewalks, etc.

[108] Adjusted to year 2017 dollars using a 2.2% inflation rate.

[109] "Year zero" failure rate would be the failure rate of the asset when first purchased (i.e., brand-new).

[110] Estimated based on FTA NTD year 2013 data multiplied by asset age.

[111] Constant k_{e1} was estimated in TCRP Report 157 to be 6.27×10^{-7} for buses and 4.0×10^{-7} for rail vehicles.

k_{e2} = a system-specific constant set to match year zero energy costs[112]

$$CMM(LM) = k_{m2} e^{k_{m1} * LM}$$

where:

CME = maintenance costs per mile

LM = lifetime mileage[113]

k_{m1} = a constant reflecting the sensitivity of maintenance costs to lifetime mileage[114]

k_{m2} = a system-specific constant set to match year zero maintenance costs[115]

3. Third, calculate the benefits by running the COBRA benefit-cost script using the Travel Model One output CSV files. The benefits associated with the scenario are calculated by COBRA using standard benefit monetizations[116] applied to all projects evaluated for Plan Bay Area 2040, which compares the "with-project" and baseline conditions.
4. Finally, COBRA outputs the benefit-cost ratio by dividing the annualized benefits by the annualized costs, incorporating a system-wide farebox recovery ratio to roughly account for fare revenue impacts associated with higher or lower ridership in a given run[117]. The result is a B/C ratio that reflects the benefits to users and society from increasing system preservation funding as defined in the scenario.

[112] k_{e2} values by operator are calibrated using a similar process as described in Step 2 under vehicle failure rates – NTD data on the primary fuel type of an operator, and its total consumption of said fuel per mile, allows us to back calculate the rough year zero energy costs by system.

[113] Estimated based on FTA NTD year 2013 data multiplied by asset age.

[114] Constant k_{m1} was estimated in TCRP Report 157 to be 1.26×10^{-6} for bus, 5.0×10^{-7} for light rail, and 4.0×10^{-7} for heavy rail.

[115] k_{m2} values by operator are calibrated using a similar process as described in Step 2 under vehicle failure rates.

[116] Benefit categories include: person time + cost (i.e., access to destinations), truck time + cost, collisions (i.e., fatalities, injuries, property damage), air quality (i.e., greenhouse gas emissions, fine particulate emissions, criteria pollutant emissions), physical activity (i.e., mortality and morbidity), auto ownership costs, and noise.

[117] This approach is consistent with expansion and operational improvement projects.

Appendix D: Project Performance Assessment – Final Results

ROW	ID	PROJECT NAME	LOCATION (COUNTY)	PROJECT TYPE	ANNUAL BENEFIT	ANNUAL COST	B/C RATIO	TARGETS SCORE
1	1503	**Highway Pavement Maintenance (Ideal Conditions vs. Preserve Conditions)**	Multi-County	Highway Maintenance	$638	($1)	>50	2.5
2	1502	**Highway Pavement Maintenance (Preserve Conditions vs. No Funding)**	Multi-County	Highway Maintenance	$2,433	$144	17	2.5
3	302	**Treasure Island Congestion Pricing (Toll + Transit Improvements)**	San Francisco	Congestion Pricing	$56	$4	14	4.5
4	1301	**Columbus Day Initiative**	Multi-County	ITS	$421	$38	11	4.0
5	209	**SR-84 Widening + I-680/SR-84 Interchange Improvements (Livermore to I-680)**	Alameda	Intraregional Road Expansion	$116	$13	9	1.0
6	501	**BART to Silicon Valley – Phase 2 (Berryessa to Santa Clara)**	Santa Clara	Rail Expansion	$472	$62	8	8.0
7	306	**Downtown San Francisco Congestion Pricing (Toll + Transit Improvements)**	San Francisco	Congestion Pricing	$84	$11	7	7.0
8	1651	**Public Transit Maintenance - Rail Operators (Preserve Conditions vs. No Funding)**	Multi-County	Rail Maintenance	$1,351	$198	7	9.5
9	506	**El Camino Real BRT (Palo Alto to San Jose)**	Santa Clara	BRT	$85	$13	7	6.5
10	301	**Geary BRT**	San Francisco	BRT	$124	$20	6	7.0
11	505	**Capitol Expressway LRT – Phase 2 (Alum Rock to Eastridge)**	Santa Clara	Rail Expansion	$77	$12	6	5.5
12	518	**ACE Alviso Double-Tracking**	Santa Clara	Rail Efficiency	$36	$6	6	1.5
13	1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	Bus Maintenance	$623	$103	6	8.0
14	1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	Ferry	$29	$5	6	4.5
15	203	**Irvington BART Infill Station**	Alameda	Rail Efficiency	$30	$6	5	3.5
16	101	**Express Lane Network (US-101 San Mateo/San Francisco)**	Multi-County	Express Lanes	$48	$10	5	0.5
17	903	**Sonoma County Service Frequency Improvements**	Sonoma	Bus Frequency Improvements	$75	$15	5	5.0
18	523	**VTA Service Frequency Improvements (15-Minute Frequencies)**	Santa Clara	Bus Frequency Improvements	$103	$23	4	5.0
19	211	**SR-262 Connector (I-680 to I-880)**	Alameda	Intraregional Road Expansion	$22	$5	4	-0.5

all benefits and costs are in millions of 2017 dollars

Plan BayArea 2040

Plan Bay Area 2040

PROJECT PERFORMANCE ASSESSMENT

FINAL RESULTS

ROW	ID	PROJECT NAME	LOCATION (COUNTY)	PROJECT TYPE	ANNUAL BENEFIT	ANNUAL COST	B/C RATIO	TARGETS SCORE
20	1403	**Local Streets and Roads Maintenance (Preserve Conditions vs. No Funding)**	Multi-County	Local Streets Maintenance	$1,875	$428	4	3.5
21	207	**San Pablo BRT (San Pablo to Oakland)**	Multi-County	BRT	$67	$16	4	7.0
22	210	**I-580 ITS Improvements**	Alameda	ITS	$44	$11	4	1.0
23	504	**Stevens Creek LRT**	Santa Clara	Rail Expansion	$144	$38	4	5.5
24	1001	**BART Metro Program (Service Frequency Increase + Bay Fair Operational Improvements + SFO Airport Express Train)**	Multi-County	Rail Efficiency	$430	$123	3	9.0
25	1101	**Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase)**	Multi-County	Rail Efficiency	$195	$56	3	6.5
26	605	**Jepson Parkway (Fairfield to Vacaville)**	Solano	Intraregional Road Expansion	$17	$5	3	1.0
27	1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	Ferry	$16	$5	3	2.5
28	1102	**Caltrain Modernization - Phase 1 + Phase 2 (Electrification + Service Frequency Increase + Capacity Expansion)**	Multi-County	Rail Efficiency	$236	$77	3	6.5
29	411	**SR-4 Auxiliary Lanes - Phases 1 + 2 (Concord to Pittsburg)**	Contra Costa	Intraregional Road Expansion	$44	$15	3	2.0
30	507	**Vasona LRT – Phase 2 (Winchester to Vasona Junction)**	Santa Clara	Rail Expansion	$30	$11	3	5.0
31	515	**Tasman West LRT Realignment (Fair Oaks to Mountain View)**	Santa Clara	Rail Expansion	$48	$18	3	5.0
32	517	**Stevens Creek BRT**	Santa Clara	BRT	$29	$11	3	5.5
33	102	**US-101 HOV Lanes (San Francisco + San Mateo Counties)**	Multi-County	Express Lanes	$63	$25	3	2.0
34	503	**SR-152 Tollway (Gilroy to Los Banos)**	Multi-County	Interregional Road Expansion	$95	$37	3	-1.5
35	307	**Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase) + Caltrain to Transbay Transit Center**	Multi-County	Rail Expansion	$290	$113	3	7.0
36	331	**Better Market Street**	San Francisco	BRT	$32	$13	3	4.5
37	1206	**Alameda Point-San Francisco Ferry**	Multi-County	Ferry	$12	$5	2	3.0
38	1204	**Berkeley-San Francisco Ferry**	Multi-County	Ferry	$10	$4	2	5.0

all benefits and costs are in millions of 2017 dollars

Plan BayArea 2040

Plan Bay Area 2040

PROJECT PERFORMANCE ASSESSMENT

FINAL RESULTS

ROW	ID	PROJECT NAME	LOCATION (COUNTY)	PROJECT TYPE	ANNUAL BENEFIT	ANNUAL COST	B/C RATIO	TARGETS SCORE
39	1302	**Express Lane Network (East and North Bay)**	Multi-County	Express Lanes	$214	$91	2	3.0
40	206	**AC Transit Service Frequency Improvements**	Multi-County	Bus Frequency Improvements	$248	$120	2	6.5
41	513	**North Bayshore LRT (NASA/Bayshore to Google)**	Santa Clara	Rail Expansion	$42	$22	2	4.0
42	502	**Express Lane Network (Silicon Valley)**	Santa Clara	Express Lanes	$69	$38	2	3.0
43	604	**Solano County Express Bus Network**	Multi-County	Express Bus Network	$21	$12	2	2.5
44	522	**VTA Service Frequency Improvements (10-Minute Frequencies)**	Santa Clara	Bus Frequency Improvements	$177	$99	2	7.0
45	412	**Antioch-Martinez-Hercules-San Francisco Privately-Operated Ferry**	Multi-County	Ferry	$9	$5	2	1.5
46	403	**I-680 Express Bus Frequency Improvements**	Multi-County	Express Bus Network	$12	$7	2	2.5
47	402	**eBART – Phase 2 (Antioch to Brentwood)**	Contra Costa	Rail Expansion	$21	$12	2	4.0
48	311	**Muni Forward Program**	San Francisco	Bus Frequency Improvements	$60	$36	2	6.5
49	901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Multi-County	Intraregional Road Expansion	$31	$19	2	3.0
50	409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	Intraregional Road Expansion	$42	$27	2	3.0
51	103	**El Camino Real Rapid Bus (Daly City to Palo Alto)**	San Mateo	Bus Frequency Improvements	$54	$36	2	2.0
52	401	**TriLink Tollway + Expressways (Brentwood to Tracy/Altamont Pass)**	Multi-County	Interregional Road Expansion	$75	$51	1	-0.5
53	312	**19th Avenue Subway (West Portal to Parkmerced)**	San Francisco	Rail Efficiency	$39	$27	1	7.5
54	801	**Golden Gate Transit Frequency Improvements**	Multi-County	Express Bus Network	$11	$8	1	4.5
55	313	**Muni Service Frequency Improvements**	San Francisco	Bus Frequency Improvements	$89	$79	1	6.0
56	1413	**Local Streets and Roads Maintenance (Preserve Conditions vs. Local Funding)**	Multi-County	Local Streets Maintenance	$194	$198	1	3.5
57	516	**VTA Express Bus Frequency Improvements**	Santa Clara	Express Bus Network	$18	$19	0.9	4.5

all benefits and costs are in millions of 2017 dollars

July 2016

Plan BayArea 2040

Plan Bay Area 2040

PROJECT PERFORMANCE ASSESSMENT

FINAL RESULTS

ROW	ID	PROJECT NAME	LOCATION (COUNTY)	PROJECT TYPE	ANNUAL BENEFIT	ANNUAL COST	B/C RATIO	TARGETS SCORE
58	202	**East-West Connector (Fremont to Union City)**	Alameda	Intraregional Road Expansion	$10	$12	**0.9**	**1.5**
59	304	**Southeast Waterfront Transportation Improvements (Hunters Point Transit Center + New Express Bus Services)**	San Francisco	Express Bus Network	$16	$27	**0.6**	**6.0**
60	404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	Interregional Road Expansion	$9	$17	**0.5**	**-0.5**
61	510	**Downtown San Jose Subway (Japantown to Convention Center)**	Santa Clara	Rail Efficiency	$10	$18	**0.5**	**6.5**
62	104	**Geneva-Harney BRT + Corridor Improvements**	Multi-County	BRT	$15	$46	**0.3**	**5.0**
63	508	**SR-17 Tollway + Santa Cruz LRT (Los Gatos to Santa Cruz)**	Multi-County	Interregional Road Expansion	$57	$200	**0.3**	**1.0**
64	601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	Intraregional Road Expansion	$5	$18	**0.3**	**2.5**
65	519	**Lawrence Freeway**	Santa Clara	Intraregional Road Expansion	$7	$34	**0.2**	**2.0**
66	1304	**Bay Bridge West Span Bike Path**	San Francisco	Bike/Ped	$4	$30	**0.1**	**2.0**
67	905	**SMART – Phase 3 (Santa Rosa Airport to Cloverdale)**	Sonoma	Rail Expansion	$0	$12	**0**	**4.0**
68	1201	**San Francisco-Redwood City + Oakland-Redwood City Ferry**	Multi-County	Ferry	$0	$8	**0**	**2.0**
69	205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	Express Bus Network	$0	$10	**0**	**5.0**

all benefits and costs are in millions of 2017 dollars

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
BENEFITS ASSESSMENT (sorted by B/C ratio)

						TRAVEL TIME + COST SAVINGS		AIR POLLUTION			HEALTH + SAFETY		
Row	ID	PROJECT NAME	B/C RATIO	ANNUAL COST	ANNUAL BENEFIT	Travel Time + Cost	Vehicle Ownership	GHG	PM	Other	Collisions	Physical Activity	Noise
1	1503	**Highway Pavement Maintenance (Ideal Conditions vs. Preserve Conditions)**	**>50**	**($1M)**	**$637.7M**	$726.7M	($0.9M)	($5.7M)	($5.4M)	($0.1M)	($47.3M)	($28.8M)	($0.9M)
2	1502	**Highway Pavement Maintenance (Preserve Conditions vs. No Funding)**	**17**	**$144M**	**$2,432.9M**	$2,735.4M	$0.8M	($22.7M)	($18.8M)	($0.5M)	($170.4M)	($87.6M)	($3.1M)
3	302	**Treasure Island Congestion Pricing (Toll + Transit Improvements)**	**14**	**$4M**	**$56.2M**	$28.5M	$0.3M	$0.5M	$0.3M	$0.0M	$3.6M	$23.0M	$0.1M
4	1301	**Columbus Day Initiative**	**11**	**$38M**	**$420.7M**	$495.5M	$0.0M	($3.8M)	($3.2M)	$0.2M	($61.4M)	($6.0M)	($0.5M)
5	209	**SR-84 Widening + I-680/SR-84 Interchange Improvements..**	**9**	**$13M**	**$116.3M**	$107.0M	($0.1M)	($0.4M)	$0.1M	$0.0M	$5.5M	$4.2M	$0.0M
6	501	**BART to Silicon Valley – Phase 2 (Berryessa to Santa Clara)**	**8**	**$62M**	**$472.0M**	$390.7M	$2.9M	$2.0M	$1.9M	$0.0M	$18.2M	$55.9M	$0.3M
7	306	**Downtown San Francisco Congestion Pricing (Toll + Transit Improvements)**	**7**	**$11M**	**$83.9M**	$16.7M	$14.9M	$0.6M	$0.9M	$0.0M	$9.2M	$41.5M	$0.1M
8	1651	**Public Transit Maintenance - Rail Operators (Preserve Conditions vs. No Funding)**	**7**	**$198M**	**$1,351.4M**	$1,160.8M	$37.8M	$4.9M	$4.5M	$0.1M	$42.4M	$100.2M	$0.7M
9	506	**El Camino Real BRT (Palo Alto to San Jose)**	**7**	**$13M**	**$85.5M**	$50.0M	$9.3M	$0.6M	$0.6M	$0.0M	$7.3M	$17.6M	$0.1M
10	301	**Geary BRT**	**6**	**$20M**	**$124.1M**	$73.8M	$13.3M	$0.5M	$0.5M	$0.0M	$5.6M	$30.3M	$0.1M
11	505	**Capitol Expressway LRT – Phase 2 (Alum Rock to Eastridge)**	**6**	**$12M**	**$77.1M**	$31.3M	$2.7M	$0.9M	$0.9M	$0.0M	$8.3M	$32.9M	$0.1M
12	518	**ACE Alviso Double-Tracking**	**6**	**$6M**	**$35.7M**	$33.3M	$0.2M	$0.0M	$0.1M	$0.0M	$0.7M	$1.4M	$0.0M
13	1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	**6**	**$103M**	**$623.0M**	$369.0M	$82.2M	$3.5M	$2.9M	$0.1M	$30.5M	$134.4M	$0.5M
14	1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	**6**	**$5M**	**$29.2M**	$16.3M	$0.3M	$0.0M	$0.1M	$0.0M	$0.9M	$11.6M	$0.0M
15	203	**Irvington BART Infill Station**	**5**	**$6M**	**$29.9M**	$17.6M	$0.7M	$0.0M	$0.0M	$0.0M	$0.6M	$11.1M	$0.0M
16	101	**Express Lane Network (US-101 San Mateo/San Francisco)**	**5**	**$10M**	**$48.5M**	$51.2M	($0.7M)	($1.8M)	($0.2M)	$0.0M	$5.9M	($5.9M)	$0.0M

all benefits and costs are in millions of 2017 dollars

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
BENEFITS ASSESSMENT (sorted by B/C ratio)

						TRAVEL TIME + COST SAVINGS		AIR POLLUTION			HEALTH + SAFETY		
Row	ID	PROJECT NAME	B/C RATIO	ANNUAL COST	ANNUAL BENEFIT	Travel Time + Cost	Vehicle Ownership	GHG	PM	Other	Collisions	Physical Activity	Noise
17	903	Sonoma County Service Frequency Improvements	5	$15M	$75.1M	$26.8M	$22.5M	$0.7M	$0.5M	$0.0M	$6.0M	$18.6M	$0.1M
18	523	VTA Service Frequency Improvements (15-Minute Frequencies)	4	$23M	$103.2M	$52.9M	$19.3M	$0.5M	$0.4M	$0.0M	$4.7M	$25.2M	$0.1M
19	211	SR-262 Connector (I-680 to I-880)	4	$5M	$22.4M	$10.1M	$0.0M	$0.4M	$0.1M	$0.0M	$6.4M	$5.5M	$0.0M
20	1403	Local Streets and Roads Maintenance (Preserve Conditions vs. No Funding)	4	$428M	$1,875.2M	$2,302.2M	($1.1M)	($19.7M)	($16.6M)	($0.1M)	($150.8M)	($235.8M)	($2.8M)
21	207	San Pablo BRT (San Pablo to Oakland)	4	$16M	$67.2M	$59.0M	$12.3M	$0.3M	$0.4M	$0.0M	$5.7M	$27.9M	$0.1M
22	210	I-580 ITS Improvements	4	$11M	$44.2M	$45.3M	$0.0M	$0.0M	($0.1M)	$0.0M	($2.3M)	$1.3M	$0.0M
23	504	Stevens Creek LRT	4	$38M	$144.2M	$67.1M	($2.9M)	$1.0M	$0.9M	$0.0M	$9.7M	$68.2M	$0.2M
24	1001	BART Metro Program (Service Frequency Increase + Bay Fair Operational Improvements + SFO Airport Ex..	3	$123M	$430.3M	$344.9M	$14.6M	$2.1M	$1.8M	$0.0M	$18.0M	$48.5M	$0.3M
25	1101	Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase)	3	$56M	$194.7M	$158.2M	$2.8M	$0.8M	$0.8M	$0.0M	$7.9M	$24.1M	$0.1M
26	605	Jepson Parkway (Fairfield to Vacaville)	3	$5M	$17.1M	$4.4M	$0.9M	($0.1M)	$0.0M	$0.0M	$4.8M	$7.0M	$0.0M
27	1202	Oakland-Alameda-San Francisco Ferry Frequency Improvements	3	$5M	$16.1M	$8.1M	$0.6M	$0.0M	$0.0M	$0.0M	$0.1M	$7.4M	$0.0M
28	1102	Caltrain Modernization - Phase 1 + Phase 2 (Electrification + Service Frequency Increase + Capaci..	3	$77M	$236.3M	$191.4M	$3.6M	$1.2M	$1.1M	$0.0M	$10.8M	$27.9M	$0.2M
29	411	SR-4 Auxiliary Lanes - Phases 1 + 2 (Concord to Pittsburg)	3	$15M	$44.3M	$39.4M	$0.3M	($0.2M)	($0.3M)	$0.0M	($1.8M)	$7.0M	($0.1M)
30	507	Vasona LRT – Phase 2 (Winchester to Vasona Junction)	3	$11M	$30.3M	$19.1M	$1.2M	$0.3M	$0.1M	$0.0M	$1.6M	$7.9M	$0.0M
31	515	Tasman West LRT Realignment (Fair Oaks to Mountain View)	3	$18M	$47.9M	$16.4M	$5.7M	$0.3M	$0.3M	$0.0M	$2.4M	$22.7M	$0.0M
32	517	Stevens Creek BRT	3	$11M	$29.1M	$11.8M	$1.5M	$0.3M	$0.3M	$0.0M	$3.7M	$11.4M	$0.1M

all benefits and costs are in millions of 2017 dollars

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
BENEFITS ASSESSMENT (sorted by B/C ratio)

						TRAVEL TIME + COST SAVINGS		AIR POLLUTION			HEALTH + SAFETY		
Row	ID	PROJECT NAME	B/C RATIO	ANNUAL COST	ANNUAL BENEFIT	Travel Time + Cost	Vehicle Ownership	GHG	PM	Other	Collisions	Physical Activity	Noise
33	102	US-101 HOV Lanes (San Francisco + San Mateo Counties)	3	$25M	$63.4M	$55.8M	$0.2M	($1.1M)	$0.1M	$0.0M	$4.6M	$3.7M	$0.0M
34	503	SR-152 Tollway (Gilroy to Los Banos)	3	$37M	$94.8M	$70.8M	$0.3M	$1.4M	$0.1M	$0.0M	$21.1M	$1.2M	$0.0M
35	307	Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase) + Caltrain to Transbay Tr..	3	$113M	$289.8M	$243.1M	$3.2M	$1.1M	$1.1M	$0.0M	$10.9M	$30.2M	$0.2M
36	331	Better Market Street	3	$13M	$32.4M	$21.7M	$5.8M	$0.4M	$0.2M	$0.0M	$1.6M	$2.7M	$0.0M
37	1206	Alameda Point-San Francisco Ferry	2	$5M	$11.7M	$5.6M	$0.3M	($0.1M)	$0.0M	$0.0M	($0.3M)	$6.3M	$0.0M
38	1204	Berkeley-San Francisco Ferry	2	$4M	$10.0M	$2.9M	$0.5M	($0.1M)	$0.0M	$0.0M	$0.3M	$6.5M	$0.0M
39	1302	Express Lane Network (East and North Bay)	2	$91M	$213.9M	$276.8M	($2.1M)	($10.5M)	($5.5M)	($0.1M)	($32.1M)	($11.7M)	($0.9M)
40	206	AC Transit Service Frequency Improvements	2	$120M	$247.6M	$149.0M	$40.2M	$1.4M	$1.2M	$0.0M	$12.6M	$43.0M	$0.2M
41	513	North Bayshore LRT (NASA/Bayshore to Google)	2	$22M	$41.9M	$24.5M	$3.8M	$0.2M	$0.3M	$0.0M	$2.0M	$11.0M	$0.0M
42	502	Express Lane Network (Silicon Valley)	2	$38M	$69.1M	$104.4M	($1.0M)	($7.1M)	($5.7M)	$0.0M	($25.2M)	($21.9M)	($1.0M)
43	604	Solano County Express Bus Network	2	$12M	$21.2M	$11.9M	$1.5M	$0.3M	$0.2M	$0.0M	$1.8M	$5.4M	$0.0M
44	522	VTA Service Frequency Improvements (10-Minute Frequencies)	2	$99M	$176.7M	$85.6M	$37.2M	$0.9M	$0.9M	$0.0M	$9.6M	$42.2M	$0.2M
45	412	Antioch-Martinez-Hercules-San Francisco Privately-Operated Ferry	2	$5M	$9.0M	$7.4M	$0.3M	$0.1M	$0.1M	$0.0M	$1.0M	$0.1M	$0.0M
46	403	I-680 Express Bus Frequency Improvements	2	$7M	$11.5M	$7.7M	$1.0M	$0.2M	$0.1M	$0.0M	$1.2M	$1.2M	$0.0M
47	402	eBART – Phase 2 (Antioch to Brentwood)	2	$12M	$20.6M	$18.4M	$0.0M	$0.2M	$0.1M	$0.0M	$1.2M	$0.7M	$0.0M
48	311	Muni Forward Program	2	$36M	$60.4M	$44.9M	$15.1M	$0.7M	$0.5M	$0.0M	$5.6M	($6.6M)	$0.1M

all benefits and costs are in millions of 2017 dollars

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
BENEFITS ASSESSMENT (sorted by B/C ratio)

						TRAVEL TIME + COST SAVINGS		AIR POLLUTION			HEALTH + SAFETY		
Row	ID	PROJECT NAME	B/C RATIO	ANNUAL COST	ANNUAL BENEFIT	Travel Time + Cost	Vehicle Ownership	GHG	PM	Other	Collisions	Physical Activity	Noise
49	901	US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2	2	$19M	$30.6M	$24.7M	$0.0M	($0.1M)	$0.1M	$0.0M	$2.1M	$3.7M	$0.0M
50	409	I-680/SR-4 Interchange Improvements + HOV Direct Connector	2	$27M	$41.8M	$40.8M	$0.2M	($0.4M)	($0.1M)	$0.0M	($0.6M)	$1.9M	$0.0M
51	103	El Camino Real Rapid Bus (Daly City to Palo Alto)	2	$36M	$53.7M	$26.9M	$4.3M	$0.2M	$0.2M	$0.0M	$2.7M	$19.3M	$0.0M
52	401	TriLink Tollway + Expressways (Brentwood to Tracy/Altamont Pass)	1	$51M	$75.1M	$66.6M	$0.4M	$0.4M	$0.3M	$0.0M	$4.9M	$2.4M	$0.0M
53	312	19th Avenue Subway (West Portal to Parkmerced)	1	$27M	$38.7M	$21.2M	$2.1M	$0.2M	$0.1M	$0.0M	$1.4M	$5.5M	$0.0M
54	801	Golden Gate Transit Frequency Improvements	1	$8M	$10.9M	$9.4M	($0.2M)	($0.1M)	$0.0M	$0.0M	($0.3M)	$2.0M	$0.0M
55	313	Muni Service Frequency Improvements	1	$79M	$89.4M	$68.0M	$25.5M	$0.6M	$0.5M	$0.0M	$5.5M	($10.8M)	$0.1M
56	1413	Local Streets and Roads Maintenance (Preserve Conditions vs. Local Funding)	1	$198M	$193.6M	$311.8M	$0.3M	($3.8M)	($4.1M)	($0.1M)	($43.4M)	($66.5M)	($0.7M)
57	516	VTA Express Bus Frequency Improvements	0.9	$19M	$17.6M	$7.5M	$1.4M	$0.0M	$0.0M	$0.0M	$0.4M	$8.3M	$0.0M
58	202	East-West Connector (Fremont to Union City)	0.9	$12M	$10.3M	$4.1M	$0.9M	$0.2M	$0.1M	$0.0M	$1.6M	$3.3M	$0.0M
59	304	Southeast Waterfront Transportation Improvements (Hunters Point Transit Center + New Express Bus Ser..	0.6	$27M	$16.4M	$17.3M	$4.6M	$0.2M	$0.1M	$0.0M	$1.1M	($7.0M)	$0.0M
60	404	SR-4 Widening (Antioch to Discovery Bay)	0.5	$17M	$9.1M	$8.7M	$0.6M	$0.2M	$0.1M	$0.0M	$1.9M	($2.3M)	$0.0M
61	510	Downtown San Jose Subway (Japantown to Convention Center)	0.5	$18M	$9.7M	$8.1M	$0.5M	$0.1M	$0.2M	$0.0M	$1.4M	($0.6M)	$0.0M
62	104	Geneva-Harney BRT + Corridor Improvements	0.3	$46M	$14.8M	$6.5M	$2.0M	$0.2M	$0.1M	$0.0M	$2.8M	$3.2M	$0.0M
63	508	SR-17 Tollway + Santa Cruz LRT (Los Gatos to Santa Cruz)	0.3	$200M	$57.3M	$68.1M	$0.8M	$0.3M	$0.6M	$0.0M	($20.8M)	$8.2M	$0.1M
64	601	I-80/I-680/SR-12 Interchange Improvements	0.3	$18M	$5.1M	$13.0M	($0.5M)	($0.5M)	($0.1M)	$0.0M	($1.3M)	($5.5M)	$0.0M

all benefits and costs are in millions of 2017 dollars

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
BENEFITS ASSESSMENT (sorted by B/C ratio)

						TRAVEL TIME + COST SAVINGS		AIR POLLUTION			HEALTH + SAFETY		
Row	**ID**	**PROJECT NAME**	**B/C RATIO**	**ANNUAL COST**	**ANNUAL BENEFIT**	Travel Time + Cost	Vehicle Ownership	GHG	PM	Other	Collisions	Physical Activity	Noise
65	**519**	**Lawrence Freeway**	**0.2**	**$34M**	**$7.3M**	$8.9M	$0.2M	($0.6M)	($0.3M)	$0.0M	($6.6M)	$5.8M	($0.1M)
66	**1304**	**Bay Bridge West Span Bike Path**	**0.1**	**$30M**	**$4.3M**	($1.3M)	$0.3M	($0.1M)	($0.1M)	$0.0M	($1.2M)	$6.6M	$0.0M
67	**905**	**SMART – Phase 3 (Santa Rosa Airport to Cloverdale)**	**0**	**$12M**	**$0.0M**	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M
68	**1201**	**San Francisco-Redwood City + Oakland-Redwood City Ferry**	**0**	**$8M**	**$0.0M**	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M
69	**205_15**	**Express Bus Bay Bridge Contraflow Lane**	**0**	**$10M**	**$0.0M**	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M	$0.0M

all benefits and costs are in millions of 2017 dollars

July 2016

Plan BayArea 2040

Plan Bay Area 2040

PROJECT PERFORMANCE ASSESSMENT

TARGETS ASSESSMENT (sorted by target score)

				Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Equitable Access			Economic Vitality			Transportation System Effectiveness		
				1	2	3	4	5	6	7	8	9	10	11	12	13
Row	ID	PROJECT NAME	Total Targets Score	Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Housing + Transportation Costs	Affordable Housing	Displacement Risk	Access to Jobs	Jobs Creation	Goods Movement	Non-Auto Mode Share	Road Maintenance	Transit Maintenance
1	1651	**Public Transit Maintenance - Rail Operators (Preserve Conditions vs. No Funding)**	9.5	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT
2	1001	**BART Metro Program (Service Frequency Increase + Bay Fair Operational Improvements + SFO Airport Express Train)**	9	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT
3	501	**BART to Silicon Valley – Phase 2 (Berryessa to Santa Clara)**	8	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
4	1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	8	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT
5	312	**19th Avenue Subway (West Portal to Parkmerced)**	7.5	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT
6	306	**Downtown San Francisco Congestion Pricing (Toll + Transit Improvements)**	7	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
7	301	**Geary BRT**	7	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
8	207	**San Pablo BRT (San Pablo to Oakland)**	7	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
9	307	**Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase) + Caltrain to Transbay Transit Center**	7	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT
10	522	**VTA Service Frequency Improvements (10-Minute Frequencies)**	7	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
11	506	**El Camino Real BRT (Palo Alto to San Jose)**	6.5	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
12	1101	**Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase)**	6.5	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT
13	1102	**Caltrain Modernization - Phase 1 + Phase 2 (Electrification + Service Frequency Increase + Capacity Expansion)**	6.5	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT
14	206	**AC Transit Service Frequency Improvements**	6.5	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
15	311	**Muni Forward Program**	6.5	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
16	510	**Downtown San Jose Subway (Japantown to Convention Center)**	6.5	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
TARGETS ASSESSMENT (sorted by target score)

				Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Equitable Access			Economic Vitality			Transportation System Effectiveness		
				1	2	3	4	5	6	7	8	9	10	11	12	13
Row	ID	PROJECT NAME	Total Targets Score	Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Housing + Transportation Costs	Affordable Housing	Displacement Risk	Access to Jobs	Jobs Creation	Goods Movement	Non-Auto Mode Share	Road Maintenance	Transit Maintenance
17	313	Muni Service Frequency Improvements	6	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
18	304	Southeast Waterfront Transportation Improvements (Hunters Point Transit Center + New Express Bus Services)	6	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
19	505	Capitol Expressway LRT – Phase 2 (Alum Rock to Eastridge)	5.5	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
20	504	Stevens Creek LRT	5.5	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
21	517	Stevens Creek BRT	5.5	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
22	903	Sonoma County Service Frequency Improvements	5	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
23	523	VTA Service Frequency Improvements (15-Minute Frequencies)	5	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
24	507	Vasona LRT – Phase 2 (Winchester to Vasona Junction)	5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
25	515	Tasman West LRT Realignment (Fair Oaks to Mountain View)	5	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
26	1204	Berkeley-San Francisco Ferry	5	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
27	104	Geneva-Harney BRT + Corridor Improvements	5	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
28	205_15	Express Bus Bay Bridge Contraflow Lane	5	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
29	302	Treasure Island Congestion Pricing (Toll + Transit Improvements)	4.5	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
30	1203	Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements	4.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
31	331	Better Market Street	4.5	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT
32	801	Golden Gate Transit Frequency Improvements	4.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT

July 2016

Plan BayArea 2040

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
TARGETS ASSESSMENT (sorted by target score)

				Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Equitable Access			Economic Vitality			Transportation System Effectiveness		
				1	2	3	4	5	6	7	8	9	10	11	12	13
Row	ID	PROJECT NAME	Total Targets Score	Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Housing + Transportation Costs	Affordable Housing	Displacement Risk	Access to Jobs	Jobs Creation	Goods Movement	Non-Auto Mode Share	Road Maintenance	Transit Maintenance
33	516	VTA Express Bus Frequency Improvements	4.5	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
34	1301	Columbus Day Initiative	4	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
35	513	North Bayshore LRT (NASA/Bayshore to Google)	4	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
36	402	eBART – Phase 2 (Antioch to Brentwood)	4	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT
37	905	SMART – Phase 3 (Santa Rosa Airport to Cloverdale)	4	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT
38	203	Irvington BART Infill Station	3.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
39	1403	Local Streets and Roads Maintenance (Preserve Conditions vs. No Funding)	3.5	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT
40	1413	Local Streets and Roads Maintenance (Preserve Conditions vs. Local Funding)	3.5	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT
41	1206	Alameda Point-San Francisco Ferry	3	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
42	1302	Express Lane Network (East and North Bay)	3	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
43	502	Express Lane Network (Silicon Valley)	3	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
44	901	US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2	3	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT
45	409	I-680/SR-4 Interchange Improvements + HOV Direct Connector	3	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT
46	1503	Highway Pavement Maintenance (Ideal Conditions vs. Preserve Conditions)	2.5	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT
47	1502	Highway Pavement Maintenance (Preserve Conditions vs. No Funding)	2.5	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT
48	1202	Oakland-Alameda-San Francisco Ferry Frequency Improvements	2.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT

July 2016

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
TARGETS ASSESSMENT (sorted by target score)

				Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Equitable Access			Economic Vitality			Transportation System Effectiveness		
				1	2	3	4	5	6	7	8	9	10	11	12	13
Row	ID	PROJECT NAME	Total Targets Score	Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Housing + Transportation Costs	Affordable Housing	Displacement Risk	Access to Jobs	Jobs Creation	Goods Movement	Non-Auto Mode Share	Road Maintenance	Transit Maintenance
49	604	Solano County Express Bus Network	2.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
50	403	I-680 Express Bus Frequency Improvements	2.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
51	601	I-80/I-680/SR-12 Interchange Improvements	2.5	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
52	411	SR-4 Auxiliary Lanes - Phases 1 + 2 (Concord to Pittsburg)	2	MODERATE ADVERSE	STRONG SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
53	102	US-101 HOV Lanes (San Francisco + San Mateo Counties)	2	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT
54	103	El Camino Real Rapid Bus (Daly City to Palo Alto)	2	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
55	519	Lawrence Freeway	2	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT
56	1304	Bay Bridge West Span Bike Path	2	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
57	1201	San Francisco-Redwood City + Oakland-Redwood City Ferry	2	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT
58	518	ACE Alviso Double-Tracking	1.5	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT
59	412	Antioch-Martinez-Hercules-San Francisco Privately-Operated Ferry	1.5	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT
60	202	East-West Connector (Fremont to Union City)	1.5	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT
61	209	SR-84 Widening + I-680/SR-84 Interchange Improvements (Livermore to I-680)	1	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
62	210	I-580 ITS Improvements	1	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT
63	605	Jepson Parkway (Fairfield to Vacaville)	1	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT
64	508	SR-17 Tollway + Santa Cruz LRT (Los Gatos to Santa Cruz)	1	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG ADVERSE	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT

July 2016

Plan BayArea 2040

Plan Bay Area 2040
PROJECT PERFORMANCE ASSESSMENT
TARGETS ASSESSMENT (sorted by target score)

				Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Equitable Access			Economic Vitality			Transportation System Effectiveness		
				1	2	3	4	5	6	7	8	9	10	11	12	13
Row	ID	PROJECT NAME	Total Targets Score	Climate Protection	Adequate Housing	Healthy + Safe Communities	Open Space + Agricultural Preservation	Housing + Transportation Costs	Affordable Housing	Displacement Risk	Access to Jobs	Jobs Creation	Goods Movement	Non-Auto Mode Share	Road Maintenance	Transit Maintenance
65	101	**Express Lane Network (US-101 San Mateo/San Francisco)**	**0.5**	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
66	211	**SR-262 Connector (I-680 to I-880)**	**-0.5**	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
67	401	**TriLink Tollway + Expressways (Brentwood to Tracy/Altamont Pass)**	**-0.5**	STRONG ADVERSE	MODERATE SUPPORT	MODERATE ADVERSE	STRONG ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
68	404	**SR-4 Widening (Antioch to Discovery Bay)**	**-0.5**	MODERATE ADVERSE	MODERATE SUPPORT	STRONG ADVERSE	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT
69	503	**SR-152 Tollway (Gilroy to Los Banos)**	**-1.5**	STRONG ADVERSE	MODERATE SUPPORT	MODERATE ADVERSE	STRONG ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	MINIMAL IMPACT

July 2016

Appendix E – Confidence Assessment

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	→			The travel model has difficulty representing the benefits of an operational strategy that relies on real-time price changes throughout the morning and evening commute periods.
102	**US-101 HOV Lanes (San Francisco + San Mateo Counties)**				-
103	**El Camino Real Rapid Bus (Daly City to Palo Alto)**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
104	**Geneva-Harney BRT + Corridor Improvements**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
202	**East-West Connector (Fremont to Union City)**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
203	**Irvington BART Infill Station**	→		→	Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model. Infill stations can be implemented quickly for near-term benefits.
206	**AC Transit Service Frequency Improvements**			→	Bus frequency projects can be implemented quickly for near-term benefits.
207	**San Pablo BRT (San Pablo to Oakland)**				-
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements (Livermore to I-680)**				-
210	**I-580 ITS Improvements**				-

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
211	**SR-262 Connector (I-680 to I-880)**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
301	**Geary BRT**		→		B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. This project can be implemented quickly to achieve benefits in the near-term.
302	**Treasure Island Congestion Pricing (Toll + Transit Improvements)**				-
304	**Southeast Waterfront Transportation Improvements (Hunters Point Transit Center + New Express Bus Services)**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
306	**Downtown San Francisco Congestion Pricing (Toll + Transit Improvements)**				-
307	**Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase) + Caltrain to Transbay Transit Center**		→		Framework does not capture the benefits to residents outside of the Bay Area who would now have improved access to San Francisco. B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. The air quality benefits of converting diesel vehicles to electric vehicles is not included in this assessment.
311	**Muni Forward Program**		→	→	B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. This project can be implemented quickly to achieve benefits in the near-term.

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
312	**19th Avenue Subway (West Portal to Parkmerced)**	→	→		B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. The modeling assumes that the land use is the same with and without the project, potentially under-estimating the change in transit benefits between the baseline and the build scenarios.
313	**Muni Service Frequency Improvements**		→	→	B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. This project can be implemented quickly to achieve benefits in the near-term.
331	**Better Market Street**		→	→	B/C framework does not estimate benefits of streetscape elements of the project (including safety and economic development). This project can be implemented quickly to achieve benefits in the near-term.
401	**TriLink Tollway + Expressways (Brentwood to Tracy/Altamont Pass)**	→			Because the land uses outside of the 9-county Bay Area are not explicitly represented, the model does not fully understand the likely impact of projects located near the boundaries of the planning region. The modeling assumes that land use is the same with and without the project, potentially over-estimating the travel time savings of this project.
402	**eBART – Phase 2 (Antioch to Brentwood)**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
403	**I-680 Express Bus Frequency Improvements**			→	Bus frequency projects can be implemented quickly for near-term benefits.
404	**SR-4 Widening (Antioch to Discovery Bay)**				-

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	→		→	The model does not explicitly represent weaving (thus ignoring the benefits of longer weaving sections), acceleration or deceleration behavior, or queue spillback. The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
411	**SR-4 Auxiliary Lanes - Phases 1 + 2 (Concord to Pittsburg)**	→			The model does not explicitly represent weaving (thus ignoring the benefits of longer weaving sections), acceleration or deceleration behavior, or queue spillback.
501	**BART to Silicon Valley – Phase 2 (Berryessa to Santa Clara)**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
502	**Express Lane Network (Silicon Valley)**	→		→	The travel model has difficulty representing the benefits of an operational strategy that relies on real-time price changes throughout the morning and evening commute periods. Some portions of the project may be implemented early and accrue benefits over a long period in the Plan, the Network likely will not be complete until near the end of the Plan period.
503	**SR-152 Tollway(Gilroy to Los Banos)**	→			The model poorly estimates freight travel behavior so may be underestimating the freight benefits of this project, both in terms of the number of truck trips and the impacts of steep grades on trucks. The modeling assumes that land use is the same with and without the project, potentially over-estimating the travel time savings of this project.
504	**Stevens Creek LRT**				-
505	**Capitol Expressway LRT – Phase 2 (Alum Rock to Eastridge)**				-

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
506	**El Camino Real BRT (Palo Alto to San Jose)**				-
507	**Vasona LRT – Phase 2 (Winchester to Vasona Junction)**				-
508	**SR-17 Tollway + Santa Cruz LRT (Los Gatos to Santa Cruz)**	→	→	→	The model does not estimate inter-regional transit trips so may be underestimating the transit benefits for this project. B/C methodology includes a broad treatment of safety benefits so may underestimate projects with the primary purpose of safety improvement. The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
510	**Downtown San Jose Subway (Japantown to Convention Center)**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
513	**North Bayshore LRT (NASA/Bayshore to Google)**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
515	**Tasman West LRT Realignment (Fair Oaks to Mountain View)**			→	The project is likely to be complete toward the end of the Plan, reducing the total benefits potentially accrued during the Plan period.
516	**VTA Express Bus Frequency Improvements**			→	Bus frequency projects can be implemented quickly for near-term benefits.
517	**Stevens Creek BRT**				-
518	**ACE Alviso Double-Tracking**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
519	**Lawrence Freeway**				-
522	**VTA Service Frequency Improvements (10-Minute Frequencies)**			→	Bus frequency projects can be implemented quickly for near-term benefits.
523	**VTA Service Frequency Improvements (15-Minute Frequencies)**			→	Bus frequency projects can be implemented quickly for near-term benefits.

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
601	**I-80/I-680/SR-12 Interchange Improvements**	→			The model does not explicitly represent weaving (thus ignoring the benefits of longer weaving sections), acceleration or deceleration behavior, or queue spillback. Freight benefits are also not explicitly included.
604	**Solano County Express Bus Network**			→	Bus frequency projects can be implemented quickly for near-term benefits.
605	**Jepson Parkway (Fairfield to Vacaville)**				-
801	**Golden Gate Transit Frequency Improvements**			→	Bus frequency projects can be implemented quickly for near-term benefits.
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**				-
903	**Sonoma County Service Frequency Improvements**			→	Bus frequency projects can be implemented quickly for near-term benefits.
905	**SMART – Phase 3 (Santa Rosa Airport to Cloverdale)**		→		Analysis is performed for a typical weekday, but many of the project's benefits will be accrued on weekends due to recreational use and tourism.
1001	**BART Metro Program (Service Frequency Increase + Bay Fair Operational Improvements + SFO Airport Express Train)**		→		B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions.
1101	**Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase)**		→		B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. The air quality benefits of converting diesel vehicles to electric vehicles is not included in this assessment.
1102	**Caltrain Modernization - Phase 1 + Phase 2 (Electrification + Service Frequency Increase + Capacity Expansion)**		→		B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. The air quality benefits of converting diesel vehicles to electric vehicles is not included in this assessment.

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
1201	**San Francisco-Redwood City + Oakland-Redwood City Ferry**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	→		→	Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model. Ferry frequency improvements can be implemented quickly for near-term benefits.
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	→		→	Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model. Ferry frequency improvements can be implemented quickly for near-term benefits.
1204	**Berkeley-San Francisco Ferry**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
1206	**Alameda Point-San Francisco Ferry**	→			Due to the project's smaller size, the travel model may not accurately estimate its benefits relative to the regional scale of the model.
1301	**Columbus Day Initiative**	→			The model is likely overestimating the benefits of arterial signal coordination in dense, urban environments. The model is likely underestimating the safety benefits of advanced queue-warning and connected vehicles.
1302	**Express Lane Network (East and North Bay)**	→		→	The travel model has difficulty representing the benefits of an operational strategy that relies on real-time price changes throughout the morning and evening commute periods. Some portions of the project may be implemented early and accrue benefits over a long period in the Plan, the Network likely will not be complete until near the end of the Plan period.
1304	**Bay Bridge West Span Bike Path**		→		Analysis is performed for a typical weekday, but many of the project's benefits will be accrued on weekends due to recreational use and tourism.

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
1403	**Local Streets and Roads Maintenance(Preserve Conditions vs. No Funding)**		→	→	While time and cost benefits are captured in the B-C framework, potential safety benefits (particularly for non-motorized users) are not included. Because the analysis was conducted for year 2040, benefits are overestimated compared to interim years; however, benefits may continue to accrue past the Plan horizon year as well.
1413	**Local Streets and Roads Maintenance (Preserve Conditions vs. Local Funding)**		→	→	While time and cost benefits are captured in the B-C framework, potential safety benefits (particularly for non-motorized users) are not included. Because the analysis was conducted for year 2040, benefits are overestimated compared to interim years; however, benefits may continue to accrue past the Plan horizon year as well.
1502	**Highway Pavement Maintenance (Preserve Conditions vs. No Funding)**			→	Because the analysis was conducted for year 2040, benefits are overestimated compared to interim years; however, benefits may continue to accrue past the Plan horizon year as well.
1503	**Highway Pavement Maintenance (Ideal Conditions vs. Preserve Conditions)**			→	Because the analysis was conducted for year 2040, benefits are overestimated compared to interim years; however, benefits may continue to accrue past the Plan horizon year as well.
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**		→	→	B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. Similar to crowding, the model does not reflect the increased comfort or perceived modernity of a new transit vehicle, for example. Because the analysis was conducted for year 2040, benefits are overestimated compared to interim years; however, benefits may continue to accrue past the Plan horizon year as well.

ID	Project Name	CONFIDENCE ASSESSMENT CRITERIA *if marked in yellow, see comments to the right*			Comments
		Travel Model Accuracy	Framework Completeness	Timeframe Inclusiveness	
1651	**Public Transit Maintenance - Rail Operators (Preserve Conditions vs. No Funding)**		→	→	B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions. Similar to crowding, the model does not reflect the increased comfort or perceived modernity of a new transit vehicle, for example. Because the analysis was conducted for year 2040, benefits are overestimated compared to interim years; however, benefits may continue to accrue past the Plan horizon year as well.
205_15	**Express Bus Bay Bridge Contraflow Lane**		→		B/C framework doesn't consider the value of relieving crowded transit vehicles and may be underestimating benefits of projects in areas with crowded conditions.

Appendix F: Sensitivity Testing – Final Memorandum

Memorandum

TO: Kristen Carnarius and Dave Vautin, MTC

FROM: Tim Grose, Krista Jeannotte, and Casey Osborn

RE: Plan Bay Area 2040 Project Performance Support – Task 4.1 Benefit Valuation Sensitivity Test Methodology and Results

---

Introduction

This memorandum and accompanying spreadsheet represent the Plan Bay Area 2040 Project Performance Support final deliverable for Task 4.1. It contains three types of sensitivity tests on the benefit-cost assessment: one on a project's cost, one on the valuation of travel time used to estimate a project's benefits, and one on reduced valuation of life. The first two components are key drivers for a project's ultimate performance in the context of the Project Performance Assessment and the third assesses the estimated impact of the adjustments made to life valuation for Plan Bay Area 2040. The values used for this assessment reflect project performance results as presented to the MTC Planning Committee on May 13, 2016.

Sensitivity Test #1 – Cost Uncertainty

Financially constrained long-term planning requires that large transportation project sponsors submit costs estimates, but these estimates are subject to uncertainty. The proposed sensitivity test approach is based on extensive research done by Bent Flyvbjerg regarding "optimism bias" in project cost. Flyvbjerg found that the projects with the highest degree of optimism bias are capital-intensive rail projects and that these are the projects most likely to experience cost overrun. Flyvbjerg's recommended cost increases were applied by project type and evaluated the extent to which cost uncertainty would affect project rankings.

Sensitivity Test #2 – Reduced Valuation of Travel Time

In benefit-cost assessments for transportation projects, the largest benefit is typically travel time and cost savings. For this test, the valuation of travel time and cost savings were reduced by 50% to assess which projects have higher "societal benefits" (e.g. safety and health) relative to user benefits.

Sensitivity Test #3 – Reduced Valuation of Life

One of the changes for Plan Bay Area is the value of statistical life has doubled from $4.8 million (in $2013) to $10 million (in $2017). The value is also applied to a new mortality benefit corresponding to changes in walking and biking. This change has increased the relative weight of health and safety impacts of transportation projects. This sensitivity test reduces the valuation

of life by half to return the weighting of health and safety to the same approximate weight as in the Plan Bay Area assessment.

Sensitivity Test Methodology

For the cost sensitivity tests, cost increases factors from Flyvbjerg's research were applied to the Plan Bay Area project cost estimates. Table 1 presents Flyvbjerg's recommended cost increases factors for different project types. Cost increase factors are provided for both the 50th percentile (i.e., projects that experience the median percentage increase from estimated cost to actual cost) and 80th percentile projects. Both values were used in the tests, with 50th percentile corresponding with typical cost increases and 80th percentile corresponding with particularly high cost increases. For cost increase factors in Table 1 with ranges (Building projects, IT projects, Standard civil engineering, and Non-standard civil engineering), 50th and 80th percentile values were calculated based on their ranges. For example, the Standard civil engineering cost increase factors were 20% in the 50th percentile and 32% in the 80th percentile.

There are not specific cost increase factors for express lanes projects, buses or ferries. Instead, the Roads cost increase factors were applied to express lanes and buses, and the Standard civil engineering cost increase factors were applied to ferry projects. Fixed links increase factors were applied to road bridges and road tunnels. Cost increase factors were not applied to state of good repair projects. Appendix A includes a brief literature review of cost uncertainty, noting different sources of overrun, and more information on Flyvbjerg's research.

Table 1. Flyvbjerg's Recommended Cost Increase Factors for Capital Expenditures[1]

Category	Types of Projects	Applicable Cost Increase Factor	
		50% Percentile	80% Percentile
Roads	Motorway Trunk roads Local roads Bicycle facilities Pedestrian facilities Park and ride Bus lane schemes Guided bus on wheels	15%	32%
Rail	Metro Light rail Guided buses on tracks Conventional rail High speed rail	40%	57%
Fixed links	Bridges Tunnels	23%	55%
Building projects	Stations Terminal buildings	4-51%	
IT projects	IT system development	10-200%	
Standard civil engineering	Included for reference purposes only	3-44%	
Non-standard civil engineering	Included for reference purposes only	6-66%	

Given the challenges of gathering comprehensive information on individual project risk factors, *general* risk factors were applied to the projects. Using a blend of general risk factors to calculate cost can mitigate the shortcomings of any single risk factor.

Four risk factors correspond with Flyvbjerg's optimism bias sensitivity adjustments. The specific operations for each risk factor are:

1. Flyvbjerg's 50th Percentile Cost Increase Factors to Capital Costs: Projects were categorized using the Flyvbjerg classes listed in Table 1. Most projects were tagged as road or rail projects, though some fell into the fixed link (i.e., roads and bridges), building, or standard civil engineering project categories. Then, the applicable 50th percentile optimism bias uplift (the percentages shown in Table 1) were added the original project capital cost estimates. For categories with ranges in Table 1, the median value of the range was used.

[1] "Procedures for Dealing with Optimism Bias" The British Department of Transport. 10 June 2004. Report no. 58924, Issue 1, Flyvbjerg – 10 Jun 2004.

2. Flyvbjerg's 80th Percentile Cost Increase Factors to Capital Costs: This operation was similar to the 50th percentile calculation but escalated project capital costs using the 80th percentile increase factors in Table 1. For categories with increase ranges, the 80th percentile value of the range was used. The 80th percentile test produces a higher and thus more conservative cost estimate.

3. Flyvbjerg's 50th Percentile Cost Increase Factors to All Costs: This test used the same method as test #1 but applied the 50th percentile cost increase factors to all costs rather than only capital costs to account for underestimated operations and maintenance costs.

4. Flyvbjerg's 80th Percentile Cost Increase Factors to All Costs: This test used the same method as test #2 but applied the 80th percentile cost increase factors to all costs rather than only capital costs to account for underestimated operations and maintenance costs.

In addition, the sensitivity test spreadsheet includes additional tests involving project benefits.

- Travel Time Sensitivity Test: This test reduces select travel time and cost benefit categories for all projects by 50%. These categories include travel and cost savings for residents, travelers passing through the region, truck drivers, and non-recurring freeway delay. The test examines how projects perform when travel time savings has a lower value compared to other benefits.

- Life Valuation Sensitivity Test: This test reduces the benefit categories that use the valuation of life by 50%. These categories include fatalities due to collisions and mortality rates due to physical activity. The test examines how projects perform when the value of statistical life is adjusted to align with the previous Plan Bay Area assumptions.

- General Benefit Sensitivity Test: This test allows MTC to adjust the relative weights of each benefit category using the sensitivity test spreadsheet.

Unit cost sensitivity tests were also considered. These tests compare each project's unit costs to average costs across similar project types. A unit cost sensitivity analysis relies heavily on the nature and number of projects included within each category and the available information on the proposed projects. Ideally, unit cost categories are both narrowly defined (i.e., contain very similar projects) and have a large number of projects. Furthermore, having rich attribute information about each historic and proposed project would make it easier to categorize projects more narrowly and isolate variables contributing to cost factors other than the overall project category.

Given the limited amount of attribute information for the proposed projects, the broad project categories with high cost ranges, and relatively small sample sizes that restricted the categorization process, applying these unit cost sensitivity tests did not yield useful results at the individual project level.

Results

This section presents key results of the sensitivity tests. It reviews trends for the different groups of sensitivity tests and shows the projects most affected by each test, measured by percent change in benefit/cost ratio (see Tables 2 through 5). Appendix B shows full results for each test.

Flyvbjerg Cost Increase Factors

Tables 3 and 4 show the shift in results from the sensitivity tests applying Flyvbjerg cost increase factors to the major Plan Bay Area 2040 projects for the 50th and 80th percentile capital cost increases. The rows shows projects by original rank. The columns with blue headings indicate original annualized benefits and costs. The columns with purple headings relate to the tests; they show adjusted annualized cost with the test, original and adjusted benefit/cost ratios (B/C ratios), percent change in B/C ratios, and original and adjusted rank. These and subsequent key results tables are filtered to include the projects experiencing the highest percent changes in B/C ratios. The Flyvbjerg increase factors are substantially higher for rail than for other projects. The next highest multipliers used were, in descending order, building projects, fixed links (i.e., bridges and tunnels), standard civil engineering projects, and roads. The Flyvberg cost increase factors were not applied to state of good repair projects.

The 50th and 80th percentile results affect the same projects proportionally and differ only in magnitude, with the latter increasing costs more. Since the Flyvbjerg cost increase factors are higher for rail than for roadway, rail projects are most affected by these tests. Because these two tests are applied only to capital costs, capital cost intensive projects experience greater cost increases. The Tasman West LRT Realignment and 19th Avenue Subway projects undergo the largest B/C ratio declines, with several rail capital projects close behind. For the 80th percentile capital cost tests, the B/C ratios for the 19th Avenue Subway dropped below 1. In the 50th percentile test, BART to Silicon Valley fell from 6th to 10th, and the Public Transit Maintenance – Bus Operators project rose into the top 10 (from 13th to 8th). In the 80th percentile capital cost test, El Camino Real BRT and Geary BRT fell out of the top 10 projects (from 9th and 10th to 11th and 12th, respectively), and Public Transit Maintenance – Bus Operators and Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements rose into the top 10 (from 13th and 14th to 7th and 10th, respectively).

The Flyvberg 50th and 80th percentile cost increase factors were also applied to all costs rather than only capital costs. Rail projects are again affected most heavily. Since these tests do not distinguish between capital and operating and maintenance costs, cost escalations are uniform across each Flyvbjerg category (hence the same B/C ratio percent changes in tables B-3 and B-4). For the 80th percentile all cost tests, the B/C ratio for the 19th Avenue Subway dropped below 1. For both tests, BART to Silicon Valley – Phase 2 (Berryessa to Santa Clara) fell out of the top 10 projects (6th to 11th and 6th to 10th, respectively), and Public Transit Maintenance – Bus Operators rose into the top 10 (13th to 8th and 13th to 7th, respectively).

Overall, the literature and subsequent Flyvbjerg test results indicate that substantial cost escalation can be anticipated for many capital projects, particularly rail projects. However, limited quantitative information about the evaluated projects and historic projects in the literature, plus

limited resources for this particular effort, make it difficult to informatively estimate more specific risk factors. These and future sensitivity tests could be improved with a wider and deeper research scope. Topics for investigation include (1) specific risk factors and associated quantities; (2) past projects, including cost escalation over project lifecycle, more refined unit costs, and richer attribute information to be investigated and analyzed for cost implications; and (3) more information on proposed projects, such as project phase, cost broken out into more detailed components, and project cost histories.

Table 2. Key Results: Flyvbjerg 50th Percentile Cost Increase Factors to Capital Costs

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$82	**8**	**6**	**-24%**	**6**	**10**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$16	**6**	**5**	**-24%**	**11**	**13**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$8	**6**	**5**	**-26%**	**12**	**15**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$166	**3**	**3**	**-25%**	**24**	**27**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$77	**3**	**3**	**-27%**	**25**	**29**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$14	**3**	**2**	**-24%**	**30**	**36**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$24	**3**	**2**	**-28%**	**31**	**38**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$152	**3**	**2**	**-25%**	**35**	**40**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$28	**2**	**1**	**-21%**	**41**	**44**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$16	**2**	**1**	**-26%**	**45**	**51**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$38	**1**	**1**	**-29%**	**51**	**53**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$23	**0.5**	**0.4**	**-21%**	**61**	**61**

Table 3. Key Results: Flyvbjerg 80th Percentile Cost Increase Factors to Capital Costs

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$90	**8**	**5**	**-31%**	**6**	**9**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$18	**6**	**4**	**-31%**	**11**	**15**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$9	**6**	**4**	**-34%**	**12**	**17**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$183	**3**	**2**	**-33%**	**24**	**28**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$85	**3**	**2**	**-34%**	**25**	**30**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$16	**3**	**2**	**-31%**	**30**	**36**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$27	**3**	**2**	**-35%**	**31**	**39**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$168	**3**	**2**	**-33%**	**35**	**40**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$30	**2**	**1**	**-28%**	**41**	**45**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$18	**2**	**1**	**-33%**	**45**	**50**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$43	**1**	**1**	**-36%**	**51**	**54**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$25	**0.5**	**0.4**	**-28%**	**61**	**61**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$308	**0.3**	**0.2**	**-35%**	**63**	**63**

Travel Time Sensitivity

The travel time sensitivity test examined how a reduction in travel time and cost savings benefits would affect a project's B/C ratio. This valuation is applied to a unified metric of travel time and cost, which means that projects that primarily affect vehicle operating costs are also influenced by the new valuation. Table 4 presents key results for the travel time valuation sensitivity test. One project, the Bay Bridge West Span Bike Path, shows positive B/C ratio change given its emphasis on benefits other than travel time. Conversely, projects that derive most or all of their benefits from travel time and cost savings experience large B/C ratio reductions. These projects include the local streets preservation and maintenance projects, the express lane projects, and I-80/I-680/SR-12 Interchange Improvements.

In the travel time sensitivity test, B/C ratios fell below 1 for the following projects:

- Local Streets and Roads Maintenance (Preserve Conditions vs. No Funding)[2]
- Local Streets and Roads Maintenance (Preserve Conditions vs. Local Funding)[2]
- Express Lane Network (East and North Bay)
- eBART – Phase 2 (Antioch to Brentwood)
- US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2
- I-680/SR-4 Interchange Improvements + HOV Direct Connector
- TriLink Tollway and Expressways (Brentwood to Tracy/Altamont Pass)
- Golden Gate Transit Frequency Improvements
- Muni Service Frequency Improvements
- 19th Avenue Subway
- Express Lane Network (Silicon Valley)

The Public Transit Maintenance – Rail Operators fell out of the top 10 projects (from 8th to 14th), and Capitol Expressway LRT – Phase 2 (Alum Rock to Eastridge) rose into the top 10 (from 11th to 5th).

[2] This project derives most of its benefits from operating cost savings, which is converted to travel time savings for the B/C ratio and monetized with the valuation of time.

Table 4. Key Results: Travel Time Sensitivity Test

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	$1,065	**17**	**7**	**-56%**	**2**	**3**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$173	**11**	**4**	**-59%**	**4**	**8**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$23	**5**	**2**	**-53%**	**16**	**23**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	$724	**4**	**2**	**-61%**	**20**	**34**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$22	**4**	**2**	**-51%**	**22**	**29**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$75	**2**	**1**	**-65%**	**39**	**48**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$4	**2**	**0.1**	**-95%**	**42**	**64**
1413	**Local Streets and Roads Maintenance** (Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	$38	**1**	**0.2**	**-81%**	**54**	**61**
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$8	**0.6**	**0.3**	**-53%**	**57**	**58**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$23	**0.3**	**0.1**	**-59%**	**63**	**63**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$3	**0.2**	**0.1**	**-61%**	**64**	**65**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	-$1	**0.2**	**0**	**-128%**	**65**	**69**

Reduced Valuation of Life Sensitivity

The life valuation sensitivity test assessed how a reduction in the value of life for fatalities would affect the project's B/C ratio. As noted previously, the value of statistical life has doubled from $4.8 million (in $2013) to $10 million (in $2017), and a new mortality benefit corresponding to changes in walking and biking was added to Plan Bay Area 2040. These changes have increased the relative weight of health and safety impacts of transportation projects by approximately double so this sensitivity test reduces the valuation of life by half to return the weighting of health and safety to the same approximate weight as in the Plan Bay Area assessment.

Table 5 presents the key results for the life valuation sensitivity test. None of the projects' B/C ratios fell from above 1 to below 1. One project – Geary BRT – fell out of the top 10 projects (from 10th to 11th). ACE Alviso Double-Tracking rose into the top 10 (from 12th to 8th).

Table 5. Key Results: Life Valuation Sensitivity Test

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$64	**7**	**6**	**-24%**	**7**	**10**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$62	**6**	**5**	**-20%**	**11**	**13**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$114	**4**	**3**	**-21%**	**23**	**25**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$13	**3**	**3**	**-24%**	**26**	**29**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$13	**3**	**3**	**-20%**	**27**	**28**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$38	**3**	**2**	**-21%**	**31**	**37**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$23	**3**	**2**	**-20%**	**32**	**38**
1206	**Alameda Point-San Francisco Ferry**	Multi-County	$12	$5	$9	**2**	**2**	**-20%**	**37**	**39**
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$7	**2**	**2**	**-26%**	**38**	**41**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$84	**2**	**2**	**21%**	**42**	**36**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	$8	**0.2**	**0.2**	**56%**	**65**	**64**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$2	**0.1**	**0.1**	**-56%**	**66**	**66**

References

Ahsan, K., I. Gunawan "Analysis of Cost and Schedule Performance of International Development Projects." International Journal of Project Management 28.1 (2010): 68-78. Web.

Baloyi, Lucis, Michiel Bekker. "Cause of construction cost and time overruns: The 2010 FIFA World Cup stadia in South Africa."

"Capital Cost Database – Purpose and Suggested Use." 1-10. Federal Transit Administration, 2010. Web.

Flyvbjerg, Bent. "Procedures for Dealing with Optimism Bias" The British Department of Transport. 10 June 2004. Report no. 58924, Issue 1. Flyvbjerg – 10 Jun 2004

Flyvbjerg, Bent, Mette Skamris Holm, and Søren Buhl, "Underestimating Costs in Public Works Projects: Error or Lie?" Journal of the American Planning Association, vol. 68, no. 3, Summer 2002, pp. 279-295.

Le-Hoai, Long, Young Dai Lee , Jun Yong Lee, KSCE Journal of Civil Engineering. November 2008, Volume 12, Issue 6, pp 367-377

Lind, Hand, Fresrik Brunes. "Polices to Avoid Cost Overruns in Infrastructure Projects: Critical Evaluation and Recommendations." JCEB.

Salling, Kim Bang; Leleur, Steen; Skougaard, Britt Zoëga. "Reference Scenario Forecasting: A New Approach to Transport Project Assessment." 12th WCTR, July 11-15, 2010 – Lisbon, Portugal

Vautin, Dave, Thomas Park, Mollie Pelon. "Cost Estimation Research Report." Draft. MTC.

Wachs, M., 1990, Ethics and advocacy in forecasting for public policy. Business and Professional Ethics Journal, 9 (1-2), pp 141-157

Appendix A. Literature Review on Cost Sensitivity

To identify risk factors that would affect cost sensitivity thresholds, and to provide some explanation of the theory behind cost sensitivity analysis, we first conducted a brief literature review.

Bent Flyvbjerg is a leading author on cost sensitivity analysis. His work relies on reference class forecasting, first developed by economists Daniel Kahneman and Amos Tversky[3], which uses data on past project cost overruns to determine the likelihood that a certain type or class of project will be at risk of cost overruns[4]. These forecasts do not predict the *future causes* of cost overruns, but instead rely on the *explanations for past* overruns by project class and uses these explanations or factors to estimate the potential for future cost overrun. (In other words, past projects provide a reference point for estimating future cost forecasts). Reference forecasting can be summarized in three steps: (1) identify the reference class, (2) establish a probability distribution for the selected class, and (3) assign the project to a particular position within this distribution[5].

In a 2002 paper[6] Flyvbjerg et al used a large sample of 258 transportation infrastructure projects throughout the world to demonstrate that the pattern of cost underestimation is statistically significant and holds for the majority of transportation projects. In their study they found that:

- A randomly selected project is 86% likely to experience a cost overrun;
- On average actual costs were 28% higher than estimated costs; and
- Rail projects underestimate cost by 44.7%, fixed links (i.e., bridges and tunnels) by 33.8%, and roads by 20.4%.

Flyvbjerg grouped explanations for cost underestimation into four categories[7]: technical, economic, psychological, and political. His study concludes that "cost estimation cannot be explained by error and seems to be best explained by strategic misrepresentation..."[8] On this

---

[3] Salling, Kim Bang; Leleur, Steen; Skougaard, Britt Zoëga. "Reference Scenario Forecasting: A New Approach to Transport Project Assessment." 12th WCTR, July 11-15, 2010 – Lisbon, Portugal

[4] "Procedures for Dealing with Optimism Bias" The British Department of Transport. 10 June 2004. Report no. 58924, Issue 1, Flyvbjerg – 10 Jun 2004.

[5] Flyvbjerg, 2004.

[6] Bent Flyvbjerg, Mette Skamris Holm, and Søren Buhl, "Underestimating Costs in Public Works Projects: Error or Lie?" Journal of the American Planning Association, vol. 68, no. 3, Summer 2002, pp. 279-295.

