San Mateo Smart Corridor Incident and Daily Activity Management

City/County Association of Government of San Mateo County Board Meeting
6:30 p.m., October 12, 2017 SamTrans Building (Auditorium)

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Outline

- San Mateo Smart Corridor Background
  - Needs, Goals and Objectives
  - Process Taken and Implementation
- Caltrans’ Mobility Focus Areas
- San Mateo Smart Corridor Briefing
  - Incident Management
    - PG&E High Voltage Tower Collapse
    - Recreational Vehicle Fire
    - Police Action near Routes 92
  - Day-to-Day Usage
  - Moving Forward
  - Questions
San Mateo County Smart Corridor Project
Background
San Mateo County Smart Corridor

Needs

- Coordinate operations and sharing of resources between Caltrans and Local Agencies to address recurrent congestion
- Remote management capability of traffic signals from City and Caltrans TMC
- Ability to monitor traffic conditions and collect traffic data along corridor
San Mateo County Smart Corridor

Goals

- Implement Intelligent Transportation Systems (ITS) solutions and strategies for countywide traffic management
- Establish cross jurisdictional coordination and cooperation
- Enable cities and Caltrans to proactively manage day-to-day traffic, during special events, and facilitate traffic impacts due to major incidents on the freeway
- Implement infrastructure that allows for expansion to meet future demands, capabilities, and integration with new technology
San Mateo County Smart Corridor

Objectives

- Enable ability to monitor real time traffic conditions and adjust signal timing remotely
- Enable shared control and operation
- Improve traffic flow, Improve mobility, Optimize vehicle throughput, Reduce traffic delays, Improve travel time reliability
San Mateo County Smart Corridor

Process Taken

- Assembled Working Group (2007)
  - City traffic engineers, Law Enforcement, Fire, Caltrans
- Together established Alternative Routes
- Inter-Agency Agreements
  - MOU on ownership and maintenance of equipment
  - Coop Agreements between Caltrans and cities
- Established Stakeholder Working Group (All cities on the corridor are represented)
  - Reviewed and approved incident response plan
  - Continue to meet (quarterly)
  - Improve communication on the ground level
  - Continue to fine-tune incident response practice
  - Share lessons learned
San Mateo County Smart Corridor Project Background

Implementation

- Phases I, II, and III
  - 25 miles of interconnected communication network
- Next Step: Portions of Phase IV and Phase V (South San Francisco, Brisbane, Daly City, Colma)
• Stakeholders identified alternate routes known as “Smart Corridor Routes”
San Mateo County Smart Corridor Project Background

What We Have Done

- Deploy infrastructure along major arterials corridors parallel to freeways
  - Install fiber optics communication network
  - Implement new signal system software integrating city-owned and Caltrans traffic signals
  - Install CCTV cameras, signage, vehicle detection

TMC

Regional Communications

System Integration

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San Mateo County Smart Corridor Project Field Elements:

Traffic Signal Controller Upgrades

Timing Values for Asset: 9002 El Camino - Hillsdale

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- Vehicles
- Overlaps
- Pedestrians
- Phase Calls
- Ped. Calls
- Overlap Ped. Calls

Active Priority | 0
Priority Type   | Hide Graphics

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</table>
San Mateo County Smart Corridor Project Field Elements:

**Trailblazer Signs**

- Alternate route guidance
- Installed at decision points
San Mateo County Smart Corridor Project Field Elements:

Arterial Dynamic Message Signs

- Additional traveler information
  - Route guidance
  - Lane closures
  - Travel times
  - Incidents
- El Camino Real @ 84, 92, 380
San Mateo County Smart Corridor Project Field Elements:

CCTV Cameras

- At Critical Locations
- Connected to Video Management System
San Mateo County Smart Corridor Project Field Elements:

Vehicle Detection Stations

- Collect traffic data
- Help detect congestion incidents
San Mateo County Smart Corridor Project

San Mateo Hub and TMC’s

• San Mateo Hub (in San Mateo Police Department)
  ➢ Communications equipment
  ➢ Servers

• City TMC
  ➢ Connected to San Mateo Hub via fiber
  ➢ Operator Workstation

• Caltrans TMC
  ➢ Connected to San Mateo Hub
  ➢ BART fiber (future)
Incident Response Process

START:
Incident Detection

Operator Confirms Incident on Freeway

System Offers Strategies or Operator Looks-up Strategies

Operator Confirms or Modifies Strategy

Operator Deploys Strategy and Notifies Affected Local Agencies

Operator Monitors Conditions and Adjusts Strategy

END:
Resume Normal Operations

- Turn ON Trailblazers and DMS
- Monitor CCTV at Critical Locations
- Implement preapproved signal timing plans
Caltrans’ Mobility Focus Areas
Transportation System Management & Operations (TSMO)

Mobility Focus Areas

• Transportation Management System
  ➢ Build-out (TMS)
  ➢ Adaptive Ramp Metering

