The Impact of Emerging Technologies

NARC’s 51st Annual Conference & Exhibition

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Metropolitan Transportation Commission
San Francisco Bay Area
Senate Bill 375

• A blueprint to coordinate land use and transportation policies, projects, and public investment

• Part of California’s approach to reducing greenhouse gas emissions from passenger vehicles

• Requires the development of a Sustainable Communities Strategy (SCS) as part of MPO’s long-range transportation planning efforts to:
  • Reduce GHG emissions 15% by 2035
  • House the region’s population
Regional GHG Emissions

2015 DAILY PER-CAPITA LIGHT-DUTY VEHICLE GHG EMISSIONS FOR “BIG 4” MPOS [ESTIMATE]

- MTC: 20.7 lbs/capita
- SCAG: 22.5 lbs/capita
- SANDAG: 25.4 lbs/capita
- SACOG: 25.5 lbs/capita

California Average: 22.9 lbs/capita

Source: California Energy Commission, 2015; California Department of Finance, 2015; based on monitoring data for retail fuel sales for gasoline by county of purchase; 300-day annualization factor.
## Regional GHG Reduction Targets

<table>
<thead>
<tr>
<th>Region</th>
<th>2020 Target</th>
<th>2035 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTC</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>SCAG</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>SANDAG</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>SACOG</td>
<td>7%</td>
<td>16%</td>
</tr>
</tbody>
</table>

### Notes

- **Regional GHG Reduction Targets for 2020 and 2035**
- Daily per-capita light-duty vehicle GHG emission reduction targets for "Big 4" MPOS [Rounds 1 & 2].

### Source

California Air Resources Board (CARB)
Low fuel prices and increased fuel efficiency is resulting in reduced auto operating costs,

Resulting in California residents driving more,

Making it more challenging for MPOs to achieve GHG reduction targets.
Bay Area PDAs & PCAs

Priority Development Areas (PDAs)
• Focus for future growth
• Locally-identified and approved

Priority Conservation Areas (PCAs)
• Areas identified for protection, preservation, and access
Focused Land Use Development

Red = Greenfield Development from 1990-2014

Black = PDAs where ~75-80% of new households are planned through 2040
Transportation Investments

- **Operate and Maintain** - Roads/Freeways/Bridges, $66.0
- **Modernize**, $49.0
- **Expand**, $31.0
- **Debt Service and Cost Contingency**, $5.0

**90%** Operate, Maintain, and Modernize

**10%** Expand

- Operate and Maintain – replace, repave, or operate
- Modernize – improve
- Expand – extend or add
Targeted Emission Reductions

Traditional transportation and land use strategies may not be enough to meet GHG emission reduction goals, requiring other programs and investments.

Transportation Demand Management
- Commuter Benefits Ordinance
- Targeted Transportation Alternatives
- Trip Caps

Alternative Fuel / Vehicle Strategies
- Regional EV Charger Deployment
- Clean Vehicles Feebate
- Smart Driving

Car Sharing and Vanpool Incentives
- Car Sharing
- Vanpool
One Bay Area Grant Funding

Plan Bay Area
MTC/ABAG (2013)

Regional Transportation Plan

Sustainable Communities Strategy

Bay Area Federal Funding
FHWA – STP/CMAQ

$862M
5 year period
FY2018 – FY2022

One Bay Area Grant
OBAG 2

Regional Programs
$476M

County Programs
$386M
A Comprehensive Funding Approach

• Distribute transportation funding through a framework that implements the Sustainable Communities Strategy (SCS)

• Provide flexibility on how money can be spent, while meeting regional objectives (ex: Complete Streets)

• Reward jurisdictions that accept and produce housing in Priority Development Areas (PDAs)

• Support open space preservation in Priority Conservation Areas (PCAs)
Regional Programs

- Regional Transit Priorities: 40%
- Regional Operations: 38%
- Regional Planning: 2%
- Pavement Mngmt. Prgm.: 2%
- Priority Development (PDA) Planning: 4%
- Climate Initiatives: 5%
- Priority Conservation (PCA): 3%
- Housing Production Incentive*: 6%

$451M (OBAG 1) FY2013-2017

$476M (OBAG 2) FY2018-2022
County Program

- Local Streets and Roads
- Bike/Ped. Improvements
- Transportation for Livable Communities