[7] The first are technological explanations, whereby the underestimation is due to "forecasting errors," such as unreliable data, flawed methods, or lack of experience. Economic explanations for cost overruns include economic self-interest - where the parties standing to benefit from the project (construction firms, etc.) have influence over the project's cost estimation - and public interest, where costs are intentionally low in order to curry the public's favor. Psychological explanations include those like a politicians' "monument complex," and more commonly "appraisal optimism." "An optimistic cost estimate is clearly a low one" (pg. 17). Lastly, there are political explanations for cost overruns, where projects are subject to political boosterism and made to look financially more favorable.

[8] Flyvbjerg et al. 2002, pg. 22.

basis, we can assume that most project costs – whether knowingly or not - are underestimated by sponsors.

Many researchers have applied and built on Flyvberg's work, and have sought to identify additional risk factors or to apply the principals of cost sensitivity analysis to different locales or project types. Cost overruns have been examined for the World Cup in South Africa,[9] in Sweden[10], and Denmark[11].

Lind et al[12] developed a questionnaire for project managers in Sweden in order to isolate some of the causes for cost overruns. The questionnaire asked project managers to provide responses to statements such as "Cost overruns would be considerably less if Design Build were used instead of Design Bid Build," and "Cost overruns would be considerably less if the client let external reviewers evaluate the project and calculation in advance." The researchers then used these responses in tandem with a literature review to propose changes to organizational structure, quality, and processes that might enable more accurate project estimates and minimize cost overruns.

Salling, et al developed an enhanced reference forecasting technique. To better capture the risk of uncertainty, the authors combined reference forecasting with more rigorous quantitative risk analysis and Monte Carlo simulations to develop a methodology they called "reference scenario forecasting." While compelling, these techniques require extensive statistical analysis.

Many researchers, Wachs[13] in particular, have investigated the political motivations behind cost underestimation and accompanying ethical concerns. While political motivations appear to be a widespread explanation for cost underestimation, they are poorly understood and difficult to capture quantitatively.

The Federal Transit Administration developed the "Capital Cost Database,"[14] using data on rail projects from across the county. This database creates "order of magnitude" project cost estimates based on user-adjusted parameters, including rail type, number of stations and type of construction. The FTA stresses that the database should not be used to prepare detailed cost estimates, but for ballpark estimates of conceptual transit projects.

The literature mentions a number of risk factors for cost overruns. Most of these risk factors do not have quantified sensitivity thresholds. Furthermore, applying a specific risk factor is unfeasible if the projects being assessed do not have sufficient information on that specific factor. A project is at risk of experiencing cost overruns if it:

---

[9] Baloyi, Lucis, Michiel Bekker. "Cause of construction cost and time overruns: The 2010 FIFA World Cup stadia in South Africa."

[10] Lind, Hand, Fresrik Brunes. "Polices to Avoid Cost Overruns in Infrastructure Projects: Critical Evaluation and Recommendations." JCEB.

[11] Salling, Kim Bang 2010.

[12] Lind, Hand, et al.

[13] Wachs, M., 1990, Ethics and advocacy in forecasting for public policy." Business and Professional Ethics Journal, 9 (1-2), pp 141-157.

[14] "Capital Cost Database – Purpose and Suggested Use." 1-10. Federal Transit Administration, 2010. Web.

- Is in very early stages of development[15], has very long implementation timeline, or is expected to have a long contract.[16]
- Is not well defined and has the potential to have major changes to scope.[17]
- Is a rail project or bridge project, which have been shown to have higher potential for cost overruns.[18]
- Is adjacent to major natural, manmade, and protected environmental assets, which could contribute to litigation and/or construction delay.[19]
- Requires land to be acquired because construction is outside of existing curblines and right-of-way.[20]
- Has a high degree of interest from politicians[21] or interest groups and costs estimates may be influenced by politics.
- Has known utility conflicts.
- Is similar in scale and scope to previous Bay Area projects that have experienced significant cost overruns.
- Does not include explicit cost contingency accommodation in the project cost estimate.

On behalf of the British Department of Transport, Flyvbjerg developed a number of sensitivity thresholds based on his past research and condensed these thresholds into what he calls the "optimism bias uplift" scale. Table 1 in the Sensitivity Test Methodology section illustrates this scale. In it, projects are sorted by category – e.g., road, rail, and fixed link (i.e., bridges and tunnels) – and are assigned a sensitivity threshold based on the accepted degree of uncertainty.

[15] See: Baloyi and Bekker. In the South Africa World Cup unfinished designs were a cause for delay.
[16] Ahsan, K., I. Gunawan. "Analysis of Cost and Schedule Performance of International Development Projects." International Journal of Project Management 28.1 (2010): 68-78. Web.
[17] Le-Hoai, Long, Young Dai Lee , Jun Yong Lee, KSCE Journal of Civil Engineering. November 2008, Volume 12, Issue 6, pp 367-377.
[18] Bent Flyvbjerg, Mette Skamris Holm, and Søren Buhl found that rail projects had a higher cost escalation than (average cost escalation 45%, SD = 38), fixed link project (average cost escalation at 34%, SD = 62), or a road project (average cost escalation is 20%, SD=30.
[19] Le-Hoai, Long, 2008.
[20] K. Ahsan, 2010.
[21] Flyvbjerg, et al, 2002.

Appendix B. Full Sensitivity Test Results

Table B-1. Results: Flyvbjerg 50th Percentile Cost Increase Factors to Capital Costs

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1503	**Highway Pavement Maintenance** (Ideal Conditions vs. Preserve Conditions)	Multi-County	$638	-$1	n/a	**Infinite**	**Infinite**	--	**1**	**1**
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	n/a	**17**	**17**	--	**2**	**2**
302	**Treasure Island Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$56	$4	$5	**14**	**12**	**-13%**	**3**	**3**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$42	**11**	**10**	**-9%**	**4**	**4**
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements** (Livermore to I-680)	Alameda	$116	$13	$15	**9**	**8**	**-12%**	**5**	**5**
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$82	**8**	**6**	**-24%**	**6**	**10**
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$13	**7**	**6**	**-13%**	**7**	**7**
1651	**Public Transit Maintenance - Rail Operators (Preserve vs. No Funding)**	Multi-County	$1,351	$198	n/a	**7**	**7**	--	**8**	**6**
506	**El Camino Real BRT** (Palo Alto to San Jose)	Santa Clara	$85	$13	$15	**7**	**6**	**-13%**	**9**	**9**
301	**Geary BRT**	San Francisco	$124	$20	$22	**6**	**6**	**-10%**	**10**	**11**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$16	**6**	**5**	**-24%**	**11**	**13**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$8	**6**	**5**	**-26%**	**12**	**15**
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	$623	$103	n/a	**6**	**6**	--	**13**	**8**
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	$29	$5	$5	**6**	**5**	**-6%**	**14**	**12**
203	**Irvington BART Infill Station**	Alameda	$30	$6	$7	**5**	**4**	**-16%**	**15**	**19**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$11	**5**	**4**	**-13%**	**16**	**18**
903	**Sonoma County Service Frequency Improvements**	Sonoma	$75	$15	$16	**5**	**5**	**-6%**	**17**	**14**
523	**VTA Service Frequency Improvements** (15 minutes)	Santa Clara	$103	$23	$23	**4**	**4**	**-2%**	**18**	**16**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
211	**SR-262 Connector** (I-680 to I-880)	Alameda	$22	$5	$6	**4**	**4**	**-13%**	**19**	**20**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	n/a	**4**	**4**	**--**	**20**	**17**
207	**San Pablo BRT** (San Pablo to Oakland)	Multi-County	$67	$16	$19	**4**	**4**	**-13%**	**21**	**22**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$12	**4**	**4**	**-12%**	**22**	**21**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$47	**4**	**3**	**-19%**	**23**	**24**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$166	**3**	**3**	**-25%**	**24**	**27**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$77	**3**	**3**	**-27%**	**25**	**29**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$6	**3**	**3**	**-11%**	**26**	**25**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$5	**3**	**3**	**-5%**	**27**	**23**
1102	**Caltrain Modernization - Phase 1 + Phase 2** (Capacity Expansion)	Multi-County	$236	$77	$87	**3**	**3**	**-11%**	**28**	**26**
411	**SR-4 Auxiliary Lanes - Phase 1 + Phase 2** (Concord to Pittsburg)	Contra Costa	$44	$15	$17	**3**	**3**	**-12%**	**29**	**28**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$14	**3**	**2**	**-24%**	**30**	**36**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$24	**3**	**2**	**-28%**	**31**	**38**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$12	**3**	**2**	**-11%**	**32**	**30**
102	**US-101 and I-280 HOV Lanes** (GP Lane Conversions in San Francisco, widening in San Mateo	San Mateo - San Francisco	$63	$25	$27	**3**	**2**	**-11%**	**33**	**32**
503	**SR-152 Tollway**	Santa Clara	$95	$37	$42	**3**	**2**	**-13%**	**34**	**33**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$152	**3**	**2**	**-25%**	**35**	**40**
331	**Better Market Street**	San Francisco	$32	$13	$15	**3**	**2**	**-13%**	**36**	**34**
1206	**Alameda Point-San Francisco Ferry**	Multi-County	$12	$5	$5	**2**	**2**	**-2%**	**37**	**31**
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$5	**2**	**2**	**-10%**	**38**	**35**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$104	**2**	**2**	**-13%**	**39**	**37**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
206	**AC Transit Service Frequency Improvements**	Alameda	$248	$120	$129	**2**	**2**	**-7%**	**40**	**39**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$28	**2**	**1**	**-21%**	**41**	**44**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$44	**2**	**2**	**-13%**	**42**	**43**
604	**Solano County Express Bus Network**	Solano	$21	$12	$13	**2**	**2**	**-8%**	**43**	**42**
522	**VTA Service Frequency Improvements** (10 minutes)	Santa Clara	$177	$99	$101	**2**	**2**	**-2%**	**44**	**41**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$16	**2**	**1**	**-26%**	**45**	**51**
311	**Muni Forward Program**	San Francisco	$60	$36	$41	**2**	**1**	**-12%**	**46**	**45**
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Marin - Sonoma	$31	$19	$22	**2**	**1**	**-11%**	**47**	**47**
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	$42	$27	$31	**2**	**1**	**-12%**	**48**	**48**
103	**El Camino Real Rapid Bus** (Daly City to Palo Alto)	San Mateo	$54	$36	$37	**2**	**1**	**-3%**	**49**	**46**
401	**TriLink Tollway + Expressways** (Brentwood to Tracy/Altamont Pass)	Contra Costa	$75	$51	$58	**1**	**1**	**-13%**	**50**	**50**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$38	**1**	**1**	**-29%**	**51**	**53**
801	**Golden Gate Transit Frequency Improvements**	Marin - Sonoma	$11	$8	$8	**1**	**1**	**-3%**	**52**	**49**
313	**Muni Service Frequency Improvements**	San Francisco	$89	$79	$83	**1**	**1**	**-5%**	**53**	**52**
1413	**Local Streets and Roads Maintenance** Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	n/a	**1**	**1**	--	**54**	**54**
516	**VTA Express Bus Network**	Santa Clara	$18	$19	$20	**0.9**	**0.9**	**-2%**	**55**	**55**
202	**East-West Connector** (Fremont to Union City)	Alameda	$10	$12	$14	**0.9**	**0.8**	**-13%**	**56**	**56**
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$27	**0.6**	**0.6**	**-2%**	**57**	**57**
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	Contra Costa	$9	$16	$17	**0.6**	**0.5**	**-8%**	**58**	**59**
403	**I-680 Express Bus Frequency Improvements**	Contra Costa	$12	$21	$21	**0.6**	**0.5**	**-3%**	**59**	**58**
404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	$9	$17	$19	**0.5**	**0.5**	**-11%**	**60**	**60**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$23	**0.5**	**0.4**	**-21%**	**61**	**61**
104	**Geneva-Harney BRT + Corridor Improvements**	San Mateo - San Francisco	$15	$46	$52	**0.3**	**0.3**	**-12%**	**62**	**62**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$247	**0.3**	**0.2**	**-19%**	**63**	**63**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$39	**0.2**	**0.2**	**-13%**	**64**	**64**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	$36	**0.2**	**0.1**	**-12%**	**65**	**65**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$34	**0.1**	**0.1**	**-13%**	**66**	**66**
205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	$0	$10	n/a	**0.0**	**0.0**	**--**	**67**	**67**
1201	**Redwood City-San Francisco Ferry**	Multi-County	$0	$8	$8	**0.0**	**0.0**	**--**	**67**	**67**
905	**SMART – Phase 3** (Windsor to Cloverdale)	Sonoma	$0	$12	$15	**0.0**	**0.0**	**--**	**67**	**67**

Table B-2. Results: Flyvbjerg 80th Percentile Cost Increase Factors to Capital Costs

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1503	**Highway Pavement Maintenance** (Ideal Conditions vs. Preserve Conditions)	Multi-County	$638	-$1	n/a	**Infinite**	**Infinite**	--	**1**	**1**
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	n/a	**17**	**17**	--	**2**	**2**
302	**Treasure Island Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$56	$4	$5	**14**	**11**	**-24%**	**3**	**3**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$47	**11**	**9**	**-18%**	**4**	**4**
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements** (Livermore to I-680)	Alameda	$116	$13	$17	**9**	**7**	**-23%**	**5**	**5**
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$90	**8**	**5**	**-31%**	**6**	**9**
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$15	**7**	**6**	**-24%**	**7**	**8**
1651	**Public Transit Maintenance - Rail Operators (Preserve vs. No Funding)**	Multi-County	$1,351	$198	n/a	**7**	**7**	--	**8**	**6**
506	**El Camino Real BRT** (Palo Alto to San Jose)	Santa Clara	$85	$13	$17	**7**	**5**	**-24%**	**9**	**11**
301	**Geary BRT**	San Francisco	$124	$20	$25	**6**	**5**	**-20%**	**10**	**12**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$18	**6**	**4**	**-31%**	**11**	**15**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$9	**6**	**4**	**-34%**	**12**	**17**
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	$623	$103	n/a	**6**	**6**	--	**13**	**7**
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	$29	$5	$6	**6**	**5**	**-9%**	**14**	**10**
203	**Irvington BART Infill Station**	Alameda	$30	$6	$8	**5**	**4**	**-23%**	**15**	**18**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$13	**5**	**4**	**-24%**	**16**	**19**
903	**Sonoma County Service Frequency Improvements**	Sonoma	$75	$15	$17	**5**	**4**	**-12%**	**17**	**16**
523	**VTA Service Frequency Improvements** (15 minutes)	Santa Clara	$103	$23	$24	**4**	**4**	**-3%**	**18**	**14**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
211	**SR-262 Connector** (I-680 to I-880)	Alameda	$22	$5	$7	**4**	**3**	**-24%**	**19**	**20**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	n/a	**4**	**4**	**--**	**20**	**13**
207	**San Pablo BRT** (San Pablo to Oakland)	Multi-County	$67	$16	$22	**4**	**3**	**-24%**	**21**	**22**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$14	**4**	**3**	**-22%**	**22**	**21**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$51	**4**	**3**	**-25%**	**23**	**24**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$183	**3**	**2**	**-33%**	**24**	**28**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$85	**3**	**2**	**-34%**	**25**	**30**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$6	**3**	**3**	**-21%**	**26**	**25**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$5	**3**	**3**	**-8%**	**27**	**23**
1102	**Caltrain Modernization - Phase 1 + Phase 2** (Capacity Expansion)	Multi-County	$236	$77	$97	**3**	**2**	**-20%**	**28**	**27**
411	**SR-4 Auxiliary Lanes - Phase 1 + Phase 2** (Concord to Pittsburg)	Contra Costa	$44	$15	$20	**3**	**2**	**-23%**	**29**	**31**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$16	**3**	**2**	**-31%**	**30**	**36**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$27	**3**	**2**	**-35%**	**31**	**39**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$13	**3**	**2**	**-20%**	**32**	**32**
102	**US-101 and I-280 HOV Lanes** (GP Lane Conversions in San Francisco, widening in San Mateo County)	San Mateo - San Francisco	$63	$25	$31	**3**	**2**	**-20%**	**33**	**33**
503	**SR-152 Tollway**	Santa Clara	$95	$37	$49	**3**	**2**	**-24%**	**34**	**35**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$168	**3**	**2**	**-33%**	**35**	**40**
331	**Better Market Street**	San Francisco	$32	$13	n/a	**3**	**3**	**--**	**36**	**26**
1206	**Alameda Point-San Francisco Ferry**	Multi-County	$12	$5	$5	**2**	**2**	**-4%**	**37**	**29**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$5	**2**	**2**	**-15%**	**38**	**34**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$120	**2**	**2**	**-24%**	**39**	**37**
206	**AC Transit Service Frequency Improvements**	Alameda	$248	$120	$139	**2**	**2**	**-13%**	**40**	**38**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$30	**2**	**1**	**-28%**	**41**	**45**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$50	**2**	**1**	**-24%**	**42**	**44**
604	**Solano County Express Bus Network**	Solano	$21	$12	$14	**2**	**2**	**-16%**	**43**	**42**
522	**VTA Service Frequency Improvements** (10 minutes)	Santa Clara	$177	$99	$103	**2**	**2**	**-4%**	**44**	**41**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$18	**2**	**1**	**-33%**	**45**	**50**
311	**Muni Forward Program**	San Francisco	$60	$36	$46	**2**	**1**	**-22%**	**46**	**46**
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Marin - Sonoma	$31	$19	$25	**2**	**1**	**-22%**	**47**	**48**
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	$42	$27	$35	**2**	**1**	**-23%**	**48**	**49**
103	**El Camino Real Rapid Bus** (Daly City to Palo Alto)	San Mateo	$54	$36	$38	**2**	**1**	**-7%**	**49**	**43**
401	**TriLink Tollway + Expressways** (Brentwood to Tracy/Altamont Pass)	Contra Costa	$75	$51	$67	**1**	**1**	**-24%**	**50**	**51**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$43	**1**	**0.9**	**-36%**	**51**	**54**
801	**Golden Gate Transit Frequency Improvements**	Marin - Sonoma	$11	$8	$8	**1**	**1**	**-5%**	**52**	**47**
313	**Muni Service Frequency Improvements**	San Francisco	$89	$79	$88	**1**	**1**	**-10%**	**53**	**52**
1413	**Local Streets and Roads Maintenance** (Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	n/a	**1**	**1**	**--**	**54**	**53**
516	**VTA Express Bus Network**	Santa Clara	$18	$19	$20	**0.9**	**0.9**	**-4%**	**55**	**55**
202	**East-West Connector** (Fremont to Union City)	Alameda	$10	$12	$16	**0.9**	**0.7**	**-24%**	**56**	**56**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$27	**0.6**	**0.6**	**-3%**	**57**	**57**
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	Contra Costa	$9	$16	$18	**0.6**	**0.5**	**-12%**	**58**	**59**
403	**I-680 Express Bus Frequency Improvements**	Contra Costa	$12	$21	$22	**0.6**	**0.5**	**-6%**	**59**	**58**
404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	$9	$17	$21	**0.5**	**0.4**	**-21%**	**60**	**60**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$25	**0.5**	**0.4**	**-28%**	**61**	**61**
104	**Geneva-Harney BRT + Corridor Improvements**	San Mateo - San Francisco	$15	$46	$58	**0.3**	**0.3**	**-22%**	**62**	**62**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$308	**0.3**	**0.2**	**-35%**	**63**	**63**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$45	**0.2**	**0.2**	**-24%**	**64**	**64**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	$41	**0.2**	**0.1**	**-22%**	**65**	**65**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$39	**0.1**	**0.1**	**-24%**	**66**	**66**
205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	$0	$10	n/a	**0.0**	**0.0**	**--**	**67**	**67**
1201	**Redwood City-San Francisco Ferry**	Multi-County	$0	$8	$9	**0.0**	**0.0**	**--**	**67**	**67**
905	**SMART – Phase 3** (Windsor to Cloverdale)	Sonoma	$0	$12	$16	**0.0**	**0.0**	**--**	**67**	**67**

Table B-3. Results: Flyvbjerg 50th Percentile Cost Increase Factors to All Costs

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1503	**Highway Pavement Maintenance** (Ideal Conditions vs. Preserve Conditions)	Multi-County	$638	-$1	n/a	**Infinite**	**Infinite**	--	**1**	**1**
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	n/a	**17**	**17**	--	**2**	**2**
302	**Treasure Island Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$56	$4	$5	**14**	**12**	**-13%**	**3**	**3**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$42	**11**	**10**	**-9%**	**4**	**4**
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements** (Livermore to I-680)	Alameda	$116	$13	$15	**9**	**8**	**-12%**	**5**	**5**
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$87	**8**	**5**	**-29%**	**6**	**11**
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$13	**7**	**6**	**-13%**	**7**	**7**
1651	**Public Transit Maintenance - Rail Operators (Preserve vs. No Funding)**	Multi-County	$1,351	$198	n/a	**7**	**7**	--	**8**	**6**
506	**El Camino Real BRT** (Palo Alto to San Jose)	Santa Clara	$85	$13	$15	**7**	**6**	**-13%**	**9**	**9**
301	**Geary BRT**	San Francisco	$124	$20	$23	**6**	**5**	**-13%**	**10**	**10**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$17	**6**	**4**	**-29%**	**11**	**13**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$8	**6**	**4**	**-29%**	**12**	**14**
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	$623	$103	n/a	**6**	**6**	--	**13**	**8**
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	$29	$5	$6	**6**	**5**	**-17%**	**14**	**12**
203	**Irvington BART Infill Station**	Alameda	$30	$6	$7	**5**	**4**	**-19%**	**15**	**18**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$11	**5**	**4**	**-13%**	**16**	**16**
903	**Sonoma County Service Frequency Improvements**	Sonoma	$75	$15	$18	**5**	**4**	**-13%**	**17**	**17**
523	**VTA Service Frequency Improvements** (15 minutes)	Santa Clara	$103	$23	$26	**4**	**4**	**-13%**	**18**	**19**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
211	**SR-262 Connector** (I-680 to I-880)	Alameda	$22	$5	$6	**4**	**4**	**-13%**	**19**	**20**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	n/a	**4**	**4**	**--**	**20**	**15**
207	**San Pablo BRT** (San Pablo to Oakland)	Multi-County	$67	$16	$19	**4**	**4**	**-13%**	**21**	**21**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$12	**4**	**4**	**-13%**	**22**	**22**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$54	**4**	**3**	**-29%**	**23**	**25**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$173	**3**	**2**	**-29%**	**24**	**29**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$79	**3**	**2**	**-29%**	**25**	**30**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$6	**3**	**3**	**-11%**	**26**	**23**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$6	**3**	**3**	**-17%**	**27**	**24**
1102	**Caltrain Modernization - Phase 1 + Phase 2** (Capacity Expansion)	Multi-County	$236	$77	$89	**3**	**3**	**-13%**	**28**	**26**
411	**SR-4 Auxiliary Lanes - Phase 1 + Phase 2** (Concord to Pittsburg)	Contra Costa	$44	$15	$17	**3**	**3**	**-12%**	**29**	**27**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$15	**3**	**2**	**-29%**	**30**	**37**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$25	**3**	**2**	**-29%**	**31**	**38**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$12	**3**	**2**	**-13%**	**32**	**31**
102	**US-101 and I-280 HOV Lanes** (GP Lane Conversions in San Francisco, widening in San Mateo County)	San Mateo - San Francisco	$63	$25	$27	**3**	**2**	**-11%**	**33**	**32**
503	**SR-152 Tollway**	Santa Clara	$95	$37	$42	**3**	**2**	**-13%**	**34**	**33**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$158	**3**	**2**	**-29%**	**35**	**39**
331	**Better Market Street**	San Francisco	$32	$13	n/a	**3**	**3**	**--**	**36**	**28**
1206	**Alameda Point-San Francisco Ferry**	Multi-County	$12	$5	$6	**2**	**2**	**-17%**	**37**	**35**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$5	**2**	**2**	**-17%**	**38**	**36**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$104	**2**	**2**	**-13%**	**39**	**34**
206	**AC Transit Service Frequency Improvements**	Alameda	$248	$120	$138	**2**	**2**	**-13%**	**40**	**40**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$31	**2**	**1**	**-29%**	**41**	**46**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$44	**2**	**2**	**-13%**	**42**	**41**
604	**Solano County Express Bus Network**	Solano	$21	$12	$14	**2**	**2**	**-13%**	**43**	**42**
522	**VTA Service Frequency Improvements** (10 minutes)	Santa Clara	$177	$99	$114	**2**	**2**	**-13%**	**44**	**43**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$17	**2**	**1**	**-29%**	**45**	**50**
311	**Muni Forward Program**	San Francisco	$60	$36	$41	**2**	**1**	**-13%**	**46**	**44**
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Marin - Sonoma	$31	$19	$22	**2**	**1**	**-11%**	**47**	**45**
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	$42	$27	$31	**2**	**1**	**-12%**	**48**	**47**
103	**El Camino Real Rapid Bus** (Daly City to Palo Alto)	San Mateo	$54	$36	$41	**2**	**1**	**-13%**	**49**	**48**
401	**TriLink Tollway + Expressways** (Brentwood to Tracy/Altamont Pass)	Contra Costa	$75	$51	$58	**1**	**1**	**-13%**	**50**	**49**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$38	**1**	**1**	**-29%**	**51**	**53**
801	**Golden Gate Transit Frequency Improvements**	Marin - Sonoma	$11	$8	$9	**1**	**1**	**-13%**	**52**	**51**
313	**Muni Service Frequency Improvements**	San Francisco	$89	$79	$83	**1**	**1**	**-5%**	**53**	**52**
1413	**Local Streets and Roads Maintenance** (Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	n/a	**1**	**1**	**--**	**54**	**54**
516	**VTA Express Bus Network**	Santa Clara	$18	$19	$22	**0.9**	**0.8**	**-13%**	**55**	**55**
202	**East-West Connector** (Fremont to Union City)	Alameda	$10	$12	$14	**0.9**	**0.8**	**-13%**	**56**	**56**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$31	**0.6**	**0.5**	**-13%**	**57**	**57**
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	Contra Costa	$9	$16	$19	**0.6**	**0.5**	**-17%**	**58**	**60**
403	**I-680 Express Bus Frequency Improvements**	Contra Costa	$12	$21	$24	**0.6**	**0.5**	**-13%**	**59**	**58**
404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	$9	$17	$19	**0.5**	**0.5**	**-11%**	**60**	**59**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$26	**0.5**	**0.4**	**-29%**	**61**	**61**
104	**Geneva-Harney BRT + Corridor Improvements**	San Mateo - San Francisco	$15	$46	$52	**0.3**	**0.3**	**-13%**	**62**	**62**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$248	**0.3**	**0.2**	**-19%**	**63**	**63**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$39	**0.2**	**0.2**	**-13%**	**64**	**64**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	$36	**0.2**	**0.1**	**-12%**	**65**	**65**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$34	**0.1**	**0.1**	**-13%**	**66**	**66**
205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	$0	$10	n/a	**0.0**	**0.0**	**--**	**67**	**67**
1201	**Redwood City-San Francisco Ferry**	Multi-County	$0	$8	$9	**0.0**	**0.0**	**--**	**67**	**67**
905	**SMART – Phase 3** (Windsor to Cloverdale)	Sonoma	$0	$12	$17	**0.0**	**0.0**	**--**	**67**	**67**

Table B-4. Results: Flyvbjerg 80th Percentile Cost Increase Factors to All Costs

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1503	**Highway Pavement Maintenance** (Ideal Conditions vs. Preserve Conditions)	Multi-County	$638	-$1	n/a	**Infinite**	**Infinite**	--	**1**	**1**
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	n/a	**17**	**17**	--	**2**	**2**
302	**Treasure Island Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$56	$4	$5	**14**	**11**	**-24%**	**3**	**3**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$47	**11**	**9**	**-18%**	**4**	**4**
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements** (Livermore to I-680)	Alameda	$116	$13	$17	**9**	**7**	**-23%**	**5**	**5**
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$98	**8**	**5**	**-36%**	**6**	**10**
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$15	**7**	**6**	**-24%**	**7**	**8**
1651	**Public Transit Maintenance - Rail Operators (Preserve vs. No Funding)**	Multi-County	$1,351	$198	n/a	**7**	**7**	--	**8**	**6**
506	**El Camino Real BRT** (Palo Alto to San Jose)	Santa Clara	$85	$13	$17	**7**	**5**	**-24%**	**9**	**9**
301	**Geary BRT**	San Francisco	$124	$20	$26	**6**	**5**	**-24%**	**10**	**11**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$19	**6**	**4**	**-36%**	**11**	**14**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$9	**6**	**4**	**-36%**	**12**	**15**
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	$623	$103	n/a	**6**	**6**	--	**13**	**7**
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	$29	$5	$7	**6**	**4**	**-24%**	**14**	**13**
203	**Irvington BART Infill Station**	Alameda	$30	$6	$8	**5**	**4**	**-27%**	**15**	**17**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$13	**5**	**4**	**-24%**	**16**	**16**
903	**Sonoma County Service Frequency Improvements**	Sonoma	$75	$15	$20	**5**	**4**	**-24%**	**17**	**18**
523	**VTA Service Frequency Improvements** (15 minutes)	Santa Clara	$103	$23	$30	**4**	**3**	**-24%**	**18**	**19**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
211	**SR-262 Connector** (I-680 to I-880)	Alameda	$22	$5	$7	**4**	**3**	**-24%**	**19**	**20**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	n/a	**4**	**4**	**--**	**20**	**12**
207	**San Pablo BRT** (San Pablo to Oakland)	Multi-County	$67	$16	$22	**4**	**3**	**-24%**	**21**	**22**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$14	**4**	**3**	**-23%**	**22**	**21**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$60	**4**	**2**	**-36%**	**23**	**26**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$194	**3**	**2**	**-36%**	**24**	**29**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$89	**3**	**2**	**-36%**	**25**	**30**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$6	**3**	**3**	**-21%**	**26**	**23**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$6	**3**	**3**	**-24%**	**27**	**25**
1102	**Caltrain Modernization - Phase 1 + Phase 2** (Capacity Expansion)	Multi-County	$236	$77	$100	**3**	**2**	**-23%**	**28**	**27**
411	**SR-4 Auxiliary Lanes - Phase 1 + Phase 2** (Concord to Pittsburg)	Contra Costa	$44	$15	$20	**3**	**2**	**-23%**	**29**	**28**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$17	**3**	**2**	**-36%**	**30**	**37**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$28	**3**	**2**	**-36%**	**31**	**38**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$14	**3**	**2**	**-24%**	**32**	**32**
102	**US-101 and I-280 HOV Lanes** (GP Lane Conversions in San Francisco, widening in San Mateo County)	San Mateo - San Francisco	$63	$25	$29	**3**	**2**	**-17%**	**33**	**31**
503	**SR-152 Tollway**	Santa Clara	$95	$37	$49	**3**	**2**	**-24%**	**34**	**33**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$178	**3**	**2**	**-36%**	**35**	**39**
331	**Better Market Street**	San Francisco	$32	$13	n/a	**3**	**3**	**--**	**36**	**24**
1206	**Alameda Point-San Francisco Ferry**	Multi-County	$12	$5	$6	**2**	**2**	**-24%**	**37**	**34**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$6	**2**	**2**	**-24%**	**38**	**35**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$120	**2**	**2**	**-24%**	**39**	**36**
206	**AC Transit Service Frequency Improvements**	Alameda	$248	$120	$159	**2**	**2**	**-24%**	**40**	**40**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$34	**2**	**1**	**-36%**	**41**	**46**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$50	**2**	**1**	**-24%**	**42**	**41**
604	**Solano County Express Bus Network**	Solano	$21	$12	$16	**2**	**1**	**-24%**	**43**	**42**
522	**VTA Service Frequency Improvements** (10 minutes)	Santa Clara	$177	$99	$131	**2**	**1**	**-24%**	**44**	**43**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$19	**2**	**1**	**-36%**	**45**	**50**
311	**Muni Forward Program**	San Francisco	$60	$36	$48	**2**	**1**	**-24%**	**46**	**44**
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Marin - Sonoma	$31	$19	$25	**2**	**1**	**-22%**	**47**	**45**
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	$42	$27	$35	**2**	**1**	**-23%**	**48**	**47**
103	**El Camino Real Rapid Bus** (Daly City to Palo Alto)	San Mateo	$54	$36	$47	**2**	**1**	**-24%**	**49**	**48**
401	**TriLink Tollway + Expressways** (Brentwood to Tracy/Altamont Pass)	Contra Costa	$75	$51	$67	**1**	**1**	**-24%**	**50**	**49**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$43	**1**	**0.9**	**-36%**	**51**	**54**
801	**Golden Gate Transit Frequency Improvements**	Marin - Sonoma	$11	$8	$10	**1**	**1**	**-24%**	**52**	**51**
313	**Muni Service Frequency Improvements**	San Francisco	$89	$79	$88	**1**	**1**	**-10%**	**53**	**52**
1413	**Local Streets and Roads Maintenance** (Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	n/a	**1**	**1**	**--**	**54**	**53**
516	**VTA Express Bus Network**	Santa Clara	$18	$19	$26	**0.9**	**0.7**	**-24%**	**55**	**55**
202	**East-West Connector** (Fremont to Union City)	Alameda	$10	$12	$16	**0.9**	**0.7**	**-24%**	**56**	**56**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Cost ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$35	**0.6**	**0.5**	**-24%**	**57**	**57**
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	Contra Costa	$9	$16	$21	**0.6**	**0.4**	**-24%**	**58**	**58**
403	**I-680 Express Bus Frequency Improvements**	Contra Costa	$12	$21	$27	**0.6**	**0.4**	**-24%**	**59**	**60**
404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	$9	$17	$21	**0.5**	**0.4**	**-21%**	**60**	**59**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$29	**0.5**	**0.3**	**-36%**	**61**	**61**
104	**Geneva-Harney BRT + Corridor Improvements**	San Mateo - San Francisco	$15	$46	$60	**0.3**	**0.2**	**-24%**	**62**	**62**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$311	**0.3**	**0.2**	**-36%**	**63**	**63**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$45	**0.2**	**0.2**	**-24%**	**64**	**64**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	$41	**0.2**	**0.1**	**-22%**	**65**	**65**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$39	**0.1**	**0.1**	**-24%**	**66**	**66**
205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	$0	$10	n/a	**0.0**	**0.0**	**--**	**67**	**67**
1201	**Redwood City-San Francisco Ferry**	Multi-County	$0	$8	$10	**0.0**	**0.0**	**--**	**67**	**67**
905	**SMART – Phase 3** (Windsor to Cloverdale)	Sonoma	$0	$12	$19	**0.0**	**0.0**	**--**	**67**	**67**

Table B-5. Results: Travel Time Sensitivity Test

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1503	**Highway Pavement Maintenance** (Ideal Conditions vs. Preserve Conditions)	Multi-County	$638	-$1	$274	**Infinite**	**Infinite**	--	**1**	**1**
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	$1,065	**17**	**7**	**-56%**	**2**	**3**
302	**Treasure Island Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$56	$4	$42	**14**	**11**	**-25%**	**3**	**2**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$173	**11**	**4**	**-59%**	**4**	**8**
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements** (Livermore to I-680)	Alameda	$116	$13	$63	**9**	**5**	**-46%**	**5**	**6**
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$277	**8**	**4**	**-41%**	**6**	**9**
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$76	**7**	**7**	**-10%**	**7**	**4**
1651	**Public Transit Maintenance - Rail Operators (Preserve vs. No Funding)**	Multi-County	$1,351	$198	$771	**7**	**4**	**-43%**	**8**	**14**
506	**El Camino Real BRT** (Palo Alto to San Jose)	Santa Clara	$85	$13	$60	**7**	**5**	**-29%**	**9**	**7**
301	**Geary BRT**	San Francisco	$124	$20	$87	**6**	**4**	**-30%**	**10**	**10**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$61	**6**	**5**	**-20%**	**11**	**5**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$19	**6**	**3**	**-47%**	**12**	**18**
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	$623	$103	$439	**6**	**4**	**-30%**	**13**	**11**
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	$29	$5	$21	**6**	**4**	**-28%**	**14**	**12**
203	**Irvington BART Infill Station**	Alameda	$30	$6	$21	**5**	**4**	**-29%**	**15**	**15**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$23	**5**	**2**	**-53%**	**16**	**23**
903	**Sonoma County Service Frequency Improvements**	Sonoma	$75	$15	$62	**5**	**4**	**-18%**	**17**	**13**
523	**VTA Service Frequency Improvements** (15 minutes)	Santa Clara	$103	$23	$77	**4**	**3**	**-26%**	**18**	**17**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
211	**SR-262 Connector** (I-680 to I-880)	Alameda	$22	$5	$17	**4**	**3**	**-22%**	**19**	**16**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	$724	**4**	**2**	**-61%**	**20**	**34**
207	**San Pablo BRT** (San Pablo to Oakland)	Multi-County	$67	$16	$51	**4**	**3**	**-24%**	**21**	**19**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$22	**4**	**2**	**-51%**	**22**	**29**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$111	**4**	**3**	**-23%**	**23**	**21**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$258	**3**	**2**	**-40%**	**24**	**26**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$116	**3**	**2**	**-41%**	**25**	**28**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$15	**3**	**3**	**-13%**	**26**	**20**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$12	**3**	**2**	**-25%**	**27**	**22**
1102	**Caltrain Modernization - Phase 1 + Phase 2** (Capacity Expansion)	Multi-County	$236	$77	$141	**3**	**2**	**-41%**	**28**	**32**
411	**SR-4 Auxiliary Lanes - Phase 1 + Phase 2** (Concord to Pittsburg)	Contra Costa	$44	$15	$25	**3**	**2**	**-45%**	**29**	**35**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$21	**3**	**2**	**-32%**	**30**	**30**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$40	**3**	**2**	**-17%**	**31**	**24**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$23	**3**	**2**	**-20%**	**32**	**25**
102	**US-101 and I-280 HOV Lanes** (GP Lane Conversions in San Francisco, widening in San Mateo County)	San Mateo - San Francisco	$63	$25	$35	**3**	**1**	**-44%**	**33**	**38**
503	**SR-152 Tollway**	Santa Clara	$95	$37	$59	**3**	**2**	**-37%**	**34**	**36**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$168	**3**	**1**	**-42%**	**35**	**37**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$9	**2**	**2**	**-14%**	**38**	**27**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$75	**2**	**0.8**	**-65%**	**39**	**48**
206	**AC Transit Service Frequency Improvements**	Alameda	$248	$120	$173	**2**	**1**	**-30%**	**40**	**39**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$30	**2**	**1**	**-29%**	**41**	**41**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$4	**2**	**0.1**	**-95%**	**42**	**64**
604	**Solano County Express Bus Network**	Solano	$21	$12	$15	**2**	**1**	**-28%**	**43**	**42**
522	**VTA Service Frequency Improvements** (10 minutes)	Santa Clara	$177	$99	$134	**2**	**1**	**-24%**	**44**	**40**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$11	**2**	**0.9**	**-45%**	**45**	**46**
311	**Muni Forward Program**	San Francisco	$60	$36	$38	**2**	**1**	**-37%**	**46**	**44**
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Marin - Sonoma	$31	$19	$18	**2**	**0.9**	**-40%**	**47**	**45**
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	$42	$27	$21	**2**	**0.8**	**-49%**	**48**	**50**
103	**El Camino Real Rapid Bus** (Daly City to Palo Alto)	San Mateo	$54	$36	$40	**2**	**1**	**-25%**	**49**	**43**
401	**TriLink Tollway + Expressways** (Brentwood to Tracy/Altamont Pass)	Contra Costa	$75	$51	$42	**1**	**0.8**	**-44%**	**50**	**49**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$25	**1**	**0.9**	**-36%**	**51**	**47**
801	**Golden Gate Transit Frequency Improvements**	Marin - Sonoma	$11	$8	$6	**1**	**0.8**	**-43%**	**52**	**51**
313	**Muni Service Frequency Improvements**	San Francisco	$89	$79	$55	**1**	**0.7**	**-38%**	**53**	**53**
1413	**Local Streets and Roads Maintenance** (Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	$38	**1**	**0.2**	**-81%**	**54**	**61**
516	**VTA Express Bus Network**	Santa Clara	$18	$19	$14	**0.9**	**0.7**	**-21%**	**55**	**52**
202	**East-West Connector** (Fremont to Union City)	Alameda	$10	$12	$8	**0.9**	**0.7**	**-20%**	**56**	**54**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$8	**0.6**	**0.3**	**-53%**	**57**	**58**
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	Contra Costa	$9	$16	$5	**0.6**	**0.3**	**-41%**	**58**	**56**
403	**I-680 Express Bus Frequency Improvements**	Contra Costa	$12	$21	$8	**0.6**	**0.4**	**-34%**	**59**	**55**
404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	$9	$17	$5	**0.5**	**0.3**	**-48%**	**60**	**59**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$6	**0.5**	**0.3**	**-42%**	**61**	**57**
104	**Geneva-Harney BRT + Corridor Improvements**	San Mateo - San Francisco	$15	$46	$12	**0.3**	**0.3**	**-22%**	**62**	**60**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$23	**0.3**	**0.1**	**-59%**	**63**	**63**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$3	**0.2**	**0.1**	**-61%**	**64**	**65**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	-$1	**0.2**	**0.0**	**-128%**	**65**	**69**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$5	**0.1**	**0.2**	**15%**	**66**	**62**
205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	$0	$10	$0	**0.0**	**0.0**	**--**	**67**	**66**
1201	**Redwood City-San Francisco Ferry**	Multi-County	$0	$8	$0	**0.0**	**0.0**	**--**	**67**	**66**
905	**SMART – Phase 3** (Windsor to Cloverdale)	Sonoma	$0	$12	$0	**0.0**	**0.0**	**--**	**67**	**66**

Table B-6. Results: Life Valuation Sensitivity Test

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1503	**Highway Pavement Maintenance** (Ideal Conditions vs. Preserve Conditions)	Multi-County	$638	-$1	$660	**Infinite**	**Infinite**	--	**1**	**1**
1502	**Highway Pavement Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$2,433	$144	$2,507	**17**	**17**	**3%**	**2**	**2**
302	**Treasure Island Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$56	$4	$46	**14**	**12**	**-17%**	**3**	**3**
1301	**Columbus Day Initiative**	Multi-County	$421	$38	$436	**11**	**11**	**4%**	**4**	**4**
209	**SR-84 Widening + I-680/SR-84 Interchange Improvements** (Livermore to I-680)	Alameda	$116	$13	$113	**9**	**9**	**-3%**	**5**	**5**
501	**BART to Silicon Valley – Phase 2** (Berryessa to Santa Clara)	Santa Clara	$472	$62	$445	**8**	**7**	**-6%**	**6**	**6**
306	**Downtown San Francisco Congestion Pricing** (Toll + Transit Improvements)	San Francisco	$84	$11	$64	**7**	**6**	**-24%**	**7**	**10**
1651	**Public Transit Maintenance - Rail Operators (Preserve vs. No Funding)**	Multi-County	$1,351	$198	$1,299	**7**	**7**	**-4%**	**8**	**7**
506	**El Camino Real BRT** (Palo Alto to San Jose)	Santa Clara	$85	$13	$77	**7**	**6**	**-10%**	**9**	**9**
301	**Geary BRT**	San Francisco	$124	$20	$110	**6**	**6**	**-11%**	**10**	**11**
505	**Capitol Expressway LRT – Phase 2** (Alum Rock to Eastridge)	Santa Clara	$77	$12	$62	**6**	**5**	**-20%**	**11**	**13**
518	**ACE Alviso Double-Tracking**	Santa Clara	$36	$6	$35	**6**	**6**	**-2%**	**12**	**8**
1650	**Public Transit Maintenance - Bus Operators (Preserve Conditions vs. No Funding)**	Multi-County	$623	$103	$560	**6**	**5**	**-10%**	**13**	**12**
1203	**Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements**	Multi-County	$29	$5	$24	**6**	**5**	**-17%**	**14**	**15**
203	**Irvington BART Infill Station**	Alameda	$30	$6	$25	**5**	**4**	**-16%**	**15**	**18**
101	**Express Lane Network (US-101 San Mateo/San Francisco)**	San Mateo - San Francisco	$48	$10	$48	**5**	**5**	**-1%**	**16**	**14**
903	**Sonoma County Service Frequency Improvements**	Sonoma	$75	$15	$66	**5**	**4**	**-12%**	**17**	**17**
523	**VTA Service Frequency Improvements** (15 minutes)	Santa Clara	$103	$23	$92	**4**	**4**	**-11%**	**18**	**20**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
211	**SR-262 Connector** (I-680 to I-880)	Alameda	$22	$5	$19	**4**	**4**	**-16%**	**19**	**21**
1403	**Local Streets and Roads Maintenance** (Preserve Conditions vs. No Funding)	Multi-County	$1,875	$428	$2,006	**4**	**5**	**7%**	**20**	**16**
207	**San Pablo BRT** (San Pablo to Oakland)	Multi-County	$67	$16	$57	**4**	**3**	**-15%**	**21**	**22**
210	**I-580 ITS Improvements**	Alameda	$44	$11	$44	**4**	**4**	**0%**	**22**	**19**
504	**Stevens Creek LRT**	Santa Clara	$144	$38	$114	**4**	**3**	**-21%**	**23**	**25**
1001	**BART Metro Program** (Service Frequency Increase)	Multi-County	$430	$123	$406	**3**	**3**	**-6%**	**24**	**23**
1101	**Caltrain Modernization - Phase 1** (Electrification + Service Frequency Increase)	Multi-County	$195	$56	$183	**3**	**3**	**-6%**	**25**	**24**
605	**Jepson Parkway** (Fairfield to Vacaville)	Solano	$17	$5	$13	**3**	**3**	**-24%**	**26**	**29**
1202	**Oakland-Alameda-San Francisco Ferry Frequency Improvements**	Multi-County	$16	$5	$13	**3**	**3**	**-20%**	**27**	**28**
1102	**Caltrain Modernization - Phase 1 + Phase 2** (Capacity Expansion)	Multi-County	$236	$77	$222	**3**	**3**	**-6%**	**28**	**26**
411	**SR-4 Auxiliary Lanes - Phase 1 + Phase 2** (Concord to Pittsburg)	Contra Costa	$44	$15	$42	**3**	**3**	**-5%**	**29**	**27**
507	**Vasona LRT – Phase 2** (Winchester to Vasona Junction)	Santa Clara	$30	$11	$27	**3**	**2**	**-12%**	**30**	**34**
515	**Tasman West LRT Realignment** (Fair Oaks to Mountain View)	Santa Clara	$48	$18	$38	**3**	**2**	**-21%**	**31**	**37**
517	**Stevens Creek BRT**	Santa Clara	$29	$11	$23	**3**	**2**	**-20%**	**32**	**38**
102	**US-101 and I-280 HOV Lanes** (GP Lane Conversions in San Francisco, widening in San Mateo County)	San Mateo - San Francisco	$63	$25	$60	**3**	**2**	**-5%**	**33**	**31**
503	**SR-152 Tollway**	Santa Clara	$95	$37	$90	**3**	**2**	**-5%**	**34**	**33**
307	**Caltrain to Transbay Transit Center + Electrification**	Multi-County	$290	$113	$274	**3**	**2**	**-5%**	**35**	**35**
331	**Better Market Street**	San Francisco	$32	$13	$31	**3**	**2**	**-4%**	**36**	**32**
1206	**Alameda Point-San Francisco Ferry**	Multi-County	$12	$5	$9	**2**	**2**	**-20%**	**37**	**39**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
1204	**Berkeley-San Francisco Ferry**	Multi-County	$10	$4	$7	**2**	**2**	**-26%**	**38**	**41**
1302	**Express Lane Network (East and North Bay)**	Multi-County	$214	$91	$226	**2**	**2**	**6%**	**39**	**30**
206	**AC Transit Service Frequency Improvements**	Alameda	$248	$120	$226	**2**	**2**	**-9%**	**40**	**40**
513	**North Bayshore LRT** (NASA/Bayshore to Google)	Santa Clara	$42	$22	$37	**2**	**2**	**-12%**	**41**	**43**
502	**Express Lane Network (Silicon Valley)**	Santa Clara	$69	$38	$84	**2**	**2**	**21%**	**42**	**36**
604	**Solano County Express Bus Network**	Solano	$21	$12	$18	**2**	**2**	**-13%**	**43**	**46**
522	**VTA Service Frequency Improvements** (10 minutes)	Santa Clara	$177	$99	$157	**2**	**2**	**-11%**	**44**	**45**
402	**eBART – Phase 2** (Antioch to Brentwood)	Contra Costa	$21	$12	$20	**2**	**2**	**-4%**	**45**	**44**
311	**Muni Forward Program**	San Francisco	$60	$36	$62	**2**	**2**	**2%**	**46**	**42**
901	**US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2**	Marin - Sonoma	$31	$19	$29	**2**	**1**	**-6%**	**47**	**48**
409	**I-680/SR-4 Interchange Improvements + HOV Direct Connector**	Contra Costa	$42	$27	$41	**2**	**2**	**-1%**	**48**	**47**
103	**El Camino Real Rapid Bus** (Daly City to Palo Alto)	San Mateo	$54	$36	$45	**2**	**1**	**-16%**	**49**	**52**
401	**TriLink Tollway + Expressways** (Brentwood to Tracy/Altamont Pass)	Contra Costa	$75	$51	$72	**1**	**1**	**-4%**	**50**	**49**
312	**19th Avenue Subway** (West Portal to Parkmerced)	San Francisco	$39	$27	$36	**1**	**1**	**-7%**	**51**	**50**
801	**Golden Gate Transit Frequency Improvements**	Marin - Sonoma	$11	$8	$10	**1**	**1**	**-5%**	**52**	**51**
313	**Muni Service Frequency Improvements**	San Francisco	$89	$79	$92	**1**	**1**	**3%**	**53**	**54**
1413	**Local Streets and Roads Maintenance** (Preserve Conditions vs. Local Funding)	Multi-County	$194	$198	$230	**1**	**1**	**19%**	**54**	**53**
516	**VTA Express Bus Network**	Santa Clara	$18	$19	$14	**0.9**	**0.7**	**-18%**	**55**	**55**
202	**East-West Connector** (Fremont to Union City)	Alameda	$10	$12	$9	**0.9**	**0.7**	**-18%**	**56**	**56**

ID	Project Name	County	Annual Benefit ($2017M)	Annual Cost ($2017M)	Adjusted Annual Benefit ($2017M)	Original B/C	Adjusted B/C	Percent Change B/C	Original Rank	Adjusted Rank
304	**Southeast Waterfront Transportation Improvements** (Hunters Point Transit Center + New Express Bus Services)	San Francisco	$16	$27	$19	**0.6**	**0.7**	**14%**	**57**	**57**
410	**Antioch-Martinez-Hercules-San Francisco Ferry**	Contra Costa	$9	$16	$9	**0.6**	**0.6**	**-3%**	**58**	**59**
403	**I-680 Express Bus Frequency Improvements**	Contra Costa	$12	$21	$11	**0.6**	**0.5**	**-6%**	**59**	**60**
404	**SR-4 Widening (Antioch to Discovery Bay)**	Contra Costa	$9	$17	$10	**0.5**	**0.6**	**8%**	**60**	**58**
510	**Downtown San Jose Subway** (Japantown to Convention Center)	Santa Clara	$10	$18	$10	**0.5**	**0.5**	**-2%**	**61**	**61**
104	**Geneva-Harney BRT + Corridor Improvements**	San Mateo - San Francisco	$15	$46	$13	**0.3**	**0.3**	**-14%**	**62**	**63**
508	**SR-17 Tollway + Santa Cruz LRT** (Los Gatos to Santa Cruz)	Santa Clara	$57	$200	$61	**0.3**	**0.3**	**6%**	**63**	**62**
519	**Lawrence Freeway** (US-101 to I-280)	Santa Clara	$7	$34	$7	**0.2**	**0.2**	**-2%**	**64**	**65**
601	**I-80/I-680/SR-12 Interchange Improvements**	Solano	$5	$32	$8	**0.2**	**0.2**	**56%**	**65**	**64**
1304	**Bay Bridge West Span Bike Path**	Multi-County	$4	$30	$2	**0.1**	**0.1**	**-56%**	**66**	**66**
205_15	**Express Bus Bay Bridge Contraflow Lane**	Multi-County	$0	$10	$0	**0.0**	**0.0**	**--**	**67**	**67**
1201	**Redwood City-San Francisco Ferry**	Multi-County	$0	$8	$0	**0.0**	**0.0**	**--**	**67**	**67**
905	**SMART – Phase 3** (Windsor to Cloverdale)	Sonoma	$0	$12	$0	**0.0**	**0.0**	**--**	**67**	**67**

Appendix G: Equity Analysis – Final Memorandum

CAMBRIDGE SYSTEMATICS

Think Forward

Memorandum

TO: Kristen Carnarius and Dave Vautin, MTC

FROM: Casey Osborn and Krista Jeannotte, Cambridge Systematics, Inc

DATE: May 11, 2016

RE: Plan Bay Area 2040 Project Performance Support – Task 5.1 Equity Assessment

---

This memorandum and accompanying spreadsheet represent the Plan Bay Area 2040 Project Performance Support deliverable for Task 5.1. It contains a summary of the equity assessment methodology and results.

Equity Assessment Methodology

As part of the performance assessment for the Plan Bay Area 2040 update, a separate equity assessment was conducted focused exclusively on a project's ability to support the equity issue areas of Plan Bay Area 2040 and to serve vulnerable populations. This equity assessment first isolated each project's scores on the equity related targets in the performance assessment. Next, the assessment considered how each project would increase access for vulnerable populations, also known as "Communities of Concern." Projects that did not increase access for these populations did not receive a score in the equity assessment. Projects that did increase access were ranked according to their score on the equity targets.

The equity-related targets taken from the overall performance assessment were:

- Reduce adverse health impacts associated with air quality, road safety, and physical activity by 10% (Target 3);
- Decrease by 10% the share of lower-income residents' household income consumed by transportation and housing (Target 5);
- Increase the share of affordable housing in PDAs, TPAs, or other high-opportunity areas by 15% (Target 6);
- Reduce the share of low-and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at an increased risk of displacement to 0% (Target 7);
- Increase the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit by 20% in congested conditions (Target 8); and
- Increase by 35% the number of jobs in predominantly middle-wage industries (Target 9).

555 12th Street, Suite 1600
Oakland, CA 94607
tel 510-873-8700 www.camsys.com **fax** 510-873-8701

The same scoring methods from the targets assessment were used for the equity analysis: strong support (1); moderate support (0.5); minimal impact (0); moderate adverse (-0.5); and strong adverse (-1). The six equity related target scores were summed to calculate an overall equity targets score ranging from +6 to -6, strong support to strong adverse impact.

To identify whether a project served a vulnerable population, each project was mapped against census tracts identified by MTC as "Communities of Concern," an index that takes into account multiple disadvantage factors[1] including percent of residents that are low-income, members of a minority group, zero-household vehicles, to name a few. At first, service areas were defined broadly, consistent with the service areas used in the overall performance assessment. A service area includes not only the cities within and adjacent to a project and its access points (bus stop, freeway on ramps, etc.), but also any cities that connect or meet up with the project area (e.g., one stop away on a BART train or along a commute path).

By this definition service areas cast a wide net, and under the service area geography nearly all projects served a Community of Concern.[2] Such a high performance rate made it clear that the Communities of Concern "service area" methodology was not subtle enough to capture variations in project locations and types.

As such, the process was refined, and projects were evaluated on whether or not they *increased access* for a Community of Concern. Using GIS, the projects that actually ran within Communities of Concern, and/or contained access points within those Communities of Concern, were identified.

This more detailed increased access consideration resulted in 16 projects that *do not* increase access for a Community of Concern. Examples to illustrate how the criteria of access points affected projects that formerly contained service areas with Communities of Concern include:

- While several ferry projects had service areas that included communities of concern such as Berkeley and San Francisco, access points along the Bay and the project scope itself were not within Communities of Concern.

- Many of the light rail transit projects in the South Bay appeared to primarily increase access for wealthier outlying areas, not necessarily for Communities of Concern. Under the service area methodology, Communities of Concern within the City of San Jose resulted in these projects initially "serving" a Communities of Concern, when in actuality no part of the project area fell within a Community of Concern.

[1] For Plan Bay Area 2040, the definition of communities of concern include all census tracts that have a concentration of BOTH minority AND low-income households at specified thresholds of significance, or that have a concentration of low-income households AND a concentration of three or more of six additional factors. These additional factors include: limited English proficiency population, zero-vehicle households, seniors 75 and older, and people with a disability, single-parent families, and severely cost-burdened renters.

[2] The exceptions were two projects, an ITS and freeway project in the Tri-Valley.

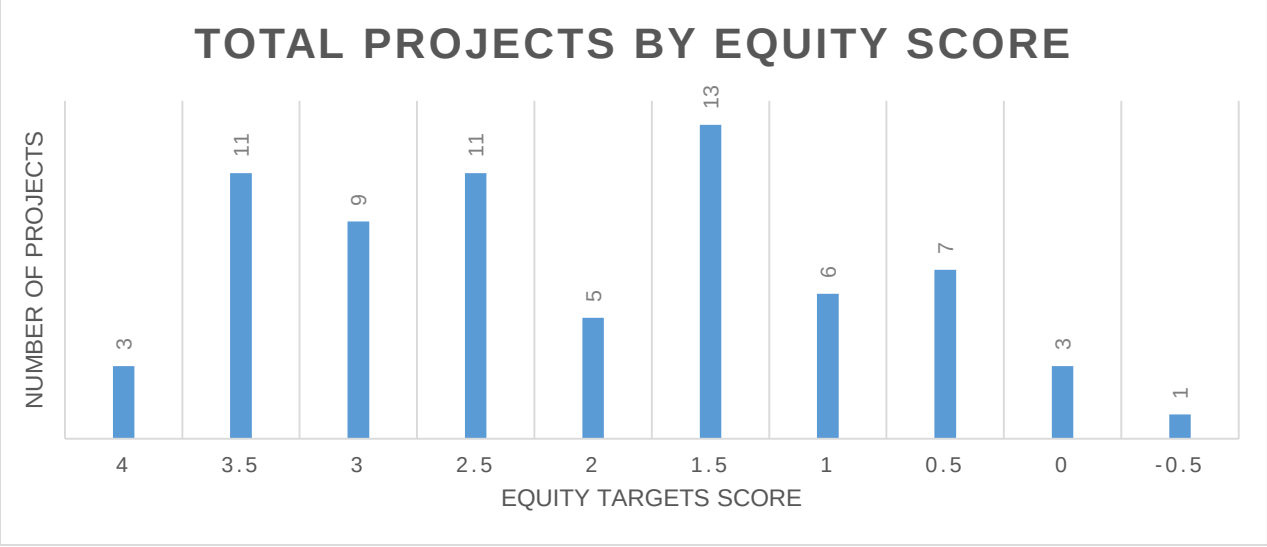
Results

Of the projects, 53 provided access to a Community of Concern, while 16 did not. The projects that increased access for a Community of Concern were then ranked according to their total equity targets score. Table 1 presents the equity analysis results.

The projects that performed highest on the equity assessment were large scale transit projects serving primarily inner urban areas, including San Pablo and Geary BRT, BART Metro, Muni Forward and AC Transit Frequency Improvements, and BART to Silicon Valley. Rounding out the top ten were VTA's Steven Creek LRT, El Camino Real BRT, and Downtown San Jose Subway. The highest scoring non-transit project was the Columbus Day Initiative. While the highest possible equity score possible was six, the three highest-performers only received a score of four. This is in part due to the many "Moderate Adverse" scores on the displacement target. The same inner urban areas that have the potential to increase access for a number of Communities of Concern, are also the areas with some of the highest risks for displacement.

In general, roadway projects did not score as high on equity targets as transit projects. This is partially attributable to roadway project's overall lower performance on targets promoting healthy and safe communities, and decreasing household and transportation costs. Figure 1 below provides a break down of number of projects by equity score.

Figure 1: Number of Projects by Equity Score



CAMBRIDGE SYSTEMATICS

Table 1: Equity Analysis Scoring

PROJECT ID	PROJECT NAME	3 - HEALTHY + SAFE COMMUNITIES	5 - HOUSING + TRANSPORTATION COSTS	6 - AFFORDABLE HOUSING	7 - DISPLACEMENT RISK	8 - ACCESS TO JOBS	9 - JOBS CREATION	EQUITY TARGET SCORE	SERVES COMMUNITY OF CONCERN
207	San Pablo BRT (San Pablo to Oakland)	STRONG SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	4	Yes
501	BART to Silicon Valley – Phase 2 (Berryessa to Santa Clara)	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	4	Yes
1001	BART Metro Program (Service Frequency Increase + Bay Fair Operational Improvements + SFO Airport Express Train)	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	4	Yes
206	AC Transit Service Frequency Improvements	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	3.5	Yes
301	Geary BRT	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	STRONG SUPPORT	3.5	Yes
311	Muni Forward Program	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	STRONG SUPPORT	3.5	Yes
402	eBART – Phase 2 (Antioch to Brentwood)	MINIMAL IMPACT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	3.5	No
504	Stevens Creek LRT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	3.5	Yes
506	El Camino Real BRT (Palo Alto to San Jose)	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	3.5	Yes
507	Vasona LRT – Phase 2 (Winchester to Vasona Junction)	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	3.5	No
510	Downtown San Jose Subway (Japantown to Convention Center)	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	3.5	Yes
522	VTA Service Frequency Improvements (10-Minute Frequencies)	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	3.5	Yes
1650	Public Transit Maintenance - Bus	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	3.5	Yes
1651	Public Transit Maintenance - Rail	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	3.5	Yes
304	Southeast Waterfront Transportation Improvements (Hunters Point Transit Center + New Express Bus Services)	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	3	Yes
307	Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase) + Caltrain to Transbay Transit Center	STRONG SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	3	Yes
312	19th Avenue Subway (West Portal to Parkmerced)	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	3	Yes
313	Muni Service Frequency Improvements	STRONG SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	3	Yes
505	Capitol Expressway LRT – Phase 2 (Alum Rock to Eastridge)	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	3	Yes
515	Tasman West LRT Realignment (Fair Oaks to Mountain View)	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	3	No
517	Stevens Creek BRT	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	3	Yes
801	Golden Gate Transit Frequency Improvements	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	3	Yes
903	Sonoma County Service Frequency Improvements	MODERATE SUPPORT	STRONG SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	3	Yes
104	Geneva-Harney BRT + Corridor Improvements	STRONG SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	2.5	Yes
306	Downtown San Francisco Congestion Pricing (Toll + Transit Improvements)	STRONG SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG ADVERSE	STRONG SUPPORT	STRONG SUPPORT	2.5	Yes
513	North Bayshore LRT (NASA/Bayshore to Google)	MODERATE SUPPORT	STRONG SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	2.5	No
516	VTA Express Bus Frequency Improvements	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	2.5	Yes
523	VTA Service Frequency Improvements (15-Minute Frequencies)	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	2.5	Yes
1101	Caltrain Modernization - Phase 1 (Electrification + Service Frequency Increase)	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	2.5	Yes
1102	Caltrain Modernization - Phase 1 + Phase 2 (Electrification + Service Frequency Increase + Capacity Expansion)	STRONG SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	2.5	Yes
1203	Vallejo-San Francisco + Richmond-San Francisco Ferry Frequency Improvements	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE SUPPORT	2.5	Yes
1204	Berkeley-San Francisco Ferry	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG SUPPORT	2.5	No
1301	Columbus Day Initiative	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	2.5	Yes
205_15	Express Bus Bay Bridge Contraflow Lane	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	2.5	Yes
203	Irvington BART Infill Station	MODERATE SUPPORT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	2	No
331	Better Market Street	MODERATE SUPPORT	STRONG SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	2	Yes

PROJECT ID	PROJECT NAME	3 - HEALTHY + SAFE COMMUNITIES	5 - HOUSING + TRANSPORTATION COSTS	6 - AFFORDABLE HOUSING	7 - DISPLACEMENT RISK	8 - ACCESS TO JOBS	9 - JOBS CREATION	EQUITY TARGET SCORE	SERVES COMMUNITY OF CONCERN
905	SMART – Phase 3 (Santa Rosa Airport to Cloverdale)	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	2	No
1403	Local Streets and Roads Maintenance (Preserve Conditions vs. No Funding)	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	2	Yes
1413	Local Streets and Roads Maintenance (Preserve Conditions vs. Local Funding)	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	2	Yes
302	Treasure Island Congestion Pricing (Toll + Transit Improvements)	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	1.5	Yes
403	I-680 Express Bus Frequency Improvements	MODERATE SUPPORT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	1.5	Yes
409	I-680/SR-4 Interchange Improvements + HOV Direct Connector	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	1.5	No
410	Antioch-Martinez-Hercules-San Francisco Ferry	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	1.5	Yes
502	Express Lane Network (Silicon Valley)	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	1.5	Yes
508	SR-17 Tollway + Santa Cruz LRT (Los Gatos to Santa Cruz)	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG SUPPORT	1.5	No
519	Lawrence Freeway	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	1.5	Yes
601	I-80/I-680/SR-12 Interchange Improvements	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	1.5	Yes
604	Solano County Express Bus Network	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	1.5	Yes
901	US-101 Marin-Sonoma Narrows HOV Lanes – Phase 2	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	1.5	No
1302	Express Lane Network (East and North Bay)	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	STRONG SUPPORT	STRONG SUPPORT	1.5	Yes
1502	Highway Maintenance (Preserve Conditions vs. No Funding)	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	1.5	Yes
1502	Highway Maintenance (Ideal Conditions vs. Preserve Conditions)	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	1.5	Yes
103	El Camino Real Rapid Bus (Daly City to Palo Alto)	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	1	Yes
401	TriLink Tollway + Expressways (Brentwood to Tracy/Altamont Pass)	MODERATE ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	1	No
605	Jepson Parkway (Fairfield to Vacaville)	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE SUPPORT	1	Yes
1201	San Francisco-Redwood City + Oakland-Redwood City Ferry	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	1	No
1206	Alameda Point-San Francisco Ferry	MODERATE SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	STRONG ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	1	Yes
1304	Bay Bridge West Span Bike Path	MODERATE SUPPORT	MODERATE SUPPORT	MODERATE SUPPORT	STRONG ADVERSE	MINIMAL IMPACT	MODERATE SUPPORT	1	Yes
102	US-101 HOV Lanes (San Francisco + San Mateo Counties)	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	0.5	Yes
202	East-West Connector (Fremont to Union City)	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	0.5	Yes
210	I-580 ITS Improvements	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	0.5	No
404	SR-4 Widening (Antioch to Discovery Bay)	STRONG ADVERSE	MINIMAL IMPACT	STRONG SUPPORT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	0.5	Yes
411	SR-4 Auxiliary Lanes - Phases 1 + 2 (Concord to Pittsburg)	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE SUPPORT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	0.5	Yes
518	ACE Alviso Double-Tracking	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	0.5	No
1202	Oakland-Alameda-San Francisco Ferry Frequency Improvements	MODERATE SUPPORT	MINIMAL IMPACT	MODERATE ADVERSE	STRONG ADVERSE	STRONG SUPPORT	MODERATE SUPPORT	0.5	Yes
101	Express Lane Network (US-101 San Mateo/San Francisco)	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	STRONG SUPPORT	0	Yes
209	SR-84 Widening + I-680/SR-84 Interchange Improvements (Livermore to I-680)	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	0	No
503	SR-152 Tollway (Gilroy to Los Banos)	MODERATE ADVERSE	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MINIMAL IMPACT	MODERATE SUPPORT	0	Yes
211	SR-262 Connector (I-680 to I-880)	MODERATE ADVERSE	MINIMAL IMPACT	MODERATE ADVERSE	MODERATE ADVERSE	MODERATE SUPPORT	MODERATE SUPPORT	-0.5	No

CAMBRIDGE SYSTEMATICS

Projects that scored high on the equity targets (with scores of 3 or greater), but failed to increase access for a Community of Concern included eBART, and two VTA LRT projects: Vasona and Tasman West LRT. There were more transit projects (9) than roadway projects (6) that did not serve Communities of Concern. The only other project that failed to serve a Community of Concern was the Santa Cruz tollway and LRT project, which is both a transit and roadway project.

Lastly, only four projects received a zero or negative score on equity targets. Of these four, two – US-101 Express Lane Network in San Mateo and San Francisco, and SR-152 Tollway – increased access for Communities of Concern. However, given their equity score of 0, the project's increase in access does not advance the six equity-related targets for Plan Bay Area 2040.

