Active Traffic Management for Arterials

NCHRP Synthesis 447

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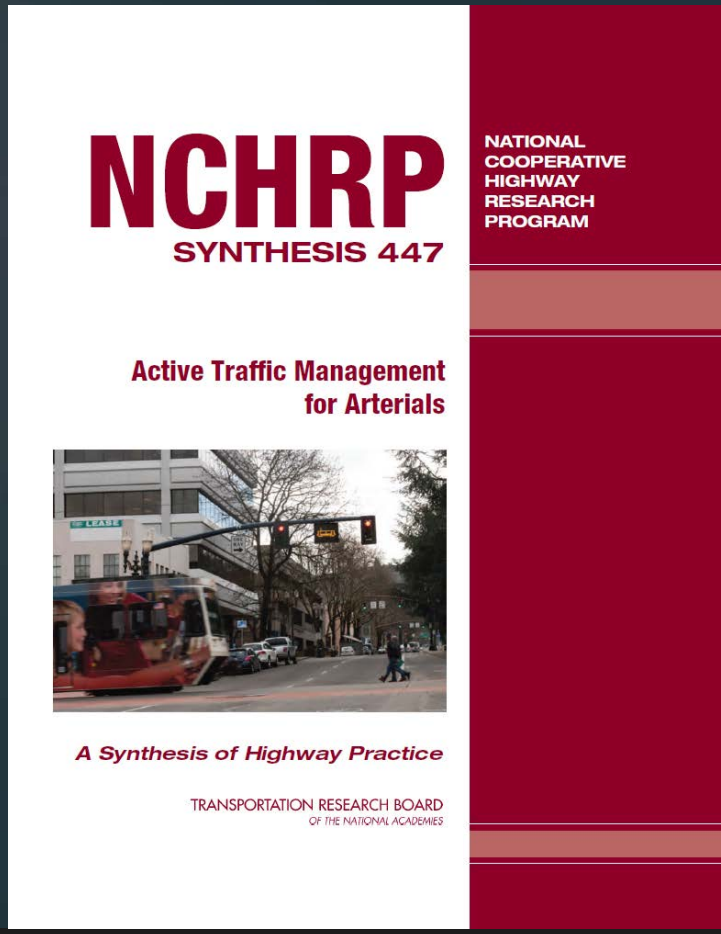
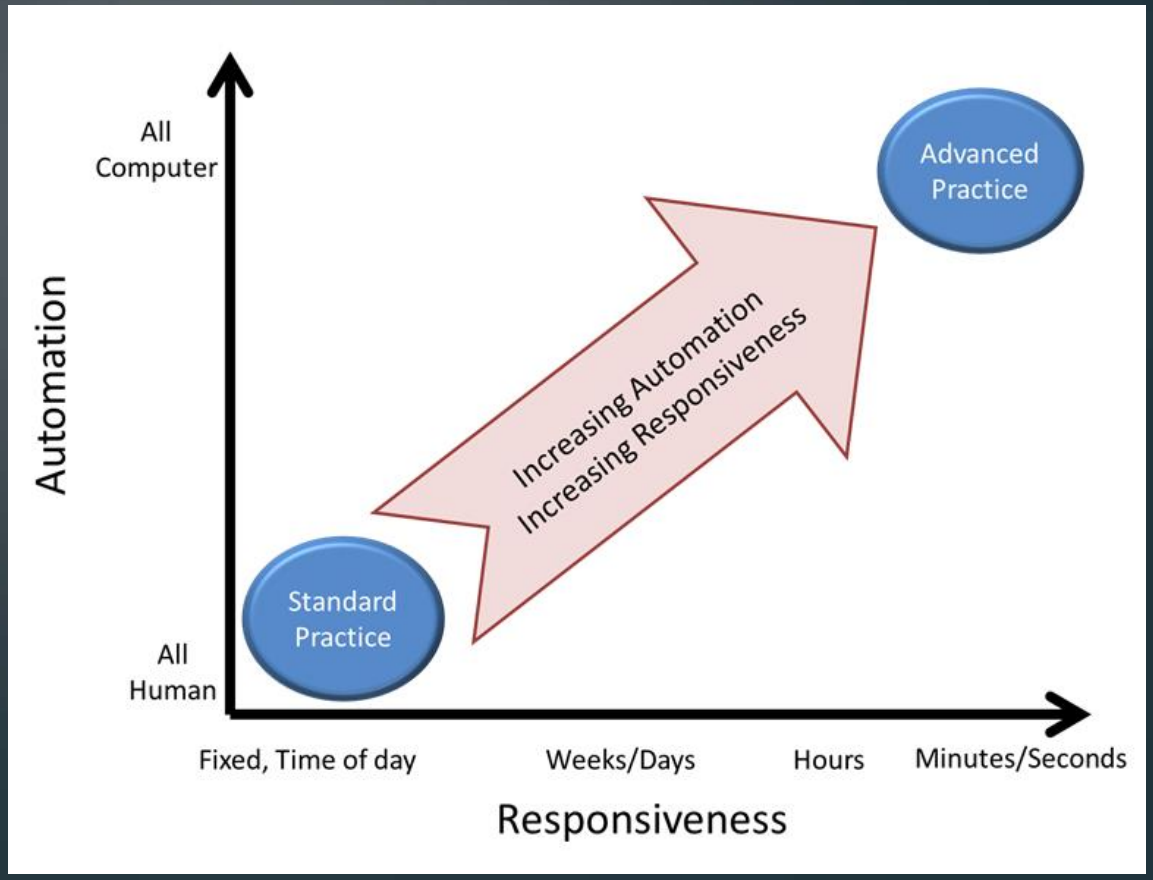
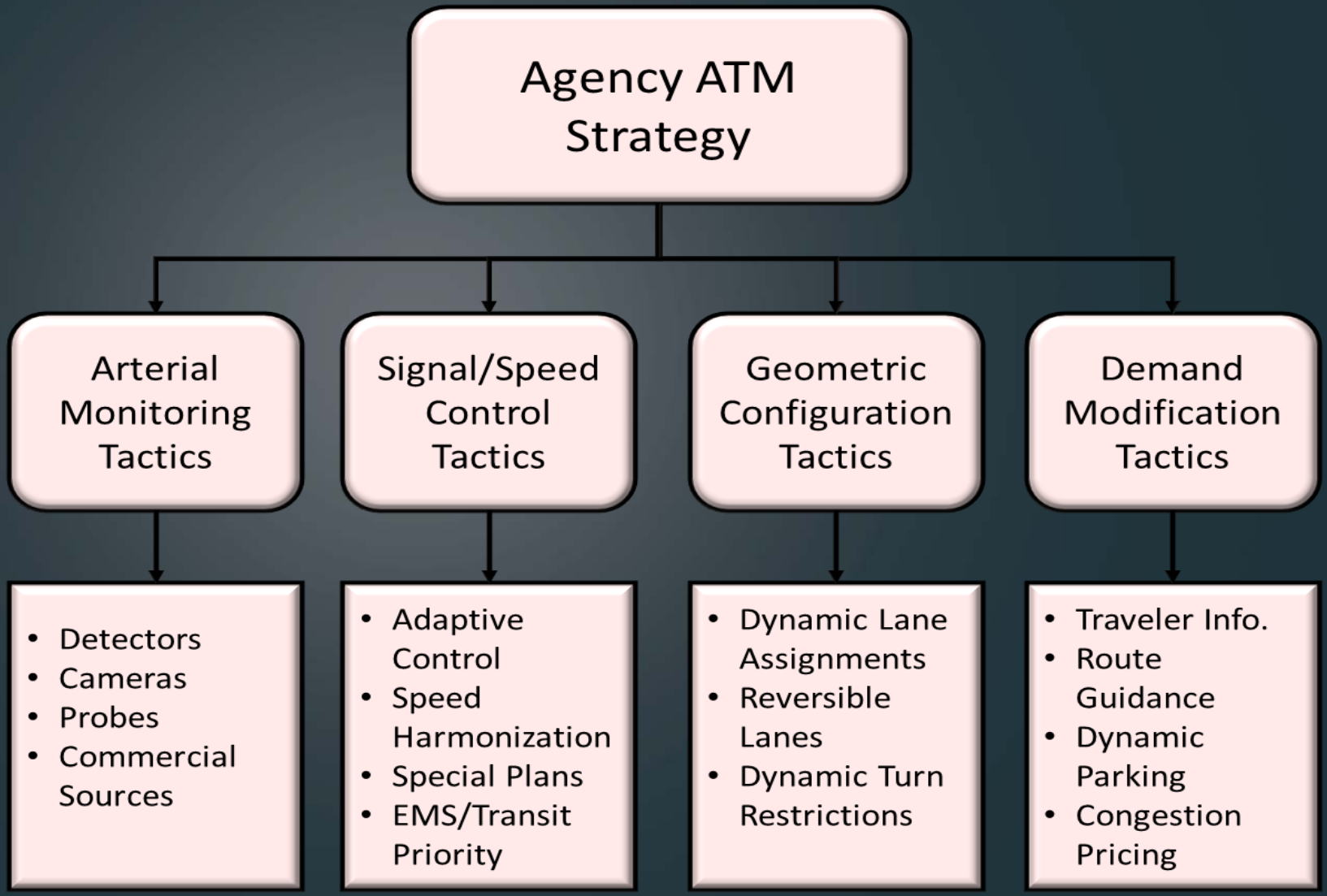


