Los Angeles County
Regional Traffic Forum Program

Metro Streets and Freeways
LA County Signal Synchronization and IEN Update
March 15, 2012
Traffic Signal Forum History

- In 1995, the Regional Traffic Signal Forum Program was established.
- Focused in three major sub-regional, geographic areas called Forums.
  - Gateway Cities – 14 Agencies
  - San Gabriel Valley – 21 Agencies
  - South Bay – 16 Agencies
MTA Call for Projects Funding

- 1995 Call for Projects - $74 million
- 1997 Call for Projects - $38 million
- 1999 Call for Projects - $28 million
- 2000 Call for Projects - $1.6 million
  - Carson Street TSSP
- 2001 Call for Projects - $23 million
- $2.5 million per year County local match distributed throughout all forums
MTA Call for Projects Funding

- 2007 Call for Projects - $27 million (deferred Gateway/SGV construction)
- 2009 Call for Projects - $46 million (deferred)
- 2011 Call for Projects - $8 million
- $2.5 million per year County local match distributed throughout all forums
LA County Traffic Signal Forum
Program Components

- Traffic Signal Synchronization
- Intelligent Transportation Systems
Traffic Signal Synchronization Program (TSSP)

- Upgrade each signal to current standards
- Install detection system for full traffic actuation
- Complete intersection capacity and safety improvements
- Implement coordination (synchronization) timing
TSSP Routes

- 1995 Call for Projects - 52 routes completed
- 1997 Call for Projects - 25 routes completed
TSSP Routes – South Bay Cities

- 1999 Call for Projects - 4 routes completed
  - Anita St./190th St./Victoria St. – PCH/Wilmington Av.
  - Normandie Av. (N) – El Segundo Bl./170th St.
  - Normandie Av. (S) – Artesia Bl./Anaheim St.
  - Torrance Bl. – PCH/Main St.

- 2001 Call for Projects – 3 routes under construction
  - Marine Av. – Sepulveda Bl./Vermont Av.
  - Vermont Av. – 105 Freeway/PCH
  - 223rd St./Wardlow Rd. – Western Av./Delta Av.
TSSP Routes – South Bay Cities

- 2007 Call for Projects – 2 routes under design
  - Aviation Bl. – 118th St./Ocean Dr.
  - Crenshaw Bl. – 105 Freeway/Crestridge Rd.

- 2009 Call for Projects – 4 routes (Funding originally programmed for FY’13-14 now deferred)

- 2011 Call for Projects – 2 routes (future FY ‘16-17)
TSSP Routes – Gateway Cities

- **1999 Call for Projects – 5 routes completed**
  - Artesia Bl. – Alameda Bl. to Valley View Av.
  - Central Av. – El Segundo Bl. to Victoria St.
  - Gage Av. – Central Av. to Slauson Av.
  - Whittier Bl. – Paramount Bl. to Valley Home Av.
  - Wilmington Av. – Imperial Hwy. to Sepulveda Bl.

- **2000 Call for Projects – 1 route completed**
  - Carson St – Long Beach Bl. to Bloomfield Av.

- **2001 Call for Projects – 5 routes under construction**
  - Bandini Blvd/37th St/38th St – Alameda St / Garfield Av
  - Colima Road/La Mirada Blvd – Mar Vista St / Alondra Bl
  - Garfield Ave – Olympic Bl / Eastern Av
  - Painter Ave/Carmenita Rd – Hadley St / South St
  - Studebaker Rd – Florence Av / Del Amo Bl
<table>
<thead>
<tr>
<th>Year</th>
<th>Call for Projects</th>
<th>Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Projects</td>
<td>2 Routes under design (construction funding deferred)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Florence Av – Central Av to Scout Av</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Florence Av – Orr and Day Rd to Whittier Bl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Alameda St – Nadeau St to Auto Drive South</td>
</tr>
<tr>
<td>2009</td>
<td>Projects</td>
<td>4 routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Funding originally programmed for FY’13-14 now deferred)</td>
</tr>
<tr>
<td>2011</td>
<td>Projects</td>
<td>1 route</td>
</tr>
</tbody>
</table>
TSSP Routes – San Gabriel Valley

- 1999 Call for Projects – 11 Routes completed
  - Citrus Ave – Arrow Hwy/10 Fwy
  - Del Mar Ave – Orange Grove Blvd/Rosemead Blvd
  - Fair Oaks Ave – Altadena Dr/Glenarm St
  - Gale Ave/Walnut Dr et al
    - Gale Ave/Walnut Dr - 7th Ave/Fairway Dr
    - Fullerton Rd – Valley Blvd/Pathfinder Rd
  - Indian Hill Blvd – Foothill Blvd/American Ave
  - Irwindale Ave/Sunset Ave/7th Ave – Arrow Hwy/60 Fwy
  - Vincent Ave/Glendora Ave/Hacienda Blvd et al
    - Vincent/Glendora/Hacienda - 10 Fwy/Colima Rd
    - Nogales St – Shadow Oak Dr/Amanda St
    - Puente Ave – Francisquito Ave/Garvey Ave
  - Fremont Avenue – Ross Av/Montezuma Av (City Administered)
TSSP Routes – San Gabriel Valley