APPENDIX A – 9

Regional Policies: Long-Range Planning / Plan Bay Area

Coordinated Public Transit-Human Services Transportation Plan

MTC Resolution No. 4310

Date: February 28, 2018
W.I.: 1311
Referred by: Planning

ABSTRACT

Resolution No. 4310

This resolution adopts the 2018 Coordinated Public Transit-Human Services Transportation Plan for the San Francisco Bay Area.

The following attachment is provided with this resolution:

Attachment A — 2018 Coordinated Public Transit-Human Services Transportation Plan

Discussion of the 2018 Coordinated Public Transit-Human Services Transportation Plan is contained in the Executive Director's Memorandum to the Planning Committee dated February 2, 2018.

Date: February 28, 2018
W.I.: 1311
Referred by: Planning

RE: 2018 Coordinated Public Transit-Human Services Transportation Plan

METROPOLITAN TRANSPORTATION COMMISSION
RESOLUTION NO. 4310

WHEREAS, the Metropolitan Transportation Commission (MTC) is the regional transportation planning agency for the San Francisco Bay Area pursuant to Government Code 66500 *et seq.*; and

WHEREAS, the Moving Ahead for Progress in the 21st Century Act (MAP-21) requires that projects funded through the Enhanced Mobility of Seniors and Individuals with Disabilities program be included in a locally developed Coordinated Public Transit-Human Services Transportation Plan (Coordinated Plan) beginning in Fiscal Year 2013; and

WHEREAS, the Fixing America's Surface Transportation (FAST) Act requires that projects funded through the Enhanced Mobility of Seniors and Individuals with Disabilities Program be included in a locally developed, Coordinated Plan beginning in Fiscal Year 2015; and

WHEREAS, MTC has dedicated significant resources toward planning efforts that have focused on the transportation needs of low-income, senior and disabled residents in the Bay Area, including the community-based transportation planning program;

WHEREAS, the California Legislature enacted the Social Service Transportation Improvement Act (Chapter 1120, Statutes of 1979) (hereafter referred to as AB 120) with the intent to improve transportation service required by social service recipients; and

WHEREAS, under the auspices of the Social Service Transportation Improvement Act, MTC designates agencies to serve as Consolidated Transportation Service Agencies (MTC Resolution 4097, Revised); and

WHEREAS, MTC completed the region's Coordinated Public Transit-Human Services Transportation Plan in 2007 and updated the plan in 2013 (MTC Resolution 4085); and

WHEREAS, the 2018 Coordinated Public Transit-Human Services Transportation Plan revises the 2013 Coordinated Plan to include new demographic, transportation service gaps and solutions, and regional context information; now, therefore, be it

RESOLVED, that MTC approves the 2018 Coordinated Public Transit-Human Services Transportation Plan as forth in Attachment A of this resolution, and be it further

RESOLVED, that the Executive Director of MTC is hereby authorized to forward the Coordinated Plan Update to the Federal Transit Administration and such agencies as may be appropriate.

METROPOLITAN TRANSPORTATION COMMISSION

Jake Mackenzie, Chair

The above resolution was entered into by the Metropolitan Transportation Commission at a regular meeting of the Commission held in San Francisco, California, on February 28, 2018.

Date: February 28, 2018
W.I.: 1311
Referred by: Planning

Attachment A
MTC Resolution No. 4310

2018 Coordinated Public Transit-Human Services Transportation Plan

The 2018 Coordinated Public Transit-Human Services Transportation Plan is incorporated by reference.

The plan and appendices are available in the MTC/ABAG Library, and on-line at https://mtc.ca.gov/our-work/plans-projects/other-plans/coordinated-public-transit-human-services-transportation-plan

COORDINATED PUBLIC TRANSIT-HUMAN SERVICES TRANSPORTATION PLAN

February 2018







METROPOLITAN TRANSPORTATION COMMISSION

MTC COMMISSIONERS

Jake Mackenzie, Chair
Sonoma County and Cities

Scott Haggerty, Vice Chair
Alameda County

Alicia C. Aguirre
Cities of San Mateo County

Tom Azumbrado
U.S. Department of Housing and Urban Development

Jeannie Bruins
Cities of Santa Clara County

Damon Connolly
Marin County and Cities

Dave Cortese
Santa Clara County

Carol Dutra-Vernaci
Cities of Alameda County

Dorene M. Giacopini
U.S. Department of Transportation

Federal D. Glover
Contra Costa County

Anne W. Halsted
San Francisco Bay Conservation and Development Commission

Nick Josefowitz
San Francisco Mayor's Appointee

Jane Kim
City and County of San Francisco

Sam Liccardo
San Jose Mayor's Appointee

Alfredo Pedroza
Napa County and Cities

Julie Pierce
Association of Bay Area Governments

Bijan Sartipi
State Business, California State Transportation Agency

Libby Schaaf
Oakland Mayor's Appointee

Warren Slocum
San Mateo County

James P. Spering
Solano County and Cities

Amy R. Worth
Cities of Contra Costa County

MANAGEMENT STAFF

Steve Heminger
Executive Director

Alix Bockelman
Deputy Executive Director, Policy

Andrew B. Fremier
Deputy Executive Director, Operations

Bradford Paul
Deputy Executive Director, Local Government Services

PROJECT STAFF

Ken Kirkey
Director, Planning

Anne Richman
Director, Programming and Allocations

Drennen Shelton
Project Manager

Kearey Smith
Tom Buckley
GIS Analysis and Mapping

Shimon Israel
Demographic Analysis

Michele Stone
MIguel A. Osorio
Graphic Design and Production

This Plan was completed in consultation with **Nelson/Nygaard Consulting Associates**

COORDINATED PLAN TECHNICAL ADVISORY COMMITTEE

Jon Gaffney
Golden Gate Transit

Tracy Repp
Sonoma County Human Services Area Agency on Aging

Debbie Toth
Choice in Aging

Shawn Fong
City of Fremont

Melissa Reggiardo
SamTrans

Katherine Heatley
Outreach

Annette Williams
San Francisco Municipal Transportation Agency

Liz Niedzela
Solano Transportation Authority

EXECUTIVE



SUMMARY

METROPOLITAN TRANSPORTATION COMMISSION



SETTING THE VISION

This is a forward-thinking, big picture plan for the region that guides MTC's coordination with partners throughout the Bay Area.

This Coordinated Public Transit-Human Services Transportation Plans goes beyond its basic federal requirements—considering the mobility needs of seniors, people with disabilities, people on low-incomes, and veterans—and designates strategies to guide MTC's efforts over the next four years.

This plan asks the question:

How can MTC and its partners provide mobility options for seniors, people with disabilities, veterans, and people with low incomes that are also cost efficient for the region?



"How can MTC and its partners provide mobility options for seniors, people with disabilities, veterans, and people with low incomes that are also cost efficient for the region?"

WHO IS SERVED?

The Coordinated Plan envisions a cost-effective expansion of services for seniors, people with disabilities, veterans, and those with low incomes.

Existing Targeted Services	Seniors	People with Disabilities	Veterans	Low-Income Populations
Fixed-route transit	✓	✓	✓	✓
ADA-mandated paratransit		✓		
Community-based shuttles	✓	✓	✓	✓
Private demand-response transportation	✓	✓	✓	✓
Subsidized fare or voucher programs	✓	✓		✓
Volunteer driver programs	✓		✓	
Information and referral	✓	✓	✓	✓
Travel training	✓	✓		
Mobility management	✓	✓	✓	✓

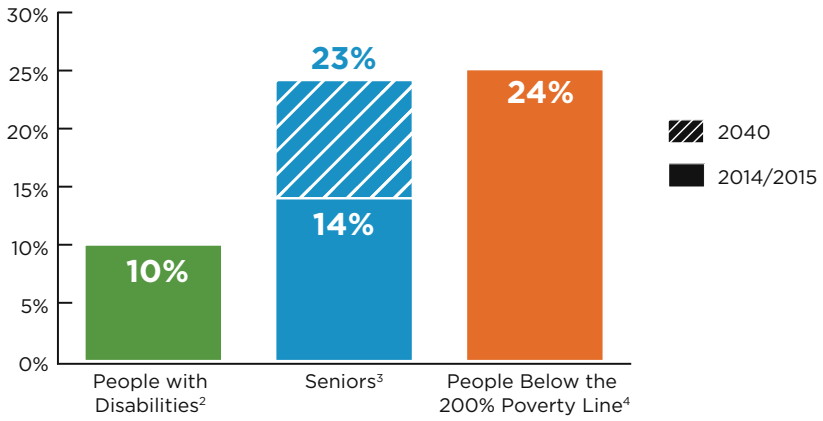
KEY CHALLENGES FOR THE REGION

The Bay Area's population is aging, and the portion of the population living in poverty has increased and suburbanized in the last decade. Combined with a growing share of the population that lacks access to a vehicle, this means that fewer of the most vulnerable people in our region have access to opportunities.

WHAT DOES THE DATA TELL US?

Predictions for the region's growth through the year 2040 indicate that the senior population will grow from 14% of today's population to 23% of the 2040 population.[1] However, those seniors are expected to stay healthy longer, with almost no growth expected in the portion of the population that is disabled.

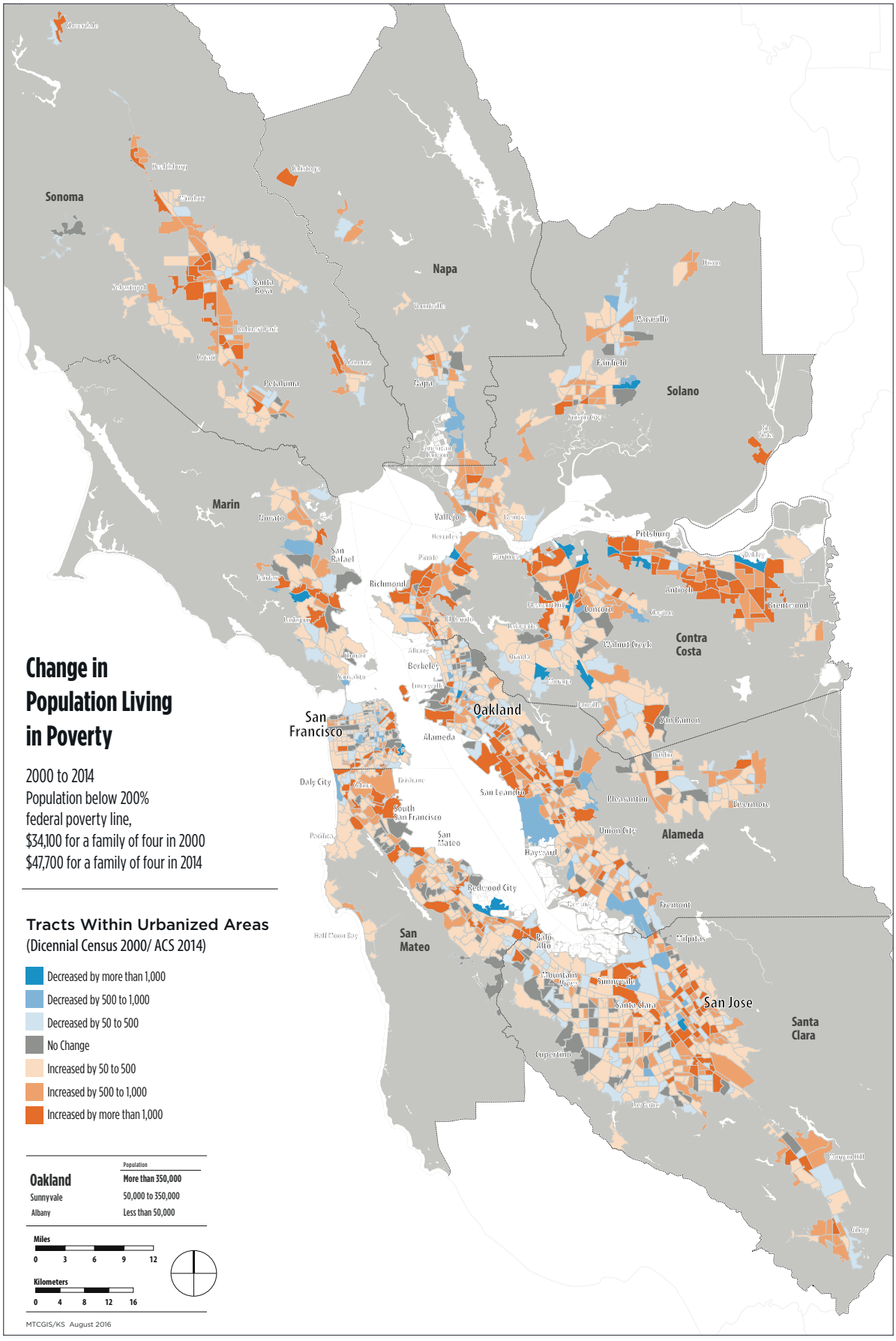
Bay Area Demographics



The cost of providing paratransit is increasing. According to the Federal Transit Administration, between 1999 and 2012, the average cost per trip on ADA paratransit services increased 138%, from $13.76 to $32.74.[5]

Today, 24% live in poverty in the Bay Area. Poverty has risen faster in suburban than urban areas, particularly in Solano, Contra Costa, and Marin counties. Low-income populations increasingly have less access to public transit and public services.

1. 2014 American Community Survey 5-Year Estimate S0101; Metropolitan Transportation Commission and Association of Bay Area Governments, Plan Bay Area 2040 Projections, Scenario 2040_03_116
2. 2014 American Community Survey 1-Year Estimate S0103
3. 2014 American Community Survey 5-Year Estimate S0101; Metropolitan Transportation Commission and Association of Bay Area Governments, Plan Bay Area 2040 Projections, Scenario 2040_03_116
4. 2015 American Community Survey 1-year Estimate B17002
5. FTA Report No. 0081, Accessible Transit Services for All


Sonoma
Napa
Solano
Marin
Contra Costa
Alameda
San Mateo
Santa Clara
San Francisco
Oakland
San Jose
Change in Population Living in Poverty
2000 to 2014
Population below 200% federal poverty line,
$34,100 for a family of four in 2000
$47,700 for a family of four in 2014
Tracts Within Urbanized Areas
(Dicennial Census 2000/ ACS 2014)
Decreased by more than 1,000
Decreased by 500 to 1,000
Decreased by 50 to 500
No Change
Increased by 50 to 500
Increased by 500 to 1,000
Increased by more than 1,000
Oakland
Sunnyvale
Albany
Population
More than 350,000
50,000 to 350,000
Less than 50,000
Miles
0 3 6 9 12
Kilometers
0 4 8 12 16
MTCGIS/KS August 2016

WHAT DO REGIONAL STAKEHOLDERS SEE AS THE BIGGEST GAPS?

Representatives from over 30 Bay Area stakeholder groups were asked to identify the biggest mobility gaps faced by their constituents. These are the most common themes heard.

- Spatial gaps—areas of our region that are either difficult or impossible to reach by public transportation—continue to be a key need expressed throughout the region
- Temporal gaps—points in time that lack service—also constrain the mobility of target populations
- With regional consolidation of facilities and growing rates of disease, healthcare access is a major concern in the region
- Transit and paratransit fares are unaffordable for many people in all parts of the Bay Area
- Funding needs are growing faster than revenues
- Constituents recognize that safety investments for pedestrians and people on bicycles improve mobility for all, and increase access to transit
- While suggestions were made to leverage emerging mobility service providers to assist in solving mobility gaps, people are concerned about the lack of accessibility of both taxis and ride-hailing services
- Stakeholders highlight the importance of transportation information availability and associated referral services to steer people to gap-filling services
- Consistent with the 2013 Plan, transfers on both the fixed-route transit network as well as between ADA Paratransit service providers (when trips cross county lines, for example) are barriers

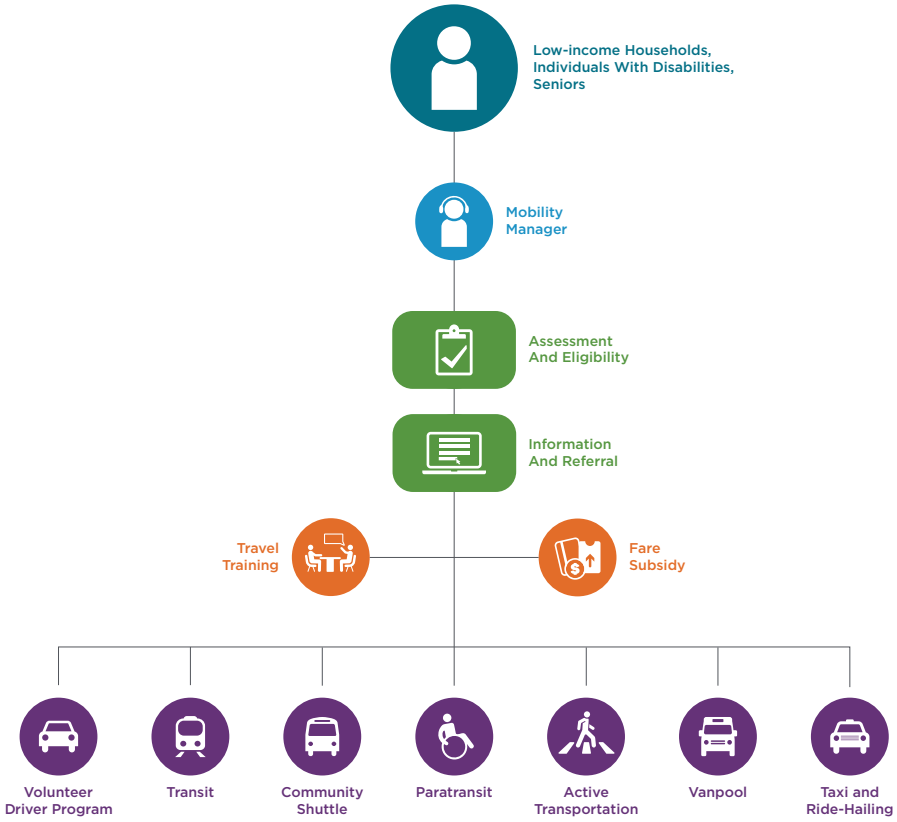
COORDINATION STRATEGIES

Strategies are big picture initiatives that MTC and its local partners can implement or facilitate. The plan identifies the following strategies for MTC and its partners:

IMPLEMENT COUNTY-BASED MOBILITY MANAGEMENT

Develop County-Based Mobility Management Across the Region that will direct passengers to all available transportation options and increase efficiency through coordination. A county-based mobility management program should include in-person eligibility assessments, travel training, and information and referral services.

The graphic below describes the typical Mobility Management process, in which an individual seeking mobility services works with a Mobility Manager to assess their needs, and to be referred to services, subsidy programs, or training opportunities for which they are eligible.





IMPROVE PARATRANSIT

Address Access to Healthcare by supporting cost sharing agreements between transportation providers and healthcare clinics, and by exploring Medi-Cal cost recovery programs for public and private providers in the Bay Area.

Reduce the Cost of Providing ADA Paratransit. Implementation of mobility management strategies will help address paratransit per-rider costs, including in-person eligibility assessments and software upgrades to allow for trip screening or Interactive Voice Response systems.

Make it Easier for Customers to Pay by exploring potential solutions with Clipper 2.0

PROVIDE MOBILITY SOLUTIONS TO SUBURBAN AREAS

Increase Suburban Mobility Options. MTC can provide guidance on public-private partnerships, increasing the availability of subsidized same-day trip programs, increasing the functionality of information and referral systems such as "one-call/ one-click" solutions, and subsidizing low-income carshare pilots or vehicle loan programs.

REGIONAL MEANS-BASED TRANSIT FARE PROGRAM

Means-Based Fare Program. To make transit more affordable for low-income people, MTC and partners should implement a financially viable and administratively feasible program.

SHARED AND FUTURE MOBILITY

Advocate for the Accessibility of Shared Mobility Solutions and Autonomous Vehicles. MTC and partners ensure equity and accessibility of bikeshare, carshare, ride-hailing, and other new mobility options by issuing policy guidance and technical assistance for agencies and non-profits entering into partnerships.

IMPROVE MOBILITY FOR VETERANS

Support Veterans'-Specific Mobility Services. Serve localized and long-distance medical trips for veterans and create opportunities for veterans to advise MTC on mobility needs.

ACTION PLAN

To cost efficiently serve seniors, people with disabilities, veterans, and people with low incomes with a range of mobility options, this plan outlines key actions for MTC and its regional partners over the next four years.

1

KEEP THE MOMENTUM
(6-12 months)

In the first year of the 2018 Coordinated Plan's adoption, MTC and its regional partners—transit operators, human service providers, Congestion Management Agencies, and others—should keep the momentum from the planning process by setting policies and establishing internal frameworks.

2

IMPLEMENT THE BASICS
(1-2 years)

One to two years after adoption, the region should begin to see visible impacts of the planning process, with service pilots, coordination summits, and other basic programs being implemented.

3

BUILD OUT THE PROGRAM
(3-4 years)

In the three to four year time frame, the major strategies for the region—county-based mobility management, means-based fares, in-person eligibility, access to health care, and an open dialog with shared mobility service providers—should come to fruition.

FOR MORE INFORMATION

Please contact:

Metropolitan Transportation Commission

415.778.6700

mtc.ca.gov

TABLE OF CONTENTS

1. INTRODUCTION AND METHODOLOGY 2

Plan Goals 3
Planning Requirements 3
Federal and State Roles to Promote Human Service Transportation Coordination 4
How was the plan developed? 5

2. BAY AREA DEMOGRAPHICS 8

Key Findings 9
Seniors 9
People With Disabilities 12
Poverty 14
Access To Vehicles 18
Veterans 19

3. TRANSPORTATION RESOURCES 24

Regional Transportation Resources 25
Overview of Projects Funded Under Previous Coordinated Plan 38

4. OUTREACH AND STAKEHOLDER GAP IDENTIFICATION 42

Summary of Gaps 43
Community Input Opportunities 45
Summary Of Feedback By County 47

5. REGIONAL STRATEGIES FOR COORDINATION 50

Strategy 1: County-Based Mobility Management 51
Strategy 2: Improve Paratransit 53
Strategy 3: Provide Mobility Solutions To Suburban Areas 56
Strategy 4: Means-Based Fares 58
Strategy 5: Shared And Future Mobility Opportunities 58
Strategy 6: Improve Mobility For Veterans 59
Recommendations Timeline 60
Progress Reporting 61

TABLE OF APPENDICES

APPENDIX A 64
Demographics

APPENDIX B 68
List of Feedback Themes

APPENDIX C 70
List of Feedback Comments

APPENDIX D 104
Consolidated Transportation Service Agencies – MTC Designation Process

APPENDIX E 106
Project Types Eligible for Funding

APPENDIX F 110
Promote Walkable Communities, Complete Streets, and the Integration of Transportation and Land Use Decisions

APPENDIX G 112
What is Mobility Management?

APPENDIX H 116
Public Comments on Coordinated Plan

TABLE OF FIGURES

Figure 2.1 Percent of Senior Population (2000-2040) 10
Figure 2.2 Percent Change in Seniors (local geography) 11
Figure 2.3 Percent of Population with a Disability (2010-2014) 12
Figure 2.4 Percent of Seniors with a Disability (2010-2014) 13
Figure 2.5 Percent of Population Living in Poverty (2000-2015) 15
Figure 2.6 Percent of Seniors Living in Poverty (2015) 16
Figure 2.7 Percent Change for Population Living in Poverty (local geography) 17
Figure 2.8 Comparison of General Public to Seniors without Access to a Vehicle (2015) 18
Figure 2.9 Percent of Population (18 and over) who are Veterans (2000-2014) 19
Figure 2.10 Percent of Veterans who are Seniors (2014) 20
Figure 2.11 Percent Change in Veterans (local geography) 21

Figure 3.1 Mobility Management Process 25
Figure 3.2 Types of Transportation Resources in the Bay Area 26
Figure 3.3 Providers of Fixed-Route and ADA-Mandated Paratransit in the San Francisco Bay Area 28-29
Figure 3.4 Volunteer Driver Partners in the Bay Area 33
Figure 3.5 Information and Referral Services in the San Francisco Bay Area 34
Figure 3.6 Mobility Management Providers in the San Francisco Bay Area 35-36
Figure 3.7 FTA Specialized Program Funding by Urbanized Area (UA), Since 2012 Coordinated Plan 38
Figure 3.8 JARC/5307 Funding by Project Type, FY 2011 – FY 2016 39
Figure 3.9 New Freedom Funding by Project Type, FY 2012 40
Figure 3.10 5310 Funding by Project Type, FY 2013 – FY 2017 40

Figure 4.1 Community Engagement and Outreach Activities 45-46

Figure 5.1 Ride Connection Support Services Provided to Service Partners 52
Figure 5.2 Access Services Paratransit Payment Methods 55
Figure 5.3 Implementation Timeline 60

Figure A.1 Existing 2014 Population Breakdown 65
Figure A2 Veteran Statistics 67
Figure B.1 List of Feedback Received in Order of Frequency 69
Figure C.1 List of Feedback Comments 71-102
Figure E.1 Project Types Eligible for Funding 107-109
Figure H.1 Public Comments on Coordinated Plan 117- 138

1. INTRODUCTION AND METHODOLOGY

To serve the needs of seniors, people with disabilities, those with low incomes, and veterans, the 2018 Coordinated Public Transit-Human Services Transportation Plan sets regional priorities for transportation investments and initiatives for human services and public transit coordination. It also serves as a federally required update to the 2013 Coordinated Public Transit-Human Services Transportation Plan, and is being completed in concert with the region's long-range regional transportation plan, Plan Bay Area 2040.

Through the involvement of the Technical Advisory Committee (TAC)—a group of regional stakeholders representing the plan's target populations,[1] this Coordinated Plan considers numerous existing or ongoing planning efforts focused on the transportation needs of low-income, senior, disabled, and veteran residents in the Bay Area. These include the Means-Based Fare Study and the Plan Bay Area Equity Analysis. Extensive, locally targeted outreach with residents and users of the system, regional stakeholders, and local advisory groups identified the transportation gaps that strategies and projects were designed to address.

1 The 2018 Coordinated Plan TAC includes representatives from Golden Gate Transit, Sonoma County Human Services Area Agency on Aging, Choice in Aging (Contra Costa County), City of Fremont, SamTrans, Outreach (Santa Clara County), San Francisco Municipal Transportation Agency, and Solano Transportation Authority.

PLAN GOALS

The Coordinated Plan provides an opportunity for a diverse range of stakeholders with a common interest in human service transportation to convene and collaborate on how best to provide transportation services for these targeted populations. Specifically, stakeholders are called upon to identify service gaps and barriers, strategize on solutions most appropriate to meet these needs based on local circumstances, and prioritize these needs for inclusion in the Coordinated Plan.

Indeed, stakeholder outreach and participation was a key element to the development of the Coordinated Plan; federal guidance issued by FTA specifically requires this participation and recommends that it come from a broad base of groups and organizations involved in the coordinated planning process, including (but not limited to):

- Area transportation planning agencies
- Transit riders and potential riders
- Public transportation providers
- Private transportation providers
- Non-profit transportation providers
- Human service agencies funding and/or supporting transportation services
- Other government agencies that administer programs for targeted population, advocacy organizations, community-based organizations, elected officials, and tribal representatives.[2]

This Coordinated Plan is intended both to capture those local stakeholder discussions, and to establish the framework for potential future planning and coordination activities.

Importantly, the Coordinated Plan provides an opportunity for MTC to prioritize strategies that can be approached on a regional level. This plan offers potential strategies and priorities for projects that target transportation-disadvantaged populations. Given the timing of the Coordinated Plan update process relative to reauthorization legislation, this document will inform priorities and certify projects receiving funds authorized under both Moving Ahead for Progress in the 21st Century Act (MAP-21) (the previous federal transportation funding authorization) and the Fixing America's Surface Transportation (FAST) Act. Planning requirements specific to the authorizations are described below.

PLANNING REQUIREMENTS

Enhanced Mobility of Seniors and Individuals with Disabilities Program (Section 5310)

The FAST Act retains the same planning requirements identified under MAP-21 for the Enhanced Mobility of Seniors and Individuals with Disabilities Program (Section 5310). Section 5310 remains the only funding program with coordinated planning requirements under the FAST Act.

In relation to the locally developed Coordinated Public Transit-Human Services Transportation Plan, the FAST Act requires:[3]

1. That projects selected are "included in a locally developed, coordinated public transit-human services transportation plan."

2. That the coordinated plan "was developed and approved through a process that included participation by seniors, individuals with disabilities, representatives of public, private, and nonprofit transportation and human service providers, and other members of the public."

3. That "to the maximum extent feasible, the services funded will be coordinated with transportation services assisted by other Federal departments and agencies," including recipients of grants from the Department of Health and Human Services.

Funds are apportioned based on each state's share of the population of seniors and individuals with disabilities. Funding decisions must be clearly noted in a program management plan.

The selection process may be formula-based, competitive or discretionary, and sub-recipients can include states or local government authorities, private non-profit organizations, and/or operators of public transportation.

2 Federal Register: March 15, 2006 (Volume 71, Number 50, pages 13459-60)

3 https://www.transit.dot.gov/funding/grants/grant-programs/section-5310-%E2%80%93-enhanced-mobility-seniors-and-individuals-disabilities

FEDERAL AND STATE ROLES TO PROMOTE HUMAN SERVICE TRANSPORTATION COORDINATION

Federal

Incentives and benefits to coordinating human services transportation programs are defined and elaborated upon in numerous initiatives and documents. Coordination can enhance transportation access, minimize duplication of services, and facilitate cost-effective solutions with available resources. Enhanced coordination also results in joint ownership and oversight of service delivery by both human service and transportation service agencies. Technical assistance related to the FAST Act built on earlier initiatives from the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and MAP-21. These earlier initiatives include:

- **United We Ride:** In February 2004, President George W. Bush signed an Executive Order establishing an Interagency Transportation Coordinating Council on Access and Mobility (CCAM) to focus 10 federal agencies on the coordination agenda.
- **A Framework for Action:** The Framework for Action is a self-assessment tool that states and communities could use to identify areas of success and highlight the actions still needed to improve the coordination of human service transportation.
- **Medicaid Transportation Initiatives:** Transit Passes – Federal regulations require that Medicaid-eligible persons who need transportation for non-emergency medical care be provided transportation. For many people, the most cost-effective way to provide this transportation is with public transportation. Expansion of Medicaid under the Patient Protection and Affordable Care Act increased the number of persons eligible for Medicaid in the State of California.

The CCAM currently sponsors the following initiatives:

- **Rides to Wellness:** An initiative to increase partnerships between health and transportation providers and show the positive financial benefit to such partnerships. The initiative's goals are to increase access to care, improve health outcomes, and reduce healthcare costs. In March 2015, FTA hosted the Rides to Wellness summit, representatives from FTA, HHS, USDA and the Department of Veterans Affairs attended. The Rides to Wellness initiative also oversees the FAST Act's competitive pilot program for innovative coordinated access and mobility to help finance innovative projects for the transportation disadvantaged that improve the coordination of transportation services and non-emergency medical transportation (NEMT) services.
- **Veterans Transportation Community Living Initiative (VTCLI):** FTA has awarded $64 million in competitive grants to help veterans, military families, and others connect to jobs and services in their communities by improving access to local transportation options.[4]
- **Healthcare Access Mobility Design Challenge (and other National Center for Mobility Management projects):** The Design Challenge was part of the Federal Transit Administration's Rides to Wellness initiative, a key component of the agency's Ladders of Opportunity program. Sixteen communities were awarded grants to design innovative transportation solutions related to healthcare access; their work was completed in March 2016.[5]
- **National Aging and Disability Transportation Center (NADTC):** The National Aging and Disability Transportation Center is a national technical assistance center funded by FTA to promote the availability and accessibility of transportation options that serve the needs of people with disabilities, seniors and caregivers with a focus on the Section 5310 program and other transit investments. The NADTC provides technical assistance, information and referral; develops field training; implements interactive communication and outreach strategies; and supports communities in assessing their needs and developing innovative transportation solutions.
- **National Center for Mobility Management (NCMM):** The National Center for Mobility Management supports FTA's Rides to Wellness Initiative and is funded through a cooperative agreement with FTA. NCMM provides capacity-building technical assistance and training; catalogs and disseminates best practice information on innovative mobility management programs around the country; and works to improve and enhance the coordination of federal resources for human service transportation, especially for people with disabilities, older adults and people with lower incomes.

4 https://www.transit.dot.gov/ccam/about/initiatives

5 http://nationalcenterformobilitymanagement.org/challenge/

- **National Rural Transportation Assistance Program (RTAP):** The National Rural Transportation Assistance Program provides outreach and training to each state's RTAP and coordinates with other organizations involved in rural transit, operates a national toll-free telephone line, a webpage, a national peer-to-peer technical assistance network and various presentations and publications and fulfillment services for National RTAP products.
- **Intelligent Transportation System (ITS) Peer-to-Peer Program:** The ITS Peer-to-Peer Program helps urban and rural clients create solutions for a variety of highway, transit, and motor carrier interests, in virtually all areas of ITS planning, design, deployment and operations.
- **National Transit Institute:** The National Transit Institute (NTI) at Rutgers University was established in 1992 to conduct training and educational programs related to public transportation. Funded by FTA, NTI's mission is to provide training, education, and clearinghouse services in support of public transportation and quality of life in the United States.
- **Transit Cooperative Research Program:** The Transportation Cooperative Research Program (TCRP) is funded by DOT and FTA. TCRP offers practical research that yields near-term results and can help agencies solve operational problems, adopt useful technologies from related industries and, find ways for public transportation to be innovative.

HOW WAS THIS PLAN DEVELOPED?

The four required elements of a coordinated plan are: (1) an assessment of current transportation services; (2) an assessment of transportation needs; (3) strategies, activities and/or projects to address the identified transportation needs (as well as ways to improved efficiencies); and (4) implementation priorities based on funding, feasibility, and time, among other criteria. This section describes the steps taken by MTC and its Technical Advisory Committee (TAC) to develop these elements of the Bay Area's coordinated plan.

Bay Area Demographic Trends

An updated demographic profile of the Bay Area was prepared using data from the Census Bureau's American Community Survey and other relevant planning documents, to determine the local characteristics of the study area as they relate to the four population groups the Coordinated Plan focuses on: persons with low incomes, persons with disabilities, veterans, and older adults.

Regional Transportation Resource Inventory

To assist county- and local-level organizations in improving local mobility, the Coordinated Plan provides an updated summary of JARC, New Freedom, and Section 5310 projects funded since the last Coordinated Plan, defines mobility management, and describes the range of transportation services that exist in the region. These services include public fixed-route and paratransit services and transportation services provided or sponsored by social service agencies. Information about options were gleaned from existing resources and the TAC.

Outreach to Stakeholders - Transportation Gaps and Solutions

Input was sought from the region's seniors, people with disabilities, people with low incomes, and veterans through various forms of outreach.

Together with findings from the demographic analysis, stakeholder input informed the development of a comprehensive list of transportation gaps and a summary of possible solutions.

Outreach

Outreach efforts focused on conversations with individuals, advocates, and agencies. Thirty-five agencies, organizations, and advisory groups from all nine counties of the Bay Area provided input, captured in more than 300 individual comments. These comments were individually classified as either identifications of existing transportation gaps or suggestions of potential solutions; further, each comment was categorized according to its overarching theme—temporal or spatial gaps, for example. These comments, along with their themes, are provided as Appendix B and Appendix C.

Summary of Gaps and Solutions

Each comment was categorized as either a gap or a solution, and further assigned a theme. In total, 53 themes emerged. Discussions with the TAC to develop locally implementable projects and regionally relevant strategies focused on the 10 most common themes heard through all engagement channels. In addition to gaps, stakeholders also offered solutions — either things that have been discussed in their county or new ideas. This input was incorporated into the strategy recommendations.

Projects Eligible for 5310 and other Funding

This plan synthesizes feedback received through the outreach process along with demographic analysis and work done in the 2013 Coordinated Plan to identify specific eligible project types; these projects become eligible for 5310 and other funding sources that require or encourage proposals to refer to this Coordinated Plan (e.g. 5311 or MTC's own competitive grant programs) Projects eligible for 5310 funding can be found in Appendix E.

Project types include Mobility Management and Travel Training, Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services, Improvements to ADA-mandated Paratransit, Improvements to Public Transit Service and Access, Pedestrian and Bicycle Improvements, Shared Mobility Accessibility, and Other Solutions.

Potential Strategies for Addressing Mobility Gaps

To leverage the unique opportunity offered by coordinating this planning effort with Plan Bay Area 2040 – the region's long range transportation plan and Sustainable Communities Strategy – MTC took the opportunity to think strategically about the regional role it can play in improving mobility for seniors, people with disabilities, veterans, and those with low incomes. These strategies are big picture initiatives that MTC can facilitate or implement. They are informed by the information gathered throughout the Coordinated Plan planning process as well as in coordination with MTC planners working on Plan Bay Area.

Implementation Recommendations

After a thorough review of strategies, the Coordinated Plan lays out next steps for MTC, Congestion Management Agencies, transit providers, and human services providers to address mobility gaps.

2. BAY AREA DEMOGRAPHICS

The San Francisco Bay Area is a geographically diverse metropolitan region that surrounds the San Francisco Bay. It encompasses the cities of San Francisco, San Jose, and Oakland, and their many suburbs, as well as the smaller urban and rural areas of the North and East Bay.

Home now to over 7.7 million people, the region comprises cities, towns, military bases, airports, associated regional, state, and national parks, and nine counties connected by a network of roads, highways, railroads, bridges, and commuter rail. Even as MTC plans to invest $303 billion in the Bay Area's transportation system over the next 24 years,[6] there are external factors that are outpacing the systems' ability to address the needs of the target populations in this report. The limits of current infrastructure coupled with the massive growth among aging demographics (the population of seniors, for example, is projected to grow from 14 percent in 2014 to 23 percent of the population in 2040), points to a lack of fiscal and organizational readiness.

Moreover, the closure and consolidation of medical facilities while rates of diabetes and obesity are on the rise will place heavy demands on an already deficient system. The demographic trends described in this chapter suggest that increased investments will need to be enhanced by policies that address the significant institutional challenges and regulatory inefficiencies inherent in the existing infrastructure.

6 Plan Bay Area 2040. San Francisco, CA: Metropolitan Transportation Commission, 2017.

KEY FINDINGS

This section presents the existing conditions for disadvantaged populations including seniors (those 65 and over), people with disabilities, those living in poverty and/or without access to a vehicle, and veterans. Some of these populations overlap and some counties have higher concentrations of people that fall into one or more of these groups. Some key findings reflecting the mobility needs of these groups are listed below.

- The Bay Area's population is aging. Specifically, the North Bay counties of Marin, Sonoma, and Napa – which are three of the region's four least populated counties – have the highest proportion of individuals who are age 65 and over.
- The percentage of people living in poverty in the past decade has increased.
- The majority of the region's veterans are seniors. Suburban areas have a higher percentage of veterans than more urban areas.
- San Francisco is an outlier. It is the most urban of all counties with the greatest density of transit services, and has the highest percentage of residents without access to a vehicle. As of 2012, San Francisco was the fifth most car-free city in the country, a much higher ranking than in 2000.[7] The increase in households without access to a vehicle suggests large investments in transit and infrastructure that supports multi-modal mobility should continue.
- San Francisco also has the highest percentage of seniors living in poverty.
- The percentage of people living without access to a vehicle has been on the rise since 2007, both nationally and around the region.
- Solano County is one of the least urban in the region and has the highest percentage of veterans.
- Growing demand for mobility programs that target seniors and people with disabilities will generate increased funding requirements.
- As the retirement population grows, there will be fewer workers to provide services and facilitate mobility among the aging population. New technology and innovative mobility strategies will be necessary to fill the gaps in mobility services.

7 Transportation Research Institute, University of Michigan. (2012). [Graph illustration of car-free cities]. Retrieved from https://www.theatlantic.com/business/archive/2014/01/why-do-the-smartest-cities-have-the-smallest-share-of-cars/283234/

SENIORS

Current Conditions

In 2014, the nine county Bay Area region had approximately 1,028,000 people age 65 or older, according to the U.S. Census's American Community Survey (ACS). **The general population is aging and the percentage of seniors is on the rise.** Seniors made up 13.6 percent of the region's total population, compared to 11.3 percent in 2000.

The North Bay counties of Marin, Sonoma, and Napa – three of the regions' four least populated counties – along with San Francisco, have the highest percentage of seniors. Marin has the highest percent of seniors in the region, but is below average in percent with a disability, living in poverty, without access to a vehicle, and veteran population. Sixteen percent of all seniors in the region were veterans.

Alameda, Solano, and Santa Clara have the lowest proportion of seniors of Bay Area counties. These percentages can be seen over time in **Figure 2.1**.

Trends

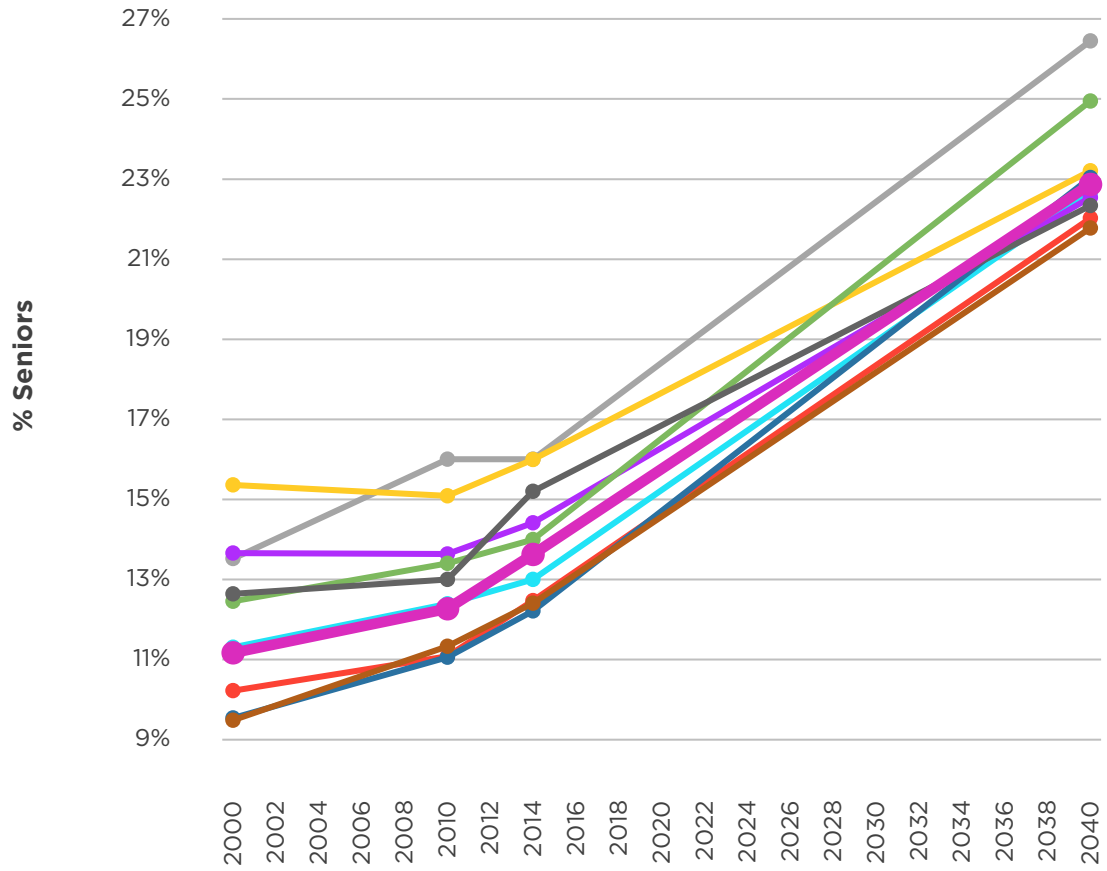
By 2040, a much greater proportion of the region is projected to be 65 or older. Seniors are projected to increase to a fifth of the population or more in every county. Marin and San Mateo Counties are projected to have the highest percentages of seniors, with a quarter or more 65 or older. Services for seniors will need to increase at or ahead of the rate at which the senior population is growing.

To put this in perspective, in 2014, people who were 65 and older made up about 14 percent of the regional population. By 2040, this segment will increase to 23 percent. Mobility will continue to be a challenge for seniors and for transportation planners as a far greater proportion of the population loses their ability to drive.

The senior population has been steadily increasing over the last decade and a half. Between 2010 and 2014, the percentage of seniors grew even more rapidly than the decade prior.

Current senior-oriented mobility services do not have the capacity to handle the increase in people over 65 years of age, as evidenced by the routine identification of service gaps in multiple studies the team has conducted throughout the Bay Area with older adults.

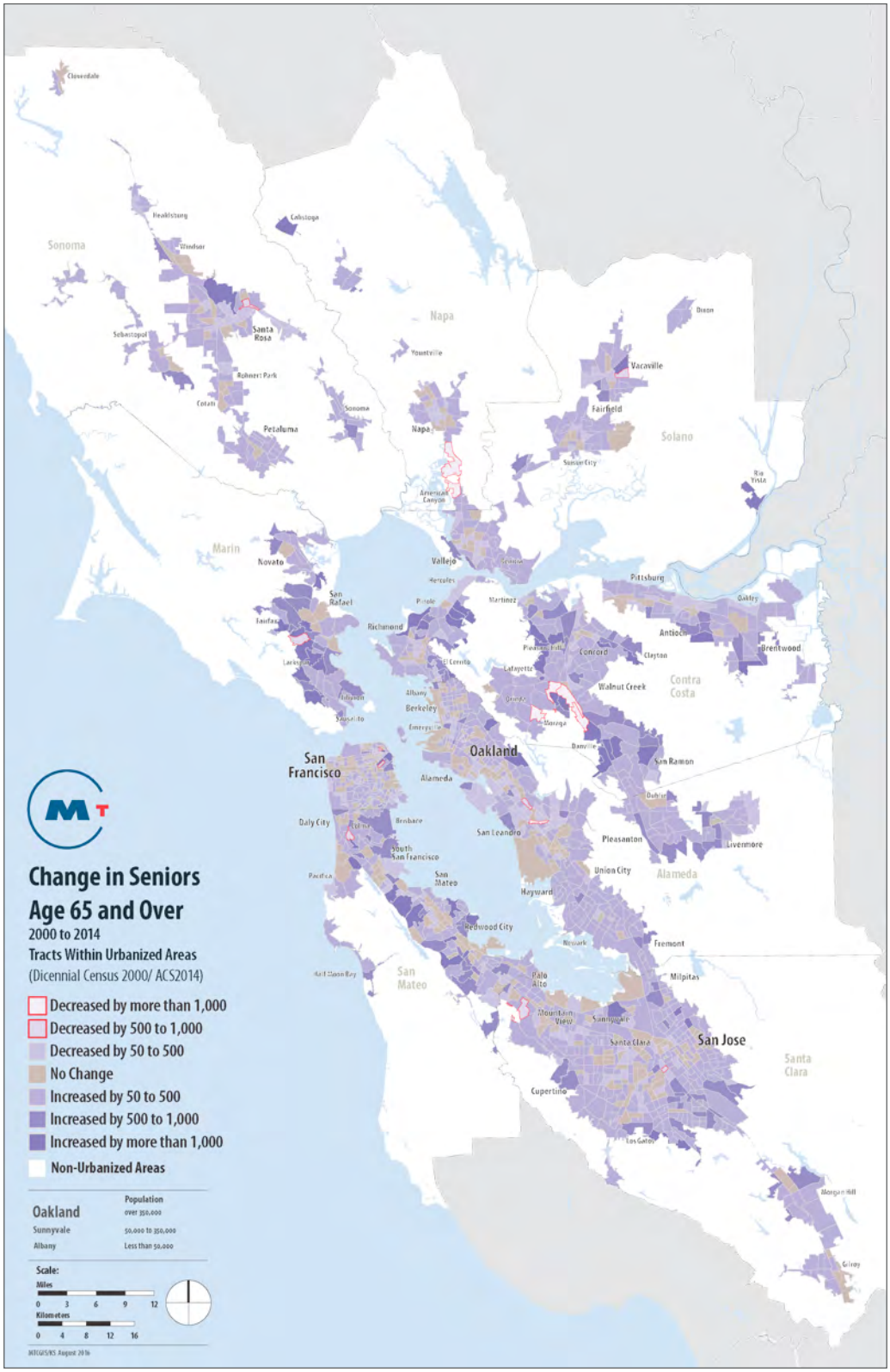
Figure 2.1 Percent of Senior Population (2000-2040)



	2000	2010	2014	2040
Alameda	10%	11%	12.5%	22%
Contra Costa	11%	12%	13.0%	23%
Marin	14%	16%	16.0%	26%
Napa	15%	15%	16.0%	23%
San Francisco	14%	14%	14.4%	23%
San Mateo	12%	13%	14.0%	25%
Santa Clara	10%	11%	12.2%	23%
Solano	9%	11%	12.4%	22%
Sonoma	13%	13%	15.2%	22%
Region	11%	12%	13.6%	23%

SOURCE: 2000 Census Summary File DP-1; 2010 American Community Survey 5-Year Estimate S0101; 2014 American Community Survey 5-Year Estimate S0101; Metropolitan Transportation Commission and Association of Bay Area Governments, Plan Bay Area 2040 Projections, Scenario 2040_03_116

Figure 2.2 Percent Change in Seniors (local geography)



SOURCE: 2000 Census Summary File 3 P011001; 2014 American Community Survey C18108

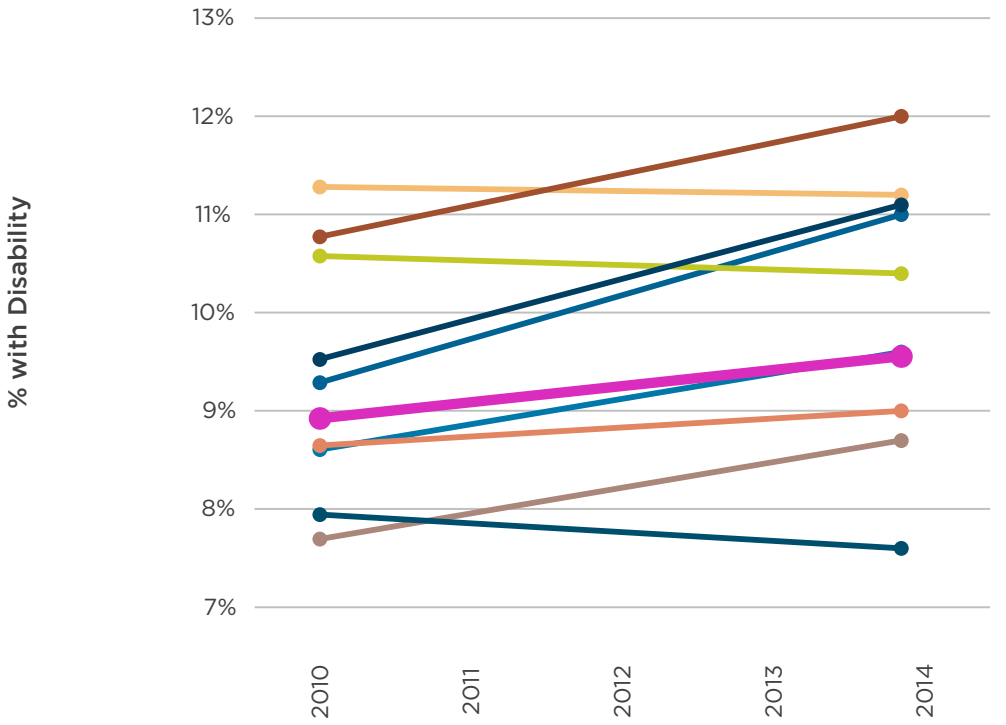
In **Figure 2.2**, the percent change in the senior population can be seen at a local level for the 2000 to 2014 period. This data is from the same source as the previously reported data, but it is summarized at a local geographic level instead of at the county geographic level. This map can aid county officials in targeting investments locally.

PEOPLE WITH DISABILITIES

Current Conditions

Sonoma County has the highest proportion of people currently living with a disability. Marin County's senior population has the lowest proportion of seniors living with a disability, suggesting that while there is a large population of seniors in the county, they are more likely not to have a disability or be as dependent on accessible services. These percentages can be seen in **Figure 2.3** and **Figure 2.4**.

Figure 2.3 Percent of Population with a Disability (2010-2014)

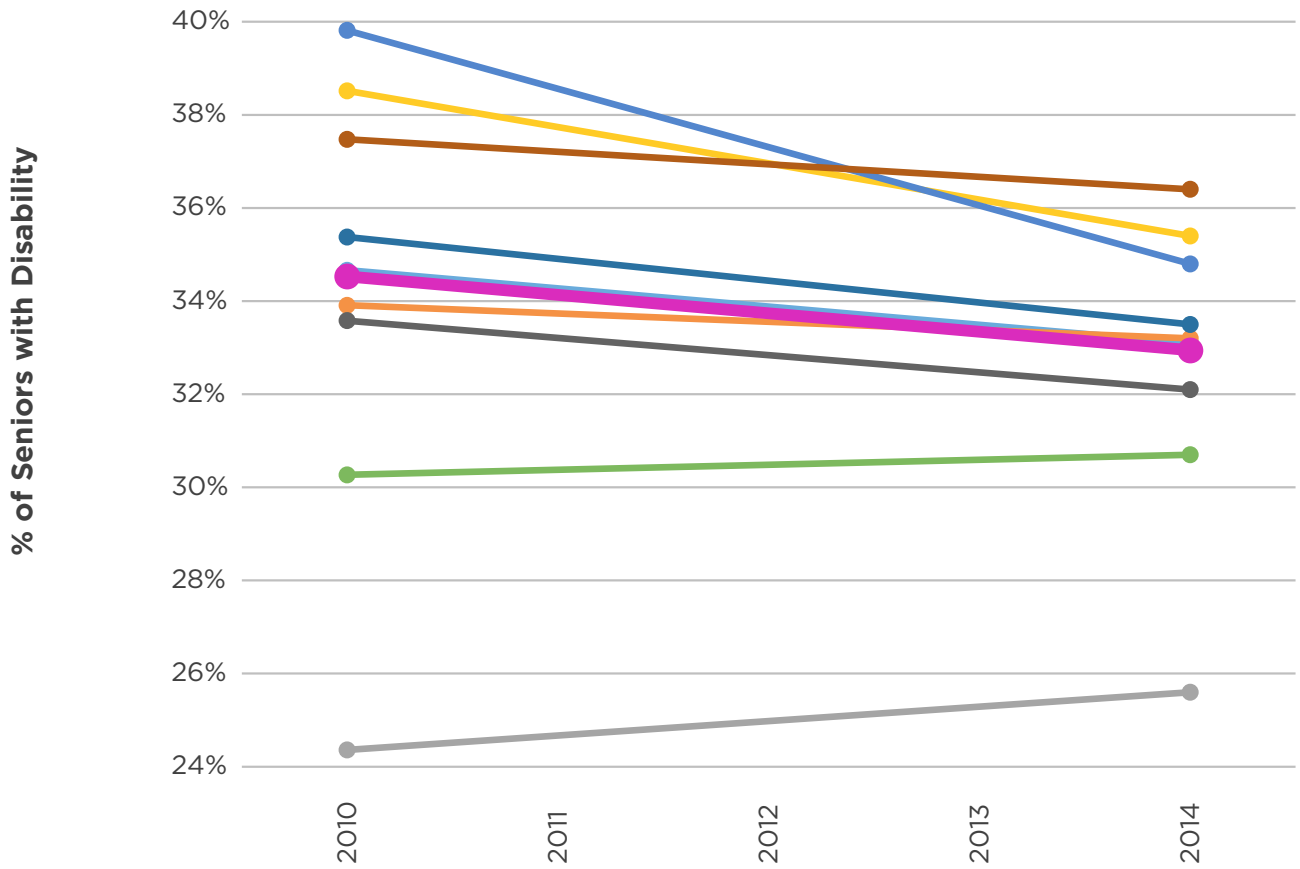


	2010	2014
Alameda	9%	10%
Contra Costa	9%	11%
Marin	9%	9%
Napa	11%	11%
San Francisco	11%	10%
San Mateo	8%	9%
Santa Clara	8%	8%
Solano	10%	11%
Sonoma	11%	12%
Region	9%	10%

SOURCE: 2010 American Community Survey 1-Year Estimate S0103; 2014 American Community Survey 1-Year Estimate S0103; Metropolitan Transportation Commission and Association of Bay Area Governments, Plan Bay Area 2040 Projections, Scenario 2040_03_116

* New disability questions were introduced in 2008, along with new questions on Health Insurance, Marital History, and Veterans' Service-connected Disability Ratings. Because of the changes to the questions, the new ACS disability questions should not be compared to the previous ACS disability questions or the Census 2000 disability data.

Figure 2.4 Percent of Seniors with a Disability (2010-2014)



	2010	2014
Alameda	35%	33%
Contra Costa	34%	33%
Marin	24%	26%
Napa	39%	35%
San Francisco	40%	35%
San Mateo	30%	31%
Santa Clara	35%	34%
Solano	37%	36%
Sonoma	34%	32%
Region	35%	33%

SOURCE: 2010 American Community Survey 1-Year Estimate S0103; 2014 American Community Survey 1-Year Estimate S0103

* New Disability questions were introduced in 2008, along with new questions on Health Insurance, Marital History, and Veterans' Service-connected Disability Ratings. Because of the changes to the questions, the new ACS disability questions should not be compared to the previous ACS disability questions or the Census 2000 disability data.

Trends

According to the demographic data gathered from the ACS, the percentage of people with a disability has remained relatively steady. Since 2010, trends have varied from county to county. On the regional level, there has been a slight decrease in the percentage of seniors with a disability over the last half decade.

POVERTY

Current Conditions

In 2015, almost one fourth of people in the region were living in poverty. Poverty has risen faster in suburban than urban areas. Due to this shift, "poor populations… have less access to public transit than they did in 2000."[8] This decentralization of poverty makes it more challenging for those in need of services, as more resources may be needed to provide services to a broader, decentralized suburban population.

Those living in poverty are less likely to be able to afford a car and are more reliant on public transit than those with high incomes. "Poor people living in suburban areas must either pay for a car or navigate an inefficient transit system, forfeiting a significant proportion of their income or the opportunity cost of their time."[9]

Trends

As can be seen in **Figure 2.5**, the percentages for years 2000 to 2015 represent those living under 200 percent of the federal poverty level. The 200 percent threshold is used in recognition of the Bay Area's high cost of living.

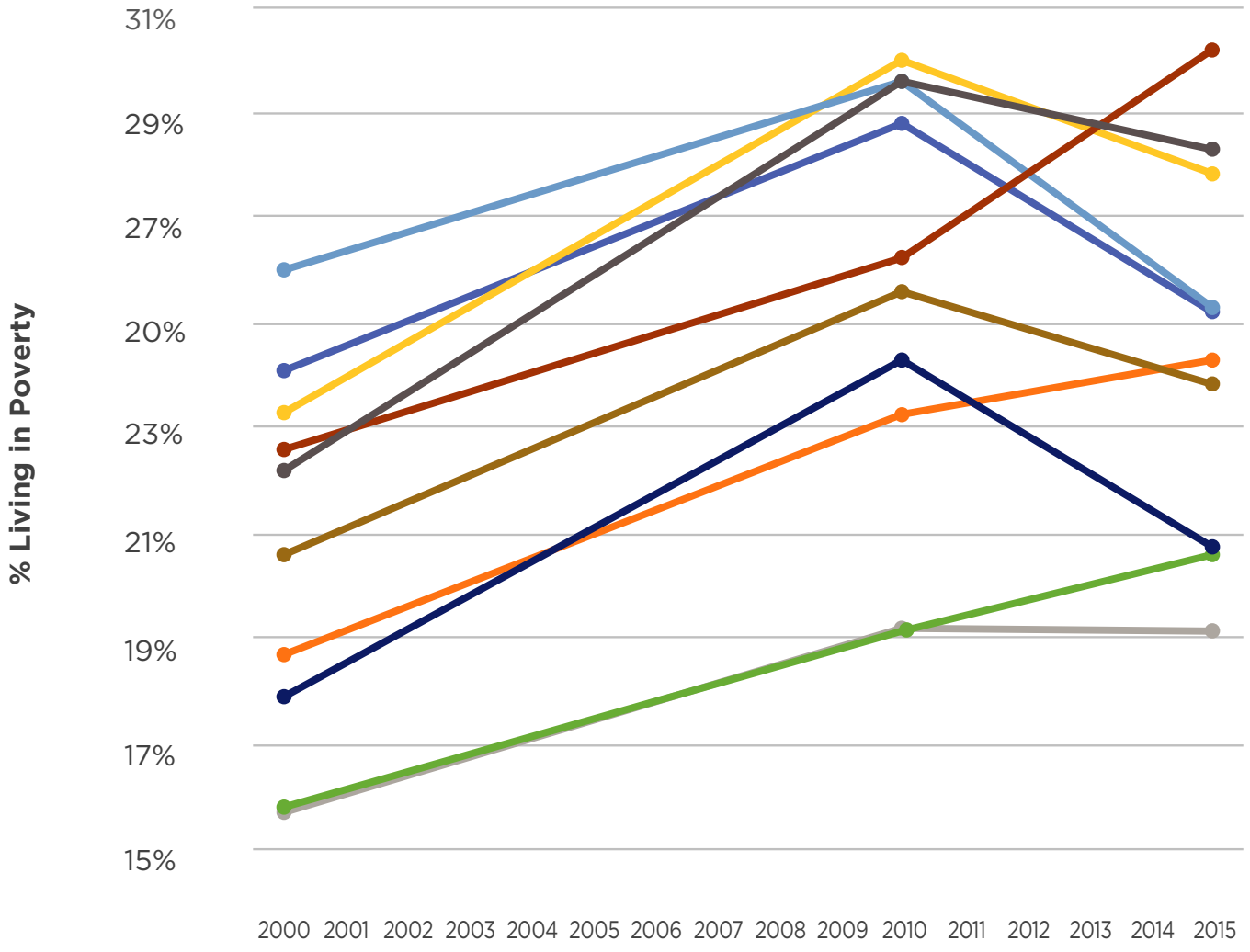
The federal poverty level provides a reasonable benchmark to understand trends over time relative to the share of population that may be considered low-income.

The middle income suburbs that are experiencing this income shift have historically had less experience with providing services for those living in poverty. **Figure 2.5** displays the historical poverty rates by county and **Figure 2.6** shows the poverty levels for seniors in 2015. **Thirty-six percent of seniors living in San Francisco are living in poverty**, far greater than any other county in the Bay Area.

8 Soursourian, M. (2012). Suburbanization of Poverty in the Bay Area. Federal Reserve Bank of San Francisco. Retrieved 11 July 2016, from http://www.frbsf.org/community-development/blog/suburbanization-of-poverty-in-the-bay-area/

9 The Suburbanization of Poverty in the San Francisco Bay Area « Building Resilient Regions. (2012). Brr.berkeley.edu. Retrieved 11 July 2016, from http://brr.berkeley.edu/2012/03/the-suburbanization-of-poverty-in-the-san-francisco-bay-area/

Figure 2.5 Percent of Population Living in Poverty (2000-2015)

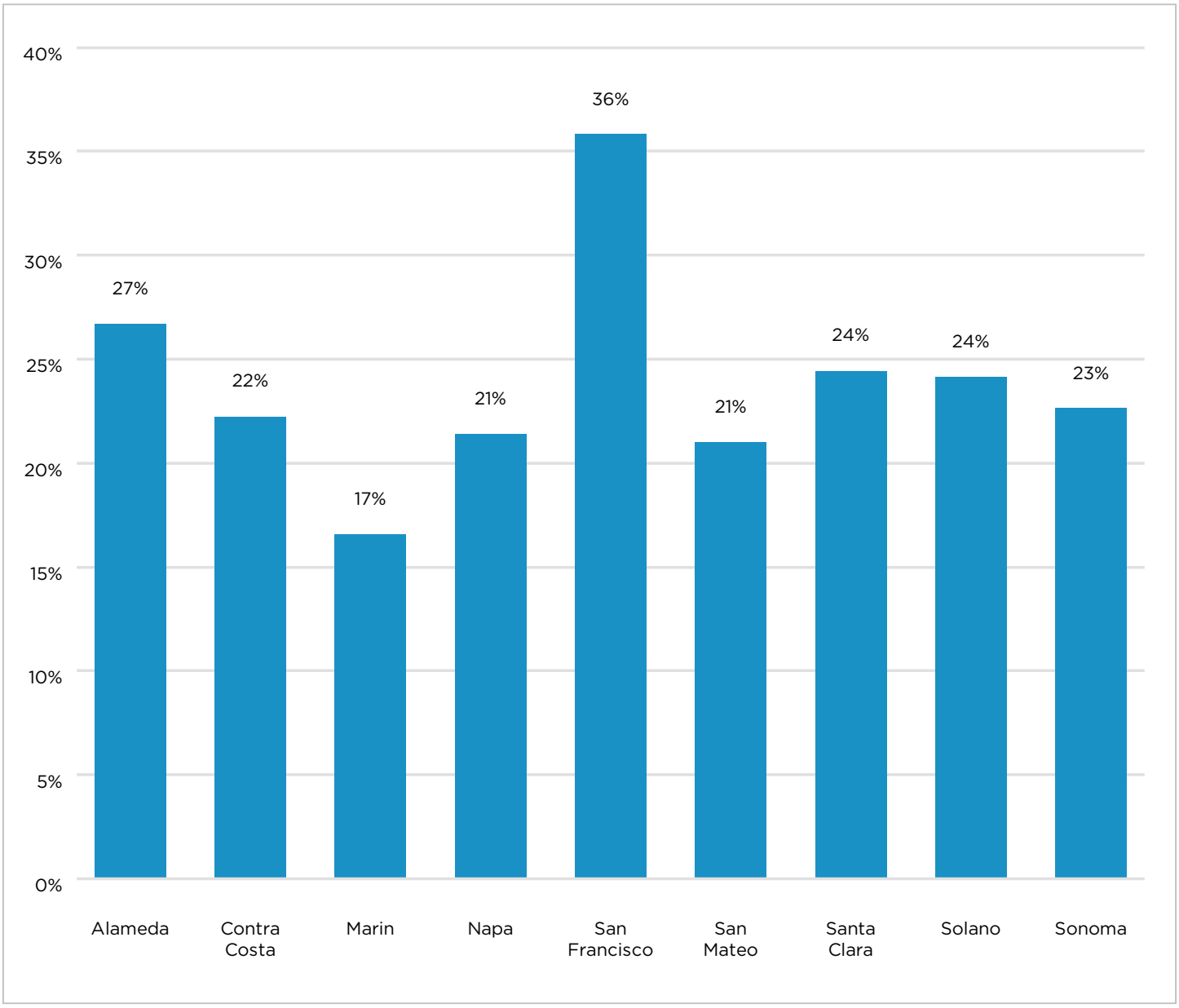


	2000	2010	2015
Alameda	24%	29%	25%
Contra Costa	19%	23%	24%
Marin	16%	19%	19%
Napa	23%	30%	28%
San Francisco	26%	30%	25%
San Mateo	16%	19%	21%
Santa Clara	18%	24%	21%
Solano	23%	26%	30%
Sonoma	22%	30%	28%
Region	21%	26%	24%

SOURCE: 2000 Census Summary File 3 P088; DP-1; 2010 American Community Survey 1-year estimate B17002; 2015 American Community Survey 1-year estimate B17002

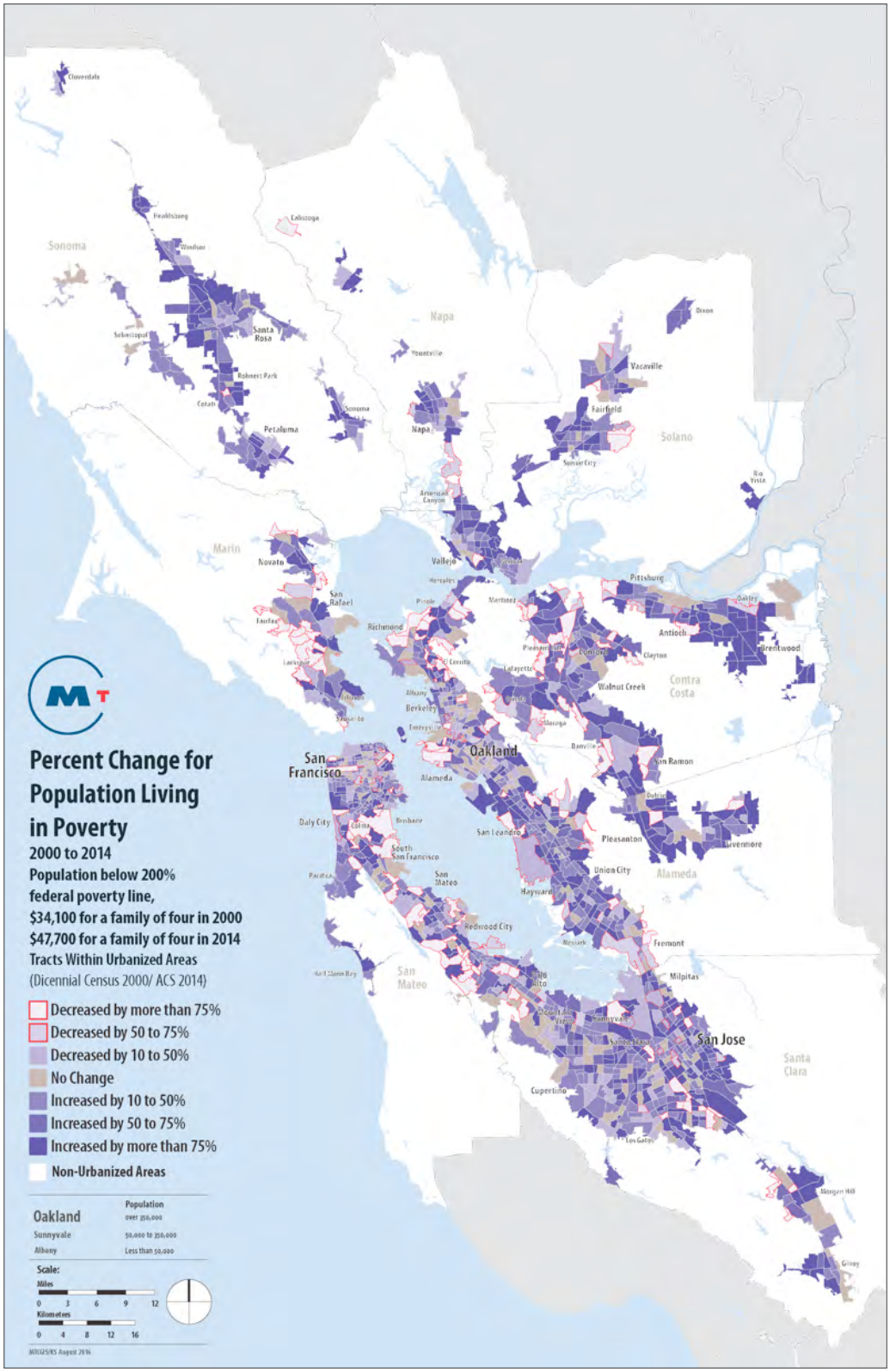
The percent of seniors living in poverty in 2015 for each county and the region can be seen in **Figure 2.6**.