Active Traffic Management Strategies

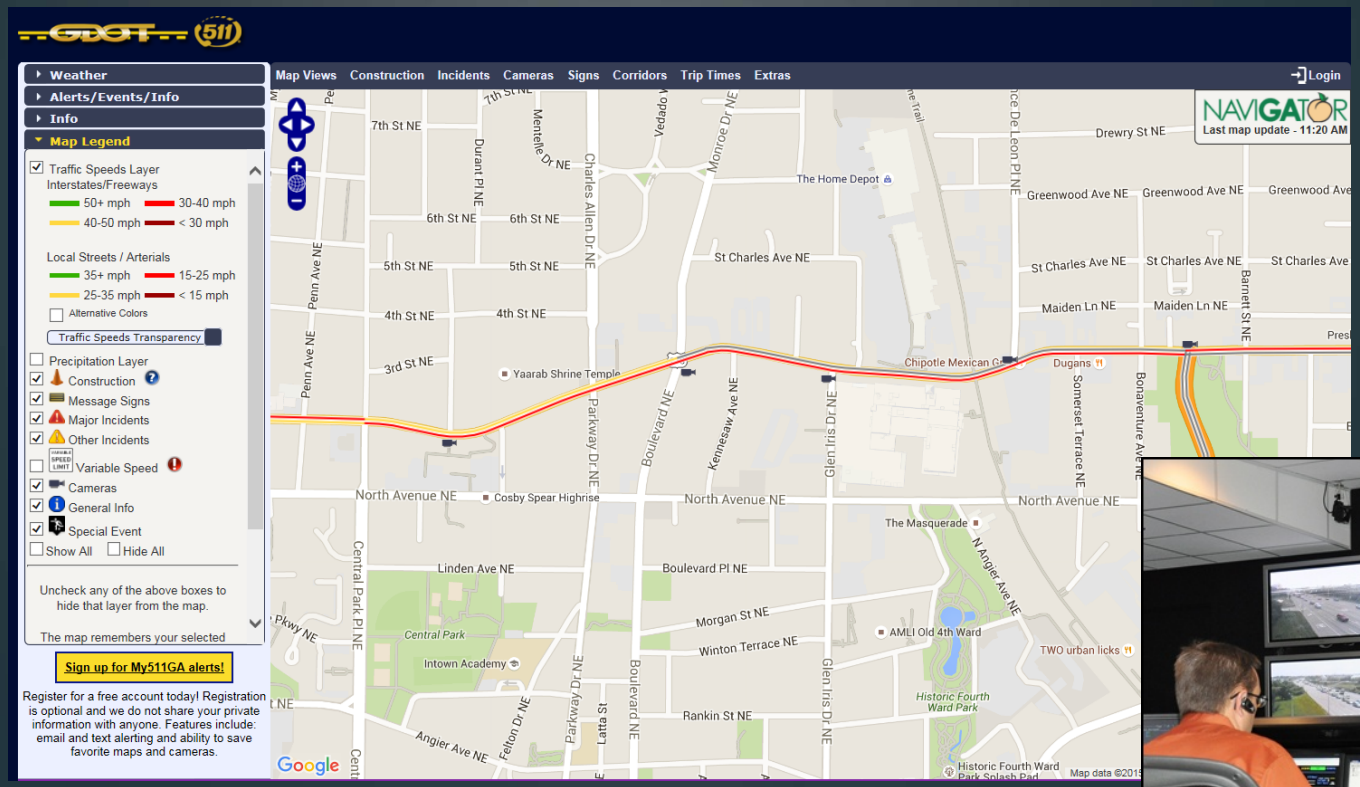
- Objective: Maximize productivity (capacity) and minimize cost (delay, stops)