• Emergency Management
  ➢ System Monitoring & Performance Measurement
  ➢ Incident Management & Disaster Planning
  ➢ Traveler Information (Regional & Statewide)

• Integrated Corridor Management
  ➢ Integrated Freeway & Arterial Operations
  ➢ Transit/Rail, Pedestrians, & Bicyclists

• Operational Improvements & System Completion
  ➢ Managed Lanes (High Occupancy Vehicle/Toll Lanes)
  ➢ Strategic Improvements

• Embrace New Technology
  ➢ Connected/Automated Vehicles & Infrastructure
San Francisco Bay Area: Integrated Corridor Management

I-80 Smart Corridor

Freeway: Electronic signs on overhead gantries turn ON upstream of an incident, and immediately past.

Activations: 308
WB I-80: 220
EB I-80: 88
Typ. Duration: 30’

8/25/16 to 8/31/17

Arterial: Trailblazer Signs turn ON and signal “flush plan” implemented along main arterial to guide traffic back to freeway.

Freeway Information Display Board
San Francisco Bay Area: Integrated Corridor Management

State Route 4 Smart Corridor

- Approximately 30 miles from I-80 to SR-160 through seven cities
- In planning stage
- 18 month schedule: Prepare Concept of Operations & High Level System Requirements for:
  - Corridor Ramp Metering
  - Incident Management
  - Travel Demand Management
San Francisco Bay Area
Integrated Corridor Management

25 miles
Contra Costa I-680 Smart Corridor
Benicia Bridge-Alameda Co. Line

32 miles
Alameda I-880 Smart Corridor
Oakland – San Jose

Moving I-680 Forward 7 Strategies

1. Complete HOV/Express Lanes
2. Cool Corridor “Hot Spots”
3. Enhance TDM Strategies
4. Increase Efficiency of Bus Services
5. Provide FM/LM Connections
6. Innovative Operational Strategies (for Smarter I-680)
7. Prepare the Corridor for the Future
San Mateo Smart Corridor Briefing
We used the Smart Corridor for the incidents below:

- PG&E High Voltage Tower Collapse in Burlingame on August 28, 2015
- Recreational Vehicle Fire in San Carlos on October 20, 2016
- Police action near Route 92 in San Mateo on April 28, 2017.
Incident Management
PG&E Power Transmission Tower Collapse

- Construction contractor hit PG&E Tower causing it to collapse on Friday night in both directions August 28, 2015.
- Southbound lanes were reopened the next day.
- Northbound lanes were reopened on Monday at 4:15 a.m.
- Broadway over crossing was reopened on Monday at 9:00 a.m.
Police action on April 28, 2017 closed northbound US 101 around 6:15 p.m. Friday evening

Drivers were diverted off the freeway at Ralston Ave.

Freeway reopened on Saturday at 12:45 a.m.
US101 was closed at 5:15 p.m. in San Carlos on October 20, 2016 due to a fully engulfed recreational vehicle carrying 50 gallon propane tank, and 5 to 10 pound model rockets.

Northbound drivers were diverted at Woodside Rd.

Southbound drivers were diverted at Holly St.

Northbound drivers were diverted at Woodside Rd.

Southbound US 101 was reopened at 6:24 p.m. and two northbound left lanes reopened at 6:58 p.m.

At 9:00 p.m., US 101 was fully opened.
US 101 Typical Day Congestion
(4:00 p.m. to 9:00 p.m., October 13, 2016)
El Camino Real Typical Day Congestion
(4:00 p.m. – 9:00 p.m., October 13, 2016)
El Camino Real RV Fire Day
(4:00 p.m. to 9:00 p.m., October 20, 2016)

Route 92

Millbrae Ave.

Southbound

Northbound

University Ave.
Day-to-Day Applications
Day-to-Day Applications

Typical

- Monitor traffic conditions
- Update signal timing remotely
- Coordinate signals with local agencies
- Address complaints
Day-to-Day Applications
Recent Examples

- Ralston Ave. and El Camino Real southbound left turn complaint.
- Coordinating of two closely spaced signals of Harbor Blvd. with El Camino Real and Old County Rd.
- Northbound and southbound US 101 off ramps to Marsh Rd.
- Half Moon Bay retiming.
With the Smart corridor, we are able to view intersection operation remotely and see how the intersection operates 24 hours a day, everyday, to pinpoint problems and address them quickly.
Moving Forward

Next Steps

- Encourage agencies to add signals to the system.

Additional Uses beyond current Smart Corridor

- Work with agencies to use elements for special events.
- Enhance communication between local agencies during freeway incident.
- Partner with researchers and auto manufacturers to utilize Smart Corridor for autonomous vehicles/ connective applications.

Expand the Smart Corridor to the Cities of Daly City, Colma, South San Francisco and Brisbane.
Questions?

Safety

Mobility

Thank you!