Figure 2.6 Percent of Seniors Living in Poverty (2015)



SOURCE: 2015 American Community Survey 5-year Estimate B17024

Figure 2.7 Percent Change for Population Living in Poverty (local geography)



SOURCE: 2000 Census Summary File 3 P088001; 2014 American Community Survey C17002

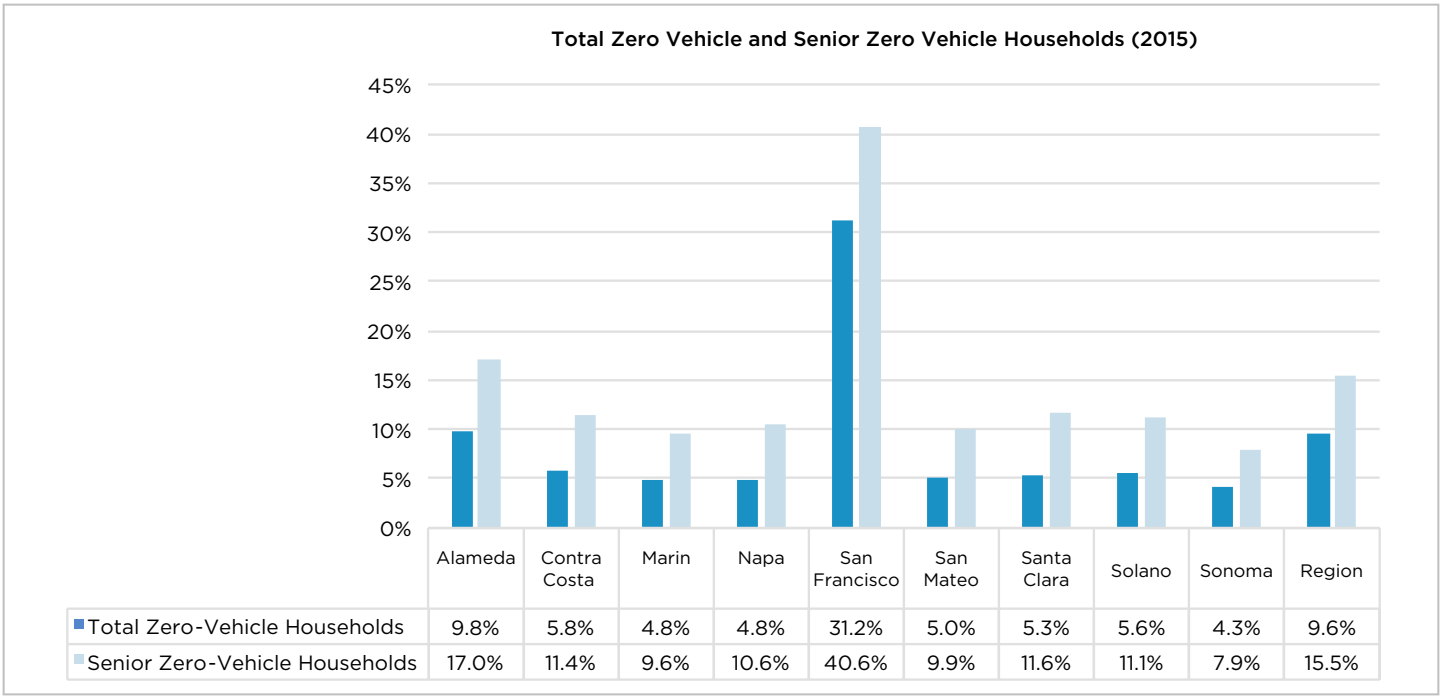
In **Figure 2.7**, the percent change in the population living in poverty can be seen at a local level for the 2000 to 2014 period. This data is from the same source as the previously reported data, but it is summarized at local geographic levels instead of at the county geographic level. This map can aid county officials in targeting investments locally.

ACCESS TO VEHICLES

Current Conditions

Almost 10 percent of Bay Area households do not have access to a vehicle. For senior households, it is 15 percent. San Francisco is the major outlier in the region. Thirty one percent of all resident households and fourty percent of household with a senior as the head of the home do not have access to a vehicle. Both these proportions far surpass the proportions of all other counties in the region. As this is the most urban county in the Bay Area with the greatest transit density, residents have less need to own a vehicle. However, the hilly terrain can be particularly challenging for seniors and those with disabilities. The county with the second highest percentage of households without access to a vehicle is Alameda County with approximately 10 percent of households in this category. The percent of the total and senior populations without access to a vehicle can be seen in **Figure 2.8**.

Figure 2.8 Comparison of General Public to Seniors without Access to a Vehicle (2015)



	Alameda	Contra Costa	Marin	Napa	San Francisco	San Mateo	Santa Clara	Solano	Sonoma	Region
Total Zero-Vehicle Households	9.8%	5.8%	4.8%	4.8%	31.2%	5.0%	5.3%	5.6%	4.3%	9.6%
Senior Zero-Vehicle Households	17.0%	11.4%	9.6%	10.6%	40.6%	9.9%	11.6%	11.1%	7.9%	15.5%

SOURCE: 2015 American Community Survey 3-year Estimate B25045

Trends

The number of people in the U.S. living in households without access to a vehicle has been on the rise since 2007.[10] This trend is even more apparent in the Bay Area. The number of Bay Area households without access to a vehicle has increased from 232 thousand households in 2007 to 261 thousand households in 2015, a 12 percent increase.[11] This is likely to increase at an even more rapid rate due to new technologies that makes living without a vehicle more convenient. In the United States, private-car ownership and issuance of driver's licenses to younger people are declining.

For instance, the share of people 16 to 24 with a "driver's license dropped from 76 percent in 2000 to 71 percent in 2013, while there has been over 30 percent annual growth in car-sharing members in North America ... over the last five years." By 2030, shared mobility services are projected to account for one in ten cars sold; by 2050, one in three cars sold may be used for shared mobility.[12]

10 Hitchin' a ride: Fewer Americans have their own vehicle | University of Michigan News. (2014). Ns.umich.edu. Retrieved 12 July 2016, from http://ns.umich.edu/new/releases/21923-hitchin-a-ride-fewer-americans-have-their-own-vehicle

11 America Community Survey 2007 and 2015 B25045

12 Automotive revolution – perspective towards 2030. (2016). McKinsey & Company. Retrieved 24 May 2017, from https://www.mckinsey.de/files/automotive_revolution_perspective_towards_2030.pdf

VETERANS

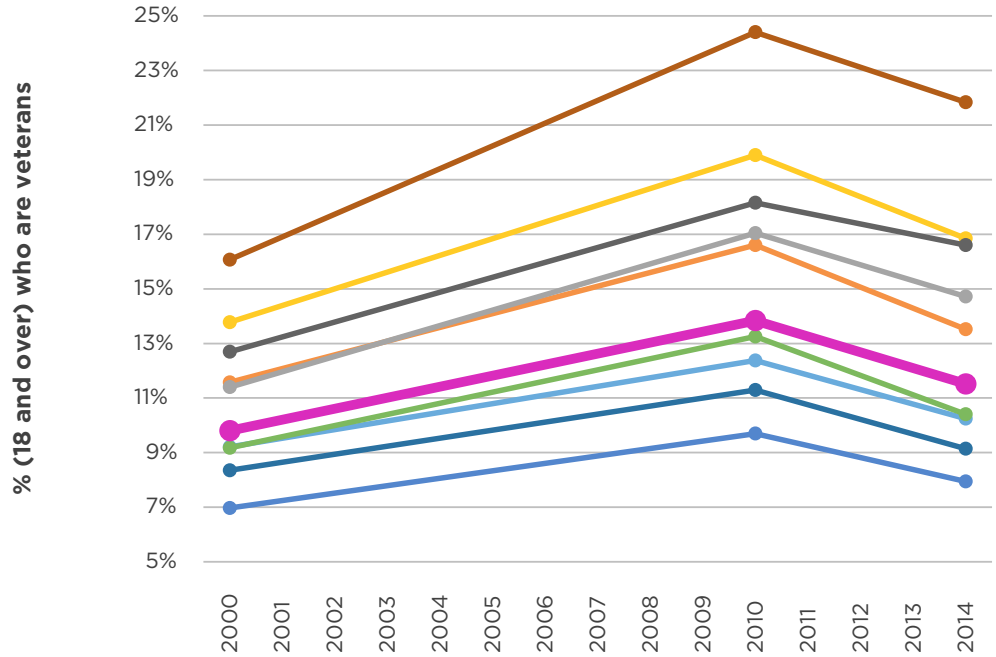
Current Conditions

In 2014, there were about 86,000 veterans in the nine county Bay Area region.[13] The veteran population in the same year was made up mostly of seniors (56 percent of veterans are 65 or older).

More than half of the region's veterans can be found in Santa Clara, Alameda, and Contra Costa Counties combined. There is an overlap between the populations of those with a disability, those with veteran status, and those who are seniors.

As a result, veterans face similar mobility access issues as other transportation disadvantaged populations.

Figure 2.9 Percent of Population (18 and over) who are Veterans (2000-2014)



	2000	2010	2014
Alameda	9%	12%	10%
Contra Costa	12%	17%	14%
Marin	11%	17%	15%
Napa	14%	20%	17%
San Francisco	7%	10%	8%
San Mateo	9%	13%	10%
Santa Clara	8%	11%	9%
Solano	16%	24%	22%
Sonoma	13%	18%	17%
Region	10%	14%	12%

SOURCE: 2000 Census Summary File DP-1; 2010 American Community Survey 1-Year Estimate S0103; 2014 American Community Survey 1-Year Estimate S0103

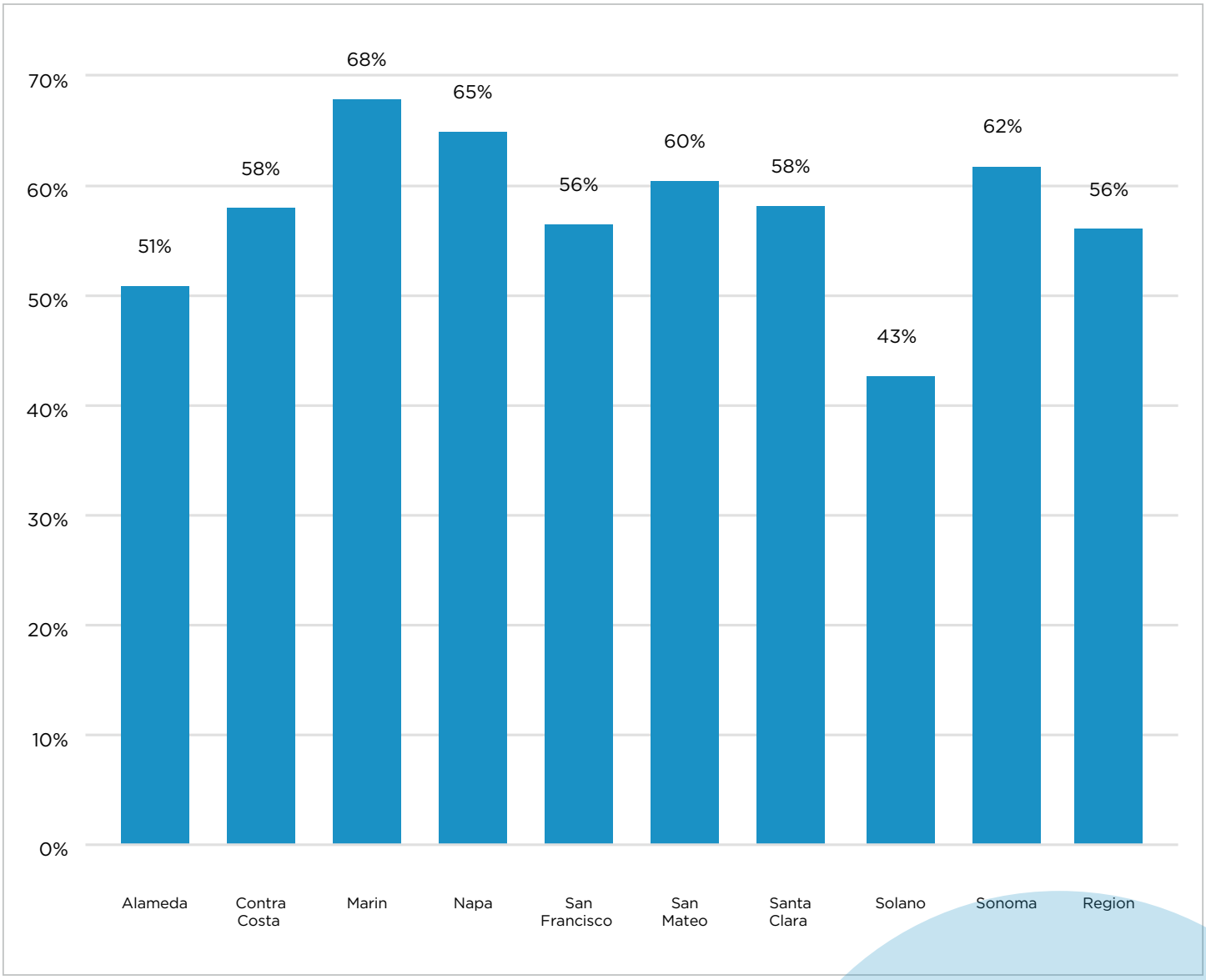
13 American Community Survey 2000 – 2014, 1 year estimates

Trends

The percentage of adult veterans increased between 2000 and 2010, but decreased between 2010 and 2014. This is illustrated in **Figure 2.9**. If this trend continues, the population of veterans is on track to return to 2000 levels by 2020. Veteran populations with mobility needs tend to fluctuate with military activity abroad, however, so this is a particularly difficult trend to predict.

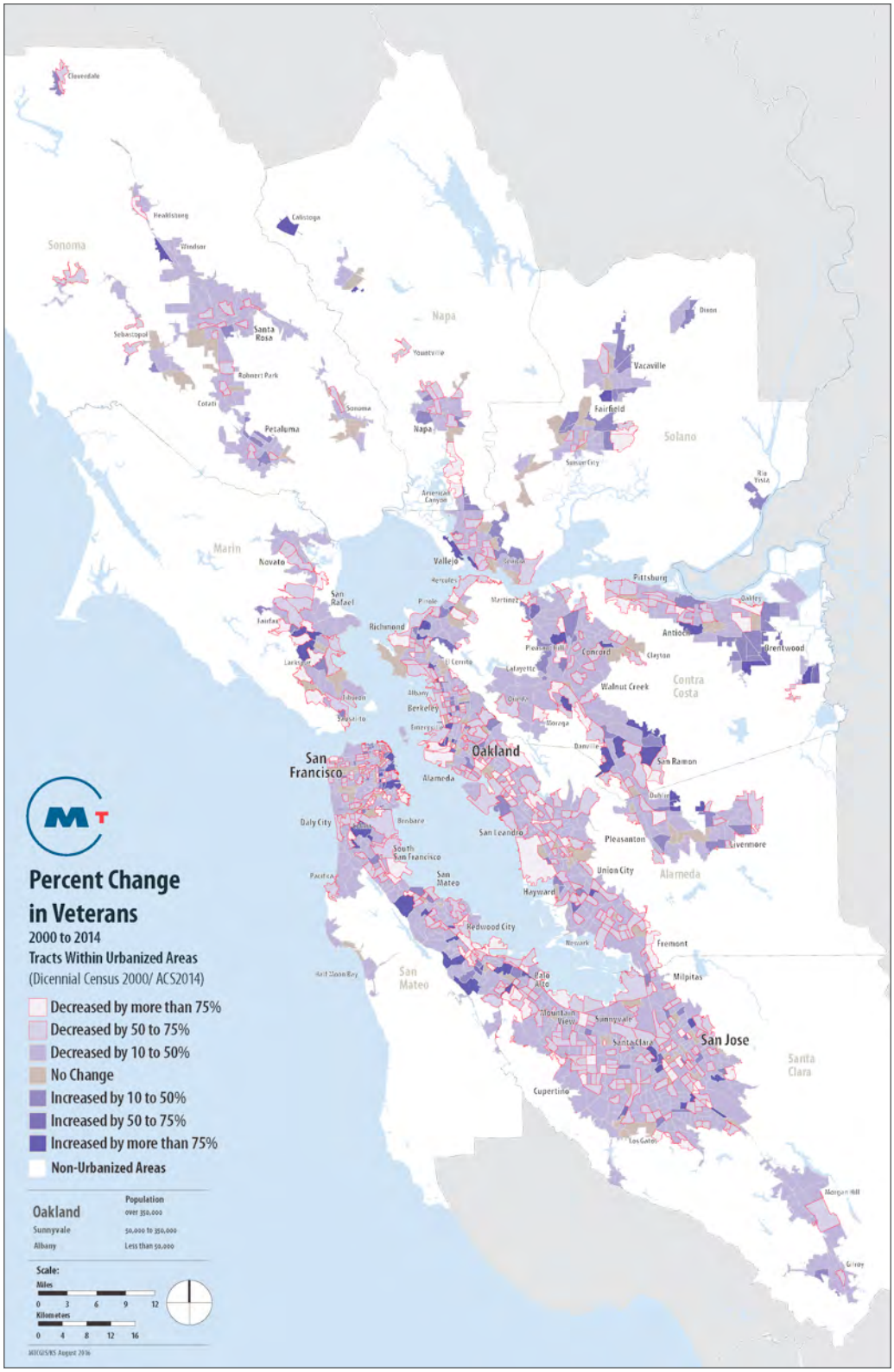
The percent of veterans who were seniors in 2014 for each county and the region is presented in **Figure 2.10**. Counties with substantial populations of retirees have significant percentages of veterans among their senior populations. The veteran population in Solano County, which has a large military base (Travis Air Force Base), is younger than in other counties. The county also has a low percentage of seniors.

Figure 2.10 Percent of Veterans who are Seniors (2014)



SOURCE: 2014 American Community Survey 1-year Estimate S0103

Figure 2.11 Percent Change in Veterans (local geography)



SOURCE: 2000 Census Summary File 3 P040001; 2014 American Community Survey B21001

In **Figure 2.11**, the percent change in the veteran population can be seen at a local level over the 2000 to 2014 period. This data is from the same source as the previously reported data, but it is summarized at local geographic levels instead of at the county geographic level.

3. TRANSPORTATION RESOURCES

This chapter documents existing transportation resources in the Bay Area that target low-income populations, seniors, people with disabilities, and veterans, including transportation services provided by public, private, and non-profit agencies. It also provides a summary of projects and services funded under the FTA programs subject to coordination requirements since the 2013 Coordinated Plan update.

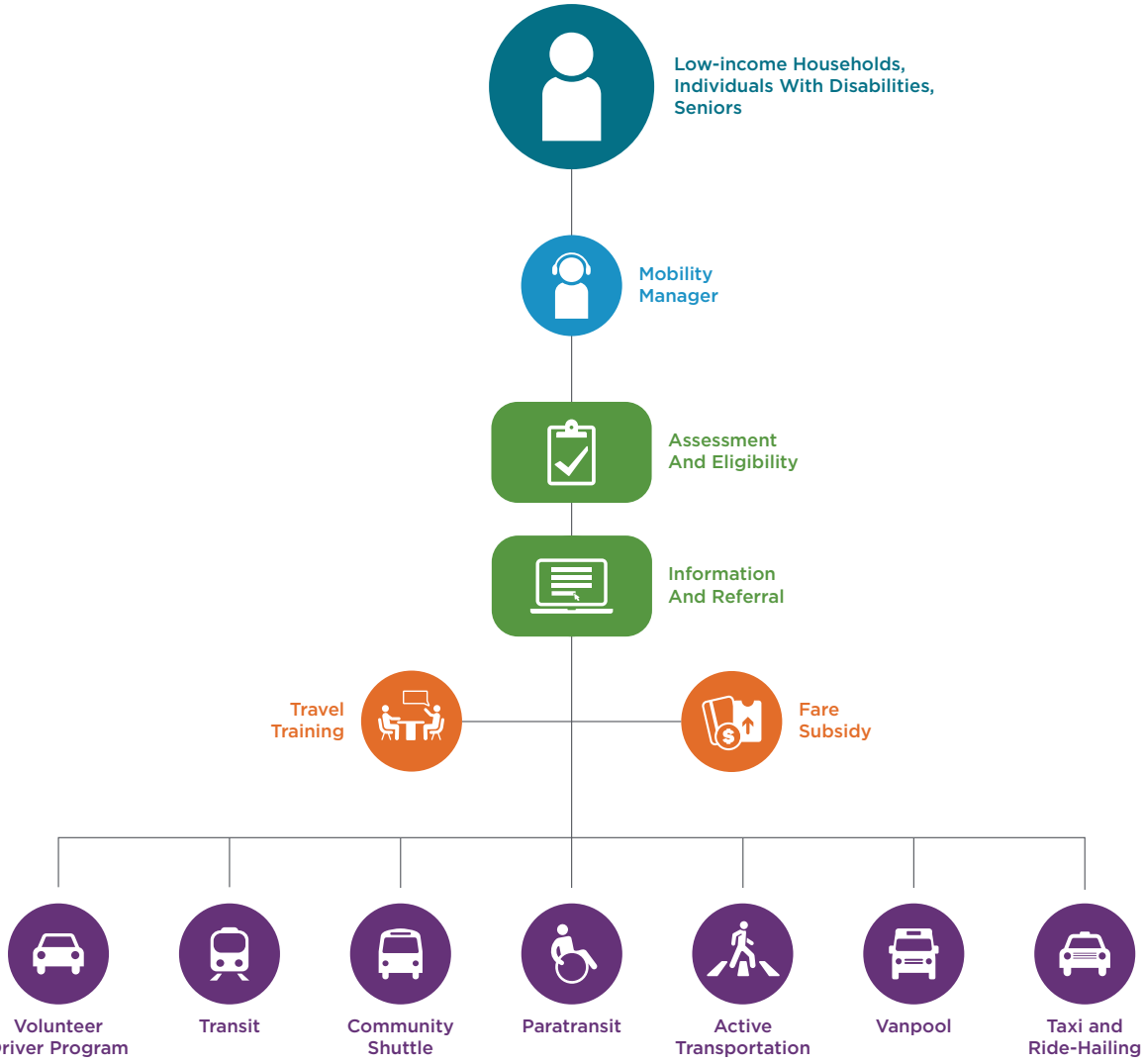
REGIONAL TRANSPORTATION RESOURCES

The San Francisco Bay Area offers a wide range of transportation options for low-income populations, seniors, people with disabilities, and veterans. These populations are often less likely to have access to an automobile and need to rely on transit and other modes of transportation. In addition to fixed-route transit, riders might use Americans with Disabilities Act-mandated paratransit, city-provided paratransit, non-profit transportation services, private providers like taxis and Transportation Network Companies (TNCs), or other options.

Riders are often unaware of the different transportation options available to them or unsure which to use for a particular trip. Mobility management strategies can assist riders in accessing an array of transportation options, and can assist providers in coordinating their services. For more information on Mobility Management – including common definitions and process – see Appendix G, "What is Mobility Management?" The Bay Area's population is aging. Specifically, the North Bay counties of Marin, Sonoma, and Napa – which makes up three of the region's four least populated counties – have the highest proportion of individuals who are age 65 and over.

How do Individuals Access and Flow through the Mobility Management Process?

Figure 3.1 Mobility Management Process



Transportation disadvantaged populations should be able to access mobility management services through a number of different "entry points." In addition to contacting a mobility manager directly, individuals might begin with an information and referral provider (e.g. a County 211 service), a non-profit organization (e.g. an Independent Living Program), a social service provider (e.g. a County Human Services department), a community service (e.g. a senior center), or a transportation provider (e.g. an ADA-mandated paratransit provider).

Coordination between service providers is essential because all of these providers should be able to refer an individual to mobility management assistance if needed.

Types of Transportation Resources in the Bay Area

There are a number of different transportation resources that low-income populations, seniors, people with disabilities, and veterans can access in the Bay Area.

These include different types of transportation services and a range of mobility management related resources, described in detail in **Figure 3.2**. Transportation options that are also available to these groups as well as the public, but are not described in detail below, include walking, biking, and driving.

Figure 3.2 Types of Transportation Resources in the Bay Area

Support Services	Short Definition[15]
Fixed-Route Transit / ADA-mandated paratransit	Buses, trains, ferries etc. operated by transit agencies that run on regular, pre-determined, pre-scheduled routes, usually with no variation. ADA-mandated paratransit is required as part of the American with Disabilities Act (ADA) to complement, or serve in addition to, already available fixed-route transit service.
Community-Based Shuttles	Transportation services offered outside of the transit agencies (often by cities, public-sector agencies, or non-profit organizations) that address the transit needs of the community, including the general public and special populations.
Private Transportation	Transportation provided by a private for-profit entity in the business of transporting people. These services are often demand-responsive and initiated and paid for by the rider. Examples are taxis, motor coach services, TNCs (Uber, Lyft, etc.), microtransit, and vanpools.[16]
Subsidized Fare Programs/ Voucher Programs	Programs typically administered through a social service agency, that enable qualified people to purchase fares/vouchers for transportation services at a reduced rate from providers such as taxis, public transit, or volunteer driver programs. Recipients are often low-income.
Volunteer Driver Programs	Programs that provide one-way, round-trip, and multi-stop rides. Trips are often door-through-door, in contrast to other transportation options. These programs are provided free of charge, on a donation basis, through membership dues, or at a minimal cost, and typically have an eligibility process and advance reservation requirements.
Information & Referral	Programs that provide community information and referral, and connect people with resources that can help them. Agencies may be independent non-profit organizations, libraries, faith-based organizations, or government agencies at every level.[17]
Travel Training	Programs designed to teach people with disabilities, seniors, youth, veterans, and/ or low-income populations to travel safely and independently on fixed-route public transportation in their community.
Mobility Management Services	Mobility management services cover a wide range of activities, such as travel training, coordinated services, trip planning, brokerage, and information and referral. For the purposes of this resource list, mobility management services refer to the provision of individual transportation information and assistance, and service linkage. Related to information and referral. For more information, see Appendix G.

15 http://www.projectaction.com/glossary-of-disability-and-transit-terms/

16 ESPA Webinar on Private Transportation and the ADA

17 http://www.airs.org/i4a/pages/index.cfm?pageid=3500

Fixed-Route Transit/ADA-Mandated Paratransit

Fixed-route transit is operated by transit agencies and offers services that run on regular, pre-determined, pre-scheduled routes, usually with no variation. All fixed-route transit providers are legally required as part of the ADA to provide paratransit to complement, or serve in addition to, already available fixed-route transit service.

Aside from driving and walking, fixed-route transit is the most widely available transportation option available in the Bay Area. From a mobility management perspective, it should provide a base level of affordable service to access major destinations like school, work, medical appointments, shopping, etc.

ADA-mandated paratransit is best utilized as a replacement for fixed-route transit only when it is impossible for an individual with a disability to use transit for a trip. Fixed-route transit has significantly more affordable fares and greater flexibility than ADA-mandated paratransit. The other transportation resources listed are best utilized to supplement or assist individuals in using fixed-route transit. Other transportation resources will often not have the same capacity as fixed-route transit and offer limited rides.

There are 29 public transit providers in the Bay Area. All are required to provide accessible service on their fixed-route vehicles, and many are required to provide complementary ADA-mandated paratransit service. Accessibility features on fixed-route transit include:

- Buses and trains equipped with wheelchair lifts or low floor ramps to allow easy access for people with disabilities.
- Priority seating for those who need it.
- Bus drivers trained to provide assistance in securing wheelchairs in designated spaces.
- Drivers trained to allow passengers time to be seated, and to get on and off the vehicle.
- Announcement of stops at major intersections, transfer points and, at the request of passengers, specific destinations.
- Stations with elevators to boarding platforms, for ease of boarding.
- Route and schedule information provided by transit agencies, including the best way to reach a desired destination. This information is available in accessible formats, if needed.[18]

For people who, due to their disability, are unable to ride regular buses and trains, some or all of the time, ADA-mandated paratransit is offered. ADA-mandated paratransit is meant to replicate fixed-route transit. This means paratransit services operate in the same area, on the same days and during the same hours as the public transit operates. Paratransit service may be provided on small buses, vans, taxis, or in sedans. It is generally a shared ride, door-to-door, or curb-to-curb service that must be reserved at least one day in advance.

18 https://511.org/transit/accessibility/overview

Figure 3.3 Providers of Fixed-Route and ADA-Mandated Paratransit in the San Francisco Bay Area[19]

Fixed-Route Transit Agency	Service Area	ADA-Mandated Paratransit Provider
AC Transit	Alameda County (Fremont to Albany) and Western Contra Costa County	East Bay Paratransit (in coordination with BART)
ACE Altamont Corridor Express	Rail service between Stockton and San Jose	The ADA does not require that commuter rail and commuter bus services provide complementary paratransit service
American Canyon Transit	City of American Canyon in Napa County	Shuttles provide door-to-door service in addition to fixed-route; VINE GO Paratransit
BART	Rapid rail transit in Alameda, Contra Costa and San Francisco counties	East Bay Paratransit (in coordination with AC Transit); other applicable paratransit providers within 3/4 mile of stations
Caltrain	Rail service between San Francisco and Gilroy	The ADA does not require that commuter rail and commuter bus services provide complementary paratransit service
Capitol Corridor	Rail service between Sacramento and San Jose	The ADA does not require that commuter rail and commuter bus services provide complementary paratransit service
County Connection	Central Contra Costa County	LINK Paratransit
Dumbarton Express (AC Transit)	Dumbarton Bridge, Union City, Palo Alto	The ADA does not require that commuter rail and commuter bus services provide complementary paratransit service
Fairfield and Suisun Transit (FAST)	Solano County cities of Fairfield and Suisun	DART Paratransit
Golden Gate Transit	Bus service in Marin, Sonoma, San Francisco, and Contra Costa counties	Marin Access Paratransit (in coordination with Marin Transit)
Golden Gate Ferry	Ferry service between Larkspur or Sausalito (Marin County) and San Francisco	Complementary paratransit requirement not defined for ferries
Marin Transit	Marin County	Marin Access Paratransit (in coordination with Golden Gate Transit)
Petaluma Transit	City of Petaluma in Sonoma County	Petaluma Paratransit
Rio Vista Delta Breeze	City of Rio Vista in Solano County	Not required
SamTrans	San Mateo County	Redi-Wheels and Redi-Coast Paratransit
San Francisco Bay Area Water Emergency Transportation Authority (WETA)	Ferry service between: Alameda/Oakland and San Francisco; Alameda/Oakland and South San Francisco; Harbor Bay and San Francisco; and Vallejo and San Francisco	Complementary paratransit requirement not defined for ferries
Santa Rosa CityBus	City of Santa Rosa in Sonoma County	Santa Rosa Paratransit

19 https://511.org/transit/accessibility/paratransit

Figure 3.3 Providers of Fixed-Route and ADA-Mandated Paratransit in the San Francisco Bay Area

Fixed-Route Transit Agency	Service Area	ADA-Mandated Paratransit Provider
SFMTA	San Francisco City and County	San Francisco Paratransit
Soltrans	Cities of Vallejo, Benicia and Fairfield in Solano County	SolTrans Paratransit
Sonoma County Transit	Intercity service in Sonoma County and local service in Rohnert Park, Cotati, Guerneville, Sebastopol, Sonoma, and Windsor.	Sonoma County Paratransit
Sonoma-Marin Area Rail Transit (SMART)	Rail service in Sonoma and Marin counties from the Sonoma County Airport to Downtown San Rafael	The ADA does not require that commuter rail and commuter bus services provide complementary paratransit service
TriDelta Transit	Eastern Contra Costa County	Tri Delta Transit Paratransit
Union City Transit	City of Union City in Alameda County	Union City Paratransit
Vacaville City Coach	City of Vacaville in Solano County	Vacaville Special Services
Vine	Napa County	VINE GO Paratransit
VTA	Santa Clara County	VTA
WestCAT	Cities of Pinole and Hercules in Contra Costa County	WestCAT Dial-a-Ride Paratransit
Wheels	Cities of Dublin, Pleasanton and Livermore in Alameda County	Wheels Dial-a-Ride Paratransit and Pleasanton Paratransit

Most fixed-route transit agencies contract with private transportation providers to provide ADA-mandated paratransit. These contractors often offer other transportation services including taxis, community shuttles, and charter services.

In addition to ADA-mandated paratransit services, substantial numbers of people with cognitive disabilities receive paratransit service provided by Regional Centers. Some centers rely exclusively on ADA paratransit to provide service to their clients, but many use a mix of ADA paratransit and door-to-door service provide by private providers under contract to the Regional Centers.

Community-Based Shuttles

A range of shuttle services are offered in addition to transit agencies' own fixed-route services. The 2016 Bay Area Shuttle Census showed that the 35 participating shuttle sponsors and operators carried over 9.6 million passengers in 2014 alone, more than all but six of the region's public transit agencies.[20]

Many of the shuttles in the Census were employment based – but for low-income populations, seniors, people with disabilities, and veterans – community-based shuttles can be an important resource. These shuttles are often sponsored by cities, public-sector agencies, or non-profit organizations, and address unmet transit needs of the community. These shuttles can be fixed-route or offer door-to-door or curb-to-curb service.

Funding provided for these transportation services is usually dedicated for a specific clientele (i.e. veterans, Medicaid eligible persons, seniors attending meal programs, etc.) and cannot easily be co-mingled with other funding sources. For the most part, social service agencies who are providing the service are not primarily in the transportation business; rather, transportation is an auxiliary rather than core service. Riders are often referred to these programs by an agency they are receiving services from, such as a senior center, County Human Service agency, or regional center.

20 http://mtc.ca.gov/sites/default/files/2016%20Bay%20Area%20Shuttle%20Census.pdf

For mobility management purposes, any one of the different transportation providers in a geographic area can be an "entry point" to services and should be able to refer riders to different options.

Mobility managers and information and referral services can be invaluable here. Examples of community-based shuttle services are listed below.

Services Provided by Jurisdictions

Some cities or communities offer free shuttles that are designed to assist people with commuting or shopping. In addition to being free, these shuttles generally offer the same accessibility options, such as lifts/ramps, as fixed-route transit. Examples of shuttles include the Palo Alto Shuttle, the Monument Shuttle in Concord, the Lamorinda (Lafayette, Moraga, and Orinda) Spirit Van, and the Emeryville Emery Go-Round.

Palo Alto offers three shuttle routes – the East Palo Alto/Caltrain Shuttle, the Embarcadero Shuttle, and the Crosstown Shuttle.[21] The Monument Shuttle in Concord has two routes and is designed to help seniors, people with disabilities, low-income workers, and residents who do not own vehicles get to medical appointments, BART and social service agencies.[22] The Lamorinda Spirit Van Program provides rides to older Lamorinda residents to get to errands, shopping, medical and personal appointments and to the Walnut Creek Senior Center. The drivers are primarily volunteers.[23] The Emery Go-Round offers four routes that connect Emeryville's employers and shopping centers with the MacArthur BART station.

Some cities or communities offer transportation for seniors and people with disabilities that supplements fixed-route transit or ADA-mandated service. Contra Costa County offers several examples including El Cerrito's Easy Ride Paratransit Service and Rossmoor's Dial-a-Bus and Paratransit. Both services offer accessible door-to-door service during the day on weekdays.[24] [25]

Services Provided in Relation to Healthcare/Social Services

There are a number of shuttles and transportation services offered by healthcare and social service providers. Unfortunately, many of these are not well-known to other transportation providers. A number of hospitals provide shuttles to nearby transit hubs. Examples in Alameda County include Kaiser Shuttles in Oakland and San Leandro, and Alta Bates/Summit Shuttles in Berkeley and Oakland. The San Francisco VA Medical Center offers several transportation options for eligible veterans and employees. These include the VAMC Transport System, Bauer's/TransMETRO Transportation, and the VA Shuttle to UCSF.[26]

Services Provided by Non-Profit Organizations

Non-profit organizations in the Bay Area also offer shuttle programs to fill unmet transportation needs. Solano County Faith in Action has a Ride with Pride shared-ride program that takes seniors to medical or social service appointments, particularly in cities with little or no ADA-mandated paratransit.[27]

In Berkeley, Easy Does It Emergency Services provides assistance to seniors and people with disabilities living independently and offers both accessible Emergency Transportation and On Demand Transportation.[28]

Private Transportation

Private transportation providers have always been an integral partner in the provision of transportation resources for low-income populations, seniors, people with disabilities, and veterans. Private transportation providers are for-profit entities in the business of transporting people. As noted earlier, most fixed-route transit agencies contract with private transportation providers to provide ADA-mandated paratransit. This is also true of many of the Community-Based Shuttles described earlier. In these instances, riders do not request or access the transportation directly from the private company, but through the agency sponsoring the service.

Other options are more likely to be requested directly by the rider. Taxis have filled gaps in service for transportation-disadvantaged populations for decades. Recently Transportation Network Companies (TNCs), like Uber and Lyft, have begun to fill some of the same gaps.

However, smart-phone software-driven transportation options are difficult to track due to the volatility of this market, with services rapidly going into and falling out of business.

21 http://www.cityofpaloalto.org/news/displaynews.asp?NewsID=212&TargetID=107

22 http://www.eastbaytimes.com/2016/08/16/concord-free-monument-neighborhood-shuttle-up-and-running/

23 http://www.lovelafayette.org/residents/transportation/lamorinda-spirit-van

24 http://www.el-cerrito.org/index.aspx?NID=285

25 rossmoor.com/resident-information/transportation/

26 http://www.sanfrancisco.va.gov/patients/transportation.asp

27 http://faithinactionsolano.org/Ride_with_Pride.html

28 http://www.easydoesitservices.org/services/

Other examples of private transportation are motor coach services, shuttles, vanpools, and limousine and sedan services, and microtransit like Chariot.

From a mobility management perspective, private transportation providers can be helpful in making first and last mile connections. However, riders can face barriers when trying to use private providers directly. Two barriers are affordability and accessibility for mobility devices.

Although private transportation providers are covered by the ADA in terms of access, service, fares and training, they are not required to use accessible vehicles. A number of Bay Area cities and counties including Alameda County, Marin County, San Francisco and Santa Clara County have attempted to increase accessible taxi options with limited success. While TNCs have not sought to add accessible vehicles to their fleet, they have attempted to increase accessible services with limited success in different locations around the U.S. through options such as uberACCESS, uberWAV, and Lyft Accessible Vehicle Dispatch.

As noted earlier some private transportation providers are deeply integrated into transportation services for low-income populations, seniors, people with disabilities, and veterans in the Bay Area. One such provider is MV Transportation. MV is a national company with corporate headquarters based in Dallas, Texas and satellite support centers located in Vacaville, California and Elk Horn, Iowa. MV is or has been an ADA-mandated paratransit provider in almost all nine Bay Area counties. They also provide a number of the community-based shuttles described earlier including the Palo Alto Shuttle, the Emeryville Emery Go-Round, Kaiser shuttles, and Alta Bates/Summit shuttles.[29]

Another example of a private transportation provider filling multiple needs is the A-Para Transit Corporation in Alameda County. The same over-arching company provides ADA-mandated paratransit services to East Bay Paratransit, accessible charter service through Bell Transit Corporation, and regular and subsidized taxi services through Yellow Cab, Veterans Cab, and St Mini Cab Corporation.

An example of a transit provider partnership with a small private transportation provider is the Marin Transit Catch-A-Ride program, which allows seniors and people with disabilities to take taxi rides at a discounted rate. Marin Transit originally contracted with On The Move (the parent company of Radio Cab, Bel Air Taxi and Yellow Cab in Marin) and North Bay Taxi Cooperative to provide the service.

When On the Move abruptly closed in 2015, the agency was left with only one provider. North Bay Taxi initially had difficulty taking on the additional rides once provided by On The Move but has since increased capacity. This demonstrates how partnerships with private transportation providers are often subject to market variability.

Subsidized Fare Programs / Voucher Programs

Subsidized fare or voucher programs are typically administered through a social service agency, and enable qualified individuals to purchase fares/vouchers for transportation services at a reduced rate from providers such as public transit, volunteer programs, or taxis. Recipients are often low-income.

As noted earlier, cost can be a barrier to accessing transportation for low-income populations, seniors, people with disabilities, and veterans. Fixed-route transit offers reduced fares to seniors 65 and above and people with disabilities. For example, in Solano County transit agencies in Fairfield and Vacaville offer free fares to riders aged 80 years or over. Some agencies, offer subsidies for particular groups independent of income, like students and veterans. Marin Transit, SFMTA, SolTrans, Sonoma County Transit, VTA, and WestCAT currently have means-based programs for some people with low income.

Many transit agencies sell fare products at bulk discounts to social service agencies that serve low-income populations. These organizations determine eligibility and issue the fare products to their clients at their own discretion, free of charge or at significant discounts. These programs are designed primarily to address immediate needs and depend on the discounts offered by transit agencies and available funds to purchase fare products.[30]

29 http://www.mvtransit.com/paratransit

30 https://s3.amazonaws.com/media.legistar.com/mtc/meeting_packet_documents/agenda_2423/03b_Means_Based_TAC_Presentation_5-28-15.pdf

Taxi subsidy programs allow eligible participants to use taxis at a reduced fare by reimbursing a percentage of the fare, or by providing a low-cost fare medium, e.g. scrip or vouchers, which can be used to cover a portion of the fare. Most Bay Area counties offer subsidized taxis for seniors and people with disabilities through transit agencies, cities, or counties.

Jurisdictions and non-profit organizations may offer paratransit subsidies dependent on available funding. However, these programs are not always widely publicized. Several cities in Alameda County are considering offering fare assistance with newly available transportation sales tax funding.

Volunteer Driver Programs

Volunteer driver programs involve a network of volunteers that provide one-way, round-trip, and multi-stop rides. Participation in these programs can be provided free of charge, on a donation basis, through membership dues, or at a minimal cost, and typically have an eligibility process and advance reservation requirements.

Programs are sponsored by non-profit organizations, transit agencies, or cities and counties. Some volunteer driver programs may also have an escort component where volunteers accompany riders with mobility devices on paratransit services, when they are unable to travel in a private vehicle.

Some programs may use staff to provide initial rides or to fill gaps when volunteers are unavailable. From a mobility management perspective, volunteer driver programs are generally designed for seniors and can fill key needs that are not met by other transportation services like ADA-mandated paratransit. This is because these programs usually offer door-through-door service. These services are therefore ideal for more frail individuals who cannot wait outside, may need a stabilizing arm, help with a jacket or carrying groceries, etc.

These programs are also well suited to certain medical trips, for example, when someone needs to stop and pick up a new prescription before going home, or go to a facility in another county for specialized treatment.

Volunteer driver programs are not usually available for low-income individuals or veterans who are not also seniors or disabled. Volunteer driver programs usually have to closely monitor their capacity and face ongoing funding challenges and finding quality volunteers.

VITAL (Volunteers in Transportation Advocacy Link) is a group made up of volunteer driver programs in the Bay Area whose mission is to meet on a regular basis to network, exchange information, address issues of mutual concern, define and share best practices, serve as mentors and supporters for each other as well as those new to the field, and work together to provide for the transportation needs of the vulnerable populations they serve through mobility management.

Their membership includes a wide range of non-profits organizations, public sector agencies, transit agencies, cities and counties. Although not an exhaustive list of programs, their membership list does provide a broad overview of volunteer driver programs in the Bay Area.

An example of a well-established program offered by a non-profit organization is Senior Support Program of the Tri-Valley's (SSPTV) Senior Transportation Program, based in Pleasanton. SSPTV staff provides the first ride, which aids in completing the intake process. Staff will also provide rides to medical facilities outside of Alameda County, and fills gaps when volunteers are unavailable. An example of a public sector sponsored program is the City of Pleasant Hill's Senior Van Service, which is driven by volunteers.

Figure 3.4 Volunteer Driver Programs in the Bay Area

Program Name	Location
American Cancer Society	Bay Area
Ashby Village	Berkeley
Avenidas	Palo Alto
Caring Hands	Walnut Creek
Catholic Charities of the Diocese of Santa Rosa	Santa Rosa
City of Fremont	Fremont, Newark, Union City
City of Lafayette	Lafayette
City of Morgan Hill	Morgan Hill
City of Pleasant Hill	Pleasant Hill
City of Richmond	Richmond
City of San Pablo	San Pablo
City of San Ramon	San Ramon
Cloverdale Volunteer Driver Program	Cloverdale
Drivers for Survivors	Fremont, Newark, Union City, Hayward, San Leandro
El Camino Hospital	Mountain View, Los Gatos
Episcopal Senior Communities	Walnut Creek
Faith in Action	Fairfield
Jewish Family and Children's Services	San Francisco, Peninsula, Marin & Sonoma Counties
Life Eldercare	Fremont, Newark, Union City, Hayward, San Leandro
Love INC	Bay Area
Marin County	Marin County
Marin Transit	Marin County
Marin Village	San Rafael
Mobility Matters	Contra Costa County
Molly's Angels	Napa
Next Village SF	San Francisco
Orinda Association	Orinda
Peninsula Jewish Community Center	Foster City
Petaluma People Services Center	Petaluma
SF Village	San Francisco
Sausalito Village	Sausalito
Sebastopol Area Senior Center	Sebastopol
Senior Support Program of the Tri-Valley	Dublin, Pleasanton, Livermore
Seniors Around Town	Orinda
Services for Seniors	San Francisco
Vintage House Sonoma	Sonoma
West Marin Senior Services	Point Reyes Station and West Marin County
Whistlestop	Marin County

Figure 3.5 Information and Referral Services in the San Francisco Bay Area

County	Program Name	Phone	Website
Alameda	Eden I&R	2-1-1	edenir.org
	Access Alameda	510-208-7400	accessalameda.org
Contra Costa	Contra Costa Crisis Center	2-1-1	crisis-center.org/
	Way to Go Contra Costa	925-284-6109 1-855-234-RIDE (7433)	waytogocc.com
Marin	2-1-1 Bay Area	2-1-1	211bayarea.org/marin/
	Marin Access	415-454-0902	marinaccess.org
Napa	2-1-1 Bay Area	2-1-1	211bayarea.org/napa/
San Francisco	2-1-1 Bay Area	2-1-1	211bayarea.org/san-francisco/
San Mateo	2-1-1 Bay Area	2-1-1	211bayarea.org/san-mateo/
	Senior Mobility Guide	650-508-6283	peninsularides.com
Santa Clara	2-1-1 Santa Clara County	2-1-1	211scc.org
Solano	2-1-1 Bay Area	2-1-1	211bayarea.org/solano/
	Solano Mobility Call Center	800-535-6883	solanomobility.org
Sonoma	Sonoma Access	2-1-1	sonomaaccess.org

All Counties offer a 2-1-1 helpline but transportation is only highlighted in Alameda and Sonoma Counties. In Counties where additional I&R resources are offered, only Alameda County coordinates with the 2-1-1 service.

Information and Referral

Information and referral (I&R) programs provide community information and referral, and connect individuals with resources that can help them. There is a spectrum of I&R services, ranging from a simple website and database listing resources, to a fully customized trip planner and referral service. While most I&R systems function mainly as lists, there are several examples of more fully featured platforms. I&R agencies may be independent non-profit organizations, libraries, faith-based organizations, or government agencies at every level.

Historically 2-1-1 is the primary free, confidential referral and information helpline and website that connects individuals to health and human services, 24 hours a day, seven days a week.[31] Although all 2-1-1 helplines offer transportation information, in the Bay Area this is only highlighted in Alameda and Sonoma Counties.

Information and referral is the key "entry point" for individuals accessing transportation services. An information and referral database or list is only useful with a sufficiently large pool of resources.

Travel Training

Travel training programs generally fall under mobility management and are designed to teach people with disabilities, seniors, youth, veterans, and/or low-income populations to travel safely and independently on fixed-route public transportation in their community, but can include other modes and services. The Association of Travel Instruction identifies three different types of travel training.[32]

Transit Orientation

Group or individual activity conducted for the purpose of explaining the transportation systems; options and services available to address individual transportation needs; use of maps and schedules as resources for trip planning; fare system, use of mobility devices while boarding, riding, and exiting; vehicular features; and benefits available.

Familiarization

Individual or small group trip activity to facilitate use of transportation systems with a travel trainer accompanying experienced traveler(s) on a new mode of transportation or route to point out/explain features of access and usability.

31 http://www.airs.org/i4a/pages/index.cfm?pageid=3500

32 http://www.travelinstruction.org/20-travel-training

Travel Training

Travel training covers one-to-one short-term instruction provided to an individual who has previously traveled independently and needs additional training or support to use a different mode of travel, a different route, mode of transit, or travel to a new destination. It also covers one-to-one comprehensive instruction, specially designed instruction in the skills and behaviors necessary for independent travel on public transportation provided to an individual who does not have independent travel concepts or skills to go from point of origin of trip to destination and back.

As noted earlier, fixed-route transit is the most widely available transportation option available in the Bay Area aside from driving and walking. In many communities, it provides a base level of affordable service to access major destinations like school, work, medical appointments, shopping, etc. Travel training can help low-income populations, seniors, people with disabilities, and veterans access this transportation resource effectively.

Local Examples

Non-profits organizations, transit agencies, and cities or counties can sponsor travel training programs. Marin Transit is an example of a transit agency that offers travel training to seniors and people with disabilities. They offer "Navigating Transit," a free, one-hour presentation and discussion about alternatives to driving for older adults in Marin County, and Individualized Travel Training.

SamTrans sponsors a volunteer Mobility Ambassador program that helps older adults and people with disabilities with many transportation-related issues, including planning a trip using public transit, finding a driver safety class, and learning

Figure 3.6 Mobility Management Providers in the San Francisco Bay Area

County	Program and Contact Information	Summary of Service
Alameda	Access Alameda 510-208-7400 accessalameda.org	The Access Alameda website is provided to help individuals identify and connect with accessible transportation services in Alameda County, including public transit, Americans with Disabilities Act (ADA) paratransit, city-based paratransit programs, and organizations that provide volunteer drivers and/or training on how to travel by using these services in Alameda County.
	Tri City Mobility Management 510-574-2053	**Fremont, Newark, and Union City:** Mobility management provides information about transportation access to all callers. Assistance can be provided for a range of transportation needs, from needing wheelchair accessible transportation to assistance retesting for a driver's license.
Contra Costa	Mobility Matters 925-284-6109 1-855-234-RIDE (7433) mobilitymatterscc.com	Works collaboratively with all types of transportation providers. Matches riders (seniors, veterans, people with disabilities, and others seeking help) with providers that best meets their individual mobility needs through the Transportation Information & Referral Helpline, utilizing a case management model. Also publishes a hard copy and online transportation guide called "Way To Go Contra Costa." In addition, operates two free, door-through-door, one-on-one, volunteers driver programs called Rides for Seniors and Rides 4 Veterans.
Marin	Marin Access 415-454-0902 marinaccess.org	Marin Access was designed and is sponsored by Marin Transit to coordinate transportation resources for Marin's older adults, persons with disabilities and low-income residents, along with others who cannot or choose not to drive. Services include Marin Access Paratransit, Catch-A-Ride, Volunteer Driver, Travel Navigators, and Travel Training.
Napa	VINE Go 707-259-8327 vinego@nvta.ca.gov ridethevine.com/ada-accessibility-0	All vehicles used by the VINE family of local and regional transportation services are wheelchair accessible and conform to the standards set by the Americans with Disabilities Act (ADA). The Vine also provides a free service called Transit Ambassadors, which provides a travel buddy to teach individuals everything they need to know to ride the bus. In addition, a transit ambassador will actually ride around town on the bus with the new rider until they feel comfortable travelling alone. Participants receive one 30-day bus pass for free.

Figure 3.6 Mobility Management Providers in the San Francisco Bay Area

County	Program and Contact Information	Summary of Service
San Francisco	SF Paratransit 415-285-6945 sfparatransit.com/general-info.htm	San Francisco's Mobility Management Programs are designed to assist people with disabilities and seniors in navigating the city's transportation options by offering information and recommending solutions that aid the rider in making the most suitible transportation choices. Services offered include travel training for groups and individuals unfamiliar with the public transportation system. Other services include: **SF Access – ADA Paratransit –** SF Access is a pre-scheduled, shared-ride, ADA-compliant van service providing door-to-door transportation to certified riders. **Paratransit Taxi & Ramp Taxi –** Paratransit Taxi is a ride service that utilizes San Francisco taxis and ramp taxis available to the general public. This is not an ADA service, but many riders find that it better meets their transportation needs. Taxi service is available for certified riders. **Group Van –** Group Van is a pre-scheduled van service providing door-to-door transportation to groups of ADA eligible riders attending certain agency programs such as Adult Day Health Care, senior centers, or work sites. **Shop-a-Round –** Shop-a-Round is a convenient, low-cost shuttle that makes it easier to go grocery shopping. The service offers registered seniors and people with disabilities personalized assistance not available on Muni. A rider must register for this service, but does not have to be ADA-paratransit eligible to use this service. Grouped riders are transported to select supermarkets in San Francisco to shop. The driver will help carry groceries on and off the shuttle upon request. **Van Gogh –** Van Gogh is a low-cost, pre-scheduled van shuttle service to groups of seniors and/or people with disabilities to attend social and cultural events in San Francisco through a social service agency or program.
San Mateo	Mobility Ambassadors 650-508-6362 seniormobility.org	The San Mateo County Senior Mobility Initiative is a joint effort by a broad coalition of concerned entities in San Mateo County, with the leadership of the San Mateo County Transit District (SamTrans), to keep older people – including those with disabilities – safe and connected to their communities as problems related to aging make it harder for them to get around. Services include Mobility Ambassadors, Senior Mobility Guide, and the Information and Assistance Program.
Santa Clara		Until fall 2016, Outreach, a non-profit organization, provided a holistic approach to each caller/customer/client and provides an array of social services and coordinated transportation services to seniors; low-income persons, families and youth; persons ADA-certified with functional disabilities; CalWORKS recipients; veterans; homeless; limited-English speakers; persons without cars and/or transit-dependent; and Medi-Cal recipients. Outreach is no longer providing these services.
Solano	Solano Mobility Call Center 800-535-6883 solanomobility.org	The Solano Mobility Call Center provides assistance in getting to appointments, shopping, work, recreation and other destinations without driving. The Call Center has information on public, non-profit organization, and private transportation services in and around Solano County.
Sonoma	Sonoma Access 2-1-1 sonomaaccess.org	Sonoma Access was designed, as a first step, to bring together information on all of the public, private and non-profit transportation options available in Sonoma County. Sonoma Access informs residents on these types of transportation services: Local and Regional Bus Service, Local and Regional Paratransit Service, Volunteer Driver Programs, Non-profit Agency Transportation Options, Private businesses that provide Transportation Options, Transportation Programs for Veterans, and Travel Training Programs that teach anyone how to ride the bus.

about alternatives to driving, such as community shuttles. Ambassadors can also give educational presentations, conduct group and one-on-one rider training, and organize group trips on transit to interesting destinations.

The Veterans Mobility Corps (VMC) was developed by SamTrans to address many transportation challenges faced by veterans of the Armed Forces when they have disabilities brought about by aging or injuries sustained during their military service. The VMC recruits and trains volunteer veterans to help veterans with disabilities to acquire skills needed to access the mobility options they are eligible for.

These options can include a broad range of choices: travel training on public transit such as SamTrans, VTA buses and light rail, BART, Muni, and Caltrain. All of the travel training services of the VMC are free of charge. This program is still in a pilot phase to identify challenges and opportunities of focusing directly on the veteran population.

The non-profit organization Center for Independent Living (CIL) in Berkeley offers a varied travel training program. They offer one-on-one and group training to youth, seniors, and people with disabilities in how to use transportation to get to destinations of their choice. They also help people with disabilities apply for a Regional Transit Connection Discount Card/Clipper Card for people with disabilities, obtain information to plan trips using the 511.org website and/or 511 phone service, and train on using a mobility device (such as a cane, walker, wheelchair, or scooter) to travel throughout the community using both public transit and pedestrian rights-of-way. Additionally, AC Transit offers wheelchair securement consultations and attachment of tether straps at CIL for participants once a month.

Some counties and cities also host or offer their own travel training programs. Solano County offers the Solano Mobility Travel Training program, which includes one-on-one trainings and group trainings provided under contract with local non-profit organizations, and has produced training videos for each operator in the county. The City of Vacaville's Public Works Department oversees the City Coach transit service. They offer one-on-one or group travel training and a Youth Travel Training Program. The Bay Area Regional Mobility Management Group frequently discusses travel training and assists the Region's programs in coordinating.

Mobility Management

Mobility management services cover a wide range of activities, such as travel training, coordinated services, trip planning, brokerage, and information and referral. For the purposes of this resource list, mobility management services refer to the provision of individual transportation information and assistance as well as service linkage.

Mobility management services are closely related to information and referral, but go further by providing more individually tailored information and providing service linkage. Where available, mobility management is an ideal "entry point" for low-income populations, seniors, people with disabilities, and veterans to the range of transportation resources available. Although all counties in the Bay Area have some sort of information and referral service, individual mobility management services are not yet available throughout the Bay Area.

The state of California recommends designating a Consolidated Transportation Service Agency (CTSA) in each county to promote and implement mobility management. This approach is also recommended in the Bay Area's 2013 Coordinated Public Transit-Human Services Transportation Plan, but only one county – Solano – in the region currently has a designated CTSA.

Several counties and/or transit agencies have hired mobility managers and these individuals are designing and implementing some new mobility management programs.

While all counties have some elements of mobility management, not all are as comprehensive as the recommendations made by MTC's Roadmap Study to implement three basic countywide components along with a formally identified Mobility Manager. The three recommended components were:

- Coordinated information and referrals, or a "one-stop" information center on multiple travel options
- Coordinated travel training and trip planning for individuals
- Enhanced Americans for Disabilities Act (ADA) paratransit certification process in coordination with transit operators

OVERVIEW OF PROJECTS FUNDED UNDER PREVIOUS COORDINATED PLAN

SAFETEA-LU required that projects receiving funds under FTA's Jobs Access Reverse Commute (JARC) program (Section 5316), New Freedom Program (Section 5317), and Section 5310 Formula Program for Elderly Individuals and Individuals with Disabilities be derived from a locally developed coordinated public transit–human services transportation plan. In July 2012, Congress passed MAP-21, the federal transportation act that superseded SAFETEA-LU. Under MAP-21, the JARC and New Freedom programs were eliminated as stand-alone programs. JARC functions and funding were combined with the Urbanized Area Formula (Section 5307) and the Non-Urbanized Area Formula (Section 5311) programs starting in FY 2012-13. The New Freedom program was merged with the Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities program, for which Caltrans is the designated recipient and the direct recipient. For the New Freedom eligible projects, MTC works with Caltrans on the 5310 Program to continue investing in New Freedom efforts (see below for more information).

Prior to MAP-21, MTC's policy was to direct JARC funds to support implementation of MTC's Lifeline Transportation Program, which includes projects that address mobility and accessibility needs in low income communities throughout the region. In response, MTC has adopted a policy to annually set aside Section 5307 funds per the JARC formula (approximately 3% of the Section 5307 appropriations) for funding projects under MTC's Lifeline Transportation Program.

Figure 3.7 summarizes funding programmed in each of the nine Bay Area counties since the 2013 Coordinated Plan was adopted. All funding was determined by regional or statewide competitive selection processes, and most of the funding went to the region's most-populated counties.

Figure 3.7 FTA Specialized Program Funding by Urbanized Area (UA), since 2012 Coordinated Plan

Urbanized Area (Large and Small)	**JARC/5307 (a)(b)**	**New Freedom (a)**	**5310 (c)**	**Total (d)**
	FY 2011-2016	**FY 2012**	**FY 2013-2017**	
Antioch	$729,224	$75,306	$1,032,188	$1,836,718
Concord	$806,351	$151,329	$2,391,773	$3,349,453
S.F. - Oakland	$10,082,572	$1,180,786	$12,959,089	$24,222,447
San Jose	$3,637,758	$496,368	$5,515,480	$9,649,606
Santa Rosa	$836,174	$99,524	$1,264,981	$2,200,679
Vallejo	$560,389			$560,389
Fairfield	$384,060			$384,060
Vacaville	$166,659			$166,659
Napa	$290,657			$290,657
Livermore	$129,033			$129,033
Gilroy-Morgan Hill	$247,964			$247,964
Petaluma	$128,224			**$128,224**
Regional Total	**$17,999,065**	**$2,003,313**	**$23,163,511**	**$43,165,889**

NOTES: (a) JARC and New Freedom (FY 2011 and 2012) includes only Large Urbanized Area (UA) funds programmed by MTC; Small UA and Rural Area funds programmed and administered by Caltrans were not included. For FTA Section 5307, FY 2013 and beyond includes Large and Small UA. In 2013, approximately $2 million in JARC funds lapsed due to delays in U.S. Department of Labor certifications on grants. The apportionments remained the same, however the project list has been modified to reflect the $2 million loss of funds.

(b) JARC/5307 funds are programmed locally by county Lifeline Program Administrators; funds were subject to Lifeline Transportation Program formula per county % of regional low-income population.

(c) 5310 includes Large UA funds that are programmed by MTC (MTC selects the projects). The Small UA and Rural Area funds are apportioned to each state. In California, these two amounts are pooled into one statewide competitive process for Caltrans to program. Depending on the results of Caltrans' competitive process, the region may receive some of the Small UA and Rural Area funds (in addition to the Large UA funding) for projects outside the Large UAs. All funds are administered by Caltrans.

(d) Apportionments represented are for Lifeline Transportation Program Cycles 3 and 4 (JARC/ 5307), New Freedom Cycle 5, and 2014 and 2017 5310 Programming Cycles.

Funding by Project Type per Funding Source

JARC/Section 5307

The Lifeline Transportation Program (JARC/Section 5307) is programmed by MTC for the region's Large Urbanized Areas. MTC established program guidelines to prioritize a wide variety of capital or operating projects based on eligibility criteria and regional priorities.

Figure 3.8 summarizes Section 5307/JARC funding by project type for the region's Large Urbanized Areas (Antioch, Concord, San Francisco–Oakland, San Jose, and Santa Rosa) funded under the third and fourth cycles of the Lifeline Transportation Program, covering FY2011 through FY2016. About half of all funding went to support fixed-route transit services connecting low-income communities to employment and other essential destinations, with most of the remainder going to alternative services other than fixed-route transit, including taxi vouchers, guaranteed ride home programs, bike programs, shuttles, and auto loan programs.

Figure 3.8 JARC/5307 Funding by Project Type, FY 2011-FY 2016

	Total	Percentage of Total	Number of Projects
Transit Capital	$1,812,046	11.6%	4
Transit Operations	$6,822,659	43.7%	19
Transit Alternatives	$3,117,427	20.0%	8
Auto Loan Programs	$1,304,077	8.4%	4
Shuttles	$1,579,641	10.1%	8
Pedestrian and Bicycle Improvements	$570,000	3.7%	4
Program Administration	$406,811	2.6%	2
Total	**$15,612,661 [(a)]**	**100%**	**49**

NOTES: (a) This programming is lower than apportionments. In 2013, approximately $2 million in JARC funds lapsed due to delays in U.S. Department of Labor certifications on grants. The apportionments remained the same, however the project list has been modified to reflect the $2 million loss of funds.

New Freedom Program

The New Freedom program was administered by MTC for the region's Large Urbanized Areas. MTC established program guidelines to prioritize a wide variety of capital or operating projects based on eligibility criteria and regional priorities.

Under this Coordinated Plan period, MTC administered one remaining New Freedom program cycle (New Freedom Cycle 5). The New Freedom program also funded a variety of capital and operating projects in the region's Large Urbanized Areas, as shown in **Figure 3.9**. The largest share went to informational and travel training program projects. The other major categories were mobility management and demand-responsive alternatives to fixed-route transit or ADA paratransit, including volunteer driver programs, taxi-based programs, and non-ADA paratransit services. New Freedom funding was not continued in MAP-21 (starting with FY 2013) and similar project-types became eligible under 5310.[33]

33 http://www.apta.com/gap/legissues/authorization/Documents/APTA%20MAP-21%20Guide.pdf

Figure 3.9 New Freedom Funding by Project Type, FY 2012

	Total	Percentage of Total	Number of Projects
Mobility Management	$360,602	18.0%	3
Info/Training	$1,237,794	61.8%	5
Transit/ADA Alternatives	$304,751	15.2%	5
Program Administration	$100,000	5.0%	1
Total	**$2,003,147**	**100%**	**14**

Section 5310

For the Section 5310 program, Caltrans funds "traditional" and "expanded" projects. Traditional projects include vehicles, transportation program-related equipment, and mobility management projects. Traditional projects must comprise at least 55 percent of the available funding. Expanded projects include operating assistance and mobility management projects of the type eligible in the former New Freedom program. In 2014 and 2017, MTC jointly administered the program with Caltrans, where MTC established program guidelines for the Large Urbanized Areas and oversaw project selection, but Caltrans remained the designated recipient, responsible for grant management, procurement, and project oversight.

Figure 3.10 summarizes 5310 funding by project types that was apportioned to the Bay Area's Large UAs, as well as funding awarded to projects in the Bay Area through the Caltrans statewide competitive process using Small UA and Rural Area funds. Approximately half of the funding has gone to mobility management projects, which comprise coordination activities, personalized trip planning, information and referral and travel training. One quarter of the funding has gone to purchase wheel chair accessible vehicles. Volunteer driver programs received 14% of the funding, and provide door-through-door transportation. Alternatives to fixed-route transit or ADA paratransit, including taxi-based programs and non-ADA paratransit services received 9% of funding. The remaining funding went to transportation program-related equipment like wheelchair restraints, radios and computer software.