ATM Arterial Tactics

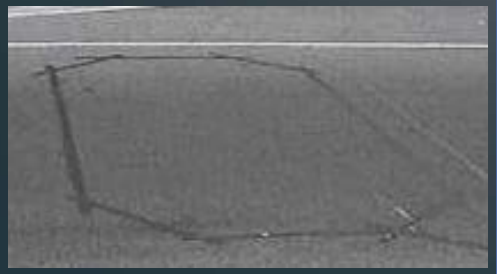


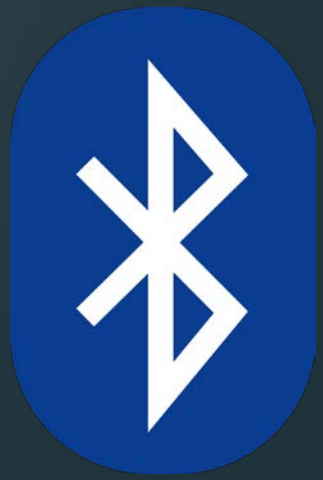
ARTERIAL MONITORING TACTICS



Arterial Monitoring

- Overview: Use of technology to monitor and collect real time traffic data
  - Provides detailed traffic data
  - Data can be used for additional traffic studies or for third party apps
- Data collection technology includes:




Arterial Monitoring Example Application

Bluetooth Arterial Monitoring

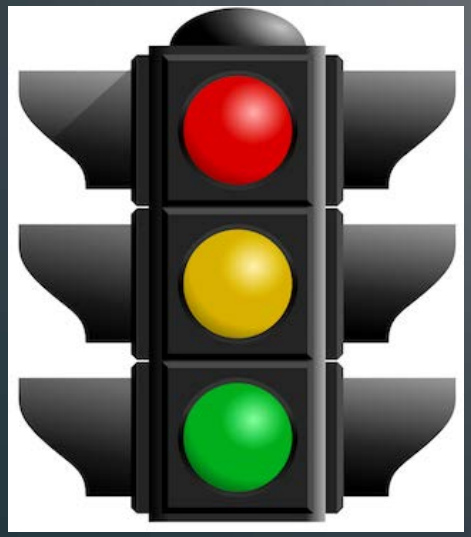
- Cobb County, Georgia
  - Overview:
    - Use Bluetooth to collect TT data on 3 corridors
  - Usage:
    - Before/after studies of signal retiming
    - Increased awareness by EMS
  - Lessons Learned:
    - Size the system appropriately
    - Work with vendor to develop performance measures