CMA Discretionary 80%

Planning 10%

Safe Routes to School 7%

Federal-Aid Secondary 3%

$327M
OBAG 1
FY2013-2017

$386M
OBAG 2
FY2018-2022
County Program Distribution

**Distribution Formula**
- Population: 50%
- RHNA - Affordable: 12%
- RHNA - Total: 8%
- Production - Affordable: 18%
- Production - Total: 12%

**Program Amounts**

<table>
<thead>
<tr>
<th>County</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda</td>
<td>$77</td>
</tr>
<tr>
<td>Contra Costa</td>
<td>$56</td>
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<tr>
<td>Marin</td>
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<tr>
<td>Napa</td>
<td>$8</td>
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<tr>
<td>San Francisco</td>
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<td>San Mateo</td>
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<td>Santa Clara</td>
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<td>Solano</td>
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<tr>
<td>Sonoma</td>
<td>$28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$386</strong></td>
</tr>
</tbody>
</table>

Millions $, rounded
Program Requirements

• **Priority Development Areas (PDAs):** 50-70% of discretionary funds to PDAs
• **Complete Streets** resolutions
• **PDA Investment and Growth Strategy:** guide project prioritization within each county
• **Local Streets & Roads:** certified pavement management program (PMP), participation in statewide data collection
• **Housing/Displacement:** reward jurisdictions with most effective housing anti-displacement policies

Program requirements introduced with OBAG 1 in 2013
When will Automated Vehicles become commonplace?

Fully Automated Vehicle (L4/5) uptake predictions based on high disruption scenarios, indicates possible percentage of new car sales 2016 to 2050.

**Revolutionary**
- Technology breakthroughs
- Regulatory resolutions
- Shared model, at much lower cost than ownership
- Rapid adoption

**Evolutionary**
- Slower technology development and rollout
- Owned AV model with cost premium
- Slower adoption
What can we learn from the past?

Diffusion of new technologies in the US car industry (in percent of car output). (Source: Jutila and Jutila, 1986.)

Source: Dr. Steven Shladover, California PATH (2017)
How quickly can change occur?

- **Information technology**
  - Product life cycles of **months**
  - Low-capital cost products and developments
  - Customer does beta testing for speed and cost saving

- **Motor vehicle technology**
  - Product life cycles of **years**
  - High capital cost products and developments
  - Safety-criticality requires extensive testing before release

- **Roadway infrastructure technology**
  - Product life cycles of **decades**
  - Very high capital cost products and developments
  - Safety-critical, and long time to plan and construct

Source: Dr. Steven Shladover, California PATH (2017)
The Emerging Patchwork: The 4 Categories of State Action on AVs

- Executive Order, Limited Pilots, or Advisory Committee
- No AV Law or AV Law Under Consideration
- Enacted broad piloting or testing laws
- Full AVs explicitly allowed

Source: National Conference of State Legislatures and individual state legislation

Created by: Ann Henebery / Eno Center for Transportation
What does the larger vision look like?

A safer, more efficient, and more enjoyable experience

- Intelligently connected
- Efficiently shared
- Increasingly electric
- Increasingly autonomous

Safer
Towards zero road accidents

Greener
Reduce air pollution and emissions

Efficient
More predictable and productive travel

Source: Qualcomm 2017
A unique opportunity, but not without risks

- New travel choices
  - Reduced car ownership
- Repurposed parking
  - Space for Housing
- Safer streets
  - Improved user experience
- Higher efficiency transit
  - Lower operating costs

- Increased VMT
  - Empty vehicle circulation
- Urban sprawl
  - Higher congestion
- Cyber attack
  - Privacy concerns
- Decline in transit use
  - Inequity
A research partnership

• Future of Mobility Research Program
• To identify and address common interests of the MPOs related to changing travel, policy, and planning shaped by Emerging Technology

Task 1
MPO’s and Future Mobility: Roles and Opportunities

Task 2
Modeling Assumptions for Emerging Technologies in Long-Range Planning

Task 3
On/Off-Model Analysis of CV/AV

Sacramento SACOG
Bay Area MTC
Los Angeles SCAG
San Diego SANDAG
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