Figure 3.10 5310 Funding by Project Type, FY 2013 – FY 2017

	Total	Percentage of Total	Number of Projects
Mobility Management/Info/Travel Training	$11,810,234	47.1%	25
Vehicles	$6,175,400	24.6%	107
Volunteer Driver Programs	$3,544,913	14.1%	15
Transit/ADA Alternatives	$2,378,769	9.5%	12
Transportation Program-Related Equipment	$31,725	0.1%	35
Program Administration	$1,158,176	4.6%	2
Total	**$25,099,217**	**100%**	**196**

4. OUTREACH AND STAKEHOLDER GAP IDENTIFICATION

To reveal high-level gaps in the Bay Area's transportation network experienced by the region's seniors, people with disabilities, people with low incomes, and veterans, this chapter draws upon feedback received through conversations with individuals, advocates, agencies who serve them, as well as on a regional demographics assessment of trends (Chapter 2). Where comments include suggested solutions to specific gaps, those have been summarized as well. Together, these gaps and solutions inform recommended strategies for MTC and its regional partners, provided in Chapter 5.

The following lists summarize the top themes heard through all engagement channels. Each comment was categorized as either a gap or a solution, and further assigned a theme. Many themes emerged and presented below are the top ten gaps and top five solutions.

SUMMARY OF GAPS

1. **Spatial gaps—areas of our region that are either difficult or impossible to reach by public transportation—continue to be a key need expressed throughout the region.** In the 2013 Coordinated Plan update, some of the top themes included needs for enhanced fixed-route and paratransit through increased connectivity. This continued to be true in feedback gathered for this 2018 Update; spatial gaps top the list of most frequently heard comments. These spatial needs are specific to location, but generally highlight a lack of connectivity either within or between suburban and rural areas. These gaps are exacerbated by several demographic trends – the proportion of the regional population composed of seniors and people living in poverty has increased over the last decade, as has the proportion of the population that lacks access to a vehicle. These trends are projected to continue into the future.

2. **Temporal gaps—points in time that lack service—also constrain the mobility of target populations.** Most comments focused on the lack of transit and paratransit availability in the evenings, late night, and weekends. However, we also heard from some stakeholders involved in volunteer driver programs that there are increasing requests for dialysis transportation services very early in the morning, either prior to available transit or at a time that feels unsafe for dialysis patients to travel alone. Further, necessary transfers between services create another type of temporal gap—long travel times, affecting those dependent on transit who often earn hourly wages.

3. **Healthcare access is a growing concern in the region.** Comments regarding medical transportation needs generally came in three types: dialysis transportation, the trend of medical facilities locating in areas difficult to serve by fixed-route transit, and the lack of affordable non-emergency medical transportation options. These healthcare access needs are heightened by the fact that the areas of the region that are aging the fastest also tend to be the most suburban or rural – areas difficult to serve by fixed-route transit. Further, seniors are living longer, and in counties like Marin, where the population is one of the longest living in the country,[35] this means an increasing strain on local budgets to support people with limited mobility.

4. **Comments from almost every county in the region raised concerns that transit and paratransit fares are too high for many people.** Seniors and families with low incomes are a growing portion of our local demographics, and these groups are some of the least able to afford increasing transportation costs. While local bus service may be a more affordable option, more costly regional transit options like BART or Caltrain increase access to medical facilities, jobs, and other critical services.

5. **Funding needs are growing faster than revenues.** Service providers say that funding is constrained to support the mobility of seniors, people with disabilities, veterans, and people with low incomes. There is increasing pressure on programs that provide mobility for target populations as those populations are growing and housing near services is less affordable. Funding available for services above and beyond the ADA—which are particularly important in counties where the fixed-route system cannot cover important destinations—are limited in counties without local sales taxes for transportation. Lastly, the grant-based nature of non-ADA funding sources threatens the consistent availability of some programs.

6. **Constituents recognize that investments in the safety of pedestrians and bicycles improve mobility for all.** Stakeholders discussed missing sidewalks, sidewalks in poor condition, sidewalk blockages due to parked cars and driveways, and missing crossing treatments. A lack of these treatments renders some individuals incapable of using the fixed-route system, which could increase the costs of operating ADA Paratransit services. Some comments also centered on transit stop amenities to make public transit more welcoming for everyone.

7. While some feedback suggested leveraging transportation network companies (TNCs, such as Lyft or Uber) and other new technologies to assist in solving mobility gaps, **many comments focused on the lack of accessibility of taxis and TNCs**. There is some concern about the ability of target groups to leverage these solutions due to the apps' reliance on smartphone ownership.

8. **Stakeholders highlight the importance of transportation information availability and associated referral services to steer people to gap-filling services.** Comments focused on a need for more real-time information about both transit and paratransit services, but also a need to increase constituents' awareness of

35 http://marinaccess.org/wp-content/uploads/2016/09/FINAL-Marin-Access-Strategic-Analysis-and-Recommendations-2016.pdf

all services and mobility options—including combining biking and transit, for example—available to them.

9. **As discussed in the 2013 Coordinated Plan, facilitating transfers on both the fixed-route transit network as well as between ADA paratransit service providers (when trips cross county lines, for example) remain a barrier.** Not only are these trips difficult and time consuming, but they can also be costlier. This is more of a problem for paratransit than fixed-route transfers, as the former often require close coordination between different providers and sometimes different counties, and have a greater impact on people with disabilities due to the challenges of long waits between transfers. Personal safety is a concern for riders. Safety measures such as lighting, accessible restrooms, safe waiting areas, benches and phones are essential. Further, riders feel that their safety can be at unnecessary risk when required to transfer between vehicles.

The remainder of feedback received covered a wide variety of topics, from housing and land use, to strained volunteer driver programs, to mobility management and coordination, to the need for more planning and study. Overall, the general gaps identified in Chapter 6 of the 2013 Plan remain, but **new comments in this update reflect recent trends in technology, medical facility accessibility, and the growth of disadvantaged populations.**

Summary of Solutions

In addition to gaps, stakeholders also offered solutions—either things that have been discussed in their county or new ideas. The summary below describes the top five solutions themes; other comments covered equity solutions for emerging mobility services, access to automobiles, fare media, and others.[36] This input will be incorporated into the 2018 Plan's ultimate strategic recommendations.

1. Consistent with the information gaps highlighted above, **stakeholders also provided several ideas for increasing the availability and efficacy of transportation information.** These ideas included:

    a. Making comprehensive information about available transportation services available to all human service providers, possibly through one-call/one-click services

    b. Offering targeted mobility information at key points of contact (e.g. for seniors at the DMV; for discharged patients or families of patients at hospitals)

    c. Increasing the availability of real-time information (e.g. "where's my ride?" paratransit information; BART elevator in service information; real-time information about available wheelchair spaces on an arriving bus)

    d. Improving on-vehicle communication (e.g. consistent operator announcements and stop information signs in both the front and rear of vehicles)

2. **To increase the affordability of transit for the target populations, there is interest in reducing the cost of public transit, paratransit, and on-demand transportation options such as taxis.** Most comments suggested partially subsidizing the cost, but some also suggested making transit free for the target populations, and others asked for discount consistency between providers in the region. Relatedly, a few commenters recommended universal fare media across transit providers and between both general public and paratransit services.

3. **Coordination and cooperation could increase cost efficiency and improve service for end users.** Underutilized resources, such as school buses at midday, or paratransit vehicles off-peak, could be made available to serve other mobility gaps if a central agency coordinated across various providers. Increased coordination between regional centers and public transit agencies could respond to specific spatial gaps. In addition, transfers between ADA Paratransit providers or between ADA Paratransit and city-based providers could improve the travel experience and reduce travel times.

4. **Creating new funding streams and increasing the sustainability of other funding streams is a top priority.** Comments suggested creating new revenue through local measures, such as a vehicle license fee. Commenters also advocated for lessening the administrative burden associated with applying for and receiving 5310 funds through Caltrans, longer-term grants, and new funding for mobility management and coordination activities to ensure that local priorities receive funding.

36 There was less consensus around solutions in the comments than gaps; therefore, only the top 5 are listed. All comments are considered in crafting the 2018 Coordinated Plan's strategic recommendations.

5. **To address spatial gaps, increase the availability of non-ADA services for the target populations, and ensure their coordination with ADA Paratransit and public transit.** There was also discussion of a need for better land use-transportation coordination, and to ensure individuals are assigned to services (e.g. regional centers, dialysis clinics) closest to their homes.

COMMUNITY INPUT OPPORTUNITIES

Figure 4.1 lists all outreach activities completed by the 2018 Coordinated Plan team. Over 30 organizations from all nine counties of the Bay Area provided input, captured in more than 300 individual comments. These comments were individually classified as either identifications of existing transportation gaps or suggestions of potential solutions; further, each comment was categorized according to its overarching theme—temporal or spatial gaps, for example. These comments, along with their themes, are provided as Appendix B and Appendix C.

Figure 4.1 Community Engagement and Outreach Activities

Organization	Counties Served	Type (Consumer, Provider, Advocate)	Date	Attendees / Representative
San Mateo County Paratransit Coordinating Council (PCC)	San Mateo	Consumer	June 13, 2016	27
Regional Mobility Management Group	Regional	Provider	June 16, 2016	18
Senior Mobility Action Committee, Contra Costa County	Contra Costa	Consumer	June 27, 2016	19
Cycles of Change	Alameda	Provider	July 6, 2016	Former Co-Director and Development Consultant
MTC Policy Advisory Council Equity and Access Committee	Regional	Consumer	July 6, 2016	9
West Contra Costa Regional Mobility Working Group	Contra Costa	Advocate	July 7, 2016	14
Home First	Santa Clara	Provider	July 7, 2016	Director of Services
Napa PCC	Napa	Consumer	July 7, 2016	12
Bay Area Partnership Accessibility Committee	Regional	Advocate	July 11, 2016	10
Contra Costa County Employment and Human Services	Contra Costa	Provider	July 11, 2016	Transportation Services Specialist
North Bay Organizing Project	Sonoma	Advocate	July 11, 2016	Executive Director
Marin PCC	Marin	Consumer	July 18, 2016	16
Contra Costa PCC	Contra Costa	Consumer	July 18, 2016	11
Sonoma PCC	Sonoma	Consumer	July 19, 2016	14
Solano PCC	Solano	Consumer	July 21, 2016	30
Alameda Paratransit Advisory and Planning Committee (PAPCO) and Paratransit Technical Advisory Committee (ParaTAC)	Alameda	Consumer and Provider	July 25, 2016	30
San Mateo County Health System	San Mateo	Provider	August 4, 2016	Senior Community Health Planner
Peninsula Family Service	San Mateo	Provider	August 4, 2016	Director, Financial Empowerment Program

Figure 4.1 Community Engagement and Outreach Activities

Organization	Counties Served	Type (Consumer, Provider, Advocate)	Date	Attendees / Representative
San Francisco PCC	San Francisco	Consumer	August 10, 2016	39
Solano Transportation Authority	Solano	Provider	August 19, 2016	Planning and Programming Staff
Western Contra Costa Transportation Advisory Committee	Contra Costa	Provider	September 1, 2016	WCCTAC Project Manager
East Bay Paratransit Service Review Advisory Committee	Alameda, San Francisco, Santa Clara	Consumer	September 6, 2016	27
Napa Valley Transportation Authority	Napa	Provider	September 8, 2016	Planning and Programming Staff
Alameda County Transportation Commission	Alameda	Provider	September 9, 2016	Planning and Programming Staff
AC Transit Accessibility Advisory Committee	Alameda, Contra Costa	Consumer	September 13, 2016	22
Transportation Authority of Marin	Marin	Provider	September 14, 2016	Planning and Programming Staff
City/County Association of Governments for San Mateo County	San Mateo	Provider	September 16, 2016	Planning and Programming Staff
Contra Costa Transportation Authority	Contra Costa	Provider	September 22, 2016	Planning and Programming Staff
Sonoma County Transportation Authority	Sonoma	Provider	September 26, 2016	Planning and Programming Staff
San Francisco County Transportation Authority	San Francisco	Provider	September 27, 2016	Planning and Programming Staff
VTA Committee for Transit Accessibility	Santa Clara	Consumer	October 12, 2016	29
Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Advocate, Provider, Consumer	October 14, 2016	19
San Francisco Planning and Urban Research (SPUR)	Regional	Advocate	November 16, 2016	Transportation Policy Staff
TransForm	Regional	Advocate	November 17, 2016	Executive Staff

SUMMARY OF FEEDBACK BY COUNTY

Below is a brief summary of comments provided by users and their advocates in each county.

Regional. Four regional groups engaged in the 2018 Plan's initial outreach process – the Regional Mobility Management Group, Bay Area Partnership Accessibility Committee, SPUR, and TransForm. The Regional Mobility Management Group is a 30-member group comprised of mobility management and human service transportation providers throughout the Bay Area.

The Bay Area Partnership Accessibility Committee is comprised of representatives from the Bay Area's ADA Paratransit providers and other interested parties. SPUR is a regional planning and policy non-profit that provides research, education, and advocacy. TransForm is a transportation advocacy non-profit focused on the Bay Area and California, promoting access, health, justice, and sustainability. Among the comments were discussions related to the ability for MTC to lead in mobility management, coordination and system seamlessness, innovative pilots and demonstration projects, additional planning or study opportunities, ensuring inclusive planning processes, and funding.

The groups also discussed issues related to new transportation technology, and urged emerging mobility services to be considered in this plan's recommended strategies.

Alameda County. The project team met with the Alameda County Paratransit Advisory and Planning Committee (PAPCO) as well as Alameda CTC staff. The common comment received focused on spatial gaps in the county — particularly related to connectivity to and from eastern sections of the County. Other comments addressed themes of transportation information, funding, temporal gaps, and fares.

Contra Costa County. The project team received input from the Contra Costa County Paratransit Coordinating Council (PCC), the Department of Employment & Human Services, WCCTAC, and the City of San Pablo. Temporal and spatial gaps, as well as funding availability, were the most concerning themes in Contra Costa County. Funding constraints limit the ability of services beyond ADA Paratransit to serve observed spatial and temporal gaps.

Marin County. The Marin County PCC's comments covered several topics without one strong overarching theme. Similar to Alameda County, sections of Marin (namely, West Marin) are perceived to be less connected than the more populated eastern parts of the county. In addition, in the eastern part of the county, the need for better pedestrian and bicycle infrastructure was mentioned as a means of addressing mobility for seniors aging in place.

Napa County. Healthcare access and the strain on the county's existing volunteer driver programs and taxi scrip programs (City of Napa only) were consistent themes throughout the meeting with the Napa PCC. These programs are meant to help address temporal and spatial gaps, but wheelchair access is limited and drivers are in short supply.

San Francisco County. San Francisco's PCC elevated congestion as one of their largest concerns — a typically urban challenge. Comments related to congestion highlighted how congestion — due to high levels of traffic and double parking — impacts both public transit and paratransit's ability to serve customers in a timely manner.

The other common theme related to transit information; participants acknowledged the provision of real-time information in and outside of buses, but highlighted that it can be inconsistently provided and difficult to see or hear from the rear of the vehicle, and a request for better information about elevator outages. The lack of transportation information and referral service was also cited. Additional comments submitted by the SFMTA cite curb access and congestion, particularly at human service locations, and vehicle storage costs due to the high demand for real estate.

San Mateo County. San Mateo's PCC and County Health System, as well as the Peninsula Family Service Agency provided feedback. The most common themes expressed had to do with pedestrian and bicycle needs at specific locations throughout the county, though some covered more general comments such as parked cars blocking sidewalk right-of-way and a desire for bike lanes to accommodate motorized scooters and wheelchairs. Transportation information, emerging mobility providers, and transit fares were other common themes.

While some comments related to the use of car share, transportation network companies (TNCs), or autonomous vehicles as potential solutions, other comments called for the increased accessibility and affordability of these services in the meantime.

Santa Clara County. Almost 40 individual comments were received from constituents in Santa Clara County representing the VTA Committee for Transit Accessibility, the Equity and Access Subcommittee, and Home First Santa Clara — a non-profit focused on housing the homeless.

Comments covered a broad spectrum of issues, from transit fares to funding, spatial gaps, healthcare access, and the uncertainty of the current paratransit program.

Solano County. In Solano County, the PCC and Faith in Action—a non-profit that provides the county's only volunteer driver program — provided comments. The top two concerns of these groups related to healthcare access and sustainable funding for programs. There is strain on all local programs to address access to dialysis and medical care, with increasing distances between home and medical centers.

Sonoma County. Sonoma's PCC, the Sonoma Access Coordinated Transportation Services (SACTS) Committee, and the North Bay Organizing Project each provided input. The North Bay Organizing Project does not provide services directly, but rather is an advocacy organization that works with diverse, multi-issue groups to empower citizens to be their own advocates.

Their main concerns related to the cost of transit to students and seniors, and the lack of access to affordable housing. Fares were also a top concern among other groups' comments, as were the accessibility of non-ADA paratransit options, transportation information, and various spatial gaps.

5. REGIONAL STRATEGIES FOR COORDINATION

Transportation gaps and solutions identified in this Coordinated Plan become eligible for funding through federal funds distributed by MTC to regional partners, as well as other funds from state and county agencies. These eligible solutions are referred to as projects, and are outlined in Appendix E – Projects Eligible for Funding. Projects are concrete solutions—new vehicles, improved sidewalk infrastructure or accessible bus stops, and software systems are some examples.

Strategies—covered in this chapter—are bigger picture initiatives that stakeholders and MTC can implement or facilitate. These strategies grow directly from feedback received from user groups, their advocates, and existing local providers of transportation and human services. They are bounded by regional policies, and the powers that MTC and transit agencies, cities, counties, congestion management agencies, non-profits, providers, and other stakeholders have to fund and implement initiatives.



STRATEGY 1: COUNTY-BASED MOBILITY MANAGEMENT

In 2016, MTC staff prepared the Roadmap Study: A Bay Area Mobility Management Implementation Plan, the purpose of which was to assess ongoing mobility management efforts in each county, and lay the groundwork for successful implementation of mobility management region wide. The study found that implementing a county-based mobility management strategy requires a multipronged approach. MTC would lead the development of a county-based mobility management program and continue to help leaders on a local level to coordinate mobility services for an entire spectrum of transportation providers. The approach and recommendations are detailed in this section.

Development of a County-Based Mobility Management Program

The promise of mobility management is two-fold: to improve the mobility of traditionally underserved groups by directing passengers to available transportation options, and to increase the efficiency of the overall system of public transit and human service transportation through coordination. Mobility management is of the utmost importance due to its ability to leverage and enhance the effectiveness and efficiency of other projects and strategies listed in this Coordinated Plan. Based on best practices, MTC expects county-based mobility management programs would include three key components:

1. **Countywide travel training,**
2. **In-person ADA paratransit certifications, and**
3. **Coordination of information and referrals (I&R) through the provision of a mobility manager in every Bay Area county.**

MTC's primary roles in facilitating such a program would include:

- Supporting funding for locally led, county-based mobility management programs, and associated program components in each county, including county one-call/one-click systems for trip planning; coordinated travel training programs for those currently not using the fixed-route system; and enhanced ADA paratransit certification processes for each transit provider.
- Serving as the central point of contact for county mobility managers, providing resources and technical support.
- Leveraging the 511 system or other available traveler information system for its role in providing travel information.
- Encouraging the creation of Consolidated Transportation Service Agencies (CTSAs) in each county. CTSAs are a mechanism for promoting mobility management. Through an MTC designation process, County Board of Supervisors, Paratransit Coordinating Councils, County Congestion Management Agencies, and transit operators confirm their support of an official mobility manager for the county. (Appendix D lays out the process for designating CTSAs in the San Francisco Bay Area.)

In addition, MTC should work with county led mobility management efforts to ensure that each county has created and maintains an online inventory of accessible vehicles in each county (e.g. all 5310-funded vehicles plus other public transit and human service transportation vehicles). This list should be shared with County-level offices of emergency services and would improve the ability of agencies to coordinate and/or enter into public-private partnerships to provide wheelchair-accessible trips.

This would increase the effectiveness of investments in the accessible fleet. MTC should also ensure that each county mobility manager provides assistance to 5310 applicants to help with applications and federal compliance, and that within each county there is a mechanism by which applicants can "piggyback" onto statewide commodity contracts (vehicles, software, capital investments) to increase cost efficiency of vehicle investments.

MTC should work with county-based mobility management efforts to make sure that each county mobility manager facilitates joint driver training and follow-up customer satisfaction surveys to monitor success, and provide assistance in the development and funding of new transportation services.

Best Practice Example:

Ride Connection (Portland, Oregon):[37] Ride Connection is a private non-profit that coordinates the transportation operations of 30+ small community-based providers of elderly and disabled transportation services. The services it provides are summarized in **Figure 5.1**.

Ride Connection provides information for all transportation options available to older adults and people with disabilities in the region, and

37 Nelson\Nygaard. Coordinated Transportation Plan for Elderly and People With Disabilities. TriMet. 2012. trimet.org/pdfs/publications/elderly-and-disabled-plan.pdf

Figure 5.1 Ride Connection Support Services Provided to Service Partners

Support Services			
• Service coordination between partners • Customer service monitoring • Grant writing, fundraising, and serving as conduit for state and federal fund • Service planning, which includes coordination of existing services for efficiency and creation and implementation of innovative ideas to meet local and regional transportation needs in the community	• Individual travel ability assessment • Web –based tools for daily operations and reporting • Contract administration, compliance and performance monitoring • Advocacy for individuals with transportation needs and for community-based service partners who meet those needs	• Driver, partner and staff training and development • Data management and reporting support • Outreach and joint marketing of regional transportation services • Technical assistance and support to service partners and community organization	• Accessible fleet acquisition • Volunteer recruitment assistance • Management and maintenance of a 100+ fleet • Service scheduling and centralized call center services for a growing number of partners

SOURCE: TriMetCoordinated Transportation Plan for Elderly and People with Disabilities 2012

refers people to the options that best fit their circumstances. With one call to Ride Connection, a rider can either access Ride Connection services or be connected to another service provider in the region who can best serve her/him.

Facilitate Coordination

Coordination is essential for meeting the needs of seniors, people with disabilities, veterans, and those with low incomes. To best serve the region's needs for mobility services, partnerships need to involve the entire spectrum of transportation providers: providers of public fixed route transit, paratransit, human service transportation providers, private taxi and ride-hailing services, departments of health and human services, advocacy groups, faith-based groups, medical and dialysis providers and providers of support services to low-income populations, seniors and individuals with disabilities.

As a funder and evaluator of grant applications, MTC has been and should continue to award extra points to projects and proposals that address cross-county or regional connections by including coordination as an evaluation criterion in appropriate fund programs. MTC will continue to provide a venue for inter-agency coordination.

Best Practice Example:

King County Access (King County Metro)[38, 39]: King County Access provides paratransit service in King County, Washington. A paratransit rider making an "Out of County Transfer trip" only needs to make a reservation with King County Access. Access will coordinate the trip scheduling with the connecting agency. King County Access recommends that riders call as early in the day as possible to give the two agencies time to coordinate the Out of County Transfer trip before the end of the day.

Access has designated transfer points for Out of County Transfer trips at transit stations or park-and-rides near the boundaries of neighboring counties. On the day of an Out of County Transfer trip, Access will pick up the rider at her/his origin, and drive her/him to the transfer point. Drivers and dispatch staff at both agencies coordinate with each other to communicate times of arrival. If the driver from the paratransit agency in the neighboring county has not arrived at a transfer point when the Access driver arrives, the Access driver will wait with the passenger until the connecting driver gets there.

This transfer method of two paratransit drivers meeting to transfer the rider from one vehicle to another – without leaving a rider at a transfer point unattended – is also known as a "hand-off." While there is an example of a Bay Area provider that has also adopted the "hand-off" model (East Bay Paratransit), most of the larger systems have yet to implement this practice.

38 King County Metro. Access Ride Guide. 2015. metro.kingcounty.gov/tops/accessible/pdf/AccessRideGuide.pdf

39 King County Access Call Staff. Phone Interview by Nelson\Nygaard. February 17, 2017.

Recommendations for MTC

Plan and Implement Mobility Management Technical Assistance Program

As regional partners begin to develop local mobility management functions, MTC staff should develop a technical assistance program to advise partners on the implementation of travel training, in-person eligibility, and information and referral programs.

Set Schedule for Coordination Summits and Assess Opportunities to Incentivize Coordination

Coordination takes preparation. MTC should keep the momentum from the Coordinated Plan and Roadmap Study efforts by establishing a schedule of regional coordination summits and topics for the convening.

MTC can host regular events with transit operators, human service agencies, CMAs, and other coordination partners. MTC can also begin to assess specific opportunities, suggested in this chapter of this plan, to incentivize coordination among transit operators and human services providers.

Identify Sustainable Sources of Flexible Funding for County-Based Mobility Management

Within one to two years of Coordinated Plan adoption, MTC should work with county and local stakeholders to identify funding for county-based mobility management programs.

Recommendations for Partners

Develop New County-Based Mobility Management and Related Initiatives

In the first one to two years of this plan's adoption, regional partners should begin to develop new mobility management functions across the Bay Area. In the first two years of this plan's implementation, county partners are expected to consider how to fund county-based mobility management functions, such as travel training, information and referral services, and ADA paratransit in-person eligibility and conditional eligibility policies.

Contribute to Regular Coordination Summits

To leverage coordination opportunities, CMAs, transit operators, human service providers, and other partners should commit to contributing and participating in regular coordination summits.

Create Consolidated Transportation Service Agencies and Seek Funding for County-Based Mobility Manager Positions

Local entities can request to become designated as a Consolidated Transportation Service Agency (CTSA) from MTC. The CTSA designation empowers each county to build out a full mobility management program that facilitates coordination between local social service agencies and transportation providers. In the next one to two years, counties that lack a CTSA should seek designation, or develop a plan to build CTSA capacity in their county. (Appendix D lays out the process for designating CTSAs in the San Francisco Bay Area.)

STRATEGY 2: IMPROVE PARATRANSIT

Paratransit services should be improved to better meet the needs of customers. The recommended approach is to improve access to healthcare, reduce the cost of service, and make it easier to pay for ADA paratransit services.

Address Access to Healthcare

The ongoing consolidation of healthcare centers and tendency to locate in peripheral locations has reduced transit accessibility to medical services. Although ADA paratransit and non-profit providers have been required to increase the volume and length of trips for medical purposes, there is currently no unified funding mechanism in place in the Bay Area for providers to recover the costs of these trips from Medi-Cal. However, "non-emergency transportation" is one of the reimbursable activities under the Medi-Cal program.

Non-emergency transportation vehicles include taxis, buses, trains, cars, and vans. Time spent and actual expenses, such as taxi vouchers and bus passes, can be claimed through County-Based Medi-Cal Administrative Activities (CMAAs). However, there is a requirement to use the lowest cost option, which often results in reimbursement being limited to transit fares.

Attempts to address this issue have been ongoing for a number of years in California. MTC can play a role by exploring a cost recovery program for Medi-Cal non-emergency transportation in the Bay Area for public and private transportation providers who are coordinating with county-based mobility management efforts. As part of the development of this program, the types of entities that would be eligible for participation should be determined, in addition to an overall implementation plan.

Given the lack of reimbursement programs, MTC could also explore other ways to help agencies contain costs. For instance, costs are particularly burdensome for ADA paratransit providers who provide subscription trips to individuals requiring dialysis. ADA paratransit providers receive no financial contribution from the clinics whose clients receive these services. MTC could bring the parties together to arrive at cost sharing arrangements that would exceed the fare paid by riders, or explore other ways to reduce travel costs, and expand travel options.

Finally, MTC could play a role in addressing service gaps to medical services by linking NEMTs and TNCs to increase capacity and provide accessible service to medical destinations. This could be achieved through MTC grants for pilot programs and/or technical assistance.

Reduce the Cost of Providing ADA Paratransit

Due to the growing population of ADA-eligible passengers, the increasing difficulty of hiring and retaining paratransit drivers, and other national trends indicating increased labor costs, the costs of providing ADA paratransit are rising.[40] Strategies to address these costs are:

- Increasing the use of in-person eligibility assessments and conditional eligibility policies. Transit agencies should implement in-person assessments, as well as evaluations of applicants' functional mobility by trained professionals to provide conditional eligibility.
- Piloting trip-screening modules in scheduling software to facilitate the implementation of conditional eligibility policies. Funding for this technology can be prioritized, and can assist in coordinating the phased development of a regional database of accessible bus stops to inform trip-screening.
- Promoting the use of Interactive Voice Response (IVR) systems to remind passengers of upcoming trips and communicate imminent arrival. IVR systems will help reduce no-shows and late cancels.

Best Practice Examples:

Most large paratransit systems in the U.S. now use in-person eligibility assessments, including functional assessments, in order to achieve more accurate eligibility determinations. One of the key benefits of this eligibility model is the ability to determine the conditions under which an applicant can ride fixed route service, even if for some of their trips.

Conditional eligibility is routinely applied in Seattle, Pittsburgh, Philadelphia, Tacoma, and Salt Lake City, and the trend is towards greater implementation. Systems that have been successful in implementing conditional eligibility generally have between 12 and 14 conditional categories, although King County Metro has over 20. Following is a listing of some of the key categories that are used by transit agencies in applying conditional eligibility:

- Street barriers (e.g. lack of sidewalks or curb cuts)
- Distance
- Slope
- Seasonal
- Snow/ice
- Temperatures
- Darkness
- Need for transfers on fixed-route
- Travel trained
- Dialysis

Transit agencies use a variety of approaches to apply eligibility conditions. King County Metro identifies conditionally eligible riders who request the same trip with some frequency. They then conduct a "pathway review" to determine if the individual would actually be able to negotiate the paths between the nearest transit stops and their points of origin and destination. If this is an option, they inform the customer of their fixed route options and do not provide the trip on paratransit. Accessible Services staff have estimated annual savings of approximately $845,000 in Access operating costs because of this approach.

In Pittsburgh, ACCESS applicants are given very specific information about their eligibility to ensure that both reservationists and the riders have a common understanding of which trips are eligible. Since 2005, ACCESS has been applying eligibility conditions on all trips requested by those with conditional eligibility.

ACCESS has found that about 29-35 percent of applicants are determined conditionally eligible, but they only take about 18 percent of the trips, and about half of those are subscription trips. This proportion of trips has not changed in nearly ten years. Therefore, the screening process, while not insignificant, is not as substantial as is commonly assumed.

40 Federal Transit Administration, Transit Cooperative Research Program, Report 142, "Vehicle Operator Recruitment, Retention, and Performance", 2010, Washington DC, Summary, page 1

ACCESS generates regular reports about conditional and feeder trips so they can evaluate the barriers that create eligibility. If these barriers can be addressed, the agency tries to implement mitigations, such as making bus stops accessible, installing traffic signalization and curb cuts.

The agency has had only limited success in this effort – but knowing why people need to use paratransit is helpful in planning efforts.

Make it Easier to Pay for Paratransit

The cost of on-vehicle card readers necessary for the use of Clipper cards is prohibitive given the relative lower volume of trips provided on paratransit as compared to fixed-route. MTC and operators can examine other technological solutions that do not increase the costs of providing ADA paratransit.

Clipper 2.0 may be able to include paratransit as a parameter in the new system. Other solutions may be available using current technology (RTC Clipper Cards), such as a system in which payment for the trip is secured upon booking, and processed upon taking the trip.

Best Practice Example:

Access Services (Los Angeles County):[41] Access Services provides paratransit services on behalf of Los Angeles County's 44 fixed route transit providers. It is the county's Consolidated Transportation Services Agency (CTSA). Access offers multiple options for riders to pay for paratransit trips both before and at boarding (**Figure 5.2**).

Having several options for paying both in advance and at boarding allows riders the flexibility to reduce their boarding time with pre-payment options, or pay when they board if there was less planning in advance of the trip. Riders can pre-load funds for paratransit rides onto their Access Rider ID/TAP card. At boarding time, the driver can then swipe their card, and the fare will be deducted automatically from the rider's Access Rider ID/TAP card account balance.

Riders can also pre-pay for upcoming trips by purchasing ride coupons in-person at a local transit agency, by mail, or online at Access's website. If a rider does not have a form of prepayment for a paratransit trip, she/he can pay the driver with a credit/debit card, or cash in exact change. The pre-paid Access Rider ID/TAP card and coupons save time during boarding, because they forego the time spent providing exact change cash to a driver.

41 Access Services. How to Pay for Your Ride. accessla.org/riding_access/access_riders_guide/pay_your_ride.html#

Recommendations for MTC

Begin Policy Discussion around Medi-Cal Cost Recovery Program for the Bay Area

To address the growing costs of transportation to healthcare in the Bay Area, in the next 6 to 12 months, MTC can begin internal policy discussions regarding how to leverage available reimbursements for non-emergency medical trips. The first step is to identify the types of entities that would be eligible to participate in the program and those who would likely participate in such a program.

Figure 5.2 Access Services Paratransit Payment Methods

Support Services	Payment Method
At Boarding	Cash
	Credit/Debit Card
In Advance	Purchase Coupons In-Person (Pomona Valley Transit Authority, City of Santa Fe Springs, City of Azusa Bus Pass Window)
	Order Coupons by Mail
	Order Coupons Online
	Pre-Load Access Rider ID/TAP card

SOURCE: Access Services

Convene Task Force to Assist Implementation of In-Person Eligibility

MTC can use its position as a regional resource to convene a task force to assist in the implementation of in-person eligibility and functional testing procedures at each of the region's transit operators that do not currently use this eligibility model. This effort can increase the effectiveness of new funding made available to regional operators for the implementation of county-based mobility management.

Recommendations for Partners

Take Opportunities to Expand Subsidized Same-Day Trip Programs

Paratransit users and operators alike see benefits in expanding options for same-day trips. Same-day trip programs provide greater mobility options and flexibility to riders, and operators may realize cost savings through innovative partnerships. Some public transit agencies across the Bay Area already have programs, typically in partnership with local taxi companies, and some are exploring relationships with ride-hailing companies. In counties where local sales taxes have afforded the opportunity to provide additional supplemental service for seniors and people with disabilities, municipal programs also exist. However, many individuals who would benefit from such programs, including veterans and those with low incomes, lack access. In the next one to two years, operators and providers should explore opportunities to implement these programs.

Implement Medi-Cal Cost Recovery Program

To address the growing costs of transportation to healthcare in the Bay Area, paratransit providers can implement Medi-Cal cost recovery programs. Recovered costs could be put back into the paratransit system, or used to fund less expensive non-ADA services.

STRATEGY 3: PROVIDE MOBILITY SOLUTIONS TO SUBURBAN AREAS

The suburbanization of poverty has resulted in challenges providing fixed-route services in low-density development areas. MTC can help the region address some of these challenges by implementing recommendations for an expansion of suburban mobility options.

Increase Suburban Mobility Options

New and expanded transportation solutions are needed for addressing mobility challenges that result from the suburbanization of poverty and older adults. Suburban development patterns are characterized by medium- and low-density land uses, which are often incompatible with traditional fixed-route transit service. Flexible, demand-responsive solutions are necessary to provide mobility in these areas.

Technical assistance for Bay Area agencies and organizations interested in developing public-private partnerships for new suburban mobility options is needed. MTC can provide guidance on requirements and best practices for ensuring equitable access to all mobility options. MTC and Bay Area operators can establish minimum data sharing requirements and minimum service characteristics. Technical assistance and region wide policies can help transit agencies and human service transportation providers expand non-ADA subsidized same-day trip programs through partnerships with taxi or ride-hailing companies. Subsidized carshare programs and low-income vehicle loan programs are essential to ensuring that low-income people have access to vehicles when trip patterns render transit not an option.

Best Practice Examples:

KEYS Auto Loan Program (Contra Costa County): The Keeping Employment Equals Your Success (KEYS) Auto Loan Program at Contra Costa County's Employment and Human Services Department (EHSD) offers a low-interest auto loan for CalWORKs participants who are unable to qualify for an auto loan on their own. In order to qualify for an auto loan in the KEYS program, a CalWORKs participant must meet the following eligibility requirements:

- Valid driver's license
- No more than one point on driving record
- Employed full-time with the same employer for at least three months

An eligible CalWORKs participant may be eligible for a loan up to $5000. The loan recipient must pay back their KEYS loan within a two-year period over monthly payments. Additionally, she or he must attend basic automobile maintenance and budget management classes.

DriveForward (Peninsula Family Service): Peninsula Family Service's DriveForward program offers auto loans to help individuals who cannot qualify for an auto loan on their own acquire a car, and mend their credit. To qualify for participation in the DriveForward program, a person must meet the following eligibility requirements:

- Valid California driver's license
- Annual household income of $75,000 or less (for a family of three)
- Live or work in San Mateo or Santa Clara counties
- Demonstrate ability to afford loan payments
- Attend a financial workshop
- Meet one-on-one with a member of the Peninsula Family Service Financial Empowerment Team

If a person meets the requirements and is approved by the Peninsula Family Service Loan Committee, she or he must select a vehicle that passes third-party certified mechanic inspection before purchasing. DriveForward requires the inspection before issuing a loan in an effort to ensure that a vehicle is safe for the participant.

LAVTA GoDublin Pilot: In 2017, the Livermore-Amador Valley Transportation Authority launched GoDublin, a year-long pilot partnership between the agency, two ride-hailing companies, and a local taxi company. In the pilot, participants can use a unique code either through the ride-hailing apps or with the taxi company to receive a discount on rides that start and end within the jurisdictional boundaries of Dublin, CA. The pilot grew out of the agency's 2016 Comprehensive Operational Analysis, which revealed low productivity on two routes and spurred the agency to consider supplemental service as a way to maintain coverage more cost-effectively.

Like other transit/ride-hailing partnerships, this pilot is still in its early days and no formal evaluation of impacts has been conducted. The agency plans to conduct and release such an evaluation by mid 2018. As such, this, and other transit/ride-hailing partnerships, are not best practice examples per se, but rather demonstrate a recent trend for agencies trying to address suburban mobility challenges in a more cost effective manner.

Recommendations for MTC

Define the Channels to Provide Shared Mobility Technical Assistance

Human service providers, transit agencies, and municipalities serving seniors, people with disabilities, veterans, and low-income groups in the Bay Area want to leverage new mobility service providers — such as carshare, ride-hailing, and bikesharing — to serve their constituents and reduce costs.

MTC can help ensure that partnerships have the best interests of all, and can start by defining appropriate channels to provide technical assistance. Key areas include:

- Providing regular venues for agencies who have piloted flexible transit in low-density areas (e.g. VTA and AC Transit) to communicate lessons learned and best practices to other transit agencies.
- Creating a region wide policy statement on the goals of public/private shared mobility partnerships and the values they should uphold in coordination and alignment with similar ongoing efforts within the agency.
- Establishing recommended policies for minimum data sharing requirements and service characteristics for public-private partnerships in coordination and alignment with similar ongoing efforts within the agency.

Recommendations for Partners

Fund Low-Income Vehicle Programs

County transportation and transit agencies should prioritize and fund low-income carshare subsidy programs to increase access to vehicles for occasional trip needs, such as shopping or medical appointments. Implementation partners may be cities with on-street carshare programs, senior centers or large developments that provide access to carshare vehicles on-site, or non-profits who can coordinate across several carsharing programs.

MTC and County transportation and transit agencies should prioritize and fund low-income vehicle loan programs for individuals whose typical trip patterns render transit not an option. This program would include funds for vehicle purchase, insurance, and maintenance, and could be implemented in coordination with county-level partners.

Prioritize One-Click Systems

County transportation and transit agencies should prioritize the development and funding of one-click systems that increase the awareness of existing suburban mobility options, and potentially make it easier to pay for trips. CMAs and mobility managers should ensure the integration of all locally available public and private mobility options to increase the availability of non-driving options.

STRATEGY 4: MEANS-BASED FARES*

Regional Means-Based Transit Fare Programs

Based on comprehensive input from stakeholders in the needs assessment of this plan, as well as other

Bay Area needs assessments and studies, transit affordability has been and continues to be a key issue for some segments of the population.

MTC has been leading a study to develop scenarios and evaluate the feasibility of implementing a regional means-based transit fare program in the nine-county Bay Area to make transit more affordable for low-income residents. The findings and recommendations of this study are expected to be available in early 2018. Recommendations for MTC and agency partners are outlined below.

Recommendations for MTC and Partners

Build Consensus for Implementation of Means-Based Fares

Pending the conclusion of the Means-Based Fare Study, MTC should continue working with transit operators to develop an implementable program and seek funding to support this effort.

STRATEGY 5: SHARED AND FUTURE MOBILITY OPPORTUNITIES*

Advocate for the Accessibility of Emerging Shared Mobility Solutions and Autonomous Vehicles

Shared mobility solutions, such as bikeshare, carshare, ride-hailing, and microtransit are options available to the public today. Most shared mobility providers are private entities, and as such may or may not prioritize service to traditionally underserved groups. MTC, CMAs, cities and counties can play an important role in ensuring access to these systems and their future driverless products, which, when taken together with public transit, promise a more seamless and convenient mobility ecosystem. Innovation must be balanced with equity and accessibility concerns. Relying exclusively on the use of smart phones, credit/debit cards, English language only, and non-accessible vehicles limits who can use emerging mobility services. MTC, CMAs, cities and counties should:

- Leverage shared and future mobility programs to liaise with the technology and automotive industries and advocate for the physical, temporal, financial, and geographic accessibility of these systems for users of all abilities
- Develop a statement of guidance to formalize agency position on these topics
- Create and fund accessible bikeshare pilots with local partners
- Create and fund subsidized shared mobility programs, such as was recently implemented by MTC with Bay Area Bike Share (now Ford GoBike), to increase access to low-income populations by incentivizing private providers to locate in traditionally underserved areas at discounted rates
- Fund cities' and non-profits' purchase of wheelchair-accessible vehicles to contribute to a "flexible fleet," made available to taxi companies, ride-hailing services, or carsharing programs

Best Practice Examples:

San Francisco: In 2017, the San Francisco County Transportation Authority and San Francisco Municipal Transportation Agency adopted Guiding Principle for Management of Emerging Mobility Services and Technologies.[42] That document serves as a framework for the implimentation of policies and programs. Further, the principles will guide decision-makers in evaluating exisiting services, identifying best practices and strategies, and highlighting goals when the City collaborates with transportation providers. The ten guiding principles[43] are:

1. Maintain roadway safety through SF Vision Zero
2. Encourage mass transit through SF Transit First
3. Ensure equitable access for people of all backgrounds or means
4. Increase mobility opportunities for people of all abilities
5. Improve environmental sustainability and reduce greenhouse gas emissions through SF Climate Action Strategy
6. Reduce roadway congestion
7. Improve accountability through data driven decision making
8. Ensure fairness in labor practices
9. Promote positive financial impacts and a state of good repair
10. Collaborate openly with public agencies, the community and innovative companies to improve our city together

Los Angeles: In August 2016, the City of Los Angeles' Transportation Technology Strategist published "Urban Mobility in a Digital Age," a plan

*Pending Commission Direction

42 Guiding Principle for Management of Emerging Mobility Services and Technologies. San Francisco, CA: City of San Francisco, 2017.

43 SFCTA. http://www.sfcta.org/emerging-mobility/FAQ#gui

to focus the City's regulatory and service provision responsibilities in an evolving ecosystem of mobility choices. Later that year, the Shared Use Mobility Center, TransitCenter, and the William and Flora Hewlett Foundation collaborated with Los Angeles County to create the "Shared Mobility Action Plan for Los Angeles County."

Each of these guiding documents highlights accessibility — both physical and economic accessibility — as necessary goals for shared mobility and autonomous vehicles within their jurisdictions. Further, both recognize the important role of local government in ensuring accessibility as a means to achieve community values.

"Without a proactive role by local government, connected and automated vehicles may not fulfill the promise of making our roadways safer, more efficient, and more accessible." [44]

"As California considers strategies to put TNCs and taxis on an 'even playing field' through statewide regulation, several of the taxi industry's legacy consumer and safety provisions — such as mandates to provide wheelchair-accessible vehicles and serve low-income neighborhoods — hang in the balance."

The Shared Mobility Action Plan makes a specific policy recommendation to apply public transit's focus on equity and accessibility to shared mobility. The plan encourages the County to work closely with Access Services — the county's ADA Paratransit provider and Consolidated Transportation Services Agency (CTSA) — to "identify and test how shared mobility can meet ADA requirements and improve the rider experience." In March 2017, a Shared Mobility Action Plan Implementers Council — comprised of stakeholders from transit agencies, cities, advocates, and mobility service providers — was formed to coordinate implementation efforts.

STRATEGY 6: IMPROVE MOBILITY FOR VETERANS

Veterans'-Specific Mobility Services

Some of veterans' mobility needs will be addressed by other strategies recommended in this plan — such as creating a more seamless transit experience or means-based fare programs. However, additional mobility services could address the affordability and access needs unique to veterans in the Bay Area, such as implementing new services for medical long-distance trips.

44 Urban Mobility in a Digital Age. Los Angeles, CA: City of Los Angeles, 2016

Serve Long-Distance Medical Trips for Veterans and Local Veterans' Shuttles

MTC can also support the development of new services designed specifically for veterans. While some of the Bay Area's veteran population is concentrated close to VA Hospitals and other veteran-specific health clinics, many parts of the region are more rural in nature, and veterans must travel long distances to reach the care they need. Other regions have set up frequent long-distance coach bus services to connect veterans with these health centers. In other locations, transit agencies have designed fixed-route shuttles around the specific needs of veterans (based on their home locations and health clinics or community centers). Volunteer driver programs have had difficulty serving these types of trips due to constraints in recruiting veteran drivers.

Best Practice Example:

- **Lufkin-Houston Veterans Bus:** Former U.S. Congressman Charlie Wilson was instrumental in obtaining private funding for the launch of a coach bus service between Lufkin and Houston — where the VA has a large medical center. The vehicle was funded by a local foundation that coordinated volunteers to distribute coffee and donuts to passengers each morning. The program, administered by the Brazos Transit District and operated by Coach America, transports 35 to 40 veterans every day. Since the launch of the service, additional "last-mile" shuttles have been initiated to connect people to Lufkin from smaller communities up to 40 miles away. Angelina County determined that a volunteer driver program was infeasible for this need given the distance and scale of demand.
- **Monterey-Salinas Transit (MST) Veterans Shuttle:** In May 2017, MST launched a new fixed-route service designed to meet the local mobility needs of veterans. A new VA clinic will open in August, and the route serves that destination as well as an integrated health facility and an area with veteran residential density.

Create a Forum for Veterans to Advise MTC on Mobility Needs

This plan recognizes that there are further opportunities to address veterans' mobility needs in the Bay Area. In some cases, the needs are regional in nature; in others, there are specific local gaps. However, more dialogue is needed to refine strategies to meet Bay Area veterans' needs. MTC can coordinate forums for this dialogue to take place.

RECOMMENDATIONS TIMELINE

This section outlines the recommended timeline for the immediate and longer-term steps required for MTC, CMAs, transit providers, and human services providers to adopt and implement this plan. **Figure 5.3** lists each component of the previously listed strategies. The recommended timeline for implementing each recommendation is included in the figure. The timeline categorizes the recommendations into the following periods: **Keep the Momentum (next 6-12 months), Implement the Basics (next 1-2 years)**, and **Build Out the Program (next 3-5 years)**. Each recommendation is also marked with the anticipated level of effort required for implementation. These are categorized as minimal, moderate, and high.

Figure 5.3 Implementation Timeline

Strategy	Recommendation	Timeline	Level of Effort
STRATEGY 1: COUNTY-BASED MOBILITY MANAGEMENT	Recognize Mobility Management as a Regional Priority	Keep the Momentum (next 6-12 months)	Minimal
	Set Schedule for Coordination Summits and Assess Opportunities to Incentivize Coordination	Keep the Momentum (next 6-12 months)	Minimal
	Identify Sustainable Sources of Flexible Funding for County-Based Mobility Management	Implement the Basics (next 1-2 years)	Moderate
	Plan and Implement Mobility Management Technical Assistance Program	Implement the Basics (next 1-2 years)	High
	Implement Regular Coordination Summits	Implement the Basics	Moderate
	Create Consolidated Transportation Service Agencies and Seek Funding for County-Based Mobility Manager Positions	Build Out the Program (next 3-5 years)	High
STRATEGY 2: IMPROVE PARATRANSIT	Begin Policy Discussion around Medi-Cal Cost Recovery Program for the Bay Area	Keep the Momentum (next 6-12 months)	Moderate
	Convene Task Force to Assist in Implementation of In-Person Eligibility	Implement the Basics (next 1-2 years)	Moderate
	Take Opportunities to Expand Subsidized Same-Day Trip Programs	Implement the Basics (next 1-2 years)	Moderate
	Implement Medi-Cal Cost Recovery Program	Build Out the Program (next 3-5 years)	High
STRATEGY 3: PROVIDE MOBILITY SOLUTIONS TO SUBURBAN AREAS	Define the Channels to Provide Shared Mobility Technical Assistance	Keep the Momentum (next 6-12 months)	Moderate
	Fund Low-Income Vehicle Programs	Implement the Basics (next 1-2 years)	High
	Prioritize One-Click Systems	Build Out the Program (next 3-5 years)	High
STRATEGY 4: MEANS BASED FARE*	Build Consensus for Implementation of Means-Based Fares	Keep the Momentum (next 6-12 months)	High
STRATEGY 5: SHARED AND FUTURE MOBILITY OPPORTUNITIES*	Advocate for Equity in Shared and Autonomous Mobility Services	Implement the Basics (next 1-2 years)	Moderate
STRATEGY 6: IMPROVE MOBILITY FOR VETERANS	Create a Forum for Veterans' Mobility Needs	Implement the Basics (next 1-2 years)	Moderate
	Identify Funding for Veterans'-Specific Mobility Services	Build Out the Program (next 3-5 years)	High

*Pending Commission Direction

PROGRESS REPORTING

Prior to the next Coordinated Plan update, MTC should assess progress made to implement the strategies called for in this Coordinated Plan. This assessment should include a report back to the members of this plan's Technical Advisory Committee and an update to the Commission. The evaluation will provide valuable input to the Coordinated Plan's next update, and should not wait until the next planning phase commences. Rather, a bi-annual progress reporting schedule is recommended.

APPENDIX A

Demographics

Figure A.1 Existing 2014 Population Breakdown

Subject	Alameda County		Contra Costa County		Marin County		Napa County		San Francisco County	
	Total	65 years and over	Total	65 years and over	Total	65 years and over	Total	65 years and over	Total	65 years and over
Total population	1,610,921	200,925	1,111,339	157,940	256,802	46,638	139,253	22,271	852,469	122,906
% over 65	12.5%		13.0%		16.0%		16.0%		14.4%	
% with disability	9.6%	33.1%	11.0%	33.2%	9.0%	25.6%	11.2%	35.4%	10.4%	34.8%
% below 200% of poverty level (2015)	25.2%	26.7%	24.3%	22.2%	19.1%	16.6%	27.9%	21.4%	25.3%	35.8%
% population without vehicle	3.5%	10.1%	2.1%	6.4%	2.3%	7.1%	1.9%	6.8%	13.0%	24.2%
% population who are veterans	3.3%	13.6%	4.4%	17.9%	4.7%	17.6%	5.4%	22.0%	2.8%	11.0%

SOURCE: 2014 American Community Survey 5-Year Estimate S0101; 2014 American Community Survey 1-Year Estimate S0103; 2015 American Community Survey 1 year Estimate B17002; 2015 American Community Survey 5-year Estimate B17024; 2014 American Community Survey 3 year Estimate B25045; 2014 American Community Survey 1 year Estimate S0103; 2014 American Community Survey 1-Year Estimate S0103

Figure A.1 Existing 2014 Population Breakdown

Subject	San Mateo County		Santa Clara County		Solano County		Sonoma County		Region	
	Total	65 years and over	Total	65 years and over	Total	65 years and over	Total	65 years and over	Total	65 years and over
Total population	758,581	111,339	1,894,605	231,475	421,624	52,311	500,292	82,536	7,545,886	1,028,341
% over 65	14.0%		12.2%		12.4%		16.5%		13.6%	
% with disability	8.7%	30.7%	7.6%	33.5%	11.1%	36.4%	12.0%	32.1%	9.6%	32.9%
% below 200% of poverty level (2015)	20.6%	21.0%	20.7%	24.4%	30.2%	24.1%	28.3%	22.6%	23.8%	24.9%
% population without vehicle	1.9%	6.4%	1.7%	6.6%	1.8%	5.3%	2.1%	6.6%	3.5%	9.3%
% population who are veterans	3.2%	13.2%	2.9%	13.9%	7.5%	25.8%	5.7%	21.2%	3.8%	15.6%

Figure A.2 Veteran Statistics

County	Number of Veterans	% of Total Population who are Veterans	% of Veterans who Live in Poverty*	% of Veterans who are Disabled
Alameda	53,888	4%	7%	29%
Contra Costa	12,092	6%	5%	31%
Marin	23,875	6%	4%	26%
Napa	55,533	7%	2%	29%
San Francisco	31,694	3%	6%	28%
San Mateo	28,341	4%	3%	23%
Santa Clara	286,013	4%	6%	27%
Solano	53,888	10%	4%	29%
Sonoma	12,092	7%	8%	29%
Region	23,875	5%	6%	28%

*Living below National Poverty Level

SOURCE: American Community Survey 1 year estimates 2000-2014

APPENDIX B

List of Feedback Themes

Figure B.1 List of Feedback Received in Order of Frequency

Themes	Comments Received
Spatial Gap	31
Fares	28
Information and I&R Services	26
Funding	22
Healthcare Access	20
Temporal	19
N/A	15
Ped/Bike	14
Taxi/TNC - Accessibility	12
Coordination & Cooperation	10
Public Transit - Accessibility	9
Transfers	8
Fare media	6
Emerging mobility services	6
Housing & Land Use	6
Public Transit - Amenities	6
Planning/Study	6
Eligibility	5
Travel Training	5
Transit Access	5
Non-ADA Paratransit	5
Volunteer Driver	5
Congestion	5
Mobility Management	5
Drivers	4
Auto access	3
Level of Service	3

Themes	Comments Received
Limited volunteers	3
Capital	2
Efficiency	2
Transportation Options	2
Regulation	2
Technology	2
Language	2
Job Access	2
ADA Paratransit	2
Public Transit - Access	2
On-time Performance	2
Same-Day Transportation	2
Resource sharing	2
Frequency	1
Safety	1
Mission creep	1
Senior Sensitivity	1
Enforcement	1
Providers	1
Quality of Service	1
Station Access	1
Constituency gaps	1
Equity	1
Youth	1
Fleet	1
Community connection	1
Grand Total	**329**

APPENDIX C

List of Feedback Comments

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	

	Theme	Comment
	Spatial Gap	Since the study was last done, many seniors have moved into older adult communities on the Coastside, so outreach to educate about available transit resources to seniors in that area is greatly needed.
	Spatial Gap	East Palo does not have a city-wide shuttle service at this time.
	Spatial Gap	More access to the College of San Mateo is needed. There is no direct service to Canada and other local colleges from the Coastside.
	Spatial Gap	Demand-response service is available to residents of Pescadero, La Honda, and other Coastside communities, but more is needed.
	Ped/Bike	Heller Street in Redwood City does not have curb cuts at many points. In general the sidewalks in Redwood City are in poor condition
	Ped/Bike	At Perimeter Road at CSM, there are no curb cuts to cross the road.
	Ped/Bike	Many cities in San Mateo County allow people to park on rolled curbs (sidewalks), blocking access to pedestrians.
	Public Transit - Amenities	The bus stop at El Camino and Trousdale in Burlingame is poorly lit and blocked by overgrown vegetation.
	Ped/Bike	In Burlingame non-intersection crosswalks are being identified with extra signs and lights.
	Ped/Bike	Many sidewalks in the county are uneven and inaccessible to individuals using mobility devices.
	Public Transit - Amenities	Bus shelters at Daly City Kaiser (395 Hickey Blvd.) have been missing.
	Ped/Bike	Audible crossing signal from El Camino is needed.
	Level of Service	Some people with disabilities need personalized assistance (escort service) that is not available on Redi-Wheels. *This statement may mean either door-to-door (which is not relevant as it is required under the ADA) or a ride escort.
	Transfers	Single vehicle (one seat ride) paratransit from the county of origin to other parts of the Bay Area would be helpful.
	Level of Service	Courtesy stops or ride wait (for pharmacy trips, etc.) should be available
	Non-ADA Paratransit	Taxi discount voucher programs (subsidized taxi).
	Taxi/TNC - Accessibility	There is a strong need for accessible taxis in the County
	Ped/Bike	Some portions of the Coastal Trail are in poor repair and inaccessible to individuals with mobility issues.
	Information and I&R Services	In Contra Costa County, resources are available at the DMV for individuals who are no longer able to drive.
	Information and I&R Services	511 information service is useful for individuals who use paratransit, as well.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Solutions	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	N/A	
6/13/2016	San Mateo County Paratransit Coordinating Council	San Mateo	Gaps	

	Theme	Comment
	Information and I&R Services	Information and referral service agencies like HART want to have more information about resources to further explain information to their clients. Information about connecting from San Mateo County to San Francisco is needed.
	Information and I&R Services	In Contra Costa County, resources are available at the DMV for individuals who are no longer able to drive.
	Information and I&R Services	The NBC has discussed the need for a Transit Information Hotline. Jean Conger presented information about this developing resource in her presentation to the PAL Committee at the May meeting. Programs at SamTrans include Veterans Program, Transit Mobil.
	Information and I&R Services	Many low-income individuals lack Internet-access. A suggestion was made that there be transportation information kiosks in shopping centers.
	Fares	SamTrans said that the price of Day Passes for SamTrans have been lowered to make them more affordable for families, since purchasing individual fares for families can be costly.
	Language	Alternative language service is available for fixed-route and paratransit service. SamTrans Customer Service use the AT & T language line to assist customers who do not speak English as a first language.
	Information and I&R Services	There are no direct trips from Pacifica to the SF VA Center. The American Cancer Society, HART, and the PJCC do not serve residents of Pacifica. All passengers going to the VA are sent to a transfer point in San Bruno. It was discussed that information should be provided to clients in this situation about temporary paratransit certification.
	Eligibility	The criteria for individuals to qualify for Lifeline Assistance make it hard for people who may be slightly above the Medi-Cal level but still can't afford transit. A pilot program with Lyft is being conducted at Little House, but funding is complicated.
	Healthcare Access	East Palo Alto individuals do not have direct, fixed-route service to San Mateo Medical Center. A transfer and drop off is located at El Camino Real and 37th Avenue, but patients are still required to walk the remaining distance up a hill to the SM Medical Center (County Hospital). The cost of this trip and transfers is a great hardship for low-income individuals. Craig added that getting to this medical facility is a hardship for many people because of the distance to the stop and the terrain.
	Public Transit - Amenities	A walk of two blocks is needed to get from the closest bus stop in Menlo Park to the Ravenswood Family Health Clinic. The bus stop lacks a bench, shelter, and busy cross-traffic makes using fixed-route service from the clinic very difficult.
	Healthcare Access	Health Plan of San Mateo County patients lack fixed-route service to that location, which is a significant hardship for people without cars. The Genentec option does not work well for them.
	N/A	Someone should reach out to the Caltrain and SamTrans Accessibility Advisory Committees for input on the MTC Coordination Study.
	Enforcement	Cars parking at bus stops affect the access for seniors and people with disabilities. People have to board and disembark in the street. If ramps are used to board buses, the slope is steeper if the ramp goes to the street, rather than to the curb. The parked cars also affect visibility, making it harder for Bus Operators to see people waiting at bus stops. Some customers would benefit from curb cuts at bus stops, especially in cases where the bus is not able to fully access the curb due to parked cars or other obstructions. The group also agreed that cities should be encouraged to lengthen less than full-size red zones at bus stops, since some marked bus stops are not actually large enough to be served easily by a 40-foot bus.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Solutions	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Contra Costa Paratransit Coordinating Council	Contra Costa	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	

	Theme	Comment
	Funding	There is a concern with rising costs that Transit providers may roll back paratransit service to strict ADA rules, excluding seniors.
	Mobility Management	Lack of knowledge on the part of transit operators of other accessible services. They don't refer riders who don't qualify for paratransit.
	Eligibility	Conditional eligibility is an important aspect of ADA paratransit.
	Mobility Management	County level documentation doesn't address travel needs that go outside county lines
	Mobility Management	Paratransit service should go beyond requirements of ADA.
	Transit Access	Fixed-route bus stops are often not accessible or safe for on- and off-boarding with wheelchairs.
	Taxi/TNC - Accessibility	Not enough accessible taxis.
	Taxi/TNC - Accessibility	TNCs don't provide wheelchair service.
	Mobility Management	Paratransit should be divorced from transit service provision.
	Temporal	Paratransit doesn't serve Sunday religious services and weekends.
	Temporal	Paratransit service hours and locations are too restrictive.
	Funding	Not enough funding for services beyond ADA.
	Funding	Existing funding doesn't allow for everyone to be served.
	Spatial Gap	Access to and from West Marin (including communities such as Bolinas, Point Reyes Station and Nicasio) is difficult, with limited or no public transit available.
	Spatial Gap	There is no transportation or paratransit service in the Pt. San Pedro area.
	Temporal	There is a shuttle service called Stagecoach in West Marin, but provides limited service.
	Temporal	Temporal remains the same as in the 2013 Coordinated Plan. New information provided that weekend service stops at 8:00 pm so there are then no other transportation alternatives.
	Temporal	In Tiburon, transit service ends at 7:30 pm
	Taxi/TNC - Accessibility	Marin needs accessible taxi service. Taxi service in Novato is no longer serving Novato as North Bay Taxi Company shut down.
	ADA Paratransit	Currently, 40% of paratransit service needs are being met.
	ADA Paratransit	Between 2 and 3 p.m. there are service capacity issues. Trips are provided but timing of trips can be impacted.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Solutions	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/18/2016	Marin Paratransit Coordinating Council	Marin	Gaps	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Gaps	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Gaps	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Solutions	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Gaps	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Gaps	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Gaps	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Solutions	
7/7/2016	Napa Paratransit Coordinating Council	Napa	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Solutions	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	

	Theme	Comment
	Public Transit - Access	Group indicated some upgrades have been made due to SMART train.
	Ped/Bike	Topography causes accessibility issues for seniors and persons with disabilities (valley/ hills are challenging).
	Ped/Bike	Mobile home parks also currently don't have sidewalks.
	Housing & Land Use	Many residents age in place in inaccessible neighborhoods and don't have options to move into more affordable housing.
	Non-ADA Paratransit	Two service providers were mentioned as no longer being in business: Elton's and On the Move.
	Healthcare Access	Insufficient transit service outside the City of Napa, particularly Lake Berryessa, Middletown and Pope Valley. Also, St. Helena to Kaiser Hospital does not have service and there is no form of transit East of St. Helena. Note: Calistoga just put in a shuttle bus service from Santa Rosa to Calistoga due to two large developments. Interest by these employers to provide to employees. $18 per rider, seems expensive.
	Healthcare Access	Not enough paratransit and fixed transit for people in nursing homes trying to get to doctors. If person does not qualify (ADA) there is insufficient transit service and taxi services may cost up to $100 per trip. Person may take ambulance instead, very costly.
	Non-ADA Paratransit	Taxi Scrip provides seniors 65 or older, or ADA certified or disabled persons with 50% discount booklets for taxi service in the City of Napa, during off-hours of the Vine fixed-route transit or if the individual does not feel well enough to take the bus during regular hours. Would like to extend this service beyond City of Napa.
	Temporal	There is limited weekend transit service after 6pm. The only services available are in St. Helena and Calistoga through the Chamber of Commerce, due to tourism demand.
	Volunteer Driver	Volunteer Driver program - mileage reimbursement for drivers. Restricted to medical necessity rides. Have to be in rural area with no transit access whatsoever. Honor system. Molly's Angels also provides volunteer's to and from medical appointments, shopping, etc. in Napa Valley.
	Volunteer Driver	Reimbursement given to driver. Should there be a cap on subsidy per year?
	Healthcare Access	There is a new Health & Human Services campus and staff are reviewing providing a shuttle program for employees.
	Ped/Bike	Bicycle & Ped Plans. Sidewalks don't necessarily exist where needed. Difficult for persons with disabilities and some seniors. NVTA staff indicated they will be embarking on a Bus Stop Improvement Plan as new Planning staff are hired soon. In addition, NVTA staff will embark on a comprehensive operational analysis to review every transit service they operate. They will see how senior/low-income persons use fixed-route transit.
	Eligibility	Sonoma county transit doing in house eligibility- Petaluma and city bus on same contract.
	Public Transit - Accessibility	Bathroom access at transit centers crucial for people with disabilities.
	Public Transit - Accessibility	More wheelchair positions on fixed-route - flip seats.
	Taxi/TNC - Accessibility	Taxis - accessible and available.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Gaps	
7/19/2016	Sonoma Paratransit Coordinating Council	Sonoma	Solutions	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Solutions	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Solutions	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	

	Theme	Comment
	Taxi/TNC - Accessibility	Need smart phone for TNC vehicles.
	Taxi/TNC - Accessibility	TNC vehicles not accessible.
	Information and I&R Services	Info kiosks should provide real time status info for bus lines.
	Information and I&R Services	511 not working for city bus.
	Public Transit - Accessibility	Sidewalks and places to sit at bus stops.
	Ped/Bike	Auto countdown signals are preferable for people who are disabled.
	Ped/Bike	Longer time to cross streets.
	Funding	Not enough funding for all the needs.
	Ped/Bike	Pedestrian improvements - even streets and curb cuts.
	Transit Access	Complete streets philosophy should be adopted everywhere - move people all people not cars.
	Temporal	There are limited times you can travel on transit in the county.
	Spatial Gap	Disabled transportation to Travis is limited.
	Coordination & Cooperation	We need a countywide vehicle share program for non-profits to use paratransit vehicles.
	Temporal	There needs to be a coordinated system to provide after-hours transportation for people with disabilities.
	Fares	Transit is too costly.
	Spatial Gap	There is no direct service between some cities in the county.
	Transfers	Transfers on paratransit are difficult and expensive.
	Funding	There is not enough money for solutions.
	Funding	Funding that is available is limited in its eligibility.
	Temporal	Reverse commute from SF is difficult - no Owl service.
	Temporal	Paratransit should be extended beyond regular service hours.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Gaps	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Solutions	
7/21/2016	Solano Paratransit Coordinating Council	Solano	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	

	Theme	Comment
	Taxi/TNC - Accessibility	There are agencies in the county who have accessible vehicles that are not being used after hours -- should be coordinated with other programs.
	Coordination & Cooperation	Between coordination is needed for travel between systems out of the county.
	Transit Access	It is great there are passenger loaders at busy stations during rush hour. This helps people in wheelchairs load faster and also helps with people who have bikes.
	Temporal	Public transit hours should be extended so that paratransit can also be extended
	Spatial Gap	East county is isolated. Hardly any way to get over the hill in transit.
	Volunteer Driver	Volunteer driver programs are important.
	Funding	Match requirements are high for non-profits.
	Spatial Gap	AC Transit routes should go more into the hills so that paratransit can go into the hills.
	Travel Training	Travel training programs are important.
	Drivers	Driver training on how to deal with people with disabilities. Sensitivity and loading wheelchairs. Sensitivity for all disabilities.
	Funding	Not enough funding for these programs.
	Spatial Gap	Paratransit Tri-Valley to inner East Bay should be easier.
	Funding	Vehicle license fee for roadmap!
	Information and I&R Services	When is my bus or vehicle coming? Notifications are great! Don't have to wait outside
	Information and I&R Services	Would be nice to know when elevator is down at BART
	Transit Access	Bathrooms should be cleaner
	Fares	Fare structure for East Bay Paratransit is confusing. Should be simpler.
	Spatial Gap	Land use planning should be a part of transportation planning.
	Spatial Gap	More housing in Emeryville. Will transit serve it?
	Fares	Clipper type card for visitors who have disabilities to the region.
	Fares	Transit is too costly. Need means-based testing for ADA and non-ADA paratransit.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Gaps	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
7/25/2016	Alameda Paratransit Advisory and Planning Committee & Paratransit Technical Advisory Committee	Alameda	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	

	Theme	Comment
	Spatial Gap	Better transit and paratransit connections for the Tri-Valley and the East Bay.
	Travel Training	Need more travel training services to direct people to public transit as opposed to paratransit, when possible.
	Information and I&R Services	Better communication from transportation providers, including ADA paratransit, on arrival times so passengers can be prepared.
	Information and I&R Services	Better standby process for ADA paratransit users.
	Station Access	Improve BART station elevators; need regular maintenance and cleaning
	Fare media	Universal senior and disabled fares and payment mediums across fixed-route transit
	Housing & Land Use	More coordination and planning around transportation, housing and other land use issues
	Fare media	Better access to public transit fare mediums for seniors and people disabilities visiting the area
	Fares	Transit is not affordable for a lot of people
	Congestion	Congestion is a major problem in SF. It makes it impossible for transit, paratransit and taxis to get around in a timely manner.
	Congestion	TNCs are responsible for uptick in congestion.
	Same-Day Transportation	Rideshare apps for seniors/low-income people to use to lower cost of taxis (Arro and Bandwagon).
	Congestion	Double parking makes it difficult for transit, paratransit and taxis to get around in a timely manner.
	Information and I&R Services	Automated voice information on transit should be louder.
	Information and I&R Services	Automated voice information on transit should announce that seats are reserved for seniors and people with disabilities.
	Frequency	Increase transit service on certain lines during tourist season.
	Information and I&R Services	A pamphlet about seats being reserved for seniors and people with disabilities should be provided with Muni tokens or short-term passes.
	Drivers	San Francisco should provide a universal license for drivers of taxis and paratransit.
	Congestion	There should be more enforcement for red lanes and the city should clarify that TNCs are private vehicles, not commercial vehicles.
	Congestion	Paratransit vehicles should be considered MUNI vehicles and should be able to turn left where buses are able to turn
	Healthcare access	Dialysis transportation continues to be a tremendous need. A more flexible transportation option, other than paratransit should be made available.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Gaps	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
8/10/2016	San Francisco Paratransit Coordinating Council	San Francisco	Solutions	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Solutions	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Solutions	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Solutions	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
10/12/2016	VTA Committee for Transit Accessibility	Santa Clara	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	

	Theme	Comment
	Information and I&R Services	Electronic stop information signs are at the front of the bus, but should also be in the middle at the back of the bus.
	Transfers	Transfers into San Mateo County continue to be very difficult. SFMTA and SamTrans need a cost sharing agreement.
	Information and I&R Services	Elevator outage information should be on the 511 system or some other way.
	Fare media	It would be great if taxis and paratransit could take Clipper.
	Temporal	Weekend fixed-route service is lacking.
	Healthcare access	NEMT is lacking.
	Spatial Gap	Outreach provides crucial gap services.
	Fares	Voucher and subsidy programs are needed for low-income, seniors and people with disabilities.
	Fares	Transit, paratransit and same day paratransit service is very expensive
	Fares	Same day paratransit services at VTA is 4x the regular fare. This is too expensive for most people in an emergency.
	Information and I&R Services	Privately operated, but publically funded "Google" shuttles are open to the public. It is difficult to understand which shuttles are open to the public.
	Funding	It is difficult to access medical reimbursement funding for NEMT.
	Healthcare access	Hospital discharge plans used to be coordinated. A guaranteed ride home program with taxi should be provided.
	Taxi/TNC - Accessibility	There is a great need for accessible taxis.
	Healthcare access	VTA should serve all the hospitals and schools.
	Taxi/TNC - Accessibility	There is a need for accessible vehicles that can accommodate large mobility devices.
	Spatial Gap	Transit service is south county is lacking.
	Transfers	Inter-county paratransit transfers are difficult. Currently VTA has agreements with SamTrans and East Bay Paratransit.
	Healthcare access	Number one request for rides is medical appointments.
	Spatial Gap	Can't address work/commute trips.
	Spatial Gap	Distances between homes and medical centers is becoming greater (particularly in Solano County).