Arterial Monitoring Example Application

Intersection Count Monitoring

- City of Bellevue, Washington
  - Overview:
    - Collects data at more than 110 intersections
  - Usage:
    - Better respond to citizen complaints
    - Availability of extensive 24-hr vehicle data
  - Lessons Learned
    - Understand how equipment collects and reports data
    - Useful for planning signal timing changes

SIGNAL CONTROL TACTICS



Signal Control Tactics

- Adaptive Control
  - System controller given flexibility to identify green times and offsets on the fly
  - Focus of NCHRP Synthesis 403 (2010)
- Specialized Signal Timing Plans
  - Developed to deal with special events
- EMS/Transit Priority
  - Works within existing timing plan to improve EMS/transit operations

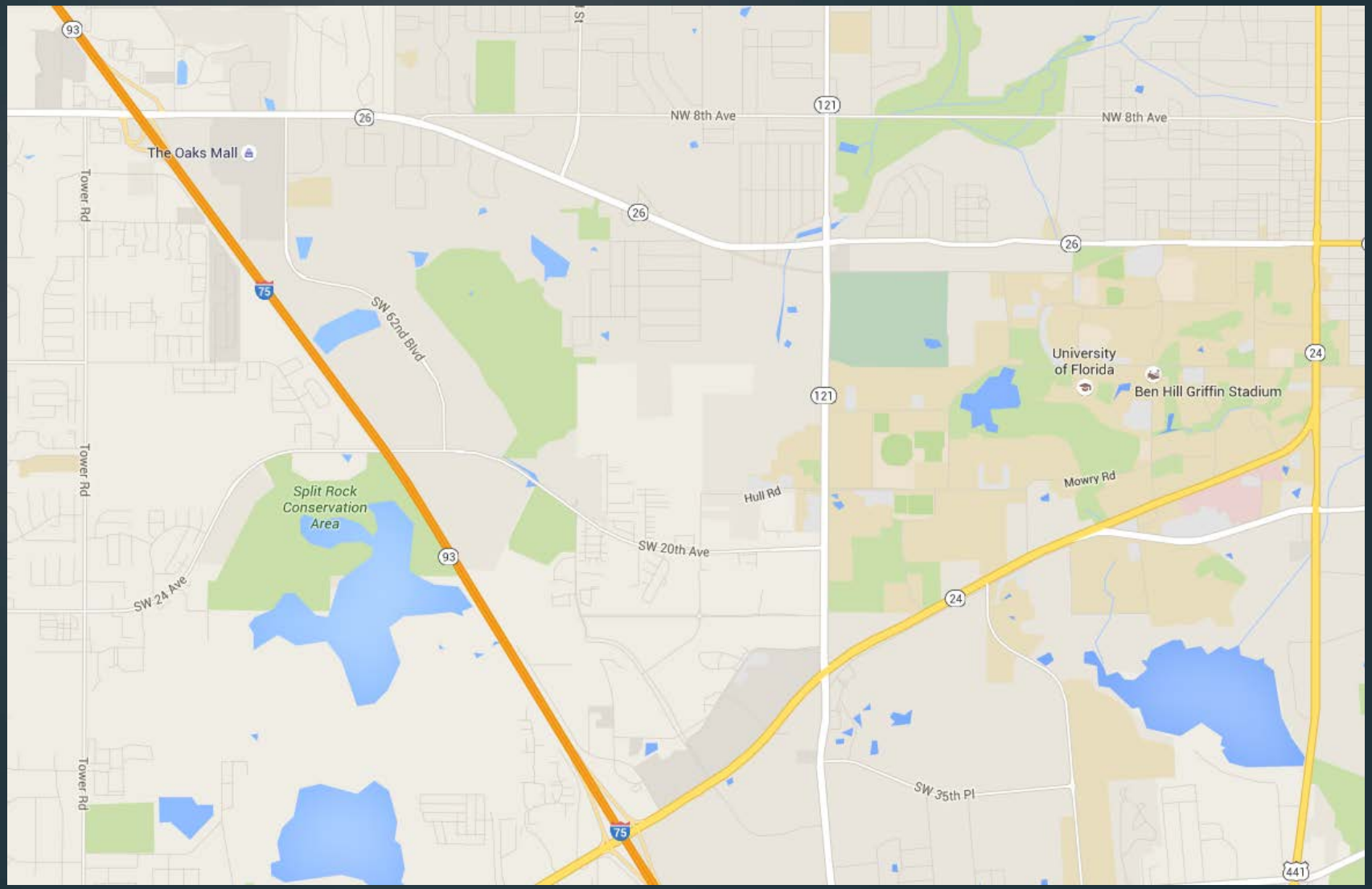
Signal Control Example Application

Specialized Timing Plans

- City of Gainesville, Florida
  - Overview:
    - Timing plans affecting >40 intersections for events