- 2001 Call for Projects – 6 routes under construction
  - Allen Ave - New York Dr/California Bl
  - Garvey Av - Westminster Av/Rosemead Bl
  - Nogales St - Amar Rd/Pathfinder Rd
  - San Gabriel Bl /Sierra Madre Bl - Huntington /Michillinda Av
  - Turnbull Canyon Rd - Valley Bl/Los Robles Av
  - Valley Bl - 710 Fwy. /Temple City Bl
  - Valley Bl - 605 Fwy. /Lemon Av
TSSP Routes – San Gabriel Valley

- **2007 Call for Projects** – 4 routes under design (construction funding deferred)
  - Foothill Boulevard - Rosemead Boulevard/Shamrock Avenue
  - Grand Avenue - Foothill Boulevard/Rowland Avenue
  - San Gabriel Boulevard - Huntington Drive/Montebello Boulevard
  - Colima Road - Camino Del Sur/E/O Tierra Luna

- **2009 Call for Projects** – 3 routes (Funding originally programmed for FY’13-14 now deferred)

- **2011 Call for Projects** – 2 routes (Future ’16-17)
LA County Traffic Signal Forum
Program Components

- Intelligent Transportation Systems
Intelligent Transportation System (ITS) Components

- Advanced Transportation Management Systems (ATMS)
  - Traffic Control System (TCS)
  - Traffic signal controller and/or firmware upgrades
  - Closed Circuit Television Cameras (CCTV)
  - Communications System
- Information Exchange Network (IEN)
Advanced Transportation Management Systems Components

• TCS implementation often requires Traffic signal controller and/or firmware upgrades
  ▪ Addition of Closed Circuit Televisions (CCTV) at key location to provide for real time monitoring of traffic conditions and incidents
Regional Traffic Forum Program – ITS Component

- Traffic Control Systems (TCS) Operating Levels/Options
  - Deploy new (or upgrade) system
  - County hosts Agency system, Agency operates
  - County operates Agency’s system
    - County to control and monitor operations
    - City may elect to have workstation
Agency-Owned TCS

- Funding to 17 Cities to purchase and/or upgrade their TCS
  - City selects TCS Vendor
  - LA County and LA County’s Consultant provide technical assistance
  - Co-Op Agreement is executed between city and county
  - 15 City TCSs installed or underway
  - 2 Cities in negotiations or future selection
AGENCY TCS

- **Centracs**
  - La Verne – 11 Intersections
  - Redondo Beach – 32 Intersections
  - Torrance - 90 Intersections
  - South Gate - 54 Intersections
  - Norwalk – 31 Original intersections, adding 22
  - Glendora - 31 Intersections (INSTALLING)
  - Santa Fe Springs - 41 Intersections (FUTURE)
AGENCY TCS

- **TransCore/TransSuite®**
  - Alhambra – 71 Intersections
  - Diamond Bar - 58 Intersections
  - Irwindale - 19 intersections (INSTALLING)
  - West Covina - 61 Intersections (INSTALLING)
  - Vernon - 35 Intersections (FUTURE)
AGENCY TCS

- Kimley Horn - KITS
  - Commerce – 34 Intersections
  - Claremont – 28 Intersections
  - San Dimas - 24 Intersections

- Siemens - i2
  - Downey - 27 Intersections

- McCain – QuicNet 4
  - Gardena – 56 Intersections (Upgraded)
Cities operating under LA County TCS
- Agency passively manages its traffic signals
  - Occasionally views operations of signals
  - Monitor mainly for alarms & malfunctions
- Monitor other Agencies’ traffic signals via VPN and Terminal Services connection to the IEN
LA County TCS

- Kimley-Horn’s KITS TCS for traffic signals in unincorporated LA County area
- Also includes those Agencies who elect to have LA County control and maintain their signals as part of our TCS
- Procurement included a Countywide license
- Currently over 485 signals on-line, and counting

Carson  El Monte  Lynwood
El Segundo  San Gabriel  Industry
Hawthorne  Temple City  Baldwin Park
Lawndale  Huntington Park
Manhattan Beach  La Mirada
LA County TCS (Continued)

- LACO-IV firmware was deployed using the AB3418E protocol
- 170E or 170ATC controllers were installed with HC-11/QUAD UART processors
Traffic Signal Forum
Communications & CCTV

- Fiber-Optic communications
  - 25 miles
- CCTV Cameras – 56 locations
- Fiber-Optic Link to City of Los Angeles
Regional Traffic Forum Program
Communication Needs

- Large geographic area
- Non-contiguous
- Second by second data requirements
- High bandwidth for Cameras
- Multijurisdictional
Communications via Fiber

- **Summary**
  - 5 Projects
  - 81 Traffic Signals
  - 25 miles
  - $10.72 Million
Communications Investigations/Alternatives