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Solutions	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Solutions	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Solutions	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Gaps	
6/29/2016	Faith in Action (Solano), Executive Director	Solano	Solutions	
7/7/2016	Home First (Santa Clara)	Santa Clara	Gaps	
7/7/2016	Home First (Santa Clara)	Santa Clara	Solutions	
7/7/2016	Home First (Santa Clara)	Santa Clara	Solutions	
7/7/2016	Home First (Santa Clara)	Santa Clara	Gaps	
7/7/2016	Home First (Santa Clara)	Santa Clara	Gaps	
7/7/2016	Home First (Santa Clara)	Santa Clara	Gaps	
7/7/2016	Home First (Santa Clara)	Santa Clara	Gaps	
7/7/2016	Home First (Santa Clara)	Santa Clara	Solutions	
7/7/2016	Home First (Santa Clara)	Santa Clara	Solutions	

	Theme	Comment
	Limited volunteers	Don't have volunteer driver capacity to say yes to all trip requests (number of denials is rising, forcing seniors to hold onto their licenses longer than would be safe).
	Healthcare access	Veterans at Travis Air Force Base being transported to Martinez for medical; more referrals to Sacramento.
	Healthcare access	Some seniors originally moved to Solano County because of the medical coverage.
	Healthcare access	Limited funding sources available for their program; trying to get hospitals to share some of the costs (some have community benefit funds).
	Healthcare access	Unable to meet weekly need for dialysis patients (particularly early morning or repeat trips).
	Coordination & Cooperation	STA contracts with Faith in Action.
	Resource sharing	Having a shared fleet of vehicles that volunteers could use would be helpful to them; cost of replacing old fleet is prohibitive.
	Funding	5310 funding delay (2 years) is too long.
	Funding	TDA funding is limited because of the 10% farebox recovery requirement; they're dealing with low-income seniors; want to be able to count the volunteer labor as revenue.
	Limited volunteers	Currently, they don't reimburse drivers for mileage; if they could, this might help increase pool of drivers.
	Limited volunteers	Last surviving volunteer program in Solano County; must shoulder all demand.
	Funding	SolTrans was looking at an FTA Mobility on Demand Sandbox grant for Uber-like app, but didn't win.
	Mission creep	They are the largest homes shelter in the county (250 beds/night; 80 of those are veterans) -- primary mission is to get people in homes quickly, but they are distracted with need to assist in transportation.
	Fares	They offer financial assistance for mechanical repairs, bus tokens/passes, sometimes taxi fares.
	Fleet	With a fleet of 8 vehicles, they provide shuttle service to key points in the area (social security office, VA office, Valley Medical Center, nearby bus/transit centers).
	Funding	Biggest expenses are bus passes and maintenance of their fleet.
	Funding	Majority of funding through public grants (85%), of which 70% is from county; limited private investment.
	Transportation Options	Only 10% of shelter individuals have a vehicle.
	Regulation	Shelter has a Conditional Use Permit with the City that requires them to be able to transport clients out of the area when the shelter is not open/available (they must have transportation services available).
	Regulation	Working to address the Conditional Use Permit (CUP) requirement to meet everyone's needs.
	Resource sharing	Resource sharing with other social service mobility providers hasn't been explored, but think there is opportunity within the County.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/11/2016	Contra Costa Employment & Human Services, Transportation Services Specialist	Contra Costa	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Gaps	
7/6/2016	Cycles of Change, Advisor and Former Co-Director	Alameda	Solutions	
7/11/2016	North Bay Organizing Project, Executive Director (Sonoma)	Sonoma	Gaps	
7/11/2016	North Bay Organizing Project, Executive Director (Sonoma)	Sonoma	Gaps	
7/11/2016	North Bay Organizing Project, Executive Director (Sonoma)	Sonoma	Gaps	
7/11/2016	North Bay Organizing Project, Executive Director (Sonoma)	Sonoma	Gaps	

	Theme	Comment
	Fares	2012-2016 Area Agency on Aging Plan found that financial difficulty outweighs all other concerns about transportation in Contra Costa.
	Information and I&R Services	2012-2016 Area Agency on Aging Plan found that knowledge of services available is low.
	Constituency gaps	Department of Employment & Human Services is very constrained in who they can serve (due to funding): low-income youth, adults, and seniors.
	Job Access	Provide a door-to-door taxi service to assist job applicants in getting to interviews and first two weeks of job (20 free rides through CalWorks), but still have difficultly accessing work thereafter - uses MTC's LIFT funding (main source of program funding with 50% match).
	Temporal	Time spent on transit is the biggest barrier to getting employment and staying employed, particularly for low-income parents who must chain/link trips.
	Housing & Land Use	Affordable housing mainly in transit sparse areas.
	Transportation Options	Without transit options, constituents also lack personal vehicles; EHS offers a self-funding auto loan program.
	Fares	Cost of local bus is not prohibitive, but cost of BART is for this group of people.
	Funding	Funding gaps - primary through grants; expectation that successful programs will become self-sufficient after the grant period.
	Job access	Lack of access to transportation options within Oakland for job access, targeted to low-income individuals.
	Information and I&R Services	Lack of knowledge of how to bicycle, or how to combine bicycling with transit.
	Housing & Land Use	Focus on populations within 2-miles of BART stations, but housing often costly in these zones.
	Youth	Transportation gaps also exist for low-income youth; they would like to work more with schools and neighborhood-based community centers to reach parents and children at the same time (funding gaps for parental population; more funding available for low-income youth).
	Capital	Lack funding to purchase vehicles for hauling bicycles.
	Capital	Lack funding to purchase storage space for bicycle donations.
	Planning/Study	Want additional funding to do market analysis and planning to expand their model, create Neighborhood Bicycle Centers.
	Funding	Lack of funding for free transit for students pilot, advocated for by student groups at Sonoma State (couldn't identify funding to make up the farebox recovery requirement).
	Fares	Transit too expensive for students.
	Spatial Gap	Transit doesn't go to/from where students need to go (affordable housing far from transit).
	Spatial Gap	Transit doesn't serve the needs of seniors who are housed in centers far from transit or need access to services far from transit.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
9/1/2016	West Contra Costa Transportation Advisory Committee, Project Manager	Contra Costa	Gaps	
9/1/2016	West Contra Costa Transportation Advisory Committee, Project Manager	Contra Costa	Solutions	
9/1/2016	West Contra Costa Transportation Advisory Committee, Project Manager	Contra Costa	Solutions	
9/1/2016	West Contra Costa Transportation Advisory Committee, Project Manager	Contra Costa	Solutions	
9/1/2016	West Contra Costa Transportation Advisory Committee, Project Manager	Contra Costa	Gaps	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Gaps	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Solutions	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Solutions	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Gaps	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Solutions	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Solutions	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Solutions	
7/11/2016	Bay Area Partnership Accessibility Committee	Regional	Solutions	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Solutions	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Solutions	

	Theme	Comment
	Spatial Gap	Western Contra Costa needs Greater connectivity from West County to destinations in Martinez, Berkeley and Oakland, especially for medical appointments.
	Information and I&R Services	Western Contra Costa County needs one stop center for communicating all transportation options for senior, disabled and low income residents in the County.
	Information and I&R Services	Western Contra Costa County needs enhanced wayfinding signage in and around transit hubs pertaining to the needs of seniors and disabled residents – where to pick up a paratransit vehicle, etc.
	Travel Training	Western Contra Costa County needs training at senior centers on how to use app based services like Lyft and Uber.
	Senior Sensitivity	Western Contra Costa County has a need for services to assist the frail elderly and disabled by noting the need for door thru door services and attendant or companion support services.
	Healthcare access	NEMT, specifically dialysis trips continue to be a huge need.
	Funding	Is it possible to cut Caltrans out of the 5310 process for FTA direct recipients?
	Coordination & Cooperation	Regional centers should be required to cooperate with transit operators.
	Fares	Regional center reimbursement rates are very low so providers don't want to contract with them.
	Coordination & Cooperation	30% of BART paratransit service is for regional centers - we need a project together for transit operator/regional center cooperation.
	Efficiency	We need ITS improvement performances for systems to bring costs down.
	Planning/Study	We need research and policies on autonomous vehicles and how paratransit/people with disabilities will benefit.
	Spatial Gap	Regional centers should be required to assign people to the center closest to home.
	Providers	Concerned that VTA's paratransit service will be diminished by the cancelation of the Outreach contract.
	Public Transit - Amenities	Transit experience for the North bay is not good. Long wait times, lack of well lit, clean shelters with trash cans.
	Public Transit - Amenities	MTC should encourage transit operators to create parklets at bus stops.
	Temporal	Weekend/evening service is lacking for paratransit service users.
	Level of Service	Escorted door to door service is necessary.
	Eligibility	The ADA paratransit eligibility process should be easier.
	Drivers	Transit drivers should be trained to be aware of guide dogs and other issues for disabled people.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Solutions	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Solutions	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Solutions	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Gaps	
7/6/2016	MTC Policy Advisory Council Equity and Access Subcommittee	Regional	Solutions	
6/16/2016	Regional Mobility Management Group	Regional	Gaps	
6/16/2016	Regional Mobility Management Group	Regional	Solutions	
6/16/2016	Regional Mobility Management Group	Regional	Solutions	
6/16/2016	Regional Mobility Management Group	Regional	Solutions	
8/4/2016	Health Policy and Planning Program, San Mateo County Health System, Senior Planner	San Mateo	Solutions	
8/4/2016	Health Policy and Planning Program, San Mateo County Health System, Senior Planner	San Mateo	Solutions	
8/4/2016	Health Policy and Planning Program, San Mateo County Health System, Senior Planner	San Mateo	Solutions	
8/4/2016	Health Policy and Planning Program, San Mateo County Health System, Senior Planner	San Mateo	Solutions	
8/4/2016	Health Policy and Planning Program, San Mateo County Health System, Senior Planner	San Mateo	Gaps	
8/4/2016	Health Policy and Planning Program, San Mateo County Health System, Senior Planner	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	

	Theme	Comment
	Travel Training	Travel training programs are very important.
	Volunteer Driver	Volunteer driver programs are very important.
	Transit Access	MTC should capture and document conditions at bus stops across the region. Easter Seals evaluation took kit way to consistently evaluate stops.
	Quality of Service	Drivers are under pressure to keep on time. This causes jerking and speed ups that are hard on seniors and people with disabilities.
	Spatial Gap	Express buses make it difficult to visit neighborhoods between stops.
	Public Transit - Accessibility	Over packed buses are difficult for seniors and people with disabilities.
	Drivers	Transit operators should provide an extra staff to help load passengers at busy stations during rush hour. This helps seniors and people with disabilities.
	Planning/Study	If the inventory is not going to be in the next Plan, can it be stored and maintained elsewhere? It is very helpful when creating county inventories.
	Technology	Make sure technology projects are included in the solutions.
	Technology	Transportation Network Companies were not really in existence during the last Plan update. Will TNCs be included in this plan update?
	Funding	MTC should host and pay for the Travel Training and PASS courses.
	Emerging mobility services	Discussed low-income solutions: TNCs.
	Auto access	Discussed low-income solutions: auto loan programs.
	Emerging mobility services	Discussed low-income solutions: car share.
	Emerging mobility services	Discussed low-income solutions: equity aspects of autonomous vehicles.
	Fares	Transit is unaffordable for many low-income people.
	Fares	Discounted fares should be listed as medium or high, instead of low.
	Housing & Land Use	Land use policies should require new developments to provide financial support for coordinated transportation.
	Emerging Mobility Services	TNCs should provide discounted rides to seniors and people with disabilities.
	Emerging Mobility Services	TNCS could provide concierge services (i.e., carrying groceries, etc.).

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Gaps	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
8/4/2016	Peninsula Family Service, Director, Financial Empowerment Program	San Mateo	Solutions	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Solutions	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	

	Theme	Comment
	Mobility Management	There is a real need for a centralized body to coordinated activities in and between all nine counties.
	Language	To address language barriers, use more symbols, numbers and electronic times in on-board transit vehicles and at stops. Also, to help with older adults, make the font larger.
	Fares	Transit fares should be decreased for seniors and people with disabilities.
	Ped/Bike	Expand bike lanes to include small scooters and motorized wheelchairs.
	Planning/Study	Strategic planning is needed to connect services to major and minor hubs (BART, Caltrans, bus stops; with taxis, TNCs and other ride sharing).
	On-time Performance	Transit services are often late - is driver training needed?
	Auto access	Coordinate with local repair garages to offer discounted repair services to seniors and people with disabilities – maybe the discount could provide them with credits on their income or other business taxes?
	Coordination & Cooperation	Collaborate with under-utilized transit providers during their non-peak periods. For example, school buses have lower utilization during the day, on weekends and during the summer. Also, bus drivers for organizations like Google wait for long periods to make the return trip at the end of the day.
	Public Transit - Accessibility	Convert some of the seats on all transit vehicles to a “fold-up” option. They would be in the down position when someone is sitting on them but could fold up to provide another wheelchair accessible space. In this way, space is not “lost” when it is a wheelchair only open space.
	Fares	Coordinate the fare structure throughout the 9 counties for seniors and people with disabilities. Make it the same for all day or monthly fares. Eliminate the change or need for additional fares for transfers from one provider to another.
	Funding	Discount paratransit fares to be offset with credits on income or other business taxes.
	Fares	Transit and paratransit is too expensive.
	Spatial Gap	There are parts of eastern and southern Alameda County that don't have very good transit service.
	Spatial Gap	There are places that paratransit-dependent riders cannot visit because transit doesn't reach those areas.
	Healthcare access	Non-emergency medical trips should be cheaper or free.
	Taxi/TNC - Accessibility	Uber-type services don't serve wheelchair-dependent riders.
	Healthcare access	There should be an Uber service for medical (dialysis) trips.
	Healthcare access	Non-emergency medical trips should be prioritized.
	Temporal	Owl service doesn't exist for disabled riders.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Gaps	
9/6/2016	East Bay Paratransit Service Review Advisory Committee	East Bay	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	

	Theme	Comment
	Transfers	Transfers between paratransit systems is very difficult. There are long wait times and sometimes an SUV is used and it is uncomfortable.
	Coordination & Cooperation	There should be better information sharing systems between paratransit systems to help coordinated transfers and eligibility.
	Transfers	Transfers between Sonoma County transit operators, as well as intercountry transfers, can be difficult. There are long wait times, there's poor lighting and transfer opportunities are infrequent.
	Fares	Transfers between fixed-route and paratransit are costly - double fares are charged.
	Fares	Paratransit and transit fares are unaffordable
	Information and I&R Services	There should be real time information for paratransit - like NextBus.
	Information and I&R Services	Since there are only up to two wheelchair positions on transit, it would be great to have NextBus information for wheelchair position availability.
	Fare Media	We need Clipper on paratransit.
	Coordination & Cooperation	Empty paratransit vehicles should be used to bring health care workers to people in their homes.
	Coordination & Cooperation	Empty paratransit vehicles should be shared with non-profit agencies.
	Fares	Transit should be free.
	Fares	Students and seniors should be able to ride free.
	Fares	Bulk discounts should be available to non-profit agencies who are purchasing vouchers/ passes for their clients.
	Spatial Gap	Paratransit is only available in the fixed-route area - there should be satellite paratransit availability.
	Auto Access	There is a need for low-income auto access - car share and auto loan.
	Same-Day Transportation	Taxi voucher programs should be expanded.
	Funding	A steady stream of funding is required for low-income, senior and people with disabilities programs.
	Taxi/TNC - Accessibility	There are parts of the county that have only one cab. There is a great need for accessible taxis and more taxis in general.
	Non-ADA Paratransit	Premium paratransit services are needed.
	Efficiency	Paratransit should use a brokerage model and "sell" seats on paratransit.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Gaps	
10/14/2016	Sonoma Access Coordinated Transportation Services (SACTS) Committee	Sonoma	Solutions	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Solutions	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Solutions	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Solutions	

	Theme	Comment
	Temporal	There is a need for evening, weekend and owl fixed-route/paratransit.
	Volunteer Driver	Rural counties depend on volunteer driver programs. There is a need for centralized recruitment and training of volunteers.
	Community connection	Transportation programs should be expanded to ensure people with disabilities and seniors have opportunities to socialize.
	Non-ADA Paratransit	Deviated and flex route transit should be explored.
	Fare Media	Clipper retail locations should be expanded.
	Equity	MTC needs to make sure that equity issues are addressed when planning and funding autonomous vehicles.
	Temporal	The paratransit service area is very limited outside of local bus hours.
	Transfers	Paratransit transfers for short trips between operators.
	Housing & Land Use	Funding and encouragement for increased density and complete neighborhoods to improve access to services and community.
	Fare Media	No RTC card center other than Oakland. Difficult for people to obtain. Richmond Hub would be a very good spot for this. San Pablo would be willing to do it too.
	Public Transit - Amenities	Bus stops are in poor condition, hardly any shelter for seniors and people with disabilities. Hard to recommend/increase public transportation ridership when the basic amenities aren't there.
	Transfers	Connections among providers are not very good, long waits between them (over an hour, in some cases).
	Temporal	Limited service on weekends (i.e. WestCAT)
	Coordination & Cooperation	Need more collaboration with transit agencies to coordinate rides to and from their destinations (City based service transfers between cities and other services).
	Healthcare Access	Difficult and scarce options for transportation to medical centers (County, Alta Bates).
	Spatial Gap	High demand for rides outside of service.
	Spatial Gap	Unincorporated areas are underserved.
	Funding	Additional funding opportunities for City-based service to accommodate more riders in Contra Costa County and alleviate East Bay Paratransit.
	Temporal	Need funding for affordable local transportation service from 5-10pm (M-F), Saturdays and Sundays.
	Information and I&R Services	One stop shops for East, Central and West County that dedicate themselves to any and all transportation assistance and referrals.

Figure C.1 List of Feedback Comments

Date	Group	County	Category	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
10/17/2016	City of San Pablo	Contra Costa	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Solutions	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Solutions	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Solutions	
9/13/2016	AC Transit Accessibility Advisory Committee	East Bay	Gaps	

	Theme	Comment
	Healthcare Access	Shorter wait time from dialysis to home with East Bay Paratransit.
	On-time Performance	Long waits, often late arrivals, for East Bay Paratransit pick-ups.
	Eligibility	Many people don't qualify for ADA Paratransit, but can't drive, walk to bus stops or have the option to take a city-based service.
	Spatial Gap	No volunteer driver program in West County.
	Fares	Cost of paratransit rides is difficult for low-income riders.
	Safety	Safety concerns for riders (re: public transportation mainly).
	Spatial Gap	Geography of Contra Costa is challenging.
	Spatial Gap	There's not enough transit service in south Alameda County - near Fremont.
	Public Transit - Accessibility	Crowding is a problem for people with mobility devices.
	Public Transit - Accessibility	There needs to be stronger policies for transit agencies to announce to free up space for riders with disabilities.
	Public Transit - Accessibility	Devices are getting bigger; transit agencies need to provide more space for people with disabilities.
	Planning/Study	The coordinated plan needs to give any solution for people in wheelchairs a higher priority.
	Planning/Study	The way that the current plan separates out low-income and people with disabilities is problematic because many people with disabilities are low-income.
	Fares	Transit discounts should exist on all systems.
	Fares	Transit affordability is a major concern.
	Public Transit - Accessibility	When transit agencies solve problems for one group of disabled group, it may be causing problems for another disabled group. For instance, tactile strips on the ground make it hard for people in wheelchairs.
	Emerging mobility services	Flex route services are an exciting development. More agencies should adopt flex routes.
	Public Transit - Access	Sidewalks are lacking in many places.
	Travel Training	There should be youth ambassador programs that teach kids how to use transit and how to behave on transit.
	Fares	It is difficult to access discounts - particularly youth discounts.

APPENDIX D

Consolidated Transportation Service Agencies – MTC Designation Process

CONSOLIDATED TRANSPORTATION SERVICE AGENCIES – MTC DESIGNATION PROCESS

MTC's process and conditions for designating Consolidated Transportation Service Agencies (CTSA) are set forth in MTC Resolution 4097, Revised. The designation process is as follows:

- Applicant makes request.
- MTC notifies the County Board of Supervisors, the PCCs, and transit operators of its intent to designate a CTSA in the County.
- MTC staff evaluates candidates for consistency with mobility management activities as outlined in the Coordinated Public Transit-Human Services Transportation Plan.
- MTC's Programming and Allocations Committee reviews and recommends CTSA designation.
- Commission adopts CTSA designation.
- MTC notifies CTSA, transit operators, State of California and PCC of CTSA designation.

Under this process, MTC evaluation of CTSA candidates would take into account various factors, including but not limited to:

- Past CTSA designations and performance; relevance of activities to current coordination objectives.
- Scale of geography covered by designation request.
- Extent to which the applicant was identified as the result of a county or subregionally based process involving multiple stakeholders aimed at improving mobility and transportation coordination for transportation-disadvantaged populations.
- The applicant's existing and potential capacity for carrying out mobility management functions described in this chapter as well as other requirements of CTSAs as defined by statute.
- Institutional relationships and support, both financial and in-kind, including evidence of coordination efforts with other public and private transportation and human services providers.

APPENDIX E

Project Types Eligible for Funding

PROJECT TYPES ELIGIBLE FOR FUNDING

One of the purposes of the Coordinated Public Transit–Human Services Transportation Plan is to identify projects eligible for FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program and other funding sources that require or encourage proposals to refer to this Coordinated Plan (e.g. 5311 or MTC's own competitive grant programs).

Accordingly, the list of eligible projects in the Coordinated Plan is inclusive enough for a wide range of proposals, but also specific enough to demonstrate regional support for competitive funds.

Figure E.1 lists projects that would be eligible for these funds. Consistent with MTC's regional priorities, projects cover:

- Mobility Management and Travel Training
- Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
- Improvements to ADA-mandated Paratransit
- Improvements to Public Transit Service and Access
- Pedestrian and Bicycle Improvements
- Shared Mobility Accessibility
- Other Solutions

These projects draw upon expressed needs in the 2013 Coordinated Plan; Section 5310 applications; and other proposed strategies.

Figure E.1 Project Types Eligible for Funding

Project	Category
Mobility management/coordination with human service transportation, transit, jurisdictions, etc. (e.g. cost sharing arrangements, joint procurements, joint maintenance, vehicle sharing)	Mobility Management and Travel Training
Enhanced local/regional information and referral systems, including one-call/one-click centers, comprehensive mobility guides	Mobility Management and Travel Training
Travel training on all modes and promotion to seniors and/or people with disabilities, including ambassador/volunteer programs	Mobility Management and Travel Training
Technical support to non-profit agencies to apply for and maintain compliance for grant funding	Mobility Management and Travel Training
Customized guaranteed ride home programs for people with disabilities, seniors, low-income, and veterans	Mobility Management and Travel Training
Capital (including but not limited to vehicles, securement, and software) and operations projects to assist community organizations (and transit agencies where eligible) to provide transportation to seniors and people with disabilities (including but not limited to shuttles, group trips, vanpools, volunteer driver programs)	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Volunteer driver programs, including training and recruitment of drivers; escorted travel on paratransit	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Programs that provide same-day wheelchair accessible service (including capital investments in vehicles and operational incentives)	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Subsidized taxi or transportation network company (TNC) programs and/or incentives or assistance to improve the quality of same-day service	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services

Figure E.1 Project Types Eligible for Funding

Project	Category
Premium services on ADA paratransit including but not limited to service beyond 3/4 mile and fixed-route transit times and days; same-day service	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Non-emergency medical transportation for Medi-Cal patients and non-ADA eligible seniors, people with disabilities, low-income populations, and veterans	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Feeder service connecting to fixed-route transit	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Group trips (e.g. grocery shopping trips)	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Sharing of provider training and methods	Improvements to Paratransit that Exceed ADA Requirements and/or Demand-Responsive Services
Projects and infrastructure to mitigate transfers and/or provide transfer assistance to help with multi-operator paratransit trips and transfers or access to or between paratransit and fixed-route service	Improvements to ADA-mandated Paratransit
Projects to implement coordinated in-person assessments to determine eligibility	Improvements to ADA-mandated Paratransit
Improved performance and service quality measurement, including increased rider participation	Improvements to ADA-mandated Paratransit
Restoration of accessible service where fixed-routes have recently been cut	Improvements to Public Transit Service and Access
Expanded fixed-route transit services and better connections between transit systems	Improvements to Public Transit Service and Access
Increased access to fare media and discounted transit fares for people with disabilities, seniors, low-income, and veterans	Improvements to Public Transit Service and Access
Transit safety education	Improvements to Public Transit Service and Access
Transit information in accessible formats, including real-time information, and other capital improvements	Improvements to Public Transit Service and Access
Targeted transit route and stop adjustments; courtesy or flag stops for people with disabilities	Improvements to Public Transit Service and Access
Wheelchair securement improvement programs; additional driver training on accessibility issues and features	Improvements to Public Transit Service and Access
Additional space for mobility devices on transit	Improvements to Public Transit Service and Access
Pedestrian infrastructure improvements in the vicinity of transit stops and/or targeted law enforcement to improve pedestrian safety near transit stops	Improvements to Public Transit Service and Access
Pedestrian and/or bicycle safety planning, especially for low-cost, high-impact solutions	Pedestrian and Bicycle Improvements

Figure E.1 Project Types Eligible for Funding

Project	Category
Technology and/or other projects to facilitate the reporting and inventorying of barriers to help promote walkable communities and complete streets	Pedestrian and Bicycle Improvements
Pedestrian and/or bicycle safety education	Pedestrian and Bicycle Improvements
Projects to increase access for mobility device users including breakdown transportation, loaner/sharing programs	Pedestrian and Bicycle Improvements
Projects that support use of new shared mobility transportation options (such as bikeshare, carshare, ride-hailing services, microtransit, and autonomous transit) by people with disabilities, seniors, low-income, and veterans	Shared Mobility Accessibility
Projects to provide wheelchair accessible carsharing access	Shared Mobility Accessibility
Projects to provide accessible bikesharing	Shared Mobility Accessibility
Auto loans for low-income families/individuals	Other Solutions
Funding for the development of emergency planning and evacuation training programs	Other Solutions
Safety training for older drivers; projects for individuals who have lost drivers licenses	Other Solutions
Capital investments in fuel-efficient wheelchair-accessible vehicles	Other Solutions

APPENDIX F

Promote Walkable Communities, Complete Streets, and the Integration of Transportation and Land Use Decisions

PROMOTE WALKABLE COMMUNITIES, COMPLETE STREETS, AND THE INTEGRATION OF TRANSPORTATION AND LAND USE DECISIONS

Localities can seek funding for specific walkability and bikeability infrastructure improvements, which play an important role in the safety and mobility of all, and help to reduce the costs of paratransit by increasing the accessibility of fixed-route transit.

CMAs and MTC can play a role in:

- Identifying **senior walking groups** for social engagement as an eligible project in appropriate funding guidelines
- **Coordinating with local agencies** responsible for the implementation of infrastructure improvements, such as Public Works and park and recreation departments, to ensure bike and pedestrian improvements related to the mobility of low-income populations, seniors and people with disabilities are programmed and prioritized

Best Practice Example:

United Seniors of Oakland and Alameda County (USOAC):[1] USOAC established a Walkable Neighborhoods for Seniors (WN4S) task force in 2003 to promote health benefits of physical activity for older adults, conduct walking audits, advocate for built environment and policy changes supportive of older adult walkability, and plan for sustaining and growing itself after its initial funding expires.

California Department of Health Services trained USOAC staff for facilitation of the task force. The task force comprised representatives from the county's sheriff department, public works agency, department of public health (Senior Injury Prevention Program), community development agency, and county council, as well as the California Highway Patrol, pedestrian advocacy groups, and citizens representing targeted neighborhoods.

The task force used the following four steps to assess neighborhood walkability:

1. Form walking groups
2. Community presentation
3. Walkability survey by older adults
4. Walkability audit by WN4S task force

WN4S formed walking groups to promote walking among older adults. These walking groups offer safety, socializing, exercise for participants, and cultivate confidence and interest in partition at WN4S task force walking assessments. The community presentations educated older adults on the importance exercise, encourage walking goals, and recruit walking survey participants. Older adults took part in the walking survey by walking selected routes and then completing a walkability survey.

Survey results informed the focus of WN4S walking audits. The WN4S walking surveys and walking audits ended in 2007, but USOAC continues to facilitate the WN4S walking groups established by the task force in 2003.

1 Steven P. Hooker, Lisa Cirill, and Lucy Wicks. Walkable Neighborhoods for Seniors: The Alameda County Experience. Journal of Applied Gerontology 2007; Volume 26; page 157-181.

www.stopfalls.org/grantees_info/files/Wicks_Walkability.pdf

APPENDIX G

What is Mobility Management?

WHAT IS MOBILITY MANAGEMENT?

There are a number of definitions for "mobility management." The following are some of the most commonly used definitions.

MTC's Definition in 2013 Coordinated Plan

Mobility management is a strategic, cost-effective approach to encourage the development of services and best practices in the coordination of transportation services connecting people needing transportation to available transportation resources within a community. Its focus is the person — the individual with specific needs — rather than a particular transportation mode.

Through partnerships with many transportation service providers, mobility management enables individuals to use a travel method that meets their specific needs, is appropriate for their situation and trip, and is cost-efficient.

NADTC/5310 Definitions

In 2016, the National Aging and Disability Transportation Center (NADTC) was launched by the Federal Transit Administration (FTA), to be administered by Easter Seals and the National Association of Area Agencies on Aging with guidance from the U.S. Department of Health and Human Services, Administration for Community Living. The NADTC assists states, communities and recipients in the development, selection, deployment and oversight of their 5310 projects and other accessible transportation initiatives. Guidance for 5310 funding defines mobility management and related activities as follows:

Mobility Management consists of short-range planning and management activities and projects for improving coordination among public transportation and other transportation service providers carried out by a recipient or sub-recipient through an agreement entered into with a person, including a government entity, under 49 U.S.C. chapter 53 (other than section 5309). Mobility management does not include operating public transportation services.

Mobility management activities may include:

1. The promotion, enhancement, and facilitation of access to transportation services, including the integration and coordination of services for individuals with disabilities, seniors, and low-income individuals;

2. Support for short-term management activities to plan and implement coordinated services;

3. The support of state and local coordination policy bodies and councils;

4. The operation of transportation brokerages to coordinate providers, funding agencies, and passengers;

5. The provision of coordination services, including employer-oriented transportation management organizations' and human service organizations' customer-oriented travel navigator systems and neighborhood travel coordination activities such as coordinating individualized travel training and trip planning activities for customers;

6. The development and operation of one-stop transportation traveler call centers to coordinate transportation information on all travel modes and to manage eligibility requirements and arrangements for customers among supporting programs; and

7. Operational planning for the acquisition of intelligent transportation technologies to help plan and operate coordinated systems inclusive of geographic information systems (GIS) mapping, global positioning system technology, coordinated vehicle scheduling, dispatching and monitoring technologies, as well as technologies to track costs and billing in a coordinated system, and single smart customer payment systems. (Acquisition of technology is also eligible as a standalone capital expense).

National Center for Mobility Management

The National Center for Mobility Management (NCMM) is an initiative of the United We Ride program, and is supported through a cooperative agreement with the FTA. The Center is operated through a consortium of three national organizations — the American Public Transportation Association, the Community Transportation Association of America, and the Easter Seals Transportation Group. The Center supports FTA grantees, mobility managers, and partners in adopting proven, sustainable, and replicable transportation coordination, mobility management, and one call–one-click transportation information practices. NCMM defines mobility management as follows:

Mobility management is an approach to designing and delivering transportation services that starts and ends with the customer. It begins with a community vision in which the entire transportation network — public transit, private operators, cycling and walking, volunteer drivers, and others — works together with customers, planners, and stakeholders to deliver the transportation options that best meet the community's needs.

Mobility management:

- Encourages innovation and flexibility to reach the "right fit" solution for customers
- Plans for sustainability
- Strives for easy information and referral to assist customers in learning about and using services
- Continually incorporates customer feedback as services are evaluated and adjusted

APPENDIX H

Public Comments on Draft Plan

Draft Plan Public Comment Period

November 27, 2017 – January 11, 2018

On November 27, 2017, the 2018 Draft Coordinated Plan Update was released to the public for review and comment. The draft plan was posted on MTC's website, and over 900 stakeholders and interested members of the public were notified via email.

Below are comments received during the public comment period of November 27, 2017 – January 11, 2018.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
1	**Regional Strategies for Coordination**	Paratransit riders have been asking when Clipper will be available on paratransit. This should be a requirement for Clipper 2.0, providing equal access to this technology that continues to receive substantial regional funding. ***Petaluma Transit***	The issue of Clipper availability on paratransit is noted as an issue in Ch. 5.
2	**Transportation Gap or Solution**	The trend in transit is toward low-floor buses and LRVs, except in San Francisco. Steep stairs on MUNI LRVs make boarding difficult. Wheelchairs boarding buses are often disruptive and time-consuming. With the increase in seniors, especially in San Francisco, where car ownership is low, MUNI should be making changes to address the needs of seniors and the disabled. ***Robert Bregoff***	The plan presents general guidance for regional prioritization, and not recommendations for individual transit operators. All transit operators are required to provide accessible service on their fixed-route vehicles, which may include buses and trains equipped with wheelchair lifts or low floor ramps to allow easy access for people with disabilities.
3	**Transportation Gap or Solution**	The number of non-working escalators at BART and MUNI stations is shocking. Recently only 2 of the escalators at Civic Center station were operating. ***Robert Bregoff***	Accessibility of transit stops and stations is noted as a need in Chapter 4, Appendix C, and Appendix E.
4	**Transportation Gap or Solution**	Seniors driving unnecessarily are a danger to cyclists and pedestrians. The state should dissuade rather than encourage people over, say, 75, from driving, and provide them with reliable transport. I'm over 60 and very healthy but have noticed that my reflexes, vision, and hearing aren't what they once were. Driving is more stressful for me because of this. ***Robert Bregoff***	The challenges of senior mobility as a result of losing the ability to drive is noted in Chapter 2. Travel training for seniors is noted as a need and solution in Chapter 3, Chapter 5, Appendix C and Appendix E.
5	**Implementation**	It would be helpful if the Coordinated Plan webpage had links to local mobility management efforts and service providers. ***Regional Mobility Management Group***	This will be considered during implementation.
6	**Other**	As discussed in Chapter 5 and in Appendix D, having a process to designate Consolidated Transportation Service Agencies in each county is a very good idea. It is important to have a community based collaborative process and a level playing field for the evaluation of agencies who wish to be CTSAs, rather than agencies self-designating. ***Choice in Aging***	The process to designate Consolidated Transportation Service Agencies is described in Appendix D.
7	**Funding**	Is there funding from MTC (or another source) for a county mobility management plan, if one does not currently exist? Considering the "lack of capacity" of the existing system identified in the plan, such a funding source is critical if meaningful progress is to be made in this area. ***Choice in Aging***	Various funding sources such as the FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities and the Caltrans Planning Grant program allows planning for mobility management as an eligible activity.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
8	**Implementation**	In chapter 5 the text says that "MTC can host regular events with transit operators..." Hopefully, these events will be at a convenient location within the county where the transit operators and agencies are located. ***Choice in Aging***	Staff will make every effort to host events throughout the region.
9	**Regional Strategies for Coordination**	The strategy, "Improve Paratransit" includes the action to "...make it easier to pay for ADA paratransit services." The County appreciates the Plan including this concept; it highlights the critical accounting component of an effective mobility management operation. ***Contra Costa County Board of Supervisors***	The issue of paratransit payment is noted in Chapter 5.
10	**Transportation Gap or Solution**	We appreciate the comprehensive discussion regarding paratransit transfer trips. Too often, plans superficially cover the topic of transfers on paratransit services, leaving the reader to assume they are similar to transfers on fixed route transit. This is far from the case; transfer trips are much more disruptive. ***Contra Costa County Board of Supervisors***	The issue of transfers between ADA paratransit providers is noted in Chapter 4, Chapter 5, Appendix B, Appendix C, and Appendix E.
11	**Transportation Gap or Solution**	One critical issue is left unaddressed in the transfer discussion, that of safety. We request that this additional safety information be included in order to have a complete and accurate discussion regarding transfers. ***Contra Costa County Board of Supervisors***	Safety concerns have been incorporated into Chapter 4.
12	**Other**	The Plan includes references to a "Roadmap Study" which includes recommendations for mobility management programs. Please include this Study as an appendix to the Plan. ***Contra Costa County Board of Supervisors***	The Roadmap Study was an implementation activity stemming from the 2013 Coordinated Plan. Recommendations from the study were incorporated into the 2018 Coordinated Plan update and can be the basis for future implementation.
13	**Regional Strategies for Coordination**	The County applauds MTC for providing a focused implementation timeline including the initial strategy of recognizing mobility management as a regional priority. We also appreciate the candid statement in the plan, "Current senior-oriented mobility services do not have the capacity to handle the increase in people over 65 years of age..." The County believes the strategies in the Plan should be correspondingly explicit. ***Contra Costa County Board of Supervisors***	The strategies presented in the plan have grown from feedback received from user groups, their advocates, and existing local providers of transportation and human services, and are intended to provide a general guidance.
14	**Implementation**	The Plan provides excellent background on the efforts at the federal and state level to increase coordination of paratransit services. The Plan should consider the impact of these efforts, whether or not they are adequate, and if we can achieve more. ***Contra Costa County Board of Supervisors***	The plan presents general and preliminary guidance for regional prioritization. Evaluation of efforts in the Bay Area can be considered during implementation.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
15	**Other**	The Plan briefly touches on impactful approaches in discussing Consolidated Transportation Service Agencies, one-call/one-click operations, and the wide spectrum transportation provider types. Explicitly discussing the topic of consolidation of services (e.g. eligibility, maintenance, financial services, scheduling/dispatch, and transportation operations) and the various methods of doing so (e.g. non-profit, administrative vs. full-service brokerage) would provide a more complete discussion and increase the usefulness of the document. ***Contra Costa County Board of Supervisors***	The plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be approached differently in a local context. The strategy to implement county-based mobility management is intended to provide a regional framework, while still allowing each county to tailor local solutions. Chapter 3 notes that coordination and cooperation could increase cost efficiency and improve services for end users.
16	**Funding**	The Bay Area made great strides in our transportation system, due in part to the leadership of MTC. We urge MTC to bring this trend of success to the paratransit field and offer comprehensive, funded strategies to address the "lack of capacity" highlighted in the plan. This would allow the population assisted by this type of service to equitably benefit from MTC's substantial regional efforts. ***Contra Costa County Board of Supervisors***	The issue of funding availability and consistency is noted as a key gap in Chapter 4.
17	**Transportation Gap or Solution**	Same day accessible service is generally lacking in the Tri-Valley and across the region. This also includes options for wheelchair breakdown services. ***LAVTA Wheels Accessible Advisory Committee***	Same day accessible service is noted as a need in Appendix C and in Appendix E.
18	**Regional Strategies for Coordination**	Expansion of low-income youth fare is highly desired, especially a continuation of the pilot Alameda County Student Transit Pass Program, funded for three years through Measure BB. ***LAVTA Wheels Accessible Advisory Committee***	Affordability of transportation is noted as a need and solution in Chapter 4. Subsidized transportation services is listed as a strategy in Chapter 5.
19	**Regional Strategies for Coordination**	From a consumer's perspective, there is a lack of standardization of administration of ADA-services throughout the MTC region. Development of a standard paratransit ID card that can be used throughout all systems in the Bay Area is highly desired. ***LAVTA Wheels Accessible Advisory Committee***	The need for county-based and regional coordination is noted in Chapter 5. This can be considered during implementation.
20	**Transportation Gap or Solution**	Improvement of transfers and coordination between providers for regional trips is highly desired. *LAVTA Wheels* ***Accessible Advisory Committee***	Regional trip coordination is noted as a need in Chapter 4 and in Appendix E.
21	**Transportation Gap or Solution**	Expansion of LAVTA's Go Dublin pilot, which utilizes Transportation Network Companies, to other areas in the Tri-Valley. TNCs offer a more cost-effective way to provide paratransit trips for able individuals. Encouraging TNCs to include wheelchair accessible vehicles is ideal for equitable service. The convenience of on-demand paratransit rides is highly desired. ***LAVTA Wheels Accessible Advisory Committee***	The need for wheelchair accessible vehicles and for policies related to TNC service provision are noted in Chapters 4 and 5.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
22	**Regional Strategies for Coordination**	Incorporation of Mobility Management Programs is a great strategy; it could be beneficial to mirror a Mobility Management Program or software already in place in another region. ***LAVTA Wheels Accessible Advisory Committee***	This can be considered during implementation.
23	**Other**	Coordination with other public entities like public works, park and rec dept, etc. will better promote walkable communities. ***Alameda County Public Health Department***	Coordination with park and recreation departments has been incorporated into Appendix F.
24	**Regional Strategies for Coordination**	Equal to coordination should be communication. It seems like there is much to navigate and that there are many stakeholders, including the end-user (the client), who needs to know the information. ***Alameda County Public Health Department***	As noted in Chapter 5, the coordination of information and referral services provide a central point of contact for end-users to access mobility managers, who provide resources and traveler information.
25	**Transportation Gap or Solution**	I have a concern about charging premium rates for premium service and how it impacts low-income riders. Does paying fall on the client? Can the charge be shared or subsidized by the entity on the other end? How would the fee/rate be determined in a way so that it doesn't provide another barrier to low-income riders getting where they need to go? ***Alameda County Public Health Department***	Chapter 5 notes the need to expand subsidized same-day trip programs.
26	**Implementation**	Coordination summits for periodic discussion of mobility management-related issues and progress in the region, and the sharing of best practices is great. I think periodic and regularly soliciting feedback is always a good thing. ***Alameda County Public Health Department***	As noted in Chapter 5, coordination summits are being recommended during implementation.
27	**Regional Strategies for Coordination**	Create Mobility Managers and Designate Consolidated Transportation Service Agencies (CTSAs): Managers/ coordinators are important. I'm just wondering if there are policies or guidelines laid out by the Feds or MTC Commission about how the managers should be engaging local cities, human service agencies, disability advocacy, etc. (all the stakeholders) because it would be good to have a way to measure efficacy in implementation. ***Alameda County Public Health Department***	Staff makes every effort to provide best practices and technical assistance to counties in establishing mobility management and engaging local partners.
28	**Transportation Gap or Solution**	Alternative Modes of Travel like taxis: I agree that alternative modes needs to be part of the mix of options available. The program has to be easy and low-tech to participate in. In addition to the list of available tools, what about offering a taxi voucher program? Also, I wanted to raise an example in South Alameda County where there is a large unaccompanied immigrant youth population. They often have to get to legal services based in Oakland. Navigating public transit from Hayward to Oakland for newcomers is very challenging, confusing and cost-prohibitive. If there were a free taxi voucher program available to them through the Hayward Unified School District, that would make it so much easier for them to see their lawyer and get to court to support their asylum case. ***Alameda County Public Health Department***	Taxi voucher programs are noted as a solution in Chapter 4 and Appendix E.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
29	**Implementation**	Create Mobility Managers and Designate Consolidated Transportation Service Agencies (CTSAs): In the engagement strategies, make sure that MTC is informed by the COC map and other data, and continue to use the stakeholder advisers to ensure MTC is reaching the local community stakeholders that need to be at the table to inform the development of and prioritizing of strategies. ***Alameda County Public Health Department***	This can be considered during plan implementation. Staff will make every effort to include Communities of Concern mapping and data, along with other technical and outreach assistance.
30	**Other**	In suburban communities, members of the public have identified the need to better synchronize pedestrian walk signals with the traffic flow, especially at multi-lane intersections that are difficult to cross. Some communities like in Hayward near Tennyson High School are bisected by rail roads and there aren't frequent enough rail crossings to notify when a train is approaching. Furthermore, data collection is often challenging or non-existent. This makes planning and advocacy difficult. ***Alameda County Public Health Department***	Appendix F identifies the need for promoting walkable communities, complete streets and the integration of transportation land use decision. Staff will make every effort to provide available data in support of local planning.
31	**Funding**	Our agency represents all the transit operators (BART, AC and WestCAT) and local cities in west Contra Costa County, as well as unincorporated west County. Our goal is to plan and fund subregional transportation needs ranging from bike/ped options to major interchange enhancements along the I-80 corridor of west county. As part of these goals, we are closely invested in assuring improved services for senior, disabled and low income residents. To this end, we are just completing a West Co Accessible Transportation Study. Based on the excellent information presented in the MTC Coordinated Plan and the information we gathered specifically on the needs of west county residents, the outstanding issue is dedicated funding. In order to have consistent, long term guaranteed services to meet the growing population of senior/disabled/low income residents, there needs to be a dedicated ongoing funding source beyond the 5310 funds. We feel strongly that new funds from sales tax, driver license fees, and other self-help efforts are not enough. SB1 and RM3 do not address the needs of this most vulnerable population. Money does not solve everything. But local efforts to better coordinate services are evolving and the communication between operators is impressive. Drennen Shelton at MTC does a fabulous job attending the many groups forming to address various ADA and non ADA services. More devotion from one person cannot be found. But we need more dedicated staff at the County level if this Plan is ever to get up on its legs and walk. ***West Contra Costa Transportation Advisory Committee***	The issue of funding availability and consistency is noted as a key gap in Chapter 4.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
32	**Transportation Resources**	Overall, I feel the plan is well presented and filled with doable items in the relatively short term along with long term wishes! Mobility Matters serves as a Mobility Management Center for Contra Costa County and operates two free volunteer driver programs, one for seniors and one for disabled veterans of any age. ***Mobility Matters***	Mobility Matters is referenced in Chapter 3.
33	**Transportation Resources**	Page 59: Strategy 6: Improve Mobility for Veterans - In June 2017, Mobility Matters launched a free, volunteer driver program for disabled veterans of any age residing in Contra Costa County who are unable to take other forms of transportation. This program is called Rides 4 Veterans and is built on a model of veterans driving veterans, but non veteran drivers can also help since there are not enough veterans drivers to meet demand. ***Mobility Matters***	Mobility Matters and Rides 4 Veterans service are referenced in Chapter 3.
34	**Outreach**	Page 100: Comment from City of San Pablo that there is no volunteer driver program in West County is misleading. Although West County does not operate its own volunteer driver program, both volunteer driver programs run by Mobility Matters serve seniors and disabled veterans in ALL parts of Contra Costa County. We also provide West County residents with the same Transportation I&R Helpline and transportation guides that are provided to Central and East County. ***Mobility Matters***	These represent needs that were identified through the outreach process and subsequently documented in Chapter 4 and Appendix C.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
35	**Funding**	Develop County-Based Mobility Management: In November 2016, Measure X did not pass with 2/3 majority vote in hopes this funding would expand services and transportation options. Our program which is funded through Measure J does not have additional funding to provide a One Stop Shop to riders outside our service area. Moving forward, there needs to be funding for local agencies to build a Tri Partnership among neighboring agencies proving as a One Stop Ambassador for San Pablo, Richmond, and El Cerrito. Collaboration is needed based on the aging population is expected to double from 35 million nationally in 2000 to 71 million in 2030. In 2014, the cities of Richmond, San Pablo and El Cerrito submitted a collaborative grant application for the FTA section 5310. This was a first time collaboration among the three cities and funds was only granted for Travel Training. Although we do meet the needs of most of our ridership, we still have barriers and gaps in our service such as: - Requests for transportation to El Cerrito, Richmond, EL Sobrante, Martinez, Berkeley and Oakland - Some riders (particularly dialysis patients) are too fragile to travel on regular ADA paratransit - Volunteer driving program provided by Mobility Matters only service East and Central County - Increased population for underserved seniors in Contra Costa County - Insufficient funding resources for transportation for seniors and people with disabilities (Measure X) ***City of San Pablo***	The issue of funding availability is noted as a key gap in Chapter 4. Mobility management is included as a recommended strategy in Chapter 5 as a two-fold solution: to improve the mobility of traditionally underserved groups and to increase the efficiency of the overall system of transportation through coordination.
36	**Funding**	Regional Transportation Resources: As it states in this draft, there are a number of different transportation resources that low-income populations, seniors, people with disabilities, and veterans can access in the Bay Area. Coordinating all of these mobility management elements will ensure the long term development for all three cities and improve overall service. Funding should not focus just on the traditional fixed routes but include smaller agencies to develop a pre scheduled route service that operates certain days and hours in the week. Proper funding allows us to effectively accomplish our goal by offering convenient, accessible and a time saving collaboration. We are in favor of this draft in hopes it will address the much needed access to transportation services and eliminate some of the barriers and gaps in serving our community. ***City of San Pablo***	The issue of funding availability and diversity is noted as a key gap in Chapter 4. Coordination is noted as a strategy in Chapter 5.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
37	**Transportation Gap or Solution**	MTC should provide funding for and expand the types of eligible projects that provide more flexibility so that innovative projects can be proposed to address long regional paratransit cross county trips and enhancing fixed route service for seniors and people with disabilities. ***BART Customer Access and Accessibility***	Project eligibility is determined by requirements of the fund sources. Currently, paratransit service beyond the ADA is eligible under FTA guidance for the Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program. The issue of transfers between ADA paratransit providers is noted in Chapter 4, Chapter 5, Appendix B, Appendix C, and Appendix E.
38	**Transportation Gap or Solution**	Improve Regional Paratransit Trips: Long regional paratransit cross county trips with timed meets between transit agencies are costly, time consuming, and difficult for passengers. Improving timed transfers and meet times is a good goal but eligible projects should be expanded to include other options that address the underlying issues. The paratransit requirements for agencies has requirements for transfers between agencies which often are the cause for long trips and passengers being left on their own. There are no specific requirements or mechanizes for interjurisdictional travel beyond transfers. Regional travel is not the primary focus or responsibility of any single agency. MTC could assist in supporting a regional paratransit plan that looks at current travel paths and destinations in support of options for regional trips that are seamless for the passenger. Currently there is no incentive for transit agencies to take passengers past their borders as it is both time consuming, costly and maroons agency vehicles outside of their service area often during the periods of heavy traffic. Strategies could include a single provider to provide regional trips and eliminate transfers. Shared coordination between agencies which focuses on regional or long-haul trips could free up agency vehicles to focus on local trips. These regional vehicles could also provide supplemental local paratransit needs when they are in an area rather than dead-heading back. Also, using fixed route service (like BART, AC Transbay etc) for large sections of regional paratransit trips might be possible if additional assistance or an escort was provided to riders. Currently paratransit shuttles are only locally run but a regularly scheduled regional paratransit shuttle service targeting high demand key destination points such as medical centers could be also be a way to provide better service. ***BART Customer Access and Accessibility***	This can be considered during plan implementation. The issue of transfers between ADA paratransit providers is noted in Chapter 4, Chapter 5, Appendix B, Appendix C, and Appendix E.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
39	**Transportation Gap or Solution**	Enhancing Fixed Route Service for Seniors and People with Disabilities: Fixed route service in the Bay Area is already very accessible but many seniors and persons with disabilities find there are aspects that are so challenging it limits or prevents them from using it and their only option is paratransit. Regional funding is needed for projects that go above the and beyond the minimum ADA requirements to keep more riders on fixed route transit. Technology assistive devices that target seniors and persons with disabilities could be used to help navigate the complex fixed route system. Many of us use apps on our phones but seniors or persons with disabilities may need different strategies, tools or different types of assistance with more personalized directions. As this is a smaller population it funding is needed to assist with getting these options developed. Strategically placed beacons for wayfinding could help guide the blind and low vision through complex transit areas and could assist seniors as well. These types of projects need regional consistency and density to become something that people can rely on. New ways could be developed to alert drivers that seniors need more time to board, get a seat, or help with directions. Staff Escorts/Assistants could be scheduled at key locations to assist with help getting seats, or moving through busy stations. Some riders only need an attendant for part of the trip. What if you could call/schedule for a travel attendant with your phone and have an attendant meet you. Regional pilot projects that are innovative need support and funding to help address the growing needs of the region. ***BART Customer Access and Accessibility***	Project eligibility is determined by requirements of the fund sources. Currently, paratransit service beyond the ADA is eligible under FTA guidance for the Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program. The need for projects that enhance fixed-route service for seniors and people with disabilities is noted in Appendix C and included in Appendix E.
40	**Transportation Resources**	Page 31 – Subsidized Fare Programs / Voucher Programs: The description of existing programs should distinguish between means-based fare programs and subsidies for particular groups, independent of income, like students, veterans, seniors, elderly, etc. Currently, Sonoma County Transit, Santa Rosa CityBus, and Petaluma Transit offer fare free rides for college students and Sonoma County Transit offers fare free rides for veterans. ***Sonoma County Transportation Authority (SCTA)***	The plan presents broad definitions of the types of transportation services and programs offered in the Bay Area. Further clarification on program types has been incorporated into Chapter 3.
41	**Regional Strategies for Coordination**	Strategy 4: Means-Based Fare: There is a need to think creatively about including means-based fare programs in areas with a high percentages of riders who would qualify and where transit agencies do not have the financial means to subsidize fares without cutting service. Where it is not financially feasible to have a full means-based fare program, the regional program could support some sort of limited subsidized pass product that is distributed to social service agencies. ***Sonoma County Transportation Authority (SCTA)***	Through the Regional Means-Based Fare Study, MTC is working with transit agencies to develop an implementable program and seek funding to support this effort. Program implementation details have not been developed and is pending MTC Commission and transit agency board support to proceed. Comment will be forwarded to the Means-Based Fare Study project.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
42	**Transportation Gap or Solution**	To address the Gaps 4 regarding high fare - how can transfer agreements be put in place between paratransit providers and also between paratransit and fixed route providers? An example would be a paratransit trip from Santa Rosa to San Rafael, could include a portion of the trip being completed on SMART. ***Santa Rosa CityBus***	The plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be different in a local context. The plan is intended to provide a regional framework, while still allowing each county, city or agency to tailor local solutions, including how transfer and cost sharing agreements are implemented between transit agencies.
43	**Transportation Gap or Solution**	To assist with the spatial gaps, Park-n-rides would increase access to fixed route as well as provide a place for those outside of the paratransit area to get to paratransit. Park-n-ride as a tool don't seem to be mentioned in the Plan. ***Santa Rosa CityBus***	Infrastructure projects have been incorporated into Appendix E.
44	**Transportation Gap or Solution**	Encourage automatic locations technology for paratransit fleets. It would improve the rider experience, improve transfer experience, reduce no-shows and save staff time – talked about in summary of gaps 8. ***Santa Rosa CityBus***	Transit information, including real time information and other capital improvements have been incorporated into Appendix E.
45	**Regional Strategies for Coordination**	Funding for low income passes: If this is important for the region the MTC could identify a funding source that agencies can apply for funding to implement a program. Or identify a certain amount of money and then provide it to the Bay area operators based on population or ridership. If not enough funds are available to fulfill all the needs, maybe just provide it on a first come first serve bases. Or develop a scholarship fund, where applicants can apply for a reduced transit pass for a certain period of time. ***Santa Rosa CityBus***	Through the Regional Means-Based Fare Study, MTC is working with transit agencies to develop an implementable program and seek funding to support this effort. Program implementation details have not been developed and is pending MTC Commission and transit agency board support to proceed. Your comment will be forwarded to the Means-Based Fare Study project.
46	**Other**	Chapter 1, Planning Requirements: Will MTC require that other plans and projects be consistent with the CPT-HSTP, or give preference to those that do? ***SamTrans***	One purpose of the Coordinated Plan is to identify projects eligible for FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities program. MTC encourages all grant applicants to draw on the information and recommendations presented in the Coordinated Plan to better serve transportation disadvantaged populations.
47	**Regional Strategies for Coordination**	From Chapter 4: *Comments from almost every county in the region raised concerns that transit and paratransit fares are too high for many people. Seniors and families with low incomes are a growing portion of our local demographics, and these groups are some of the least able to afford regional transit options like BART and Caltrain that increase access to medical facilities, jobs, and other critical services.* These are the two most expensive options in the Bay Area. Overlooks more affordable bus service. ***SamTrans***	Affordability of transportation, particularly regional transit trips, is noted as a need and solution in Chapter 4. Subsidized transportation services is listed as a strategy in Chapter 5.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
48	**Regional Strategies for Coordination**	From Chapter 5: *Coordination is essential for meeting the needs of seniors, people with disabilities, veterans, and those with low incomes.* *To best serve the region's needs for mobility services, partnerships need to involve the entire spectrum of transportation providers: providers of public fixed route transit, human service transportation providers, private taxi and ridehailing services, departments of health and human services, advocacy groups, faith-based groups, medical and dialysis providers and providers of support services to low-income populations, seniors and individuals with disabilities.* Although presumably included by implication under "providers of public fixed route transit", and not included within the scope of Mobility Management, it would be helpful if this section mentioned ADA paratransit specifically in some way, since many in the community tend to view it as a standalone service. ***SamTrans***	Paratransit has been incorporated into Chapter 5.
49	**Regional Strategies for Coordination**	From Chapter 5: *Address Access to Healthcare…costs are particularly burdensome for ADA paratransit providers who provide subscription trips to individuals requiring dialysis.* *ADA paratransit providers receive no financial contribution from the clinics whose clients receive these services.* *MTC could bring the parties together to arrive at cost sharing arrangements that would exceed the fare paid by riders.* For-profit dialysis businesses have very little incentive to "share" the cost of their customers' transportation, given the requirement that ADA paratransit operators provide those trips without capacity constraints. ***SamTrans***	MTC will consider how best to initiate conversations between parties to explore cost sharing arrangements, reduce travel costs and expand travel options.
50	**Regional Strategies for Coordination**	From Chapter 5: *Piloting trip-screening modules in scheduling software to facilitate the implementation of conditional eligibility policies.* *Funding for this technology can be prioritized, and can assist in coordinating the phased development of a regional database of accessible bus stops to inform trip-screening.* The biggest single obstacle to implementing meaningful conditional eligibility enforcement is the lack of GIS data. Assistance from MTC in developing the necessary databases would be extremely helpful. ***SamTrans***	This can be considered during plan implementation.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
51	**Regional Strategies for Coordination**	From Chapter 5: *Make it Easier to Pay for Paratransit Without contributing to the cost of providing ADA paratransit, operators can provide seamless paratransit payment options for passengers.* *The cost of on-vehicle card readers necessary for the use of Clipper cards is prohibitive given the relative lower volume of trips provided on paratransit as compared to fixed-route.* The fact that the cost for onboard clipper readers is "prohibitive" suggests that this initiative could contribute substantially to the overall cost of providing paratransit. ***SamTrans***	As noted in Chapter 5, Clipper 2.0 may be able to include paratransit as a parameter in the new system. Other solutions may be available using current technology, such as a system in which payment for the trip is secured upon booking, and processed upon taking the trip.
52	**Regional Strategies for Coordination**	*Riders can pre-load funds for paratransit rides onto their Access Rider ID/TAP card.* *At boarding time, the driver can then swipe their card, and the fare will be deducted automatically from the rider's Access Rider ID/TAP card account balance.* What on-vehicle equipment is needed to process fare payments via TAP card? ***SamTrans***	As noted in Chapter 5, Clipper 2.0 may be able to include paratransit as a parameter in the new system, and may or may not require on-vehicle equipment. Other solutions may be available using current technology, such as a system in which payment for the trip is secured upon booking, and processed upon taking the trip.
53	**Regional Strategies for Coordination**	From Chapter 5: *To address the growing costs of transportation to healthcare in the Bay Area, paratransit providers can implement Medi-Cal cost recovery programs.* *Recovered costs could be put back into the paratransit system, or used to fund less expensive non-ADA services.* If this cost recovery practice were widely adopted, what is the likelihood that Medi-Cal would change the rules for reimbursement? Our understanding is that Medi-Cal must approve trips before they are provided, in order for the trips to be eligible for reimbursement. While this might be relatively straightforward in the case of subscription or standing-order paratransit trips, pre-approval could be exceedingly difficult in the case of same-day or next-day demand-responsive trips. ***SamTrans***	The plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be different in a local context. Implications and outcomes of seeing Medi-Cal cost recovery will need to be further explored during implementation.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
54	**Regional Strategies for Coordination**	From Chapter 5: *Paratransit users and operators alike see benefits in expanding options for same-day trips. Same-day trip programs provide greater mobility options and flexibility to riders, and operators may realize cost savings through innovative partnerships.* The document refers to city-based programs. How would this apply to countywide transit operators? While independent "non-ADA" ride-hailing or taxi based programs would be of great benefit to the users, listing this item under "*Strategy 2: Improve Paratransit*" creates the impression that MTC is requiring or encouraging ADA paratransit operators to provide same-day ADA paratransit service – including the prohibition against capacity constraints. We suggest moving it to another section for clarity's sake. ***SamTrans***	This section is not necessarily referring to city-based programs. The plan is intended to provide a regional framework, while still allowing each county, city or agency to tailor local solutions, including services beyond the ADA. Further, the plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be different in a local context.
55	**Regional Strategies for Coordination**	From Chapter 5: *Convene Task Force to Assist Implementation of In-Person Eligibility MTC can use its position as a regional resource to convene a task force to assist in the implementation of in-person eligibility and functional testing procedures at each of the region's transit operators that do not currently use this eligibility model.* *This effort can increase the effectiveness of new funding made available to regional operators for the implementation of county-based mobility management.* Is MTC proposing a regional eligibility contract or MOU? ***SamTrans***	MTC is not proposing a contract or an MOU. The plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be different in a local context.
56	**Regional Strategies for Coordination**	Strategy 3: *Increase suburban mobility options. New and expanded transportation solutions are needed for addressing mobility challenges that result from the suburbanization of poverty and older adults.* *Suburban development patterns are characterized by medium- and low-density land uses, which are often incompatible with traditional fixed-route transit service. Flexible, demand responsive solutions are necessary to provide mobility in these areas.* Privately operated demand responsive service depends on a critical mass of business (ridership) in order to be sustainable. The same land use issues that make fixed route bus service too inefficient to be sustainable in the suburbs also make it hard to get a cab. If they don't have enough business to stay busy all the time, cab/TNC drivers will choose not to provide this service. ***SamTrans***	The plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be different in a local context. Some suburban areas are experimenting with TNC projects and the region hopes to learn from these projects.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
57	**Regional Strategies for Coordination**	From Chapter 5: *Fund Low-Income Vehicle Programs. MTC and County transportation and transit agencies should prioritize and fund low-income vehicle loan programs for individuals whose typical trip patterns render transit not an option.* This recommendation appears to run counter to efforts to promote public transit as an attractive option and decrease the prevalence of single-occupancy vehicles. If the intent is to address the needs of low income people in rural areas, or of graveyard-shift workers who must commute during hours when no bus service is provided, that should be stated clearly. From the Peninsula Family Services DriveForward website: *"Life is infinitely more challenging when you must rely solely on public transportation; commutes become longer, errands more difficult, and arriving on time to work or school nearly impossible."* ***SamTrans***	New and expanded transportation solutions are needed for addressing mobility challenges that result from the suburbanization of poverty. Solutions beyond fixed-route bus service are presented in recognition that a diversity of transportation solutions are needed.
58	**Regional Strategies for Coordination**	Means-based fares: How will this affect compliance with standards for farebox recovery ratio? ***SamTrans***	This concern has been raised by transit agencies through the Regional Means-Based Fare Study. The impacts of a means-based fare program on farebox recovery is not currently known. MTC will continue to discuss and address this issue with transit agencies if a regional means-based fare program is implemented.
59	**Regional Strategies for Coordination**	From Chapter 5: *Advocate for the Accessibility of Emerging Shared Mobility Solutions and Autonomous Vehicles Shared mobility solutions, such as bikeshare, carshare, ride-hailing, and microtransit are options available to the public today.* *Most shared mobility providers are private entities, and as such may or may not prioritize service to traditionally underserved groups.* Unlikely without enforceable regulation, both in terms of ADA and Title VI. Most successful examples from the taxi industry require both significant incentives and severe coercive measures. ***SamTrans***	Comment noted. Further examination of needs, opportunities, and constraints will be undertaken during implementation.
60	**Veterans Transportation**	Many non-veterans have the same needs as veterans. This need could better be addressed at the federal level, by creating a VA transportation program. ***SamTrans***	Veterans are included in this plan as a response to the growing veteran population and their transportation needs in the region. The FTA has occasionally issued funding opportunities to address veterans' transportation needs. MTC will continue to seek and advocate for funding.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
61	**Implementation**	Ranking the recommendations or some direct statement about the importance of each would also be helpful. ***SamTrans***	The plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be weighted differently in a local context. Prioritization of the recommendations will be considered during implementation.
62	**Funding**	Related to Appendix E (premium services on ADA paratransit including but not limited to service beyond 3/4 mile and fixed-route transit times and days; same-day service), can this funding be used to support existing service where the ADA paratransit provider already exceeds the time and distance requirements? ***SamTrans***	Project eligibility is determined by requirements of the fund sources. Currently, paratransit service beyond the ADA is eligible under FTA guidance for the Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program.
63	**Projects Eligible for Funding**	*Related to Appendix E, are "Group trips (e.g. grocery shopping trips)"* compatible with the rules against providing charters? ***SamTrans***	Project eligibility is determined by requirements of the fund sources. Currently, group trips are eligible under FTA guidance for the Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program, and are typically provided under city-based services and nonprofit providers. Transit operators should continue to abide by applicable charter rules.
64	**Funding**	Related to Appendix E, "Improved performance and service quality measurement, including increased rider participation", is this limited to increasing rider participation, or could funding be used for data reporting tools and other technical improvements? ***SamTrans***	Project eligibility is determined by requirements of the fund sources. Currently, some technological improvements are eligible under FTA guidance for the Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program.
65	**Regional Strategies for Coordination**	Strategy 1: County-Based Mobility Management. We agree that MTC should continue to award extra points to projects and proposals that address cross-county or regional connections and that MTC should provide a venue for inter-agency coordination. What are the current venues and is MTC staff able to provide grant-specific support that brings potential collaborators together before a call for projects? ***Marin Transit***	MTC provides technical assistance during calls for projects, and will continue to support regional coordination.
66	**Regional Strategies for Coordination**	Strategy 1: County-Based Mobility Management. Partners regularly participate in informal collaboration meetings, including the Bay Area Regional Mobility Management Group and BAPAC (Bay Area Partnership for Accessibility working group). We encourage MTC to recognize and leverage the informal coordination which already exists. ***Marin Transit***	This can be considered during plan implementation.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
67	**Funding**	Strategy 2: Improve Paratransit. Recommendation for partners to take opportunities to expand subsidized same-day trip programs: The draft plan recognizes that veterans and those with low incomes will likely not benefit from these programs, typically supported by local sales taxes. Does MTC foresee that counties will receive support through 5310 or other funding streams to supplement/ bolster programs and include these groups or is the draft plan recommending that partners proceed with implementing these programs without funding for additional groups? ***Marin Transit***	Project eligibility is determined by requirements of the fund sources. MTC and local agencies can evaluate the use of fund sources for this purpose as implementation efforts progress with consideration of impacts on other priorities.
68	**Regional Strategies for Coordination**	Strategy 2: Improve Paratransit. Recommendation for partners to implement Medi-Cal Cost Recovery Program: It is our understanding that establishing a Medi-Cal cost recovery program is a complex process that requires a considerable amount of staff time. Smaller transit agencies would require significant technical assistance. ***Marin Transit***	This can be considered during plan implementation.
69	**Regional Strategies for Coordination**	Strategy 3: Provide Mobility Solutions to Suburban Areas. As emphasized in the draft plan, today's older adults are expected to stay healthy longer, with almost no growth expected in the portion of the population that is disabled. This is especially true in Marin County where we have the highest percent of seniors in the region but are below average in percent living with a disability, living in poverty, and without access to a vehicle. To provide this population with attractive mobility options beyond driving, we will require MTC's support in developing and piloting innovative, accessible, and equitable solutions beyond traditional fixed route transit and ADA-mandated paratransit. We commend MTC for including direction in this spirit among its key recommendations and look forward to a fruitful partnership that encourages innovation and flexibility. ***Marin Transit***	This can be considered during plan implementation.
70	**Regional Strategies for Coordination**	Strategy 3: Provide Mobility Solutions to Suburban Areas. Recommendation for partners to prioritize one-click systems: We are committed to increasing access to information and encouraging coordination, however, it is a risk for small transit agencies to invest in software and development of one-click systems that may become obsolete or will be incompatible with regional partners. MTC can help provide guidance and support towards a cost-effective uniform regional solution. ***Marin Transit***	This can be considered during plan implementation.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
71	**Regional Strategies for Coordination**	Strategy 4: Means-Based Fares. Poverty has risen faster in suburban than urban areas of the nine counties. In Marin County this contributes to an increasing income equality gap among residents. Our local funds support only a sub-set of low-income riders. Marin Transit supports regional efforts that will aid local efforts in establishing and funding an equitable means-based fare program where those operators that have already implemented some form of low income fare are recognized and are eligible to participate in a regional program. ***Marin Transit***	Through the Regional Means-Based Fare Study, MTC is working with transit agencies to develop an implementable program and seek funding to support this effort. Program implementation details have not been developed and is pending MTC Commission and transit agency board support to proceed. Comment will be forwarded to the Means-Based Fare Study project.
72	**Regional Strategies for Coordination**	Strategy 5: Shared and Future Mobility Opportunities (pending Commission direction). We encourage the Commission to adopt the strategy in the Draft Plan and apply public transit's focus on equity and accessibility to shared mobility. The Draft Plan outlines a number of promising ways to ensure access to private shared mobility providers and their future driverless products. ***Marin Transit***	This can be considered during plan implementation.
73	**Outreach**	Concerned about how South Santa Clara County was not engaged for input to this study except through VTA advisory committee. The level of stakeholder input was quite limited. For Santa Clara County, where are the City Senior Centers and organizations that were stakeholders during Measure B such as Transit Justice Alliance? ***City of Morgan Hill***	Input from Santa Clara County was provided from a range of stakeholders, including the MTC Policy Advisory Council Equity and Access Subcommittee, the Bay Area Partnership Accessibility Committee, Home First Santa Clara, VTA Committee for Transit Accessibility, and through the Coordinated Plan Technical Advisory Committee.
74	**Regional Strategies for Coordination**	Strategy 3 for Mobility solutions for Suburban Areas is insufficient to address transportation issues in suburban areas especially the South Santa Clara County. We suggest that Strategy 1 be expanded to include specific support for suburban areas through local extension of the Countywide Mobility Manager that is proposed. We believe that would offer an opportunity for greater impact than what is suggested in Strategy 3. ***City of Morgan Hill***	The strategy to implement county-based mobility management is intended to provide a regional framework, while still allowing each county to tailor local solutions, including how to fund agencies. Further, the plan presents general and preliminary guidance for regional prioritization, and recognizes that solutions may be weighted differently in a local context.
75	**Other**	By study admission, South Santa Clara County workers are resolved to being automobile dependent, with "best practices" including low cost loans for lower income families to purchase a car and insurance." This is in contrast to the ABAG Priority Development Area (PDA) policies which have located affordable and dense housing near transit lines and centers in south County to produce transportation mode-split opportunities. ***City of Morgan Hill***	New and expanded transportation solutions are needed for addressing mobility challenges that result from the suburbanization of poverty. Solutions beyond fixed-route bus service are presented in recognition that a diversity of transportation solutions are needed.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
76	**Transportation Resources**	Morgan Hill and South Santa Clara County is served by numerous long-haul corporate shuttles. ***City of Morgan Hill***	Community-based shuttles, including employment based shuttles, are noted included in Chapter 3.
77	**Transportation Gap or Solution**	Note in the study that economic development in South Santa Clara County is heavily industrial/manufacturing employing people in good jobs, but not jobs which pay enough to allow the employee to live in this county, therefore more are auto dependent. ***City of Morgan Hill***	The issue of poverty growth in suburban areas is noted in Chapter 2 and providing mobility solutions to suburban areas is listed in Chapter 5.
78	**Transportation Gap or Solution**	Gilroy and Morgan Hill are not wealthy cities which can invest in their own transit options, and therefore rely on public transit agency investment. ***City of Morgan Hill***	Improvements to public transit service and access is noted in Chapter 4 and Appendix E.
79	**Transportation Gap or Solution**	Investment in transit, not disinvestment should be a South County priority to connect people to jobs and services, and reduce congestion on the freeways. ***City of Morgan Hill***	Improvements to public transit service and access is noted in Chapter 4 and Appendix E.
80	**Transportation Gap or Solution**	It should be a priority that Caltrain services shuttle to and from South County during the day, not just north in the morning and south in the evening promoting transit use and access to jobs and services. ***City of Morgan Hill***	Improvements to public transit service and access is noted in Chapter 4 and Appendix E.
81	**Funding**	With reference to mobility management the plan encourages formation of Consolidated Transportation Service Agencies (CTSA). Other regions are able to sustain these agencies with funding from TDA section 4.5 funding. I think CTSAs are a good thing. I just didn't see a clear way to fund the agencies. ***Tighe Boyle***	The strategy to implement county-based mobility management is intended to provide a regional framework, while still allowing each county to tailor local solutions, including how to fund agencies.
82	**Regional Strategies for Coordination**	I totally support Strategy 1: County based mobility management. I would like to see an official government group bringing community managers together. Currently a group (Regional Mobility Management Group) meets quarterly exchange ideas and information. I would like to see something more formal that would assist in inter-county coordination from a mobility management perspective. ***Tighe Boyle***	This can be considered during plan implementation.
83	**Transportation Gap or Solution**	Travel training should be available for all transportation services, not just fixed-route public transit. ***Tighe Boyle***	Incorporated into Chapter 4 and Appendix E.
84	**Transportation Gap or Solution**	Reimbursement vouchers should be made available on all modes of transportation. ***Sonoma Access Coordinated Transportation Services***	Affordability of transportation is noted as a need and solution in Chapter 4. Subsidized transportation services is listed as a strategy in Chapter 5.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
85	**Veterans Transportation**	Sonoma County veterans face particular challenges in taking public transit to the VA hospital in San Francisco. ***Sonoma Access Coordinated Transportation Services***	Healthcare access is noted as a need in Chapter 4 and improving mobility for veterans is listed in Chapter 5.
86	**Transportation Gap or Solution**	Transfer agreements and easier connections between ADA-paratransit and fixed route transit should be established. ***Sonoma Access Coordinated Transportation Services***	Noted as a need in Chapter 4 and Appendix E.
87	**Transportation Gap or Solution**	Park and Ride lots are a good tool for providing access to paratransit services, and should be listed under as a need for the region. ***Sonoma Access Coordinated Transportation Services***	Infrastructure projects have been incorporated into Appendix E.
88	**Transportation Gap or Solution**	We appreciate the incorporation of emerging mobility services, and agree they provide an opportunity to innovate the way mobility services are provided to low income users, seniors, people with disabilities, and veterans. For a more robust snapshot of what is available, we recommend incorporating a discussion of available services beyond ridesharing and ride hailing, for example mictrotransit services such as Chariot. ***San Francisco County Transportation Authority***	Reference to microtransit has been incorporated into Chapter 3, and is noted in Chapter 5.
89	**Transportation Gap or Solution**	As the Coordinated Plan indicates, it is currently a challenge to ensure physical accessibility of shared or hailed vehicles. We recommend addressing additional equity-related concerns such as gaps in technology for users (e.g. access to a smart phone) and the need to make mobility services available for those without access to credit cards or other banking services. ***San Francisco County Transportation Authority***	References to additional equity-related concerns have been incorporated into Chapter 5.
90	**Regional Strategies for Coordination**	On July 25, 2017, our Board adopted Guiding Principles for Management of Emerging Mobility Services and Technologies. We encourage you to review these principles and incorporate them into the Coordinated Plan. At our December 12, 2017 meeting, we released a new report that could serve as an additional reference, entitled "The TNC Regulatory Landscape – An Overview of Current TNC Regulation in California and Across the County." ***San Francisco County Transportation Authority***	SFCTA's Guiding Principles have been incorporated into Chapter 5 as a best practice.
91	**Other**	We suggest making the final report available in full page version for electronic viewing, as it is difficult to read the double-pane report on standard page size. ***San Francisco County Transportation Authority***	Noted. Staff will make every effort to ensure a more readable electronic version is posted.
92	**Other**	Throughout, the Coordinated Plan should distinguish between ridesharing (defined as carpool matching platforms where drivers are paired with riders who share similar destinations as them and are not fare motivated e.g. Waze Carpool and Scoop) and ridehailing (defined as platforms which connect fare-motivated drivers with riders similar to taxi services e.g. Uber and Lyft). ***San Francisco County Transportation Authority***	The Coordinated Plan defines ride-hailing as services that are often demand-responsive and initiated and paid for by the rider, most typically taxis and TNCs like Uber and Lyft. Ridesharing services such as Waze Carpool and Scoop are not discussed in the plan.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
93	**Transportation Resources**	Consider including an appendix cataloging the different mobility services MTC researched that are available for the targeted population. Useful examples are provided in Chapter 3 such as the Palo Alto Shuttle, the Monument Shuttle in Concord, the Lamorinda Spirit Van, and the Emeryville Emery Go-Round). This would serve as a valuable resource that describes the breadth of services provided in each jurisdiction all in one place. ***San Francisco County Transportation Authority***	Guided by the Coordinated Plan Technical Advisory Committee and stakeholder feedback, staff opted for providing a chapter on the types of transportation services available to the plan's target population, rather than an exhaustive inventory of services than would quickly become outdated.
94	**Outreach**	We appreciate the extensive outreach that has been conducted to develop this plan and encourage additional outreach to emerging mobility companies about this plan if it hasn't happened already. ***San Francisco County Transportation Authority***	Outreach for the Coordinated Plan focused on transportation-disadvantaged individuals, advocates, organizations and agencies. We did not conduct outreach to providers of private transportation.
95	**Bay Area Demographics**	Ch 2 - The fourth key finding bullet point on page 9 indicates that San Francisco is an outlier and that there is a need to allocate additional resources to infrastructure that supports transit and multi-modal mobility since the share of no-car households increased since 2000. Rather than demonstrating as a city we aren't investing enough in transit and multi-modal mobility, we actually see this as a success - more people are able to go without a car since there are so many non-auto resources available (Transit First policies and a robust paratransit program). And, the report doesn't adequately acknowledge the significant proliferation of ride-hailing and other technology services in San Francisco that are attracting and enabling so many households that choose to not own a car. We request revising this key finding as follows to simply call out the trend or key data point and not point to strategies, which is the case for almost all of the other key findings. "San Francisco is an outliner. It is the most urban of all counties, with the greatest density of transit services, and has the highest percentage of residents without access to a vehicle. As of 2012, San Francisco was the fifth most carfree city in the county, a much higher ranking than in 2000." ***San Francisco County Transportation Authority***	Changes to this section have been incorporated.
96	**Bay Area Demographics**	Ch 2 - Based on latest data shown in the figures, the fifth key finding that "San Francisco has one of the highest percentages of people living in poverty and people living with a disability" does not appear to reflect the actual data (for poverty it is 25% or rank 4 tied with Alameda and for disability it is 10% or rank 5 tied with Alameda). We suggest deleting this text or replace it with another San Francisco key finding such as: "San Francisco has the highest percentage of seniors living in poverty." ***San Francisco County Transportation Authority***	These changes have been incorporated.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
97	**Bay Area Demographics**	Ch 2 - We suggest adding additional context that the household income needed to afford housing varies across the region, so defining low income flatly as 200% of the federal poverty line may underrepresent those experiencing poverty conditions in high-cost areas such as San Francisco and the Peninsula. ***San Francisco County Transportation Authority***	MTC uses 200 percent of the federal poverty line to assess poverty rates in many contexts, including in Plan Bay Area 2040.
98	**Bay Area Demographics**	Ch 2 - On Page 14, in "Poverty - Trends" section, there is a statement - "Almost a quarter of seniors living in San Francisco are living in poverty." However, Figure 2.6 shows that the percent is 36% which is well over a third. ***San Francisco County Transportation Authority***	This correction has been incorporated.
99	**Bay Area Demographics**	Ch 2 - On page 18, in "Access to Vehicles - Current Conditions," there is mention of both "senior household" and "households with senior at head." Please clarify what a "senior household" is if it is different than a household with a senior at head. If both phrases refer to the same population, please adjust the intro sentences - "For senior household, it is 15 percent. For households with a senior at the head, this number is closer to 1 in 10." ***San Francisco County Transportation Authority***	The second reference has been deleted.
100	**Transportation Resources**	Ch 3 - The illustration provided on page 25 presents taxis and ridesharing but should say "taxis and ridehailing." ***San Francisco County Transportation Authority***	This correction has been incorporated.
101	**Transportation Resources**	Ch 3 - In addition to TNCs as private transportation options filling accessibility gaps for seniors and disabled people, we encourage MTC to study microtransit/private transit vehicle services such as Chariot to perform similar services. ***San Francisco County Transportation Authority***	Reference to microtransit has been incorporated into Chapter 3, and is noted in Chapter 5.
102	**Transportation Gap or Solution**	Ch 3 - When considering barriers to private transportation services, particularly those driven by mobile applications, please include access to a smart phone, 508 compliance of mobile applications, and how to serve people without access to credit or banking services (unbanked). ***San Francisco County Transportation Authority***	References to additional equity-related concerns have been incorporated into Chapter 5.
103	**Transportation Gap or Solution**	Ch 4 - We appreciate seeing the mention of temporal gaps. San Francisco's Late Night Transportation Study found that late-night and early-morning commuters are disproportionately low-income compared to daytime commuters, and we suggest noting the importance of providing travel options during these gaps in terms of providing access to employment opportunities for low-income workers. ***San Francisco County Transportation Authority***	To reveal top transportation gaps in the Bay Area, outreach was conducted and comments were collected. Temporal gaps, of all kinds, were cited as a top gap, and is reflected as such in Chapter 4.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
104	**Transportation Gap or Solution**	Ch 4 - Feedback by County: In looking at the list of feedback comments, San Francisco participants also were concerned with Information and Referral Services, which should be reflected in the summary. ***San Francisco County Transportation Authority***	A reference to the lack of transportation information and referral has been incorporated into Chapter 4.
105	**Transportation Gap or Solution**	Ch 4 - We appreciate the gaps identified so far and suggest an additional gap of access to technology. Low income and senior residents may be less likely to have access to a smartphone, and therefore lack access to emerging mobility services and technologies such as ridesharing, ridehailing, and bikesharing. ***San Francisco County Transportation Authority***	Access to technology was not cited as a transportation gap through the plan's outreach efforts. However, references to smartphone requirements for emerging mobility services has been incorporated into Chapter 5.
106	**Regional Strategies for Coordination**	Ch 5 - Shared and future mobility: We agree with MTC's position to advocate for emerging mobility services and technologies to ensure equity and accessibility of these shared services. The Transportation Authority has adopted ten guiding principles for emerging mobility services and technologies, and we recommend incorporating these as appropriate into the Coordinated Plan. ***San Francisco County Transportation Authority***	SFCTA's Guiding Principles have been incorporated into Chapter 5 as a best practice.
107	**Regional Strategies for Coordination**	Ch 5 - Thank you for providing examples of best practices, which is a significant enhancement to prior drafts. ***San Francisco County Transportation Authority***	Comment noted.
108	**Regional Strategies for Coordination**	Strategy 2 - We recommend including: Make paratransit more flexible by allowing customers to book and cancel trips more easily, and with less time restrictions, based on their needs. ***San Francisco County Transportation Authority***	The strategies presented in Chapter 5 are big picture initiatives, and are not meant to be an exhaustive list. The recommendations in Strategy 2 are intended to improve paratransit without raising costs.
109	**Regional Strategies for Coordination**	Strategy 2 we recommend including: Modernize ride reservations to allow customers to book and pay for trips in advance online. We are proposing that this service be added to any call-in reservation process. ***San Francisco County Transportation Authority***	The strategies presented in Chapter 5 are big picture initiatives, and are not meant to be an exhaustive list. The recommendations in Strategy 2 are intended to improve paratransit without raising costs.
110	**Regional Strategies for Coordination**	Strategy 2 we recommend including: Encourage agencies to minimize the window of time when a paratransit vehicle may arrive. We recognize that this strategy, in particular, has to be considered in concert with associated cost implications. ***San Francisco County Transportation Authority***	The strategies presented in Chapter 5 are big picture initiatives, and are not meant to be an exhaustive list. The recommendations in Strategy 2 are intended to improve paratransit without raising costs.
111	**Regional Strategies for Coordination**	Strategy 2 we recommend including: Encourage agencies to provide call-in and online real-time arrival information. ***San Francisco County Transportation Authority***	This is included in the strategy as "Promoting the use of Interactive Voice Response (IVR) systems to remind passengers of upcoming trips and communicate imminent arrival."