  - Usage:
    - Reduces duration of congestion
    - Reduced queue spillback onto interstate
  - Lessons Learned:
    - Special timing plans take several iterations to tweak
    - Every event is different

Signal Control Example Application

Specialized Timing Plans



Signal Control Example Application

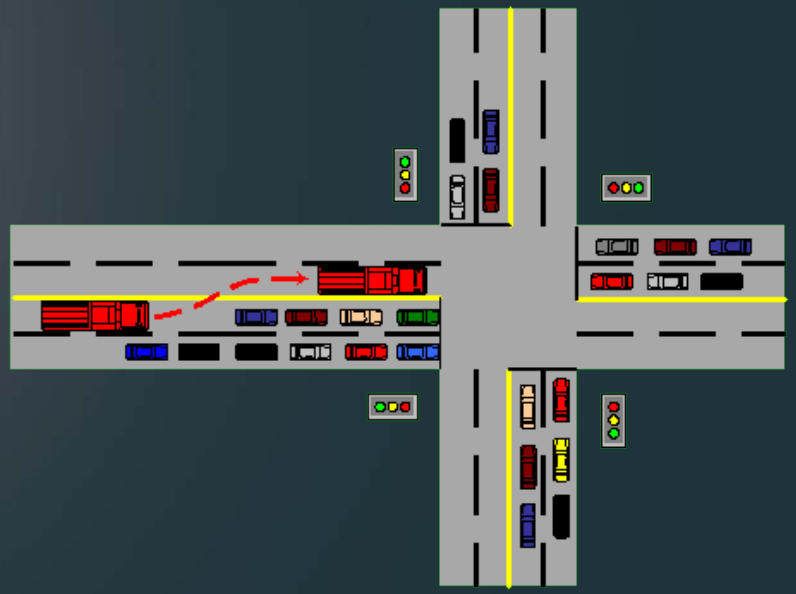
EMS Priority

- Harris County, Texas
  - Overview:
    - Installed EMS priority signal system at 50 intersections
  - Usage:
    - Allows signal and EMS vehicles to communicate location data
    - Reduces the “wave” effect of EMS vehicles
  - Lessons Learned
    - Communication with intended users is key

Signal Control Example Application

EMS Priority

- Harris County, Texas



GEOMETRIC CONFIGURATION TACTICS

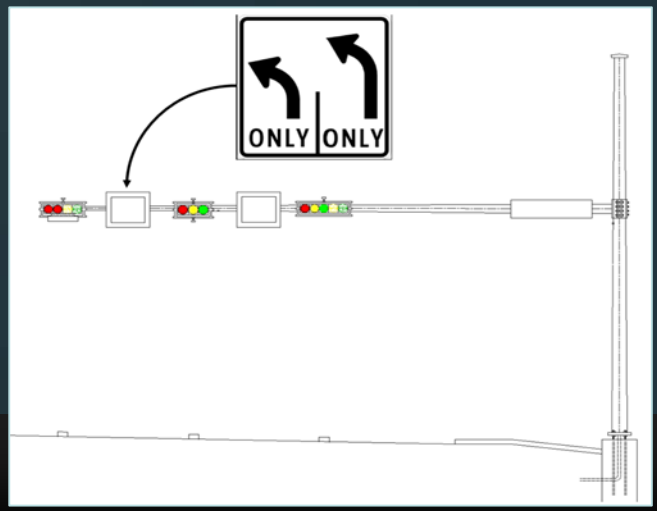
Geometric Configuration Tactics

- Dynamic Lane Assignment
  - Allows agencies to change lane assignments to meet different demands