- Fiber—limited deployment area
- Alternative solution: Leased telephone lines
- Obtained Metro approval to pay for 10 years of leased telephone lines as an alternative to fiber deployment due to cost effectiveness
Leased Telephone Lines

- Initial Deployment area – South Bay
- AT&T negotiations
- Initially explored installation of leased telephone lines to 300 signals
- Tremendous cost - $5 million to install communications from telephone company demarcation point to traffic signal controller for 300 signals
- Need to find another more cost effective communications media
Wireless Communications

- Original Requirement
  - Provide a wireless communication network that would allow 1 second polling access to traffic signals and cameras.
  - Must support a minimum of 8 intersections per leased telephone line (T1 telephone line)
  - Initial leased telephone line location at Hawthorne City Hall to transmit data back to Los Angeles County’s Traffic Management Center in Alhambra - ~ 20 miles away
  - Equipment needed to fit inside traffic signal controller
Wireless Communications

- **Solution: Wireless Broadband Ethernet Radios**
  - 1 second polling access to traffic signals and cameras.
  - Must support a minimum of 8 intersections per leased telephone line (T1 telephone line)
  - Supporting equipment needed to fit inside traffic signal controller
  - Must be reliable, less than one percent failure rate
Wireless Communications

- Currently installing a hybrid communication system of broadband radios – Proxim Wireless radios (5.8 GHz unlicensed frequency)
- Back haul provided by wireless communications and/or leased lines
  - Original plan to install one leased telephone lines per 10 signals
  - Currently 8 leased telephone lines supporting over 500 signals have been installed
Backhaul Communications
Radio Installation
LA County Traffic Signal Forum
Program Integration Needs

- 50 Agencies
- 25 TCSs
- 30 Agencies under LA County TCS
- 5 types of TCSs
- City of Los Angeles
- Caltrans Freeway Network
- LA County IEN
Information Exchange Network (IEN)
IEN – Operational Goals

- Enables each local Agency to operate & maintain its own traffic control system (TCS) independently
- Provides for data exchange among Agencies to enhance coordination
- Ability to monitor traffic signal operations & congestion in adjacent jurisdictions

*Operational since Feb ‘02*
IEN – CDI System Interfaces
Current Status

- TransCore Series 2000
  - Pasadena (Operational – Feb ‘02)

- TransCore TransSuite®
  - Arcadia (Operational – Dec ’07)
  - Diamond Bar (Operational – June ‘09)
  - Alhambra (Installation – Late ‘10)
  - West Covina (Installation – Early ‘11)

- Siemens i2tms
  - Downey (Operational – Sept ‘09)
  - Pasadena (Operational – Nov ‘09)
IEN – CDI System Interfaces
Current Status (cont.)

- McCain QuicNet IV or QuicNet Pro
  - Inglewood (Operational – Aug ‘05)
  - West Hollywood (Operational – July ‘06)
  - Pasadena (Operational – Dec ‘06)
  - Burbank (Operational – Feb ‘08)
  - Glendale (Operational – Feb ‘08)
  - Gardena (Operational – Dec ‘09)
  - Santa Clarita (Installation – Late ‘10)
IEN – CDI System Interfaces
Current Status (cont.)

- LADOT-to-IEN XML Interface
  - Operational – June ‘07
  - 1-way interface that brings ATSAC data into the IEN via LADOT’s Web Services
  - Includes fiber-optic connection
- Kimley-Horn KITS
  - LA County (In Negotiations)
- Econolite Centracs
  - South Gate, Torrance, La Verne, Redondo Beach, Santa Fe Springs, & Norwalk (In Negotiations)
IEN Multiple Corridor Server – Project Overview

- Increase the capacity of the LA County IEN
- Make the distribution of data between Agencies more efficient
- Add several new features to improve inter-Agency signal coordination
- Incorporate Lessons learned
  - Need to protect MTA/County investment – ensure signals are coordinated
  - Enhanced monitoring of signals

LA County Information Exchange Network
IEN Multiple Corridor Server Project

- Lessons Learned - Enhancements
  - Real-Time Time-Space Diagram
  - Automatic Detection of Signal Coordination Changes
  - Direction of the Main Street Movement
  - Cycle Lengths on the IEN’s ATMS Map
LA County Traffic Signal Forum Agreements

- TSSP
- Agency-owned TCS/Operational
- LA County Hosted TCS
  - System Hosting only
  - Monitor/control/change upon request
Agreements – TSSP
- Agencies must maintain traffic signals and coordination – or work with County to make changes
- No cost to City to maintain coordination timing on previously synchronized routed

Agreements – Agency-owned TCS/Operational
- Outline roles and responsibilities
- Agency must operate and maintain system
Los Angeles County
Regional Traffic Forum Program
Metro Streets and Freeways

Jane White
Los Angeles County Department of Public Works
Traffic and Lighting Division

jwhite@dpw.lacounty.gov