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
112	**Regional Strategies for Coordination**	Strategy 2 we recommend including: Allow customers to rate rides and provide feedback so that agencies can better assess performance and customer needs and satisfaction. ***San Francisco County Transportation Authority***	The strategies presented in Chapter 5 are big picture initiatives, and are not meant to be an exhaustive list. The recommendations in Strategy 2 are intended to improve paratransit without raising costs.
113	**Regional Strategies for Coordination**	Strategy 5 - Shared and Future Mobility Opportunities: It would be great to see San Francisco's work to develop and implement guiding principles included as a best practice. ***San Francisco County Transportation Authority***	SFCTA's Guiding Principles have been incorporated into Chapter 5 as a best practice.
114	**Regional Strategies for Coordination**	Strategy 6 - Improve Mobility for Veterans: We encourage MTC to recommend a feedback service to allow agencies to assess veterans' needs and satisfaction. ***San Francisco County Transportation Authority***	This can be considered during implementation.
115	**Transportation Gap or Solution**	We recommend a clearer strategy for addressing temporal gaps in transit service, which we have found to be of particular importance to low income workers and while presenting a funding challenge for operators given relatively lower ridership at off-peak hours. ***San Francisco County Transportation Authority***	The strategies presented in Chapter 5 are big picture initiatives for the region, and are not meant to be an exhaustive list of solutions to gaps.
116	**Other**	We appreciate the strategies included in Appendix F to promote walkable communities, but suggest providing more robust strategies for improving pedestrian and bicycle mobility as part of this chapter as well. ***San Francisco County Transportation Authority***	Pedestrian and sidewalk right-of-ways, bicycles lanes and other safety improvements for pedestrian and cyclists are discussed in Chapter 3.

Figure H.1 Public Comments on Draft Coordinated Plan

	Category	Comment/Commenter	Response
117	**Projects Eligible for Funding**	In Figure E.1, please indicate which project types are eligible for the FTA 5310 funds, 5311 funds, and the other fund sources encompassed in MTC's regional competitive funds (e.g. STA Population funds). ***San Francisco County Transportation Authority***	Appendix E includes a list of eligible projects for the FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program. Project eligibility for other fund sources is not included.
118	**Projects Eligible for Funding**	In Appendix E, please acknowledge the significant role that local funds play in funding these project types to meet the needs of the targeted users. Federal funds continue to be a shrinking resource, and we must rely more heavily on self-help from local, regional, and state sources. ***San Francisco County Transportation Authority***	Appendix E includes a list of eligible projects for the FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program. This appendix does not include project eligibility requirements, including local matching fund rates. The issue of funding availability and consistency is noted as a key gap in Chapter 4.
119	**Projects Eligible for Funding**	In Appendix E, please acknowledge the difficulty in identifying funds, particularly a sustainable source of funds, for operating projects (e.g. education, training, service operations) and fare subsidies (e.g. low income transit pass), since most grant programs focus on capital infrastructure. ***San Francisco County Transportation Authority***	Appendix E includes a list of eligible projects for the FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program, and does not provide information on other fund sources or requirements. The issue of funding availability and inconsistency of grant-based funding is noted as a key gap in Chapter 4.
120	**Other**	Appendix F does not seem to include recommendations for the integration of transportation and land use decisions to improve needs of low-income people, seniors and people with disabilities. Please either re-title the section to exclude "Integration of Transportation and Land Use Decisions" or add an example such as strategies to link transportation resources to the production of affordable housing. ***San Francisco County Transportation Authority***	Changes to Appendix F have been incorporated.

METROPOLITAN TRANSPORTATION COMMISSION

Bay Area Metro Center
375 Beale Street, Suite 800
San Francisco, CA 94105

415.778.6700

www.mtc.ca.gov

APPENDIX A – 10

Regional Policies: Long-Range Planning / Plan Bay Area

Regional Transit Expansion Program (RTEP)

MTC Resolution No. 3434

Date: December 19, 2001
W.I.: 12110
Referred by: POC
Revised: 01/30/02-C 07/27/05-C
04/26/06-C 10/24/07-C
09/24/08-C

ABSTRACT

Resolution No. 3434, Revised

This resolution sets forth MTC's Regional Transit Expansion Program of Projects.

This resolution was amended on January 30, 2002 to include the San Francisco Geary Corridor Major Investment Study to Attachment B, as requested by the Planning and Operations Committee on December 14, 2001.

This resolution was amended on July 27, 2005 to include a Transit-Oriented Development (TOD) Policy to condition transit expansion projects funded under Resolution 3434 on supportive land use policies, as detailed in Attachment D-2.

This resolution was amended on April 26, 2006 to reflect changes in project cost, funding, and scope since the 2001 adoption.

This resolution was amended on October 24, 2007 to reflect changes in the Transit-Oriented Development (TOD) Policy in Attachment D-2.

This resolution was amended on September 24, 2008 to reflect changes associated with the 2008 Strategic Plan effort (Attachments B, C and D).

Further discussion of these actions are contained in the MTC Executive Director's Memorandum dated December 14, 2001, July 8, 2005, April 14, 2006, October 12, 2007 and September 10, 2008.

Date: December 19, 2001
W.I.: 12110
Referred by: POC

RE: Regional Transit Expansion Program of Projects

METROPOLITAN TRANSPORTATION COMMISSION
RESOLUTION NO. 3434, Revised

WHEREAS, the Metropolitan Transportation Commission (MTC) is the regional transportation planning agency for the San Francisco Bay Area pursuant to Government Code Section 66500 et seq.; and

WHEREAS, MTC adopted Resolution No. 1876 in 1988 which set forth a new rail transit starts and extension program for the region; and

WHEREAS, significant progress has been made in implementing Resolution No. 1876, with new light rail service in operation in San Francisco and Silicon Valley, new BART service extended to Bay Point and Dublin/Pleasanton in the East Bay, and the BART extension to San Francisco International Airport scheduled to open in 2002; and

WHEREAS, MTC's long range planning process, including the Regional Transportation Plan and its *Transportation Blueprint for the 21st Century*, provides a framework for comprehensively evaluating the next generation of major regional transit expansion projects to meet the challenge of congestion in major corridors throughout the nine-county Bay Area; and

WHEREAS, the Commission adopted Resolution No. 3357 as the basis for assisting in the evaluations of rail and express/rapid bus projects to serve as the companion follow-up program to Resolution No. 1876; and

WHEREAS, local, regional, state and federal discretionary funds will continue to be required to finance an integrated program of new rail transit starts and extensions including those funds which are reasonably expected to be available under current conditions, and new funds which need to be secured in the future through advocacy with state and federal legislatures and the electorate; and

WHEREAS, the Regional Transit Expansion program of projects will enhance the Bay Area's transit network with an additional 140 miles of rail, 600 miles of new express bus routes, and a 58% increase in service levels in several existing corridors, primarily funded with regional and local sources of funds; and

WHEREAS, MTC recognizes that coordinated regional priorities for transit investment will best position the Bay Area to compete for limited discretionary funding sources now and in the future; now, therefore, be it

RESOLVED, that MTC adopts a Regional Transit Expansion Program of Projects, consistent with the Policy and Criteria established in Resolution No. 3357, as outlined in Attachment A, attached hereto and incorporated herein as though set forth at length; and be it further

RESOLVED, that this program of projects, as set forth in Attachment B is accompanied by a comprehensive funding strategy of local, regional, state and federal funding sources as outlined in Attachment C, attached hereto and incorporated herein as though set forth at length; and, be it further

RESOLVED, that the regional discretionary funding commitments included in this financial strategy are subject to the terms and conditions outlined in Attachment D, attached hereto and incorporated herein as though set forth at length.

METROPOLITAN TRANSPORTATION COMMISSION

Sharon J. Brown, Chair

The above resolution was entered into by the
Metropolitan Transportation Commission
at a regular meeting of the Commission held
in Oakland, California, on December 19, 2001.

ATTACHMENT A - Regional Transit Expansion Policy Criteria Evaluation Matrix

			Resolution 1876-Tier 1	TEA-21 Funds	TCRP	Dedicated Local Funding	Operations/ Maintenance	Supportive Land Use		Cost-Effectiveness	System Connectivity			System Access	Project Readiness
Project	**Sponsor**	**Project Cost 2001 $ Millions**	prior 1876 Tier 1 commitment	TEA-21 authorization or other federal appropriations	TCRP or other state level commitments	Local funds as a percent of total capital cost	Demonstrated operating plan	Residential densities around stations	Employment densities around stations	Cost per new transit rider	# connecting operators	Frequency	Regional gap closures	# of modal access options	# of pre-construction activities completed or in progress
BART to Warm Springs	BART	$ 634	Yes	Yes	Yes	H	Yes	M	M	M	M	H	No	H	M
BART: Warm Springs to San Jose	VTA	$ 3,710	No	Yes	Yes	H	Yes	H	M	M	H	H	Yes	H	L
MUNI 3rd St. LRT Phase 2 - New Central Subway	SFCTA/Muni	$ 647	No	Yes	Yes	M	Yes	H	H	L	H	H	No	H	H
BART/Oakland Airport Connector	BART	$ 232	No	Yes	No	M	Yes	M	M	H	M	H	Yes	H	M
Caltrain Downtown Extension/Rebuilt Transbay Terminal	SFCTA	$ 1,885	Yes	Yes	No	H	Yes	H	H	L	H	H	Yes	H	M
Caltrain Rapid Rail/Electrification	JPB	$ 602	No	No	No	H	Yes	M	H	L	H	M	No	H	M
Caltrain Express: phase 1	JPB	$ 127	No	No	Yes	L	Yes	M	H	H	H	M	No	H	H
Downtown East Valley: Light Rail and Bus Rapid Transit Phase 1 and 2	VTA	$ 518	No	No	No	H	Yes	H	M	L	H	H	No	H	M
Capitol Corridor: Phase 1 Expansion	CCJPA	$ 129	No	No	Yes	L	Yes	H	M	H	H	L	No	H	M
AC Transit Oakland/San Leandro Bus Rapid Transit: Phase 1 (Enhanced Bus)	AC Transit	$ 151	No	No	No	L	Yes	H	H	H	L	H	No	H	L
Regional Express Bus Phase 1	MTC/Operators	$ 40	No	No	Yes	L	Yes	-	-	H	M	-	Yes	H	H
Dumbarton Rail	JPB	$ 129	No	No	No	H	No	M	M	L	H	L	Yes	H	L
BART/East Contra Costa Rail Extension	CCTA	$ 345	No	No	Yes	L	No	-	-	-	-	-	-	-	L
BART/Tri-Valley Rail Extension	ACCMA	$ 345	No	No	Yes	L	No	-	-	-	-	-	-	-	L
Altamont Commuter Express (ACE): service expansion	ACE	$ 121	No	No	No	L	-	M	M	H	M	L	No	M	-
Caltrain Express Phase 2	JPB	$ 330	No	No	No	H	-	M	H	-	H	-	No	H	-
Capitol Corridor: Phase 2 Enhancements	CCJPA	$ 284	No	No	Yes	L	Yes	H	M	-	H	L	No	H	M
Sonoma-Marin Rail	SMART	$ 200	No	No	Yes	L	No	L	M	-	H	L	No	H	L
AC Transit Enhanced Bus: Hesperian/Foothill/MacArthur corridors	AC Transit	$ 90	No	No	No	L	-	H	M	H	L	H	No	H	-

Note: "--" indicates that complete information is not available.

Resolution No. 3357 Criteria: Definitions and Measurement

Financial Criteria:

Honor 1876 commitments: Priority assigned to those projects of the original seven "Tier 1" Resolution No. 1876 projects that do not yet have a defined and secured financial agreement.
Rating: "Yes" or "No"

TEA-21/federal reauthorization: Current federal financial support exists for the project, through TEA-21 authorizing language for New Starts funding, or other federal appropriation commitments.
Rating: "Yes" or "No"

TCRP/State commitments: Current state financial commitment is secured by the project, through Traffic Congestion Relief Program funds, or other existing state funding commitments.
Rating: "Yes" or "No"

Dedicated local commitments: Local financial commitment for the project, based on percentage of local funds to total capital costs.
Rating: "High": Greater than 50%; "Medium": 30% to 50%; "Low": under 30%

Operations/Maintenance: Project can be maintained and operated once built, based on financial plans and policies submitted by the project sponsor, outlining sources and commitments of funds for the period of operations through the end of the RTP (2025) or for at least 10 years, whichever is longer. Any financial burden imposed by the transit expansion project may not undermine core bus service within the same system, especially that needed by transit dependent persons.
Rating: "Yes" or "No"

Performance Criteria:

Land Use: Evaluate potential system benefits accrued as a result of adjacent land uses along rail/bus corridors, based on year 2025 projected net residential and employment land use densities around planned stations or transit corridors.
Rating: "High": urban or urban core/CBD; "Medium": suburban; "Low": rural or rural suburban, as measured below:

Net Population Density	Total Population/ Residential Area square miles	Net Employment Density	Total Employment/ Commercial Area square miles
Rural	< 5,000	Rural	< 5,000
Rural-Suburban	5,000-10,000	Suburban	5,000-20,000
Suburban	10,000-20,000	Urban	20,000-50,000
Urban	20,000-50,000	Urban Core	50,000-100,000
Urban Core	>50,000	Urban CBD	>100,000

Cost-effectiveness: "Cost per new rider", measured as dollars per new rider (shifting from auto to transit; not transit to transit).
Rating: "High": $0 - $15/new rider; "Medium": $16 - $30/new rider; "Low": over $30/new rider

Note: Resolution No. 3357 also provides for another measure of cost effectiveness: "transit user benefits" that will be incorporated into this analysis at a later date once the methodology is available from the Federal Transit Administration.

System Connectivity: Assess the interconnected relationship of the transit expansion and the existing transit network, through measures of connections, service frequency and gap closures.
Rating:
A. Number of Connecting Operators: "High": 5 or more; "Medium": 3 to 4; "Low": 1 to 2

B. Frequency: Peak Period Headways: "High": 10 minutes or less; "Medium": 20 minutes to 11 minutes; "Low": Greater than 20 minutes

C. Gap Closures: " Yes" or "No" for completion of a major closure in the regional network.

System Access: Determine the ability of users to easily access (via walking, biking, auto or transit transfers) the new extensions, based on number of modal access options
Rating: "High": 4 or more; "Medium": 3; "Low": 1 to 2

Project Readiness: Priority assigned to projects that are able to proceed expeditiously to implementation, based on pre-construction activities completed or in progress as of December 2001.
Rating: "High": corridor evaluation+environmental analysis+preliminary design and engineering; "Medium": corridor evaluation+environmental analysis; "Low": Sketch planning or corridor evaluation only.

Date: December 19, 2001
W.I.: 12110
Referred by: POC
Revised: 01/30/02-C
04/26/06-C
09/24/08-C

Attachment B
Resolution No. 3434

Regional Transit Expansion Policy: Recommended Program of Projects

PROJECT	COST (millions of YOE $)
AC Transit Berkeley/Oakland/San Leandro Bus Rapid Transit	250
AC Transit Enhanced Bus: Hesperian/Foothill/MacArthur corridors	41
BART/Oakland Airport Connector	459
Tri-Valley Transit Access Improvements to BART	168
East Contra Costa BART Extension (eBART)	525
BART to Warm Springs	890
BART: Warm Springs to San Jose/Santa Clara	6,133
Caltrain Express: Baby Bullet ** OPEN FOR SERVICE**	128
Caltrain Electrification	785
Caltrain Express: Phase 2	427
Transbay Transit Center: Phase 1	1,189
Transbay Transit Center: Phase 2	2,996
Capitol Corridor Expansion	108
Capitol Corridor: Phase 2 Enhancements	89
Regional Express Bus **OPEN FOR SERVICE**	102
MUNI Third Street Light Rail Transit Project - Central Subway	1,290
SFCTA and SFMTA: Van Ness Avenue Bus Rapid Transit	88
Altamont Commuter Express (ACE): service expansion	150
Sonoma-Marin Rail	646
Dumbarton Rail	596
Downtown to East Valley: Light Rail and Bus Rapid Transit Phase 1 and 2	465
Expanded Ferry Service to Berkeley, Alameda/Oakland/Harbor Bay, Hercules, Richmond, and South San Francisco; and other improvements.	180

Attachment C: Regional Transit Expansion Policy - Funding Strategy

Project Capital Cost/Funding in Millions and Year of Expenditure $
Alphabetical by Tier

			Committed Funding						*Regional Discretionary Funding*												
Project	**Sponsor**	**Project Cost (YOE $)**	TCRP	Sales Tax	Resolution 1876	RTIP	Federal Earmarks	Other [see notes]	Section 5309 New Starts	Section 5309 Small Starts	Section 5309 Fixed Guideway Modernization	Ferryboat Discretionary	RM1	RM 2	AB 1171	Prop 1B - Transit	Prop 1B - SLPP	ITIP	ITIP Intercity Rail	CARB/ AB 434	**Capital Shortfall**
Caltrain Express: Baby Bullet ** OPEN FOR SERVICE**	Caltrain JPB	128	127					1													-
Regional Express Bus **OPEN FOR SERVICE**	MTC	102	40											62							-
Tier 1 - No Current Scope, Schedule, Budget Issues as Reported By Sponsors																					
AC Transit Berkeley/Oakland/San Leandro Bus Rapid Transit	AC Transit	250		24		50	2	35		75				65							-
BART to Warm Springs	BART	890	100	221	205	69		26					53	85	5	40	86				-
East Contra Costa BART Extension (eBART)	BART/CCTA	525	7	196		14		6					52	96	115	40					-
Capitol Corridor Expansion	CCJPA	108	24			4		15											64		-
Capitol Corridor: Phase 2 Enhancements	CCJPA	89	1											3					85		-
MUNI Third Street Light Rail Transit Project - Central Subway	SFMTA	1,290	14	126		92		45	762							250					-
SFCTA and SFMTA: Van Ness Avenue Bus Rapid Transit	SFCTA and SFMTA	88		18						70											-
Transbay Transit Center: Phase 1	TJPA	1,189		105		28	64	646					53	142	150						-
Tri-Valley Transit Access Improvements to/from BART	BART/ACCMA/ LAVTA	168	3	10				14		11			16	16	95	2					-
Downtown to East Valley: Light Rail and Bus Rapid Transit Phase 1 and 2	VTA	465		318		58										90					-
Expanded Ferry Service to Oakland, Alameda/Oakland/Harbor Bay, Hercules, Richmond, and South San Francisco; and other improvements.	WETA	180		47			19					25		89							-
Tier 2 - Projects Needing More Scope/Cost Refinement																					
BART/Oakland Airport Connector	BART	459		99		21		231					31	68				10			TBD
Caltrain Electrification	Caltrain JPB	785		360		28		23			4									29	341
Tier 3 - Projects Needing Ongoing Operating Funds																					
Sonoma-Marin Rail	SMART	646	37	24			7	65						35							478
BART: Warm Springs to San Jose/Santa Clara	VTA	6,133	649	4,734					750												-
Tier 4 - Shortfall is equal to or greater than 50% project cost																					
AC Transit Enhanced Bus: Grand-MacArthur corridor	AC Transit	41				7		1						3							30
Caltrain Express: Phase 2	Caltrain JPB	427						13			41					15					358
Dumbarton Rail	SMTA, ACCMA, VTA, ACTIA, Capitol Corridor	596		113		15								135					39		295
Altamont Commuter Express (ACE) Right-of-Way Acquisition for Service Expansion	SJRRC, ACCMA, VTA	150		67				3			5										75
Transbay Transit Center: Phase 2	TJPA	2,996		73				868						8							2,047
TOTAL		**$ 17,703**	**$ 1,002**	**$ 6,533**	**$ 205**	**$ 385**	**$ 92**	**$ 1,994**	**$ 1,512**	**$ 156**	**$ 50**	**$ 25**	**$ 205**	**$ 807**	**$ 365**	**$ 437**		**$ 10**	**$ 188**	**$ 29**	**$ 3,624**

Attachment C: Regional Transit Expansion Policy - Funding Strategy (cont.)

Notes: For all projects, see Terms and Conditions.

Detail on 'other' funding is provided below:

1. AC Transit Berkeley/Oakland/San Leandro Bus Rapid Transit: $35 million in CMAQ bonus funds programmed in 2008.
2. BART to Warm Springs: $2.2 M local CMA funds. $24 M in BART agency contribution. Prop 1B Transit funds are 50% MTC and 50% BART. Of the $205 million in Resolution 1876 commitment, $145 million is SFO Extension Revenues. Then SFO Extension revenues are subject to the provisions outlined in Attachment D, subsection 5.
3. East Contra Costa BART Extension: $6 million in developer fees. Prop 1B Transit funds are 50% MTC and 50%
4. Capitol Corridor Expansion: Other includes $10 million in ACE funds, $.5 million in Caltrain funds, $2.1 million in CCJPB funds, $2.3 million in State PTA funds and $0.5 million in Prop 116 funds.
5. Muni Third Street Light Rail Project: New Starts request is $762 million in Year of Expenditure dollars. Prop 1B Transit funds are 40% MTC and 60% SFMTA.
6. Transbay Transit Center Phase 1: Other funds include $411 million in land sales and tax increment revenue, $8.8 million in FTA 1601 funds, and $227 million in TIFIA loan proceeds.
7. Tri-Valley Transit Access Improvements to BART: $6 million in federal CMAQ funds, $6.4 million in federal 5307 funds, and $1.6 million in TDA funds. Prop 1B Transit funds are LAVTA Revenue-based.
8. VTA Downtown to East Valley: Prop 1B Transit funds are 50% MTC and 50% VTA.
9. BART/Oakland Airport Connector: $31.5 million is Port of Oakland funds, $25 million federal Public/Private Pilot Program and $174 million private financing.
10. Caltrain Electrification: $12 million in regional STP/CMAQ funds and $11.3 million in PJPB funds.
11. Sonoma-Marin Rail: Other includes $28 million in Prop. 116 and $37.2 million in North Coast Rail Authority funds
12. BART: Warm Springs to San Jose/Santa Clara: New Starts request is $750 million in Year of Expenditure dollars. Confirmation of RTIP commitment pending reconciliation by VTA between the Santa Clara county-wide plan and MTC's Transportation 2030.
13. AC Transit Enhanced Bus: Grand MacArthur Corridor: $.8 million is Transportation Fund for Clean Air funds through BAAQMD
14. Caltrain Express: $13.2 million is Joint Powers Board member contributions.
15. ACE Service Expansion: Other includes $3 million in San Joaquin federal fund contributions.
16. Transbay Transit Center Phase 2: Other funds include $424 million in land sales and tax increment revenue and $445 million in TIFIA loan proceeds.

Definitions and Assumptions of Regional Discretionary Funding

- Federal Section 5309 New Starts: the total shown is an estimate for the 25-year RTP period. This estimate trends against recent historical averages of the Bay Area's New Starts funding compared to the nation, an average of 7% over the last 10 years. This represents a target for advocacy in Washington, D.C.; actual authorizations and appropriations are at the discretion of Congress.

- Federal Section 5309 Small Starts: estimate for the 25-year RTP period, beginning with the federal reauthorization in 2005. Small Start Capital Grants may not exceed $75 million under law. This represents a target for advocacy in Washington D.C.; actual authorization and appropriations are at the discretion of Congress. This estimate does not include the Very Small Starts program.

- Federal Section 5309 Rail Modernization: These Federal Transit Administration formula funds are eligible for fixed guideway infrastructure projects. In the MTC region these funds are by policy devoted to capital replacement. The funding would replace diesel locomotives with electric locomotives when eligible for the Caltrain Electrification project.

- Federal Ferryboat Discretionary Program: estimate for the 25-year RTP period, beginning with the federal reauthorization in 2005; provides a special category for the construction of ferry boats and ferry terminal facilities. This represents a target for advocacy in Washington D.C.; actual authorization and appropriations are at the discretion of Congress.

- Regional Measure 1 Rail Reserve: the total shown is an estimate for the 25-year RTP period, net of existing commitments to the BART Warm Springs extension. These funds from the base $1 Bay Bridge toll are directly allocated by the Commission to rail projects in the bridge corridor according to a statutory formula splitting the funds 70% to East Bay projects, and 30% to West Bay projects. This funding estimate assumes debt financing against this revenue stream. This estimate was revised as part of the 2008 Strategic Plan effort.

- Regional Measure 2: Regional voter-approved measure providing $812 million to Resolution 3434 projects. The specific amounts are identified in statute for each project. This funding estimate assumes debt financing against this revenue stream.

- AB 1171: This is a discretionary funding source passed by the Legislature and signed by the Governor in October 2001. AB 1171 (Dutra) extends the $1 seismic surcharge (the second half of the current $2 auto toll) on the seven state-owned Bay Area toll bridges for up to 30 years to finance retrofit work. Under certain financing provisions, a portion of that toll revenue will return to MTC acting as the Bay Area Toll Authority (BATA). This funding can be used for projects consistent with the voter approved Regional Measure 1 program—including congestion relief projects in corridors served by some proposed transit expansion projects—and is estimated over the 25-year period of the RTP to total $570 million; $370 million of this amount is being assigned to the Regional Transit Expansion program of projects. This estimate was revised as part of the 2008 Strategic Plan effort.

- Proposition 1B Transit: Proposition 1B, approved by California voters in November 2006, directed $3.6 billion toward transit capital improvements, including about $1.3 billion for projects in the Bay Area. Within this $1.3 billion, roughly $1 billion is distributed directly to the transit operators, and about $347 million is anticipated to come directly to MTC through statutorily defined formulas. On June 27th, 2007 the Commission adopted the MTC Proposition 1B Regional Transit Program - Resolution 3814. Resolution 3814 committed $185 million in Proposition 1B - Population-based funds conditioned upon operators committing $185 million in Propostion 1B - Revenue-based funds. Operator contributions may exceed the matching requirement of Resolution 3814.

- Proposition 1B State Local Partnership: Proposition 1B, approved by California voters in November 2006, directed $1 billion toward the State/Local Partnership Program (SLPP). This program was included in the bond measure to reward local jurisdictions for their financial contributions to California's transportation system. The program may match county sales taxes, transit sales taxes, and voter-approved bridge tolls such as Regional Measures 1 and 2. Should the eligible match element of the program include bridge tolls, MTC commits the initial $40 million to Resolution 3434 projects conditioned on SLPP contributions from partner agencies, as outlined in Attachment D. The remaining amount, estimated to be roughly $26 million, would be held in an unrestricted reserve.

- Interregional Transportation Improvement Program: the total shown is an estimate for the 25-year RTP period; other ITIP funding is assumed for highway and other projects. As ITIP funds are the state's discretionary portion of the State Transportation Improvement Program, this represents a target for advocacy in Sacramento. Actual programming commitments and allocations are at the discretion of the California Transportation Commission.

- CARB/AB 434: Both the California Air Resources Board (CARB) and the Bay Area Air Quality Management District (AB 434) administer discretionary funding programs focused in whole or in part on reducing emissions from diesel engines. $29 million is assumed from the two programs combined to help fund the Caltrain electrification project. This funding target for advocacy over the RTP period is sized to the annual funding levels of the two programs.

Terms and Conditions

General Terms

1. Operating Funding – In order for an extension of service to be included in the Regional Transportation Plan (RTP), the project sponsor must provide evidence of its ability to fund operation of the service for a minimum of 10 years, or the duration of operations within the 25-year RTP time horizon, whichever is longer. These financial capacity determinations must also include a demonstration of the transit operator's ability to sustain levels of core bus services to low-income and minority populations, as required under MTC Resolution No. 3357. Should the transit operator's financial stability deteriorate, or the expansion project in question experience significant cost increases, these financial capacity determinations will be revisited in MTC's review of the operator's applicable Short Range Transit Plan.

2. Cost Increases – Commitments of regional discretionary funds (Section 5309 New Starts, Small Starts, and Fixed Guideway Modernization, Regional Measure 1 Rail Reserve, ITIP, AB 1171, CARB/AB 434, Regional Measure 2, Ferry Boat Discretionary) are capped at the amounts shown in Attachment C in year of expenditure dollars. Project sponsors are responsible for funding any cost increases (including financing costs) above the estimates shown in Attachment C from other sources. Funding shortfalls must be addressed for projects to be included in the Regional Transportation Plan.

3. Amendment – The Commission shall consider amending this regional transit expansion program following the passage of major new funding sources that could advance projects with current shortfalls into the RTP. New funding sources also could be used to offset cost increases for projects already included in the RTP.

4. Station Access Planning: Consistent with recommendations of MTC's Regional Bicycle Plan, all new transit stations that are built as result of Resolution No. 3434 investments must provide direct and convenient pedestrian and bicycle access from adjacent walkways and bicycle facilities. Station access planning shall be consistent with the conclusions reached from the evaluation of FSM 5 in the 2001 Bay Area Ozone Attainment Plan.

Specific Conditions

1. Section 5309 New Starts – The region's priorities for federal New Starts funds are the BART Extension to Silicon Valley and the Muni Central Subway project, with equal priority.

2. Section 5309 Small Starts – The region's priorities for federal Small Starts funds are the AC Transit Oakland/San Leandro Bus Rapid Transit project and the Van Ness Avenue Bus Rapid Transit project in San Francisco, with equal priority.

3. AB 1171 – These funds will be subject to terms and conditions established by MTC acting as the Bay Area Toll Authority (BATA). The balance of these funds not committed in Attachment C will be reserved as follows:

   - **Corridor Improvements Adjacent to the I-80/680 Interchange:** $100 million reserved for improvements in the vicinity of the I-80/680 interchange. These AB1171 funds are in addition to the $100 million approved through Regional Measure 2 (RM2) for corridor improvements in the vicinity of the I-80/680 interchange.
   - **Other Improvements:** $100 million for other corridor improvements.

4. BART Warm Springs to San Jose – In addition to the general terms for operating funding imposed on all projects, the BART Warms Springs to San Jose project is included in the RTP contingent upon approval by the BART and VTA Boards of an operating and maintenance agreement regarding extension of service into Santa Clara County and associated impacts of the extension on the core BART system. If a TDA "lien" is implemented pursuant to the BART/VTA agreement after 2009, MTC will condition allocation of the remaining TDA funds subject to the following:

   At the time that the BART to San Jose extension commences revenue service, or at any point thereafter, should VTA's bus service levels have not achieved, or later fall below, a 600 fleet/500 peak target, then MTC shall hold public hearings at which VTA must demonstrate that services to Title VI communities have been assured, based on MTC's Lifeline Transportation analysis, as validated and amended by transit operators and the Congestion Management Agencies.

Should VTA choose to identify TDA funds as the guaranteed operating and maintenance subsidy pursuant to the BART/VTA agreement and demonstrate that it has secured other funding sources

to replace the TDA revenue so guaranteed, then MTC shall not condition its allocation of TDA funds as described above.

5. BART Extension to Warm Springs: MTC commits the following funds subject to availability: $40 million from MTC's share of Proposition 1B State Local Partnership Program, $29 million in RM1 and $5 million in AB 1171. These funding commitments are conditioned upon: 1) BART contributing an additional $24 million; 2) Alameda and Santa Clara Counties contribute $30 million and $16 million, respectively, from Proposition 1B State Local Partnership Program proceeds; and 3) VTA's Board committing to a full funding plan for an operable BART segment in Santa Clara County.

   To address the cash flow challenges wherein the $145 million surplus fare revenue on the BART SFO Extension are not expected to be available during the BART to Warm Springs construction period, $91 million of Regional Measure 2 (RM2) and $54 million, shared equally, in funding advanced from MTC and BART/ACTIA are proposed. This proposal is conditioned on the following: 1) the Commission holding a public hearing and approving reassignment of $91 million in RM2 funds from the Dumbarton Rail project to the BART to Warm Springs project; and 2) first priority and equivalent repayment of $27 million each to MTC and ACTIA/BART from the surplus BART SFO Extension revenues

6. AC Transit Berkeley/Oakland/San Leandro Bus Rapid Transit: MTC commits $35 million in CMAQ funds subject to the following conditions: 1) Alameda County Congestion Management Agency (ACCMA) adopts an RTIP funding commitment plan and explores a strategy to advance the $40 million RTIP funds commitment; 2) AC Transit submits documentation for inclusion into the 2009 Federal Transit Administration (FTA) Small Starts report; and 3) AC Transit adopts a board resolution committing to the following: a) use the $35 million to deliver a useable bus rapid transit segment; and b) develop a phasing plan to deliver the full Berkeley/Oakland/San Leandro Bus Rapid Transit project, if the entire project as submitted to FTA for the Small Starts program, is not immediately deliverable.

7. Dumbarton Rail: Should the Commission hold an RM2 Public Hearing and reassign $91 million in RM2 funds from the Dumbarton Rail project to the BART to Warm Springs project, the $91 million will be replaced with $91 million in Alameda Regional Transportation Improvement Program (RTIP) funds. The reassignment is conditioned on the Alameda County Congestion Management Agency adopting a board resolution committing the RTIP funds to the project. MTC, in cooperation with Caltrain and the other funding partners, shall:

1. Support completion of the alternatives analysis and environmental phase
2. Support steps toward the purchase of Right-of-Way in the ACE, Capitol, and Dumbarton Corridors
3. Support expanded cost-effective express bus service in the corridor to build ridership
4. Explore other funding opportunities, including the potential for future bridge tolls, to accelerate repayment of the reassigned $91 million in RM2 funds.
5. In conjunction with all funding partners, explore other funding opportunities, including the potential for future bridge tolls, to close the $300 million project shortfall.

MTC RESOLUTION 3434 TOD POLICY FOR REGIONAL TRANSIT EXPANSION PROJECTS

1. Purpose

The San Francisco Bay Area—widely recognized for its beauty and innovation—is projected to grow by almost two million people and one and a half million jobs by 2030. This presents a daunting challenge to the sustainability and the quality of life in the region. Where and how we accommodate this future growth, in particular where people live and work, will help determine how effectively the transportation system can handle this growth.

The more people who live, work and study in close proximity to public transit stations and corridors, the more likely they are to use the transit systems, and more transit riders means fewer vehicles competing for valuable road space. The policy also provides support for a growing market demand for more vibrant, walkable and transit convenient lifestyles by stimulating the construction of at least 42,000 new housing units along the region's major new transit corridors and will help to contribute to a forecasted 59% increase in transit ridership by the year 2030.

This TOD policy addresses multiple goals: improving the cost-effectiveness of regional investments in new transit expansions, easing the Bay Area's chronic housing shortage, creating vibrant new communities, and helping preserve regional open space. The policy ensures that transportation agencies, local jurisdictions, members of the public and the private sector work together to create development patterns that are more supportive of transit.

There are three key elements of the regional TOD policy:

(a) Corridor-level thresholds to quantify appropriate minimum levels of development around transit stations along new corridors;

(b) Local station area plans that address future land use changes, station access needs, circulation improvements, pedestrian-friendly design, and other key features in a transit-oriented development; and

(c) Corridor working groups that bring together CMAs, city and county planning staff, transit agencies, and other key stakeholders to define expectations, timelines, roles and responsibilities for key stages of the transit project development process.

2. TOD Policy Application

The TOD policy only applies to physical transit extensions funded in Resolution 3434 (see Table 1). The policy applies to any physical transit extension project with regional discretionary funds, regardless of level of funding. Resolution 3434 investments that only entail level of service improvements or other enhancements without physically extending the system are not subject to

TABLE 1
Resolution 3434 Transit Extension Projects Subject to Corridor Thresholds

Project	Sponsor	Type	Threshold is met with current development?
BART East Contra Costa Rail Extension	BART/CCTA	Commuter Rail	No
BART – Downtown Fremont to San Jose / Santa Clara (a) Fremont to Warm Springs (b) Warm Springs to San Jose/Santa Clara	(a) BART (b) VTA	BART extension	No
AC Transit Berkeley/Oakland/San Leandro Bus Rapid Transit: Phase 1	AC Transit	Bus Rapid Transit	Yes
Caltrain Downtown Extension/Rebuilt Transbay Terminal	TJPA	Commuter Rail	Yes
MUNI Third Street LRT Project Phase 2 – New Central Subway	MUNI	Light Rail	Yes
Sonoma-Marin Rail	SMART	Commuter Rail	No
Dumbarton Rail	SMTA, ACCMA, VTA, ACTIA, Capitol Corridor	Commuter Rail	No
Expanded Ferry Service to Berkeley, Alameda/Oakland/Harbor Bay, Hercules, Richmond, and South San Francisco; and other improvements.	WTA	Ferry	No

** Ferry terminals where development is feasible shall meet a housing threshold of 2500 units. MTC staff will make the determination of development feasibility on a case by case basis.*

the TOD policy requirements. Single station extensions to international airports are not subject to the TOD policy due to the infeasiblity of housing development.

3. Definitions and Conditions of Funding

For purposes of this policy "regional discretionary funding" consists of the following sources identified in the Resolution 3434 funding plan:

- FTA Section 5309- New Starts
- FTA Section 5309- Bus and Bus Facilities Discretionary
- FTA Section 5309- Rail Modernization
- Regional Measure 1- Rail (bridge tolls)
- Regional Measure 2 (bridge tolls)
- Interregional Transportation Improvement Program
- Interregional Transportation Improvement Program-Intercity rail
- Federal Ferryboat Discretionary
- AB 1171 (bridge tolls)
- CARB-Carl Moyer/AB434 (Bay Area Air Quality Management District) [1]

These regional funds may be programmed and allocated for environmental and design related work, in preparation for addressing the requirements of the TOD policy. Regional funds may be programmed and allocated for right-of-way acquisition in advance of meeting all requirements in the policy, if land preservation for TOD or project delivery purposes is essential. No regional funds will be programmed and allocated for construction until the requirements of this policy have been satisfied. See Table 2 for a more detailed overview of the planning process.

4. Corridor-Level Thresholds

Each transit extension project funded in Resolution 3434 must plan for a minimum number of housing units along the corridor. These corridor-level thresholds vary by mode of transit, with more capital-intensive modes requiring higher numbers of housing units (see Table 3). The corridor thresholds have been developed based on potential for increased transit ridership, exemplary existing station sites in the Bay Area, local general plan data, predicted market demand for TOD-oriented housing in each county, and an independent analysis of feasible development potential in each transit corridor.

[1] The Carl Moyer funds and AB 434 funds are controlled directly by the California Air Resources Board and Bay Area Air Management District. Res. 3434 identifies these funds for the Caltrain electrification project, which is not subject to the TOD policy.

TABLE 2
REGIONAL TOD POLICY IMPLEMENTATION PROCESS
FOR TRANSIT EXTENSION PROJECTS

Transit Agency Action	City Action	MTC/CMA/ABAG Action
All parties in corridors that do not currently meet thresholds (see Table 1) establish Corridor Working Group to address corridor threshold. Conduct initial corridor performance evaluation, initiate station area planning. ⇩		
Environmental Review/ Preliminary Engineering /Right-of-Way	Conduct Station Area Plans	Coordination of corridor working group, funding of station area plans
Step 1 Threshold Check: the combination of new Station Area Plans and existing development patterns exceeds corridor housing thresholds .		
Final Design	Adopt Station Area Plans. Revise general plan policies and zoning, environmental reviews	Regional and county agencies assist local jurisdictions in implementing station area plans
Step 2 Threshold Check: (a) local policies adopted for station areas; (b) implementation mechanisms in place per adopted Station Area Plan by the time Final Design is completed. ⇩		
Construction	Implementation (financing, MOUs) Solicit development	TLC planning and capital funding, HIP funding

TABLE 3: CORRIDOR THRESHOLDS
HOUSING UNITS – AVERAGE PER STATION AREA

Project Type / Threshold	BART	Light Rail	Bus Rapid Transit	Commuter Rail	Ferry
Housing Threshold	3,850	3,300	2,750	2,200	2,500*

Each corridor is evaluated for the Housing Threshold. For example, a four station commuter rail extension (including the existing end-of-the-line station) would be required to meet a corridor-level threshold of 8,800 housing units.

Threshold figures above are an average per station area for all modes except ferries based on both existing land uses and planned development within a half mile of all stations. New below market rate housing is provided a 50% bonus towards meeting housing unit threshold.

** Ferry terminals where development is feasible shall meet a housing threshold of 2500 units. MTC staff will make the determination of development feasibility on a case by case basis.*

- Meeting the corridor level thresholds requires that within a half mile of all stations, a combination of existing land uses and planned land uses meets or exceeds the overall corridor threshold for housing (listed in Table 3);
- Physical transit extension projects that do not currently meet the corridor thresholds with development that is already built will receive the highest priority for the award of MTC's Station Area Planning Grants.
- To be counted toward the threshold, planned land uses must be adopted through general plans, and the appropriate implementation processes must be put in place, such as zoning codes. General plan language alone without supportive implementation policies, such as zoning, is not sufficient for the purposes of this policy. Ideally, planned land uses will be formally adopted through a specific plan (or equivalent), zoning codes and general plan amendments along with an accompanying programmatic Environmental Impact Report (EIR) as part of the overall station area planning process. Minimum densities will be used in the calculations to assess achievement of the thresholds.
- An existing end station is included as part of the transit corridor for the purposes of calculating the corridor thresholds; optional stations will not be included in calculating the corridor thresholds.

- New below-market housing units will receive a 50 percent bonus toward meeting the corridor threshold (i.e. one planned below-market housing unit counts for 1.5 housing units for the purposes of meeting the corridor threshold. Below market for the purposes of the Resolution 3434 TOD policy is affordable to 60% of area median income for rental units and 100% of area median income for owner-occupied units);
- The local jurisdictions in each corridor will determine job and housing placement, type, density, and design.
- The Corridor Working Groups are encouraged to plan for a level of housing that will significantly exceed the housing unit thresholds stated here during the planning process. This will ensure that the Housing Unit Threshold is exceeded corridor-wide and that the ridership potential from TOD is maximized.

5. Station Area Plans

Each proposed physical transit extension project seeking funding through Resolution 3434 must demonstrate that the thresholds for the corridor are met through existing development and adopted station area plans that commit local jurisdictions to a level of housing that meets the threshold. This requirement may be met by existing station area plans accompanied by appropriate zoning and implementation mechanisms. If new station area plans are needed to meet the corridor threshold, MTC will assist in funding the plans. The Station Area Plans shall be conducted by local governments in coordination with transit agencies, Association of Bay Area Governments (ABAG), MTC and the Congestion Management Agencies (CMAs).

Station Area Plans are opportunities to define vibrant mixed use, accessible transit villages and quality transit-oriented development – places where people will want to live, work, shop and spend time. These plans should incorporate mixed-use developments, including new housing, neighborhood serving retail, employment, schools, day care centers, parks and other amenities to serve the local community.

At a minimum, Station Area Plans will define both the land use plan for the area as well as the policies—zoning, design standards, parking policies, etc.—for implementation. The plans shall at a minimum include the following elements:

- Current and proposed land use by type of use and density within the ½ mile radius, with a clear identification of the number of existing and planned housing units and jobs;
- Station access and circulation plans for motorized, non-motorized and transit access. The station area plan should clearly identify any barriers for pedestrian, bicycle and wheelchair access to the station from surrounding neighborhoods (e.g., freeways, railroad tracks, arterials with inadequate pedestrian crossings), and should propose strategies that will remove these barriers and maximize the number of residents and employees that can access the station by these means. The station area and transit village public spaces shall be made accessible to persons with disabilities.
- Estimates of transit riders walking from the half mile station area to the transit station to use transit;
- Transit village design policies and standards, including mixed use developments and pedestrian-scaled block size, to promote the livability and walkability of the station area;

- TOD-oriented parking demand and parking requirements for station area land uses, including consideration of pricing and provisions for shared parking;
- Implementation plan for the station area plan, including local policies required for development per the plan, market demand for the proposed development, potential phasing of development and demand analysis for proposed development.

The Station Area Plans shall be conducted according to the guidelines established in MTC's Station Area Planning Manual.

6. Corridor Working Groups

The goal of the Corridor Working Groups is to create a more coordinated approach to planning for transit-oriented development along Resolution 3434 transit corridors. Each of the transit extensions subject to the corridor threshold process, as identified in Table 1, will need a Corridor Working Group, unless the current level of development already meets the corridor threshold. Many of the corridors already have a transit project working group that may be adjusted to take on this role. The Corridor Working Group shall be coordinated by the relevant CMAs, and will include the sponsoring transit agency, the local jurisdictions in the corridor, and representatives from ABAG, MTC, and other parties as appropriate.

The Corridor Working Group will assess whether the planned level of development satisfies the corridor threshold as defined for the mode, and assist in addressing any deficit in meeting the threshold by working to identify opportunities and strategies at the local level. This will include the key task of distributing the required housing units to each of the affected station sites within the defined corridor. The Corridor Working Group will continue with corridor evaluation, station area planning, and any necessary refinements to station locations until the corridor threshold is met and supporting Station Area Plans are adopted by the local jurisdictions.

MTC will confirm that each corridor meets the housing threshold prior to the release of regional discretionary funds for construction of the transit project.

7. Review of the TOD Policy

MTC staff will conduct a review of the TOD policy and its application to each of the affected Resolution 3434 corridors, and present findings to the Commission, within 12 months of the adoption of the TOD policy.

APPENDIX A – 11

Regional Policies: Long-Range Planning / Plan Bay Area

MTC's Regional Policy for Accommodation of Bicycle and Pedestrian Facilities During Transportation Project Planning, Design, Funding and Construction

MTC Resolution No. 3765

Date: June 28, 2006
W.I.: 1125
Referred by: POC

ABSTRACT

Resolution No. 3765

This resolution sets forth MTC's regional policy for accommodation of bicycle and pedestrian facilities during transportation project planning, design, funding and construction.

Further discussion of these actions are contained in the MTC Executive Director's Memorandum to the Planning Committee dated June 9, 2006.

Date: June 28, 2006
W.I.: 1125
Referred by: PC

RE: Regional Policies for Accommodation of Bicycle and Pedestrian Facilities In Transportation Project Planning, Design, Funding and Construction

METROPOLITAN TRANSPORTATION COMMISSION
RESOLUTION NO. 3765

WHEREAS, the Metropolitan Transportation Commission (MTC) is the regional transportation planning agency for the San Francisco Bay Area pursuant to Government Code Section 66500 et seq.; and

WHEREAS, MTC adopted Resolution No. 3427 in 2001 which adopted the 2001 Regional Transportation Plan and the 2001 Regional Bicycle Plan for the region; and

WHEREAS, MTC adopted Resolution No. 3681 in 2005 which adopted the Transportation 2030 Plan including Calls to Action to address bicyclist and pedestrian transportation needs during project development; and

WHEREAS, MTC recognizes that coordinated development of pedestrian and bicycle infrastructure offers cost savings in the long term and opportunities to create safe and convenient bicycle and pedestrian travel; now, therefore, be it

RESOLVED, that MTC adopts the Recommendations from the study *Routine Accommodation of Pedestrians and Bicyclists in the Bay Area,* as outlined in Attachment A, attached hereto and incorporated herein as though set forth at length

METROPOLITAN TRANSPORTATION COMMISSION

Jon Rubin, Chair

The above resolution was entered into by the Metropolitan Transportation Commission at a regular meeting of the Commission held in Oakland, California, on June 28, 2006.

Date: June 28, 2006
W.I.: 1125
Referred by: PC

Attachment A
Resolution No. 3765

Routine Accommodation of Pedestrians and Bicyclists in the Bay Area: Study Recommendations

POLICY

1. Projects funded all or in part with regional funds (e.g. federal, STIP, bridge tolls) shall consider the accommodation of bicycle and pedestrian facilities, as described in Caltrans Deputy Directive 64. These recommendations shall not replace locally adopted policies regarding transportation planning, design, and construction. These recommendations are intended to facilitate the accommodation of pedestrians, which include wheelchair users, and bicyclist needs into all projects where bicycle and pedestrian travel is consistent with current, adopted regional and local plans. In the absence of such plans, federal, state, and local standards and guidelines should be used to determine appropriate accommodations.

PROJECT PLANNING and DESIGN

2. Caltrans and MTC will make available routine accommodations reports and publications available on their respective websites.

3. To promote local bicyclist and pedestrian involvement, Caltrans District 4 will maintain and share, either quarterly or semi-annually at the District 4 Bicycle Advisory Committee, a table listing ongoing Project Initiation Documents (PIDS) for Caltrans and locally-sponsored projects on state highway facilities where bicyclists and pedestrians are permitted.

FUNDING and REVIEW

4. MTC will continue to support funding for bicycle and pedestrian planning, with special focus on the development of new plans and the update of plans more than five years old.

5. MTC's-fund programming policies shall ensure project sponsors consider the accommodation of bicyclists and pedestrians consistent with Caltrans' Deputy Directive 64. Projects funded all or in part with regional discretionary funds must consider bicycle and pedestrian facilities in the full project cost consistent with Recommendation 1 above. The Federal Highway Administration recommends including up to 20% of the project cost to address non-motorized access improvements; MTC encourages local agencies to adopt their own percentages.

6. TDA Article 3, Regional Bike/Ped, and TLC funds shall not be used to fund bicycle and pedestrian facilities needed for new roadway or transit construction projects that remove or degrade bicycle and pedestrian access. Funding to enhance bicycle and/or pedestrian access associated with new roadway or transit construction projects should be included in the funding for that project.

7. MTC, its regional bicycle and pedestrian working groups, the Partnership's Local Streets and Roads committee, and the county congestion management agencies (CMAs) shall develop a project checklist to be used by implementing agencies to evaluate bicycle and pedestrian facility needs and to identify its accommodation associated with regionally-funded roadway and transit projects consistent with applicable plans and/or standards. The form is intended for use on projects at their earliest conception or design phase and will be developed by the end of 2006.