Geometric Configuration Application

Dynamic Lane Assignment

- Harris County, Texas
  - Overview:
    - Implementing dynamic lane assignment
  - Usage:
    - Used to better handle varying traffic patterns
  - Lessons Learned:
    - A lot of planning is needed to overcome technical challenges



Geometric Configuration Application

Dynamic Lane Assignment

- Harris County, Texas

Geometric Configuration Tactics

- Reversible Lanes
  - Increased capacity in the peak direction

Geometric Configuration Application

Reversible Lanes

- West Valley City, Utah
  - Overview:
    - DOT installed a reversible lane system on 5400 S
  - Usage:
    - Provides additional capacity without ROW acquisition
    - DOT wished to maintain TWLTL
  - Lessons Learned:
    - It is difficult to overcome the technical challenge of maintaining the TWLTL
    - Fully account and plan for your objective

Geometric Configuration Application

Reversible Lanes

- West Valley City, Utah

Geometric Configuration Tactics

- Dynamic Turn Restrictions
  - Restricts certain movements only when necessary such as:
    - During a pedestrian scramble
    - RTOR with a heavy volume U-turn

Geometric Configuration Application

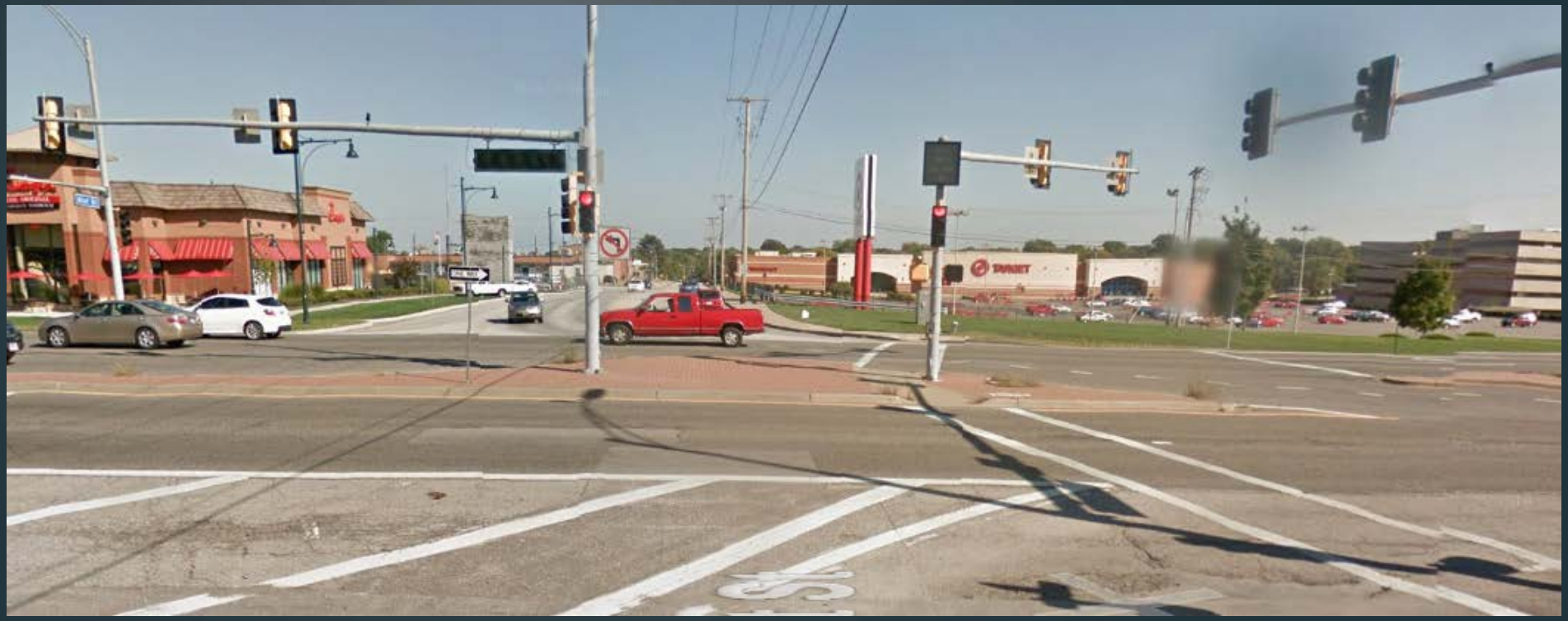
Dynamic Turn Restrictions

- City of Overland Park, Kansas
  - Overview:
    - Using dynamic turn restrictions at 6 locations
  - Usage:
    - Removal of overlap to favor u-turns
    - Reduced conflicts with fire trucks exiting the station
    - Turning restrictions for particular phases
  - Lessons Learned:
    - Spend time to understand how equipment operates

Geometric Configuration Application

Dynamic Turn Restrictions