8. CMAs will review completed project checklists and will make them available through their websites, and to their countywide Bicycle/Pedestrian Advisory Committees (BPACs) for review and input to ensure that routine accommodation is considered at the earliest stages of project development. The checklist outlined in Recommendation 7 should be the basis of this discussion prior to projects entering the TIP.

9. Each countywide BPAC shall include members that understand the range of transportation needs of bicyclists and pedestrians consistent with MTC Resolution 875 and shall include representation from both incorporated and unincorporated areas of the county.

10. MTC and its partner agencies will monitor how the transportation system needs of bicyclists and pedestrians are being addressed in the design and construction of transportation projects by auditing candidate TIP projects to track the success of these recommendations. Caltrans shall monitor select projects based on the proposed checklist.

TRAINING

11. Caltrans and MTC will continue to promote and host project manager and designer training sessions to staff and local agencies to promote routine accommodation consistent with Deputy Directive 64.

APPENDIX A – 12

Regional Policies: Long-Range Planning / Plan Bay Area

Transit Sustainability Project

MTC Resolution No. 4060

Date: May 23, 2012
Referred by: TSP Select Committee
Revised: 04/24/13-C

ABSTRACT

Resolution No. 4060, Revised

This resolution approves the recommendations of the Transit Sustainability Project.

This resolution was amended on April 24, 2013 to include the Inner East Bay Comprehensive Operational Analysis recommendations.

Discussion of the recommendations made under this resolution is contained in the Executive Director Memorandum presented to the Select Committee on Transit Sustainability on April 11, 2012 and March 27, 2013.

Date: May 23, 2012
Referred by: TSP Select Committee

Re: Transit Sustainability Project

METROPOLITAN TRANSPORTATION COMMISSION
RESOLUTION NO. 4060

WHEREAS, pursuant to Government Code § 66500 et seq., the Metropolitan Transportation Commission ("MTC") is the regional transportation planning agency for the San Francisco Bay Area; and

WHEREAS, MTC develops a long-range Regional Transportation Plan (RTP), pursuant to Government Code §§ 66513 and 65080; and

WHEREAS, the last major update of the RTP, adopted in April 2009 (Transportation 2035 - MTC Resolution No. 3893), identified twenty-five year transit capital and operating shortfalls of $17 billion and $8 billion, respectively; and

WHEREAS, to address these shortfalls, as well as address immediate transit operators' service reductions and budget shortfalls, to improve transit performance for the customer, and to attract more customers to the transit system, in January 2010, the Commission created the Select Committee on Transit Sustainability to guide the Transit Sustainability Project (TSP); and

WHEREAS, the TSP focused on three project elements: financial, service performance and institutional frameworks; and

WHEREAS, to inform the TSP, a Project Steering Committee was formed, made up of transit agency, government, labor, business, environmental and equity representatives to provide executive-level input into the project; and

WHEREAS, additional input and guidance was received from the MTC Policy Advisory Committee, as well as from multiple public events and forums sponsored by interested parties; now, therefore, be it

RESOLVED, that based on project findings related to the financial and service performance of the Bay Area transit system, MTC approves the performance measures and targets and investment recommendations set forth in Attachment A to this resolution; and, be it further

RESOLVED, that based on project findings related to the financial, service performance, and institutional framework of the Bay Area transit system, MTC approves the policy recommendations set forth in Attachment B to this resolution; and, be it further

RESOLVED, that MTC will conduct periodic reviews of progress toward the performance targets and policy recommendation implementation.

METROPOLITAN TRANSPORTATION COMMISSION

Adrienne J. Tissier, Chair

The above resolution was approved by the
Metropolitan Transportation Commission
at a regular meeting of the Commission held
in Oakland, California, on May 23, 2012.

Performance and Investment Policies

Performance Measures and Targets
To monitor the performance of the seven largest transit agencies in the Bay Area, the Commission establishes the following TSP performance target, measures, and monitoring process:

Performance Target
5% real reduction in at least one of the following performance measures by FY2016-17 and no growth beyond CPI thereafter. To account for the results of recent cost control strategies at agencies, the baseline year will be set at the highest cost year between FY2007-08 and FY2010-11.

Performance Measures
- Cost Per Service Hour*
- Cost Per Passenger*
- Cost Per Passenger Mile*

**As defined by the Transportation Development Act*

Monitoring Process
In FY2012-13, agencies are to adopt a strategic plan to meet one or more of the targets and submit to MTC.
On an annual basis, starting in FY2013-14, the transit agencies submit performance measure data on all three targets to MTC.
In FY2017-18, MTC will analyze agency progress in meeting target
In FY2018-19, MTC will link existing and new operating and capital funds administered by MTC to progress towards achieving the performance target.

The following agencies, the largest seven transit agencies in the Bay Area, are subject to the performance measures and targets: AC Transit; BART, Caltrain, Golden Gate Transit, SFMTA, SamTrans, and Santa Clara VTA.

Transit Performance Initiative and Customer Satisfaction Survey
The Commission establishes an investment, incentive and monitoring strategy to improve service performance and attract new riders to the region's transit system. The target for each agency is to increase ridership levels at or above the rate of population growth in counties/corridors in which the agency operates service. Agencies are encouraged to utilize the Transit Competitive Index tool, developed for the Bay Area as part of the TSP, to achieve this target.

Investment
As part of the OneBayArea Grant program, the Commission has established an initial commitment of $30 million to fund service improvements on major bus and light rail corridors, focusing on improvements to major corridors in the AC Transit, SFMTA, SamTrans, and Santa Clara VTA service areas. If successful in demonstrating achievement of operational and ridership goals, similar investments would be recommended in the future.

Incentive
The Commission will reward transit agencies that achieve ridership increases and productivity improvements and will allocate transit funds on the basis of performance, thereby encouraging *all* of the region's transit operators to continuously improve their service and attract more riders. Funding sources, amounts and distribution formulas shall be established by the Commission. In establishing distribution formulas, the Commission shall consider at least one alternative that does not reduce the cumulative current funding level for small operators for the fund sources established by the Commission for this incentive program.

Monitor
Maintaining and/or improving customer satisfaction ratings is an important indicator of whether transit is meeting the needs of the traveling public. The Commission will conduct a bi-annual regional customer satisfaction survey to provide a consistent region-wide mechanism to measure customer satisfaction and provide information to build new ridership and improve service. Agencies will be required to coordinate data collection efforts, either through cost sharing, resource sharing, or project management.

Service, Paratransit and Institutional Recommendations

Service

1. **Integrate bus/rail scheduling software to facilitate schedule coordination and customer travel planning. Establish a regional schedule change calendar.**

   The Commission finds that schedule coordination between connecting agencies will increase the attractiveness of public transit but that connecting agencies make schedule changes on different dates and in some cases use incompatible scheduling software systems that make schedule integration difficult. This recommendation would align the schedule change calendar for major schedule changes among the region's operators and require all connecting operators to implement a compatible scheduling software system. Implementation would be subject to each transit agency's future scheduling system procurement timeline, and, for some agencies, may be subject to negotiation of changes to existing labor contract provisions that govern schedule change dates.

2. **Conduct multi-agency Short-Range Transit Plans (SRTPs) at the county or subregion-level to promote interagency service and capital planning.**

   The Commission has historically provided federal planning funds for each transit agency to independently prepare an SRTP of the agency's 10-year operating and capital plan. This recommendation would strengthen the joint planning that has begun in the region and recommend that transit agencies in a county or multi-agency travel corridor collaborate on a 10-year plan. The multi-agency SRTPs should develop capital replacement priorities and schedules, consider connectivity in service planning, establish fare policy consistency, establish common performance measures, and identify opportunities for shared functions. Future funding for SRTPs will take into account coordination opportunities.

3. **Support transit agency operations on major corridors by requiring local jurisdictions to consider transit operating speeds and reliability in projects affecting these corridors.**

   Travel time savings are a key component in building customer satisfaction and attracting new passengers. Under the Commission's proposed OneBayArea Grants program, local jurisdictions are required to adopt a complete streets resolution to be eligible for regional funding. Complete streets aims to consider all road network users including pedestrians, bicyclists and transit riders. MTC is further proposing to expand the scope of the Freeway Performance Initiative to include investments to improve transit operations on key arterial roadways.

4. Consider fare policies focused on the customer that improve regional/local connections.

Implement the Phase III Clipper requirements to revise existing operations and fare policies to a standardized set of business rules. Continue to work towards a more consistent regional standard for fare discount policies and minimize transfer penalties so that passengers can choose the most optimal route for their transit trip.

5. Recommendations specific to Marin, Sonoma, and Solano Counties

The Commission is committed to achieving more rational service delivery in geographic areas served by multiple transit agencies by supporting the collaboration, coordination and consolidation efforts already underway to bring them to implementation stage.

Sonoma: County-level SRTP work is underway in Sonoma County. MTC will provide funding to the Sonoma County Transportation Authority to collect customer opinion and demographic survey data to better inform service planning throughout the county.

Marin/Sonoma: The commencement of SMART service in Marin and Sonoma counties will alter transit travel patterns. This presents an opportunity to strengthen coordination and service planning among Marin and Sonoma transit providers serving the 101 Corridor and local connections. In coordination with the SRTP process, MTC will work with transit operators and the Marin and Sonoma County CMAs to develop a two-county corridor transit plan for submittal and presentation to the Commission.

Solano: County-level SRTP work is underway in Solano County. MTC will provide funding to the Solano Transportation Authority (STA) to complete the analysis to better inform service planning throughout the county. STA and the Solano transit operators are to use this process to identify service improvements, performance objectives and potential service functional and institutional consolidation opportunities.

6. Inner East Bay Comprehensive Operational Analysis

The Commission supports the following recommendations developed by AC Transit and BART for the Inner East Bay shared service area to: 1) promote a seamless Inner East Bay bus and rail system; 2) build the urban core to allow for spontaneous bus and rail network use by customers; 3) match bus and rail service levels with demand, focusing on improving service productivity while increasing overall system ridership; and 4) ensuring on-going financial sustainability.

BART Service Recommendations for the Inner East Bay

1. Change the dominant BART role from commute to Urban Metro integrated with the Inner East Bay bus network.
2. Implement capacity utilization strategies.
3. Ensure Title VI/Environmental Justice considerations are addressed in both service quality and coverage.

AC Transit Service Recommendations for the Inner East Bay

1. Focus resources on key urban trunk corridors to provide "spontaneous use" Metro network.
2. Redefine "coverage service" or service that provides basic access to transit regardless of ridership levels, as 30 minutes or higher.
3. Invest in service speed improvements.
4. Transbay pilots based on the following design options:
    i. Current service model modified to improve productivity and cost effectiveness
    ii. Fast, frequent shuttles to BART stations
    iii. Augment BART with Transbay service
5. Ensure Title VI/Environmental Justice considerations are addressed in both service quality and coverage.

Joint Fare Product Pilot Programs Recommendation

Implement two pilot fare product programs to provide incentives for customers to use AC Transit and BART interchangeably. The pilots will test the concept that reducing transfer barriers between AC Transit and BART service allows customers to select the optimal mode for each trip. The evaluation of the programs will assess the tradeoffs between Inner East Bay fare revenue and ridership growth.

Paratransit Cost Containment and Service Strategies

The Commission finds that transit agencies must consider strategies to contain the cost of ADA paratransit service using tools that are available to them individually or collectively. MTC expects individual agencies to consider the following strategies:

1. Fixed Route Travel Training and Promotion to Seniors

Expanding fixed route travel training – through mobility orientation sessions and one-on-one individualized training – would increase mobility for the users and help reduce growth of ADA paratransit demand. Ideally, training and outreach should be conducted before individuals apply for paratransit service or, at a minimum, should be made available during the process of determining eligibility for these services.

2. Premium Charges for Service Beyond ADA Requirements

Where transit agencies provide paratransit service that goes beyond what the ADA requires, they may charge extra for those "premium" services. For example, transit agencies that serve an entire jurisdiction (for example they may serve an entire city or taxing district) can define a "two-tiered" service area, with the first tier being the ADA required service area within ¾ mile of the fixed route service and the second tier extending to the jurisdictional limits. A higher fare can then be charged for trips in that second tier. The transit agency can also adopt

differing policies for that premium second tier, such as more limited service hours, denials of service once capacity is reached, and so forth.

3. **Enhanced ADA Paratransit Certification Process**

   A robust certification process that includes in-person interviews as well as evaluations of applicants' functional mobility by trained professionals provides more accurate determinations of applicants' travel skills and may result in more applicants being referred to fixed route service based on their individual abilities. This may result in some reduction in ADA paratransit costs and also result in improving the mobility of riders due to the increased spontaneity afforded by fixed-route transit. Depending on the transit agency, available cost savings range from none to substantial. One centralized regional process is not needed, but many transit agencies can enhance their processes. Some smaller agencies could combine this function for efficiency and to support staff with specialized skills.

4. **Implement Conditional Eligibility**

   Conditional eligibility finds that some applicants can use fixed-route service for at least some of their trips and specifies the particular conditions under which paratransit service is required. While this requires a more sophisticated eligibility certification process of conditional eligibility avoids ADA paratransit costs for those trips that ADA-eligible riders take on fixed-route service. Opportunities exist at several transit operators in combination with an enhanced eligibility process.

5. **Creation of sub-regional Mobility Managers (e.g. CTSA) in one or more sub-regional area to better coordinate resources and service customers**

   National and local coordinated models exist and should be evaluated to deliver high quality and efficient paratransit services across transit agency boundaries and shared costs with social services. Several MTC programs, including Lifeline and New Freedom, have funded mobility management efforts to identify best practices and develop mobility management models for regional replication. The Commission will use the information from these efforts to recommend specific areas and agency leads for implementation of sub-regional mobility managers in the Bay Area.

6. **Improve Fixed-Route Transit (per Plan Bay Area)**

   Continuous improvements to the fixed route system will shift some demand from paratransit to the fixed route system.

7. **Walkable Communities, Complete Streets, and Land Use Planning (per Plan Bay Area)**

   The term "walkable communities" refers to communities that are pedestrian friendly, with sidewalks and pathways connecting residential areas with activity centers. Improving the "walkability" of a community is a more holistic approach to addressing ADA paratransit sustainability than other strategies. Similarly, planning efforts should, to the extent possible, ensure that senior housing and other senior-related facilities are sited in locations that are close to fixed-route services and close-in within the community and proximate to activity centers featuring shopping, medical and other services, as opposed to locations outside the community and isolated from activity centers. The ultimate impact of this recommended strategy is very large, even though this is a long-term strategy in which transit agencies will only play a supportive role. It requires an active role from cities and counties.

   An integrated land-use/transportation plan is the primary goal of Plan Bay Area, under development and scheduled for adoption in 2013. In addition, the proposed OneBayArea grant program seeks to reward local jurisdictions for building housing near transit and conditions funding on adherence to complete streets policies.

Institutional

1. **Complete service consolidations for Soltrans and ferry services (Vallejo, Alameda-Oakland, and Harbor Bay).**

   Per the Solano Transit Consolidation Study conducted by the Solano Transportation Authority – the cities of Vallejo and Benicia have formed a joint powers authority (Soltrans) to operate their transit service as a consolidated system. Senate Bill 1093 called for the consolidation of Vallejo, Alameda-Oakland, and Harbor Bay ferry services under WETA. WETA has adopted a transition plan to guide the consolidation of all ferry service, except the Golden Gate ferry services. WETA is currently operating the Alameda-Oakland and Harbor Bay ferry service and set to assume Vallejo service in 2012. Soltrans has completed the initial stages of the consolidation. The Commission will support these agencies and monitor progress during the consolidation process and support Solano County to move forward to consider further consolidations as supported through local planning.

2. **Pursue functional and institutional consolidation among smaller operators where supported by local planning and input.**

   Through the local planning process and, as transit agencies do coordinated planning and fare policy setting, the benefits of functional and institutional consolidation should be further evaluated. Work with Congestion Management Agencies and operators, focusing on

Marin/Sonoma and Solano to continue to improve coordination and evaluate the benefits of additional functional and/or institutional consolidation to improve the financial stability and service for the customer. The appropriateness of these efforts and timeline will be established based on local planning and input.

3. **Integrate multiple transportation functions (transit operating, planning, sales tax, etc).**

   The importance of other transportation decisions, such as roadway projects and pricing, in the success and performance of the public transit system was highlighted throughout the TSP. Therefore, opportunities to better integrate these decision-making authorities should be explored. Currently, the Santa Clara Valley Transportation Authority is the one example of an agency in the region that serves as the sales tax authority, transit agency, and congestion management agency. Work with transit operators and Congestion Management Agencies to identify potential vertical integration opportunities and local support for such integration.

4. **Expand regional capital project planning/design to include sharing existing expertise (e.g., BRT) and facilities (e.g., maintenance shops).**

   Several transit agencies and congestion management agencies in the region have developed robust expertise in capital project development and delivery. As new projects or systems are developed, expertise should be shared across transit agencies to optimize resources. Using Plan Bay Area project listings, MTC will identify specific upcoming projects that may benefit from a sharing of resources and convene a joint discussion of county CMAs and transit agencies to identify specific projects and terms for sharing resources.

5. **Formalize joint procurement of services and equipment.**

   Transit agencies currently have an informal process to monitor each other's bus purchases, allowing agencies to "piggy-back" on another Bay Area or national procurement. This reduces administrative costs of duplicative procurement processes and lowers the unit cost of the purchase because of the higher volume order. The TSP recommends that these joint procurements be strengthened and formalized.

   The Commission will identify typical annual procurements (scope and cost) in addition to those included in the Regional Transit Capital Inventory (major capital replacements), convene transit agencies to identify strong candidate services and equipment for joint procurement, and work with transit operators to evaluate and implement joint procurement models.

APPENDIX A – 13

Regional Policies: Long-Range Planning / Plan Bay Area

MTC's Transit Coordination Implementation Plan

MTC Resolution No. 3866

Date: February 24, 2010
W.I.: 1227
Referred By: Operations Committee
Revised: 10/26/11-C
07/22/15-C

ABSTRACT

Resolution No. 3866, Revised

This resolution updates and adopts MTC's Transit Coordination Implementation Plan pursuant to the requirements of California Government Code §§ 66516 (SB 1474) and 66516.5; Public Utilities Code §§ 99282.5l and 99314.7; and Streets and Highways Code § 30914.5.

This resolution supersedes Resolution No. 3055, as amended.

Attachment B to this resolution was revised on July 22, 2015 to update and revise requirements for the 511 transit information program (Appendix B-1), the regional hub signage program (Appendix B-2), and the Clipper® program (Appendix B-3), and to add a new Appendix B-5 containing coordination requirements applicable to transit rider surveys.

Date: February 24, 2010
W.I.: 1227
Referred By: Operations Committee

Re: Transit Coordination Implementation Plan

METROPOLITAN TRANSPORTATION COMMISSION

RESOLUTION NO. 3866

WHEREAS, pursuant to Section 66516 of the California Government Code, the Metropolitan Transportation Commission (MTC) is required to adopt rules and regulations to promote the coordination of fares and schedules for all public transit systems within its jurisdiction and to require every system to enter into a joint fare revenue sharing agreement with connecting systems; and

WHEREAS, pursuant to Section 66516.5 of the Government Code, MTC may identify and recommend consolidation of those functions performed by individual public transit systems that could be consolidated to improve the efficiency of regional transit service and;

WHEREAS, pursuant to Section 99282.5 of the California Public Utilities Code (PUC), MTC is required to adopt rules and regulations to provide for governing interoperator transfers so that the public transportation services between public transit operators are coordinated; and

WHEREAS, pursuant to Section 99314.7 of the Public Utilities Code, MTC is required to evaluate an operator's compliance with coordination improvements prior to an operator receiving allocations of State Transit Assistance (STA) funds; and

WHEREAS, pursuant to Section 30914.5 of the Streets and Highways Code, MTC must adopt, as a condition of Regional Measure 2 fund allocation, a regional transit connectivity plan to be incorporated in MTC's Transit Coordination Implementation Plan pursuant to Section 66516.5, requiring operators to comply with the plan, which must include Policies and procedures for improved fare collection; and

WHEREAS, MTC previously adopted Resolution No. 3055 to implement these requirements; and

WHEREAS, in order to ensure progress toward implementing coordination recommendations, MTC wishes to formalize these recommendations by adopting the rules and requirements required pursuant to Government Code Section 66516 and PUC Section 99282.5 as set forth in this MTC Transit Coordination Implementation Plan, which includes a regional Transit Connectivity Plan and Implementation Requirements, attached to this Resolution as Attachments A and B, and incorporated herein as though set forth at length;

WHEREAS, MTC has consulted with the region's transit agencies to develop the regional Transit Connectivity Plan and Implementation Requirements, as required by Government Code §§ 66516 and Streets and Highways Code § 30914.5; now therefore be it

RESOLVED, that MTC adopts the Transit Connectivity Plan ("Plan") as set forth in Attachment A; and be it further

RESOLVED, that MTC adopts the Implementation Requirements, as set forth in Attachment B; and, be it further

RESOLVED, that prior to determining fund programming and allocations for an operator, MTC shall review the efforts made by the operator to implement the requirements identified in Attachments A and B, and if MTC determines that the operator has not made a reasonable effort to implement the requirements of Attachments A and B, MTC may, at its discretion, withhold, restrict or re-program funds and allocations to such operator to the extent allowed by statute, rule, regulation, or MTC policy; and, be it further

RESOLVED, that all funds subject to programming and/or allocation by MTC are covered by this resolution including but not limited to State Transit Assistance, Transportation Development Act, Regional Measure 2, Congestion Mitigation and Air Quality, Surface

Transportation Program and Transit Capital Priorities funds, to the extent permitted by statute; and, be it further

RESOLVED, that this resolution shall be transmitted to the affected transit operators to guide them in development of their annual budgets and short-range transit plan revisions; and, be it further

RESOLVED, that the Operations Committee is authorized to approve amendments to Attachments A and B, following consultation with the affected transit operators; and be it further

RESOLVED, this resolution supersedes Resolution No. 3055.

METROPOLITAN TRANSPORTATION COMMISSION

Scott Haggerty, Chair

The above resolution was entered into by
the Metropolitan Transportation Commission
at a regular meeting of the Commission held in
Oakland, California, on February 24, 2010

Attachment A
MTC Transit Connectivity Plan

This Attachment A incorporates by reference the Transit Connectivity Plan, previously approved by MTC in MTC Resolution No. 3055, which may be downloaded at: http://www.mtc.ca.gov/planning/connectivity/index.htm.

Attachment B
Implementation Requirements

The purpose of these Implementation Requirements is to establish the expectations and requirements for each transit agency with respect to implementing the recommendations of the Commission's Transit Connectivity Plan (2006) and maintaining other transit coordination programs, to outline the process by which MTC will involve transit operators in changes to coordination requirements, and to establish the process for Commission action in the event of transit agency non-compliance with these implementation requirements. A copy of this Resolution 3866 is available for download at http://www.mtc.ca.gov/planning/tcip/.

Per the Transit Connectivity Plan, MTC places high priority on improvements that:

- Accomplish tangible improvements for the passenger;
- Benefit the largest number of transit users, including both inter- and intra-system transit riders, to the extent possible;
- Improve system productivity by sharing agency resources; and
- Enhance the ability of transit riders to reach significant destinations in adjoining jurisdictions and along regional corridors by (1) improving the connections between system services and (2) providing through service to adjoining jurisdictions in those cases where the market clearly justifies such service.

In order to manage resources effectively, MTC will focus on a limited number of high priority improvements, transfer project leadership from MTC to one or more transit agencies where possible upon agreement of project partners, and establish priorities for implementing new projects.

The Commission has established specific transit operator requirements to implement a coordinated regional network of transit services and to improve overall service productivity as defined in the Transit Connectivity Plan. Any agency that is an eligible recipient of funds subject to allocation or programming by MTC is subject to these requirements, including, but not limited to the following:

1. Altamont Corridor Express
2. Alameda-Contra Costa Transit District
3. Caltrain
4. Capital Corridor Joint Powers Authority
5. Central Contra Costa Transit Authority
6. Eastern Contra Costa Transit Authority
7. Golden Gate Bridge, Highway and Transportation District
8. Livermore/Amador Valley Transit Authority
9. Marin County Transit District
10. Napa County Transportation Planning Agency
11. San Francisco Bay Area Rapid Transit District
12. San Francisco Municipal Transportation Agency
13. San Mateo County Transit District
14. Santa Clara Valley Transportation Authority
15. Solano County Transit (SolTrans)
16. Solano Transportation Authority
17. Sonoma County Transit
18. Sonoma Marin Area Rail Transit
19. Transbay Joint Powers Authority
20. Union City Transit
21. Water Emergency Transportation Authority
22. Western Contra Costa Transit Authority
23. City of Dixon
24. City of Emeryville
25. City of Fairfield (Fairfield and Suisun Transit)
26. City of Petaluma
27. City of Rio Vista
28. City of Santa Rosa
29. City of Vacaville

Unless a particular action is reserved for the Commission or the Operations Committee in this Attachment B (including any Appendices hereto), where reference is made in this Attachment B to approval, determination, clarification or the development of guidelines or policies by MTC, such action may be taken or made by MTC staff in a manner that is consistent with the principles set forth in Resolution 3866 and this Attachment B.

A. Operator Implementation Requirements

1. Implementation Requirements

The region has a history of implementing projects to improve transit coordination. Early efforts focused on regional programs and policies such as disseminating tax-free transit benefits and making paratransit eligibility determinations. More recent efforts, such as the Transit Connectivity Plan and efforts to increase Transit Sustainability, identified improvements to (1) designated regional transit hubs, including way-finding signage and transit information, real time transit information, schedule coordination, last-mile services and hub amenities, (2) system wide connectivity improvements, including 511 information and Clipper® and (3) coordination of demographic and travel pattern transit rider surveys.

Specific implementation requirements for transit operators are listed in Appendices to this Attachment:

- Appendix B-1, 511 Transit Program Requirements (including real-time transit);
- Appendix B-2, Regional Transit Hub Signage Program Requirements;
- Appendix B-3, Clipper® Implementation Requirements; and
- Appendix B-4, Maintenance of Existing Coordinated Services.
- Appendix B-5, Cooperative Demographic and Travel Pattern Transit Rider Survey Program Requirements

As MTC continues to address recommendations from the Transit Connectivity Plan and other emerging issues such as Transit Sustainability, new implementation requirements may become necessary. The appendices may be modified to reflect changes in implementation responsibilities, following the procedures outlined in this Attachment B, and subject to approval by the Commission.

2. SB 602 Fare and Schedule Coordination Requirements

Currently, each operator certifies its adherence to the provisions of SB 602 (Statutes 1989, Chapter 692, Government Code Section 66516, and as subsequently amended) as part of the annual allocation process for TDA and STA funds when requests for these funds are submitted to MTC. The SB 602 requirements are now incorporated into this Res. 3866, and each operator's compliance will be monitored accordingly. Per the requirements of SB 602, each transit agency in the region has a revenue sharing agreement with every connecting agency. In some cases, this takes the form of a reciprocal agreement to accept each other's passengers free of charge or to honor each other's period passes or single-trip transfers for a discounted fare. The BART/Muni FastPass is an example of a joint fare instrument to address SB602 requirements. Each transit agency in the region is required to maintain these reciprocal agreements as a condition of receiving STA funds (Gov. Code 66516).

3. Preserve Ability to Post and Disseminate Transit Information

MTC expects transit operators to preserve rights for MTC and connecting transit operators to post and disseminate connecting transit information for free within their facilities. This would include but not be limited to route, schedule, fare, real-time transit information and information about regional transit projects (511, Clipper®). For any transit agency that has already entered into a third-party agreement that compromises these rights, MTC expects the transit agency to make good faith efforts to reinstate these rights in their agreement at the earliest opportunity and, at a minimum, to reinstate such rights in future agreements or renewals entered into after adoption of this Resolution. Nothing herein shall be interpreted as requiring transit agencies to display advertising. Rather, the objective is to provide transit customers with pertinent information that improves their transit experience.

B. Cost-Sharing

Implementation activities and other new transit connectivity and coordination efforts added to these Implementation Requirements will be funded with MTC discretionary funds, transit agency funds, and/or in-kind contributions of MTC and transit agency staff resources. If MTC considers

adding new projects or services, MTC would implement the consultation process described in Section C below to vet any expected cost impacts on the operators. Transit agencies are required to waive all agency fees (for permits, etc.) they would otherwise charge to MTC, other transit operators or third-party contractors to implement and maintain regional transit coordination projects detailed in these requirements. Unless otherwise noted, MTC and transit agencies are expected to cover the cost to implement their respective roles and responsibilities as identified in these requirements or in pre-existing agreements. As specific initiatives move to implementation, a lead agency may be designated to coordinate implementation activities on behalf of the other participating transit agencies. Any agency that assumes this lead role and incurs costs that it would otherwise not assume in order to perform this function may be reimbursed, based upon an equitable agreement with the participating agencies, on a marginal cost basis (i.e., the additional cost the transit operator incurs to perform the work).

C. Consultation Process

MTC will consult with transit agencies when defining new coordination requirements for inclusion in Res. 3866 or when updating or revising requirements already in Res. 3866.

MTC will first consult with one or more of its technical advisory committees (TACs) to receive transit agency input on the specific implementation requirements. MTC will notify TAC members of the meetings and provide agendas in advance, and facilitate TAC discussions. Affected transit operators are expected to participate. Transit agencies are responsible for ensuring that the appropriate staff attends TAC meetings, that they participate in discussions in good faith, and that they communicate with other relevant staff within their agency (including those employees whose work may be affected) and executive management so that timely and constructive agency feedback can be provided to MTC. MTC will consider TAC input when formulating draft policy. In cases where there is no relevant TAC to address the issue under consideration, MTC will formulate draft policy and solicit feedback from general advisory groups, such as the Partnership Technical Advisory Committee (PTAC) or the Transit Finance Working Group.

At its discretion, MTC may also solicit input from the Partnership Board, the Partnership Technical Advisory Committee, the Transit Finance Working Group and MTC's Policy Advisory Council prior to Commission action. Following consultation with the TAC(s) and/or other advisory groups, MTC will solicit feedback from the Partnership Transit Coordination Committee. MTC will provide notification of the proposed PTCC meeting and agenda through written communication to transit general managers and transit program coordinators and posting of the meeting materials on MTC's web site.

After consulting with transit agencies, MTC will forward staff's recommendations to the MTC Operations Committee and the Commission.

D. Sanctions

The Commission expects each transit agency to comply with the requirements outlined in this Resolution and its Attachments as a condition of eligibility for STA and TDA funds, Regional Measure 2 funds, transit capital funds (including federal transit formula funds, STP, CMAQ and

STIP funds) and other funds subject to Commission programming and allocation actions. MTC intends that the region's transit agencies will implement these requirements in good faith and cooperation among themselves and with MTC. The sanction of withholding, restricting or re-programming funds to enforce cooperation will be exercised by MTC through an action of the Commission in cases where an agency fails to meet or fails to exhibit good faith in meeting these requirements. In such cases, MTC staff will notify the agency of the possibility that a sanction may be imposed. This notification will also recommend corrective actions that the agency should take to meet the implementation requirements. The notification will be sent no less than sixty (60) days prior to forwarding an MTC staff recommendation to the Commission.

Appendix B-1
511 Transit Information Requirements

MTC provides static transit data through the 511 phone and web service and real-time transit departure information through the 511 phone and web services and the Regional Hub Signage Program. MTC requires the full participation and support of all transit agencies to deliver quality and timely information. MTC and the transit agencies have jointly developed data transfer mechanisms for static and real-time transit data and identified appropriate roles and responsibilities for all parties, as documented in "*511 Transit and Real-Time Transit Program Roles and Responsibilities*." MTC will review these requirements on an as-needed basis with transit agency partners, and they may be updated from time to time. The document is available at: http://www.mtc.ca.gov/planning/tcip/. The key roles and responsibilities to provide transit agency data on 511 services are as follows:

Transit Agencies will:

Generally:

1. Participate in MTC's 511 Regional Transit Information System (RTIS) and Real-Time Transit Technical Advisory Committee (511 TAC).
2. Support, fund and staff their roles and responsibilities related to the 511 services as described below.
3. Notify transit customers of the availability of 511 information and 511.org on transit agency web sites, in printed materials, at bus stops/rail stations, and on other transit agency information channels.

For Static Transit Information:

4. Provide accurate, complete, and timely information regarding transit routes, stops, schedules, and fares for dissemination on 511 and/or through data feeds to third parties.
5. Transmit and maintain transit schedule data and other transit service information to MTC, through provided tools, protocols and processes as discussed, updated and agreed in 511 TAC meetings, in advance of any schedule changes to allow for MTC's timely inclusion on 511 and/or data feeds to third parties. MTC will provide a schedule identifying the necessary advance time.
6. Perform quality control review (focusing on data changed for upcoming service revisions) on a representative sample of agency service data prior to transmittal to MTC.

For Real-time Transit Information:

7. Provide prediction data to the Regional System by establishing and maintaining a data connection to the Regional System and operating and maintaining an interface application.
8. Meet requirements, as defined in "*511 Transit and Real-Time Transit Program Roles and Responsibilities.*"
9. Conduct on-going performance monitoring to ensure accurate and timely transfer of data to the Regional System and accurate provision of prediction data to the public, in collaboration with MTC.
10. Ensure that there is no impact to its provision of prediction data to 511 in the event that the transit agency provides its specific prediction data to a third party.

11. Provide service disruption information to 511 where available and logistically feasible through agreed upon formats.

MTC will:

Generally:

1. Organize and facilitate the 511 TAC.
2. Fund, operate, and maintain the 511 traveler information program for regional transit information, including 511.org, 511 phone, regional electronic Transit Information Displays (eTIDs) at transit hubs, and other relevant applications.
3. In collaboration with transit agencies, conduct performance monitoring to ensure accurate and timely transfer of both static and real-time transit data to the Regional 511 System.

For Static Transit Information:

4. Notify transit customers of the availability of transit agency websites at appropriate locations on web site pages of 511.org.

For Real-time Transit Information:

5. Share with third party vendors and the general public the real-time transit data as described in "*511 Transit and Real-Time Transit Program Roles and Responsibilities.*"
6. Provide agencies with contact information for the 511 Traveler Information Center (TIC) to allow for the posting of real-time transit service disruption/emergency information on 511.

Appendix B-2
Regional Transit Hub Signage Program Requirements

MTC and transit agencies have developed the Regional Transit Hub Signage Program Technical Standards and Guidelines (e.g. 'the Standards') to ensure consistency across the region as the signage is deployed and maintained. A detailed version of the Standards is available at: http://www.mtc.ca.gov/planning/tcip/. The Standards may be periodically updated.

The Standards include:

1. Four main sign types: directional signs, wayfinding kiosks, transit information displays, real-time transit information displays.
2. Guidance to locate signs at key decision points between transit operator services.
3. Design elements to establish a common "look" and "feel" for the signage including:
   - Orange 'i' icon on a green background;
   - Standard logos, icons, arrows and messages and an organizing hierarchy;
   - Standard 'frutiger' font;
   - Hierarchy for the location of information in each sign;
   - Consistent map orientation and colors;
   - Directional map compass and walking distance/time radius;
   - Transit stop designation through agency logo/mode icon/route number 'bubbles'; and
   - Prominent 511 logo/message and regional transit program information.

Transit Agencies will:

1. Participate on the Transit Connectivity TAC as needed to raise and consider any further revisions to the Standards or other relevant transit connectivity policies.
2. Comply with the Standards. Where exceptions to the Standards are desired, transit operators must seek prior approval from MTC. Where ambiguity in the Standards exists, transit operators shall request clarification from MTC.
3. Comply with task responsibilities (O&M, replacement and ownership) further detailed in Appendix B-2, Attachment 1. In most cases, the transit agency that owns the property on which the sign has been installed is assigned responsibility. For signs installed on property not owned by a transit agency, the transit agency providing the most service (passenger boardings) in the area of the sign has been assigned responsibility.
4. Facilitate the permitting of signs by waiving all fees that a transit agency would usually charge for sign installation on its property or leased operating areas.
5. As transit agencies plan new facilities or prepare for major remodels of existing facilities, transit agencies will consult with MTC early in the planning process to ensure effective information is provided to transit users and consistency with the Standards is achieved. MTC will determine if a project requires application of the Standards. If yes, the responsible transit agency will implement the appropriate signage throughout the transit facility in accordance with the Standards.

MTC will:

1. In consultation with Transit Connectivity TAC, develop, document and periodically update regional sign Standards.
2. Comply with cost and task responsibilities detailed in Appendix B-2, Attachment 1.

3. Solicit feedback from transit agencies on significant changes to regional policy affecting the 24 hubs through the Transit Connectivity Technical Advisory Committee.
4. As resources permit, provide technical assistance to transit agencies wishing to extend the regional sign Standard to non-regional hubs.
5. Explore opportunities to extend constancy of wayfinding information across modes throughout the region, including through technological and other innovative means.

Appendix B-2, Attachment 1: Hub Signage Program Cost/Task Responsibilities

Hub Signage Operations & Maintenance (O & M)	Task	Cost Responsibility		Task Responsibility	
		Region	Operator	Region	Operator
A. Physical O & M by Sign Type					
1. Directional/Wayfinding Signs (incl. hub identification signs)	a. Annual Operations and Maintenance (O&M)[1]		X		X
	b. Lifecycle Replacement[2]		X		X
	c. Ownership[3]		X		X
2. Wayfinding Kiosks	a. Annual Operations and Maintenance (O&M)[1]		X		X
	b. Lifecycle Replacement[2]		X		X
	c. Ownership[3]		X		X
3. Real-Time Transit Signs	a. Annual Operations and Maintenance (O&M)[1]		X		X
	b. Lifecycle Replacement[2]	X			X
	c. Ownership[3]		X		X
4. Transit Information Displays	a. Annual Operations and Maintenance (O&M)[1]		X		X
	b. Lifecycle Replacement		X		X
	c. Ownership[3]		X		X
B. Information Content O & M by Sign Type					
1. Directional/Wayfinding Signs (incl. hub identification signs)	d. Static Information Content		X		X
2. Wayfinding Kiosks	d. Printed information content[4]	X		X	
3. Transit Information Displays	d. Printed information content[4]	X		X	
4. Real-Time Transit Signs	d. Electronic information content	X		X	

[1] Including electricity, cleaning, graffiti removal, and repairs.

[2] Including planning, procurement, coordination, and installation.

[3] Insurance, liability, and warranty claims.

[4] Including quarterly cleaning of physical sign case.

Appendix B-3
Clipper® Implementation Requirements

This Appendix defines the Commission's expectations of the transit agencies to ensure a successful operation of the Clipper® (formerly TransLink®) system in three sections:

I. Participation Requirements
II. Regional Clipper® Communications and Marketing Activities
III. Fare Media Transition Schedules by Specific Operators

Section I describes general Clipper® implementation requirements for participating operators.

Section II defines expectations for communications and marketing: a program area critical to smooth implementation of a full transition to Clipper® that can only be addressed through a collaborative, regional approach.

Section III establishes the dates by which the transit agencies that are currently operating Clipper® will transition their existing prepaid fare media to Clipper®-only availability.

I. Participation Requirements

The Clipper® fare payment system was procured by MTC and has been implemented, operated and maintained under the Design Build Operate Maintain contract between MTC and Cubic Transportation Systems, Inc. for the Clipper® fare payment system (the current Clipper® Contract). The Clipper® Contract was assigned to Cubic Transportation Systems, Inc. (the current Clipper® Contractor), on July 2, 2009 and has an operating term extending through November 2, 2019. In this role as counterparty to the Clipper® Contract, MTC is sometimes referred to in this Appendix B-3 as the "Contracting Agency." Transit agencies operating Clipper® as their fare payment system are required to enter into the Memorandum of Understanding (MOU) among MTC and the transit agencies operating Clipper®.

The following describes general Clipper® implementation requirements for participating operators. An operator's failure to meet one or more of these requirements may result in non-compliance with Resolution 3866.

1. Implement and operate the Clipper® fare payment system in accordance with the Clipper® Operating Rules, as adopted and amended from time to time in accordance with the MOU. The current Clipper® Operating Rules (updated in June 2012) are incorporated herein by this reference. The Clipper® Operating Rules establish operating parameters and procedures for the consistent and efficient operation of Clipper® throughout the region and are available on MTC's website at http://www.mtc.ca.gov/planning/tcip/.

2. Pay its share of costs according to the MOU, including the cost allocation formula set forth in Appendix B to the MOU.

3. Abide by the revenue sharing formula in Appendix B to the MOU.

4. Make its facilities and staff available for implementation and operation of Clipper®. Any Operator and the Contracting Agency may agree to an Operator-Specific Implementation Plan, setting forth specific requirements regarding implementation and operation of Clipper® for such Operator.

5. Make determinations regarding the placement of Clipper® equipment on the Operator's facilities and equipment; perform necessary site preparation; attend Clipper® Contractor training on the use of the Clipper® equipment; and provide training to employees using the equipment.

6. Implement, operate and promote Clipper® as the primary fare payment system for each Operator. Clipper®'s primary market is frequent transit riders (i.e., commuters and transit passholders). Operators shall not establish other fare payment systems or fare policies that could deter or discourage these patrons' preference to use Clipper®. Operators shall set fares so that fares paid with Clipper® are equivalent or lower than fares paid either with cash or other forms of payment.

   No new non-Clipper® prepaid fare product, other than for promotional, special event or limited-audience—e.g., tourist—fares, shall be created by any transit operator without consulting with and receiving prior approval from MTC.

   Nothing in this provision is intended to discourage operators from providing leadership on new technologies or innovations that would offer improvement to fare collection operations or the customer experience. The expectation is that these new initiatives should leverage the attributes and assets of Clipper®, not compete with Clipper® or undermine customers' preference to use Clipper®.

7. Perform first-line maintenance upon Clipper® equipment located on their facilities or vehicles, promptly notify the Clipper® Contractor when second-line maintenance of Clipper® equipment is needed, promptly notify the Contracting Agency and the Clipper® Contractor of any issues affecting daily financial reconciliation or accuracy of system reports, issue all types (including, but not limited to, cards configured as senior or youth) of Clipper® cards and add value to existing Clipper® cards from all Ticket Office Terminals located at their business facilities, and provide at least the same level of front-line customer service to their patrons using Clipper® as to patrons using other forms of fare payment.

8. Sufficiently train and educate agency personnel who have Clipper®-related responsibilities so those personnel are able to carry out the requirements placed upon operators in this Resolution.

9. Assist MTC, as necessary, to develop a program for Transit Capital Priorities (TCP) funds for the purpose of procuring and installing end-of-lifecycle Clipper® equipment and to submit and administer grants for programmed TCP funds on a "pass-through" basis.

10. Take financial responsibility for replacement of equipment damaged in-service due to vandalism or any other cause not covered by the Clipper® Contract warranty.[1]

II. Regional Clipper® Communications and Marketing Activities

1. Effective Date. For operators currently operating the Clipper® system, these Clipper® marketing and communications requirements are effective immediately. For operators not yet operating Clipper®, the requirements are effective two months after MTC's approval of the Clipper® system as Revenue Ready for that operator.
2. General Requirements. Operators shall present Clipper® to customers, employees and media as a fully operational fare payment option. This includes, but is not limited to, identification of Clipper® as a fare payment option in brochures, websites, advertisements, schedules/timetables, email newsletters, internal memos, bulletins and training manuals, and any other materials that describe an operator's fare payment options. Operators shall present Clipper® as an option so that Clipper® has equal or greater prominence than the presentation of other payment options. Each operator shall incorporate and/or modify the presentation of Clipper® in existing brochures, websites, schedules/timetables, etc. whenever the operator next updates the content of these items.

   In all cases, operators' marketing and communications about Clipper®, whether in brochures, websites, advertisements or other forms, shall adhere to Clipper® brand guidelines developed by MTC with input from transit operators. The Clipper® Brand Guidelines are available athttps://www.clippercard.com/ClipperWeb/toolbox.do.
3. Equipment Identification. If not already identified as such, operators shall identify Clipper®-compatible fare payment and Clipper®-compatible vending equipment with a decal or other visual identifier to indicate the equipment's Clipper® compatibility.
4. Operator Training. Operators shall ensure appropriate Clipper®-related training for transit operator staff including, but not limited to, vehicle operators, station agents, conductors, customer service personnel, proof of payment officers, ticket sales staff and any other personnel responsible for interacting with customers concerning payment options.
5. Marketing Coordination. Operators shall participate in the development and implementation of a Clipper® marketing and communications initiative that will begin approximately June 1, 2010. This includes, but is not limited to:
   - Staff participation in the development and implementation of the initiative;
   - Dissemination of Clipper® brochures and/or other information materials on vehicles and/or in stations in a manner consistent with the operator's dissemination of other similar operational information; and
   - Providing information about Clipper® utilizing space available on vehicles and/or in stations that is already used by the operator for dissemination of operational information (space available includes, but is not limited to, car cards, posters, and electronic displays).

[1] During the term of the existing Clipper® Contract, MTC shall procure replacement equipment on an operator's behalf, and operators shall pay for the full cost of the equipment including all installation costs and materials.

6. Funding. Funding for the initial phases of the communications and marketing program shall come from the marketing funds already in the Clipper® capital budget and previously assigned to individual operators.

III. Fare Media

The tables below set forth ***the fare media*** that the designated operator shall convert to Clipper®-only availability and ***the date*** by which the operator shall no longer accept such fare media in its existing form. In general, MTC has emphasized with each operator a transition of those fare products which currently represent a significant portion of that operator's boardings.

An operator will be excused from compliance with a transition date requirement for particular fare media, if the Clipper® Contractor has not met at least 80% of the cardholder support service level standards set forth in Section B.1.12 of the Clipper® Contract for the two calendar months ending one month before the scheduled transition date. The operator's transition date requirement for the affected fare media will be reset to one month after the Clipper® Contractor has met at least 80% of the Clipper® Contract's cardholder support service level standards for two consecutive calendar months.

AC Transit will transition its existing fare media by the following dates:

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
EasyPass	Transition complete	
31-Day Transbay Pass – Adult	Transition complete	
Bear Pass (U.C. Berkeley Employee Pass)	Transition complete	
10-Ride Ticket – Youth	Transition complete	
10-Ride Ticket – Adult	Transition complete	
31-Day Local Pass – Youth	Transition complete	
31-Day Local Pass – Adult	Transition complete	
10-Ride Ticket – Senior/Disabled	Transition complete	Product in paper form was effectively eliminated upon transition of Youth 10-Ride Ticket to Clipper®-only.

BART will transition its existing fare media by the following dates:

Fare Media	Date for Ending Sales and/or Acceptance of Listed Prepaid Fare Media	Comments
EZ Rider card as payment for transit	Transition complete	
High Value Discount (HVD) adult magnetic stripe ticket (blue)	12/31/2011	• Prior to 12/31/11, BART must discontinue sales of HVD tickets except as noted below; however, BART may continue accepting HVD tickets for fare payment after 12/31/2011. • BART may continue sales of HVD tickets for a limited period of time at seven My Transit Plus locations currently operating in BART stations. This exception shall remain in effect until 60 days after: (i) The Clipper® equivalent of HVD tickets becomes available through WageWorks and Edenred USA (parent company of Commuter Check); and (ii) The Clipper® Contractor completes the requirements in Section 2.3 of Clipper® Contract Change Order 122.
Senior magnetic stripe ticket (green)	12/31/2011	• Prior to 12/31/11, BART must discontinue sales of green tickets except as noted below; BART may continue accepting green tickets for fare payment after 12/31/2011. • BART may continue sales of green tickets at a limited number of existing sales locations. The number of locations and the length of time sales can continue is subject to mutual agreement by MTC and BART after public comment.

(table continues on following page)

Fare Media	Date for Ending Sales and/or Acceptance of Listed Prepaid Fare Media	Comments
Youth and disabled magnetic stripe ticket (red)	12/31/2011	• Prior to 12/31/11, BART must discontinue sales of red tickets except as noted below; BART may continue accepting red tickets for fare payment after 12/31/2011. • BART may continue sales of red tickets at a limited number of existing sales locations. The number of locations and the length of time sales can continue is subject to mutual agreement by MTC and BART after public comment.
Student magnetic stripe ticket (orange)	Requirement waived	Product not available on Clipper®. Recommend that BART align its definition of youth/student discount with all other operators in region and eliminate this fare product.

Caltrain will transition its existing fare media by the following dates:

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
Full Fare Monthly Pass	Transition complete	
8-ride Ticket	Transition complete	
Caltrain + Muni Monthly Pass	Transition complete	
Eligible Discount Monthly Pass	Transition complete	
8-ride Eligible Discount Ticket	Transition complete	

Golden Gate Transit and Ferry will transition its existing fare media by the following dates:

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
$25 Value Card	Transition complete	
$50 Value Card	Transition complete	
$75 Value Card	Transition complete	

San Francisco MTA will transition its existing fare media by the following dates:

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
Monthly Passes		
Adult BART/Muni Monthly Pass	Transition complete	
Adult Muni Monthly Pass	Transition complete	
Senior Muni Monthly Pass	Transition complete	.
RTC/Disabled Monthly Pass	Transition complete	
Youth Monthly Pass	Transition complete	
Visitor/Cable Car		
1 Day Passport	Requirement waived	Product not currently available on Clipper® limited-use (LU) tickets. However, LUs are preferred implementation option.
3 Day Passport	Requirement waived	Product not currently available on Clipper® limited-use (LU) tickets. However, LUs are preferred implementation option.
7 Day Passport	Requirement waived	Product not currently available on Clipper® limited-use (LU) tickets. However, LUs are preferred implementation option.
Ticket Books/Tokens		
Adult Single Ride Ticket Book	Transition complete	
Inter-Agency Transfers		
BART Two-Way Transfer	Transition complete	
BART/Daly City Two-Way Transfer	Transition complete	
Golden Gate Ferry Two-Way Transfer	Transition complete	
Transfers		
Bus Transfers	Requirement waived	MTC and SFMTA are considering alternative strategies that could have a

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
		similar market share impact, including a fare differential favoring Clipper®
Metro/Subway Transfers	Transition complete	
ADA Transfers	Transition complete	

SamTrans will transition these existing fare media by the following dates:

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
Local Monthly Pass	Transition complete	SamTrans may continue to distribute paper form of this fare product through the county's social services agencies.
Local SF Monthly Pass	Transition complete	
Express Monthly Pass	Transition complete	
Eligible Discount Monthly Pass—senior/disabled	Transition complete	SamTrans may continue to distribute paper form of this fare product through the county's social services agencies.
Youth Monthly Pass	Transition complete	• SamTrans may continue to distribute paper form of this fare product through the county's social services agencies. • "Discount Youth Pass" may continue to be available in paper form through schools for eligible students only.

VTA will transition these existing fare media by the following dates:

Fare Media	Date for Ending Acceptance of Listed Prepaid Fare Media	Comments
Monthly Pass	Transition complete	Paper monthly passes will only be sold to social service agencies and providers, school districts, and nonprofit organizations which distribute the passes free or at a discount.
Monthly Express Pass	Transition complete	Paper monthly express passes will only be sold to social service agencies and providers, school districts, and nonprofit organizations which distribute the passes free or at a discount.
Day Pass Tokens	Transition complete	Day pass tokens will only be sold to social service agencies and providers, school districts, and nonprofit organizations which distribute the passes free or at a discount.

Other Operators

The following are general Clipper® implementation and fare media transition requirements for operators not yet operating Clipper®. Following MTC's approval of the Clipper® system as Revenue Ready for a given operator, MTC will work with the operator to identify more specific fare media transition plans. Unless otherwise approved by MTC, an operator shall (i) begin accepting Clipper® for fare payment by customers no more than two months following MTC's approval of the Clipper® system as Revenue Ready for the operator, and (ii) end acceptance of prepaid non-Clipper® fare media no more than one year following MTC's approval of the Clipper® system as Revenue Ready for the operator.

All of the below-listed operators (the "Phase 3 Operators") are exempt from subsection (ii) of the immediately preceding paragraph for the shorter of (a) the term of the MOU, as it may be extended hereafter, and (b) the term of the existing Clipper® Contract as it may be extended hereafter. For the duration of such exemption, the Phase 3 Operators may continue to accept prepaid non-Clipper® fare media, including passes, tickets and transfers; provided that such Operators continue to comply with Section I.6 and all other applicable provisions of this Appendix B-3.

Phase 3 Operators

Central Contra Costa Transit Authority (County Connection)
City of Fairfield, as the operator of Fairfield and Suisun Transit (FAST)
City of Petaluma, as the operator or Petaluma Transit
City of Santa Rosa, as the operator of Santa Rosa CityBus
City of Vacaville, as the operator of Vacaville City Coach
Eastern Contra Costa Transit Authority (Tri Delta Transit)
Livermore/Amador Valley Transit Authority (LAVTA Wheels)
Marin County Transit District (Marin Transit)
Napa County Transportation and Planning Agency (VINE Transit)
Solano County Transit (SolTrans)
Sonoma County Transit
Union City Transit
Water Emergency Transportation Authority (San Francisco Bay Ferry)
Western Contra Costa Transit Authority (WestCAT)

Appendix B-4
Maintenance of Existing Coordinated Services

The Commission's previously adopted Transit Coordination Implementation Plan (Resolution No. 3055) included a number of coordination programs that were not modified by the Transit Connectivity Plan. Of these, the Commission expects the transit operators to continue to support the following:

1. Regional Transit Connection (RTC) Discount Card Program – Provides identification cards to qualified elderly and disabled individuals for reduced fares on transit. Transit operators and MTC maintain memorandums of understanding about roles and responsibilities for program implementation. The RTC Discount Card is being incorporated into the Clipper® program
2. ADA Paratransit Eligibility Program – Consists of a regional application, a regional eligibility database administered by a transit agency on behalf of the region and universal acceptance across transit systems of all eligibility determinations. Transit operators have flexibility to tailor the application process to screen applicants to facilitate eligibility determinations.
3. Interagency ADA Paratransit Services – Establishes policies to promote a consistent approach to interagency paratransit passenger transfers (see Appendix A-4, Attachment 1).
4. Regional Transportation Emergency Management Plan – The Regional Transportation Emergency Management Plan (formerly know as the Trans Response Plan) is a framework to coordinate transit services during regional emergencies. Transit operators are required to participate in regional exercises to test the implementation of the plan. Transit agencies certify compliance through their annual State Transit Assistance (STA) funding claims process, and also address emergency coordination planning through their Short Range Transit Plans.
5. Regional Links/Express Bus/Feeder Bus Services – Regional Links include bus service across the Bay Bridge, Dumbarton Bridge, the San Mateo Bridge and the Richmond/San Rafael Bridge that has been incorporated into the Express Bus Services program funded with Regional Measure 2 (RM2), and will be monitored per RM2 requirements. Express Bus Services also include Owl Service which operates along the BART rail lines at night when BART is closed. Express feeder bus services to/from BART stations during peak periods are maintained through direct allocation of BART's STA funds to transit agencies as specified in the annual Fund Estimate. If STA is unavailable, BART's General Fund up to $2.5 million is available to support these services per existing agreement. If additional funding is needed, it will be subject to discussion on an annual basis.

Appendix B-4, Attachment 1
Requirements for Interagency ADA Paratransit Services

Note: Transit operators developed guidelines for interagency ADA paratransit services. MTC adapted these guidelines for the purpose of defining coordination requirements.

Consistent with the Americans with Disabilities Act (ADA) requirement to provide paratransit services that are complementary to fixed-route transit services, Bay Area transit operators have identified a transfer-oriented network of interagency paratransit services. Interagency paratransit trips may require a transfer between connecting paratransit providers at a location specified by the transit operator. The following regional requirements are intended to improve connections between paratransit services for both passengers and paratransit providers. The requirements establish regional protocol for how the system will operate as well as specify the responsibilities of paratransit providers to assure an efficient, user-friendly system.

1. All public transit agencies in the San Francisco Bay Area will honor the regional ADA Eligibility Process [as approved by transit agencies] when certifying an individual for ADA paratransit services.

2. Eligibility for an individual requesting interagency paratransit services will be verified through the ADA Paratransit Regional Eligibility Database.

3. Transit operators will develop and make available customer information on how to access and use interagency paratransit services. This information will be made readily available in accessible formats.

4. Interagency paratransit trips will usually require a transfer between connecting paratransit providers at a location specified by the transit operator. Transit operators will transfer passengers at designated transfer locations that, to the extent possible, are also used as fixed-route transfer sites. For operational efficiency or customer service quality, use of other transfer sites is not precluded. Operators will seek to establish transfer locations that are clean, safe, sheltered and well-lit with accessible telephones and restrooms nearby. Established interagency paratransit transfer locations on transit properties will be clearly marked with a consistent sign designed and adopted at the regional level.

5. For operational efficiency or customer service reasons, transit operators may:

    - transfer passengers to a connecting paratransit provider at a transfer location, including having the passenger wait without assistance until the connecting provider arrives; or
    - provide through-trip service into an adjoining transit agency's service area (not requiring a transfer); or
    - provide transfer assistance to passengers at transfer points (waiting with the passenger until connecting provider arrives); and

- coordinate their schedules and dispatch procedures with connecting provider(s) on the day of service.

6. Coordinating Bay Area interagency paratransit reservations shall be the responsibility of paratransit providers. Subject to availability of rides, a single transit coordinator will be responsible to schedule an interagency paratransit trip (including round-trip service). For trips requiring coordination between only two transit operators, the operator in whose jurisdiction the trip originates will usually perform the function of trip coordinator to schedule the entire trip and to serve as a point of contact for passenger inquiries. For trips involving three or more paratransit providers, a regional trip coordinator may perform these functions.

7. Transit operators shall accept reservations for interagency paratransit trips according to their local advance reservation policies. When coordinating a trip, the shorter advance reservation period of the connecting agencies will apply. In some cases, the scheduling operator will be unable to determine the availability of a requested interagency paratransit trip until the shortest advance reservation period is open. If, due to differences in advance reservation periods, trip availability cannot be determined at the time the trip is requested, the scheduling operator will inform the passenger of when to call to complete the trip reservation process. In the meantime, the scheduling operator may book available legs of the requested trip according to local advance reservation policies.

8. Transit operators will charge a fare consistent with each individual operator's fare payment policy. All fares will be communicated to the passenger by the operator scheduling the first leg of the interagency paratransit trip at the time the ride is confirmed. Operators and MTC will work toward a regional fare payment method and/or regional fare policy for paratransit services.

Appendix B-5
Cooperative Demographic and Travel Pattern Transit Rider Survey Program Requirements

This Appendix defines the Commission's expectations of the transit agencies to ensure efficient collection of passenger demographic and travel pattern[2] information.

The Commission and the transit agencies have a common interest in understanding the demographics and travel patterns of transit riders. Between 2012 and March 2015, Commission staff have carried out transit surveys in partnership with 15 separate transit agencies as part of the Cooperative Demographic and Travel Pattern Transit Rider Survey Program ("Survey Program" henceforth). Collecting this information together is more cost effective than collecting it separately. The resulting consolidated data facilitates across-agency comparisons and analyses.

The key roles and responsibilities of MTC and the transit agencies on the Survey Program are as follows:

Transit agencies will:

1. Participate in the Survey Program when collecting information on transit passenger demographics AND travel patterns together.
2. Contribute to the cost of the agency-specific survey performed as part of the Survey Program. Federally-funded operators not listed below will pay no cost to survey service they provide; the following operators will pay 20 percent of the cost to survey service they provide:
    - Alameda-Contra Costa Transit District;
    - Bay Area Rapid Transit District;
    - Caltrain;
    - Golden Gate Bridge, Highway and Transportation District;
    - San Francisco Municipal Transportation Agency;
    - San Mateo County Transit District; and,
    - Santa Clara Valley Transportation Authority.
3. Contribute a limited number of agency-specific survey questions.
4. Contribute advice and suggestions to the survey procedures including, but not limited to, development of sampling plans, frequency and timing of demographic and travel pattern surveying, instrument design, and recruitment strategies.
5. Share ownership of all work products including raw and processed data.

---

[2] Defined here as: (a) the precise location of the trip origin, first transit boarding, last transit alighting, and trip destination; (b) the means of travel between the trip origin and first transit boarding and between the last transit alighting and trip destination; and, (c) the sequence of transit routes used between the first transit boarding and the last transit alighting.

MTC will:

1. Procure consultant resources to carry out the Survey Program.
2. Oversee consultant performance to ensure delivery of high quality products.
3. Contribute to the cost of the Survey Program. MTC will pay 80 percent of the cost to survey service provided by the seven agencies identified in item 2 of the "transit agencies will" list above; MTC will pay 100 percent of the cost to survey service provided by federally-funded transit providers not identified in the above list.
4. Develop a standard set of survey questions (including response options) and update these questions, as needed, in consultation with the transit agencies.
5. Develop and update a set of survey procedures including, but not limited to, development of sampling plans, instrument design, and passenger recruitment strategies.
6. Deliver survey results, including raw data, procedure documentation, and summary reports, to transit agencies in a timely manner.
7. Maintain a database of regional transit rider demographics and travel patterns.
8. Convene a working group to discuss the surveying effort (including the survey procedures) and the timing of surveys relative to capital projects, federal requirements, financial resources, customer service and other agency-led survey efforts, and schedule mark-ups (a.k.a., sign-ups, bid-dates). The group will meet no less than once a year and will develop and maintain a set of Survey Program standard operating procedures that will define operator-specific question allowances, data distribution procedures (including any necessary privacy safeguards), and other details.
9. Share ownership of all work products including raw and processed data.

APPENDIX A – 14

Regional Policies: Long-Range Planning / Plan Bay Area

Project Review Criteria and Procedures

MTC Resolution No. 3115

Date: October 28, 1998
W.I.: 61.1.10
Referred By: WPC

ABSTRACT

Resolution No. 3115

This resolution adopts the criteria and procedures to be employed by the MTC in the review and approval of projects and related grant applications pursuant to §§ 665l8 and 66520 of the Government Code, and § 21655.6 of the Vehicle Code, and federal Intergovernmental Review requirements, and fulfill MTC's responsibilities under the memoranda of understanding with the Association of Bay Area Governments and the California Department of Transportation as authorized pursuant to MTC Resolution No. 1569.

This resolution supersedes MTC Resolution No. 1570.

Date: October 28, 1998
W.I.: 61.1.10
Referred By: WPC

Re: Project Review Criteria and Procedures

METROPOLITAN TRANSPORTATION COMMISSION
RESOLUTION NO. 3115

WHEREAS, the Metropolitan Transportation Commission (MTC) is the regional transportation planning agency for the San Francisco Bay Area pursuant to Government Code § 66500 et seq.; and

WHEREAS, Government Code § 665l8 provides that the California Transportation Commission, when allocating funds for construction projects on the state highway system within the region, shall determine that the projects conform to the MTC's Regional Transportation Plan and its schedule of priorities; and

WHEREAS, Government Code § 66520 provides that any application to the state or federal government, for any grant of money, whether an outright or matching grant, by any city, city and county, county, or transportation district within the San Francisco Bay Area shall, if it contains a transportation element, first be submitted to MTC for review as to its compatibility with the Regional Transportation Plan (RTP), and the schedule of priorities included therein; and

WHEREAS, Vehicle Code § 21655.6 requires that the Department of Transportation (Caltrans) obtain the approval of the regional transportation planning agency prior to establishing the exclusive or preferential use of highway lanes for high-occupancy vehicles; and

WHEREAS, certain transportation projects and/or programs defined in federal regulations (49 CFR l7) are subject to Intergovernmental Review under procedures implementing Executive Order 12372; and

WHEREAS, a Memorandum of Understanding (MOU) among the Association of Bay Area Governments (ABAG), the California Department of Transportation (Caltrans), and the MTC defines their respective roles and responsibilities in the Intergovernmental Review process (MTC Resolution No. 1569); and

WHEREAS, by Resolution No. 1570 the MTC adopted criteria used to determine the "Regional vs. Local" nature of projects to be reviewed, and instituted a project classification listing to indicate the application of those criteria in selecting projects for review; and

WHEREAS, the MTC desires to establish criteria and procedures for project review and application approval appropriate to the type of transportation projects and/or programs which are the subject of such action; now, therefore, be it

RESOLVED, that the MTC finds that the criteria and procedures for project review and application approval described in Attachment A to this resolution, attached hereto and incorporated herein as though set forth at length, permit the efficient and proper discharge of its responsibilities under Sections 66518 and 66520 of the Government Code and § 21655.5 of the Vehicle Code; and, be it further

RESOLVED, that the MTC finds that those criteria and procedures satisfy Intergovernmental Review requirements and fulfill its responsibilities under the MOU; and, be it further

RESOLVED, that the MTC adopts the criteria and procedures for project review and application approval shown in Attachment A as those to be employed for such actions henceforth; and, be it further

RESOLVED, that the MTC directs staff, with the next annual cycle, to revise the project review procedures described in the Regional Transportation Plan to conform to those contained in Attachment A; and, be it further

RESOLVED, that Resolution No. 1570 is hereby superseded.

METROPOLITAN TRANSPORTATION COMMISSION

Jim Spering, Chairman

The above resolution was entered into by the Metropolitan Transportation Commission at a regular meeting of the Commission held in Oakland, California on October 28, 1998.

MTC Project Review and Application Approval Criteria and Procedures

I. PROJECT REVIEW — COMMISSION REVIEW AND APPLICATION APPROVAL

Any projects or program contained in the Annual/biennial Element of the Transportation Improvement Program (TIP) which fall under any of the criteria for major transportation projects listed below shall require Project Review by MTC to determine consistency with the Regional Transportation Plan and as a condition for implementation.

This shall also apply to any project or program amended into the Annual/biennial element of the TIP subsequent to its adoption.

Criteria

1. The authorizing or permitting exclusive or preferential use of highway lanes for high-occupancy vehicles, with the exception of HOV bypass lanes, by the State Department of Transportation;
2. The construction of mixed-flow highway lanes or of auxiliary lanes which do not terminate at the first subsequent interchange on the State highway system.
3. Interchange or local arterial improvements which have the potential to affect main-line operations on the State Highway System;
4. Transit projects that involve the construction of rail extensions, new stations, or parking facilities that exceed 500 parking spaces;
5. Transportation projects that have special circumstances or issues (i.e. design, environmental, financial) that warrant a review by the Commission.

Procedure:

All projects or programs contained in the Annual/Biennial Element of the current Transportation Improvement Program (TIP) falling under any one of the above criteria must be submitted to MTC by the project sponsor for project review and application approval, pursuant to Sections 66518 or 66520 of the California Government Code.

Upon receipt of an application, staff reviews the project or program documentation and, if appropriate, advises the applicant of any deficiencies or other problems likely to delay application approval. When the project sponsor's documentation and applicable environmental analysis is found to be satisfactory, staff prepares a Staff Evaluation of the project and a

resolution that determines that the project conforms with the RTP, and supports the grant application for the amounts contained in the Annual/Biennial Element. The Staff Evaluation and resolution are presented to the Grant Review & Allocations Committee for review and, if found satisfactory, referral to the Commission for approval. The project sponsor can access TIP funding only after Commission approval of the application.

II. ADMINISTRATIVE APPROVAL

Any project or program contained in the annual/biennial element of the Transportation Improvement Program (TIP) not falling under any of the criteria for major transportation projects listed above shall be considered consistent with the Regional Transportation Plan and the schedule of priorities included therein, and will require no further review or approval action by MTC as a condition for implementation.

Procedure

In adopting the federal Transportation Improvement Program (TIP), the Annual/Biennial projects or programs eligible projects will be identified for administrative approval. Each entry in the TIP tabulation will include the name of the implementing agency, the project description (as shown in the TIP), and the total estimated cost in the Annual/Biennial Element. Unless a project is revised, no further review by MTC will be necessary after the approval of the TIP.

III. REVIEW OF LOCALLY FUNDED ROAD PROJECTS

Generally, locally funded road projects are not normally subject to project review and may be administratively approved. However, if these road projects significantly impact the State highway system, Project Review will be required to determine consistency with the Regional Transportation Plan.

Additionally, locally funded road projects that have regional significance will be listed in the TIP. *Regionally significant* projects must be included in the TIP to ensure adequacy of the federal air quality conformity analysis. *Regionally significant projects* mean capacity increasing projects that normally include principal arterial highways or fixed guideway transit facilities or that offer an alternative to regional highway travel.

Other related actions, such as an amendment of the Transportation Improvement Program, may be necessary in addition to the process described above.