- City of Overland Park, Kansas

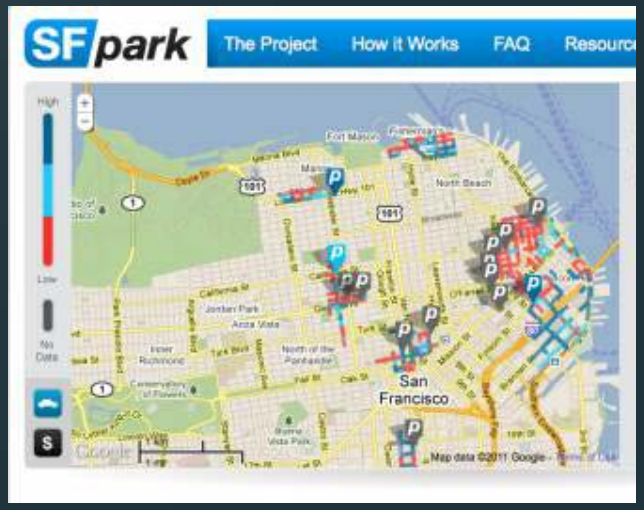


DEMAND MODIFICATION TACTICS

SFpark
CIRCLE LESS, LIVE MORE

Demand Modification Tactics

- Overview: Use of various tactics to better manage vehicle demand
- Demand modification tactics include:
  - Arterial Travel Information Dissemination
  - Dynamic Route Guidance
  - Dynamic Parking Management
  - Congestion Pricing



Demand Modification Tactics Application

Dynamic Parking Management

- City of Seattle, Washington
  - Overview:
    - City allocates an annual budget to perform a study and set parking rates
  - Findings:
    - Decreasing rates does not always increase occupancy
    - Originally divided into 22 neighborhoods, additional subdivision is needed
  - Lessons Learned:
    - Support/discussion with many stakeholders is useful
    - Required significant technology to make data useful

CONCLUSIONS

Conclusions

Successful ATM Deployments

- Need for dynamic management of arterial ops
  - Recurring/non-recurring congestion
  - Limited capacity improvement options

- Agency with sufficient M/O resources including:
  - Staff/consultant expertise
  - Budget to tweak and maintain

Conclusions

Successful ATM Deployments

- Active participation and coordination among stakeholders including:
  - Staff
  - Politicians
  - Community

Conclusions

Successful ATM Deployments

- Detailed Planning and Design
  - Accurate inventory of infrastructure needs
  - Recognition technology is not perfect
  - Consideration of project on maintenance costs
  - Easy to underestimate required costs (capital/maintenance)

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