
Los Angeles County
Metropolitan Transportation
Authority (Metro)

**Metro's Countywide Signal
Priority Program**

T3 Webinar
January 22, 2008



Metro

Background

- In the late 90's, Metro funded several transit signal priority demonstrations
 - City of Los Angeles
 - City of Glendale
 - City of Lancaster
 - City of Santa Monica
 - Metro

Metro's Bus Signal Priority Pilot Project

- Initiated in January 1999
- Multijurisdictional effort aimed at
 - minimizing delay experienced by buses and
 - shortening round trip running times
- Develop a preferred signal priority solution for high-ridership corridors traversing multiple jurisdictions with different local traffic control equipment and software

Program Context

Los Angeles County

- 89 jurisdictions
- 43 public agencies providing fixed route bus service
- Metro alone operates 191 bus routes with over 1.3 million weekday boardings on average



Program Context, cont'd

Los Angeles County

- 1,433 square miles in Metro service area
 - City of Los Angeles = 466 sq. miles
 - 88 other jurisdictions = 967 sq. miles
- Over 10,000 traffic signals



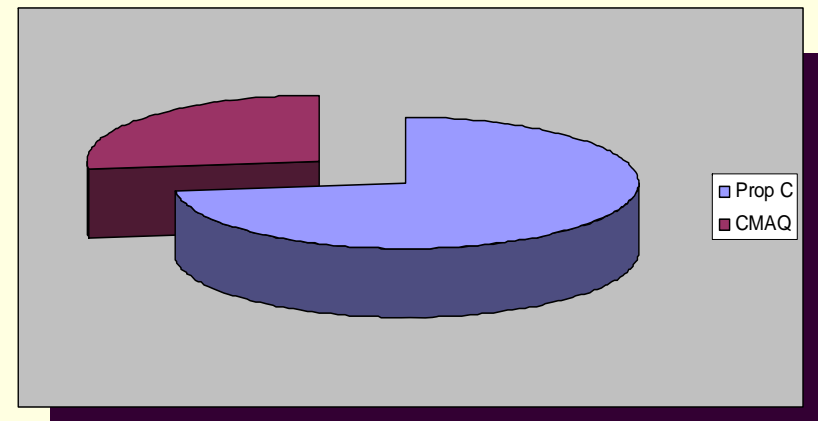
Program Funding

■ Local

- Proposition C: ½-cent sales tax used to maintain, improve and expand public transit as well as reduce congestion and increase mobility in LA County

■ Federal

- Congestion Mitigation and Air Quality (CMAQ) funds through FTA

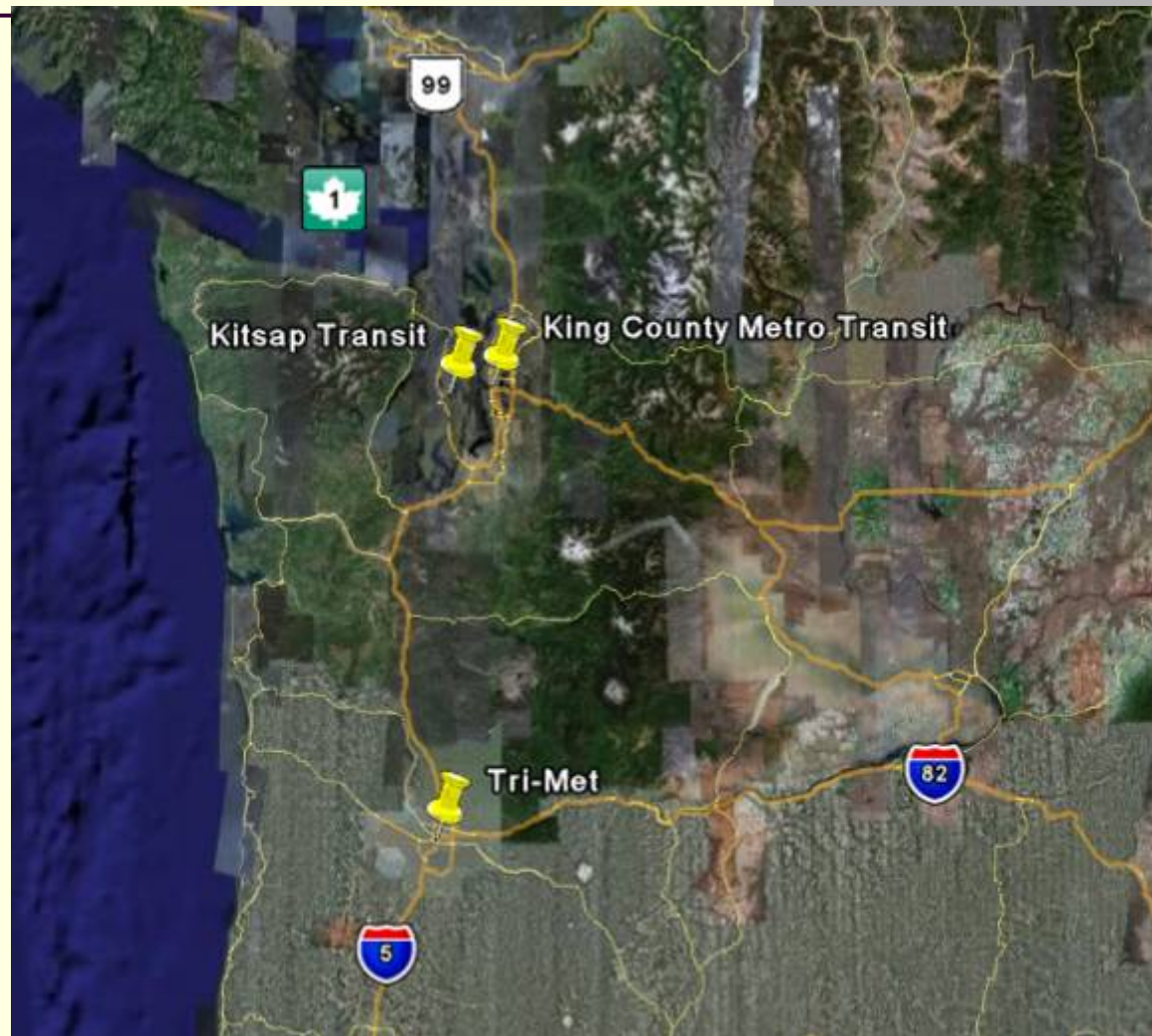


Program Funding

- Bus Signal Priority Pilot Project: \$4.3 million
- Metro Rapid Countywide Signal Priority Expansion
 - Phase 1: \$7.5 million
 - Phase 2: \$8.7 million (estimate)

Study Tour

- Locations
 - Portland Tri-Met
 - KITSAP Transit
 - King County Metro



Study Tour Objectives

- Evaluate different signal priority technology solutions implemented by various transit properties
- Study the institutional, political, legal, and financial issues
- Assess systems integration complexities
- Review adopted signal priority implementation guidelines
- Discuss “lessons learned”

King County Metro Transit Peer Review

- Multiple jurisdictions
- Several different traffic signal control hardware types
- Multiple firmware interfaces
- Decision to grant priority made at the local control level
- Headway intervals were similar to ours
- Local traffic engineering control

Countywide Signal Priority Pilot Project

- **Crenshaw Corridor**
 - 10.5 miles
 - Adams Blvd. to Redondo Beach Blvd.
 - 54 Signalized Intersections
 - 51 signal-priority-equipped
- **Jurisdictional Partners**
 - City of Los Angeles
 - City of Inglewood
 - County of Los Angeles
 - Unincorporated County areas, City of Gardena and City of Hawthorne

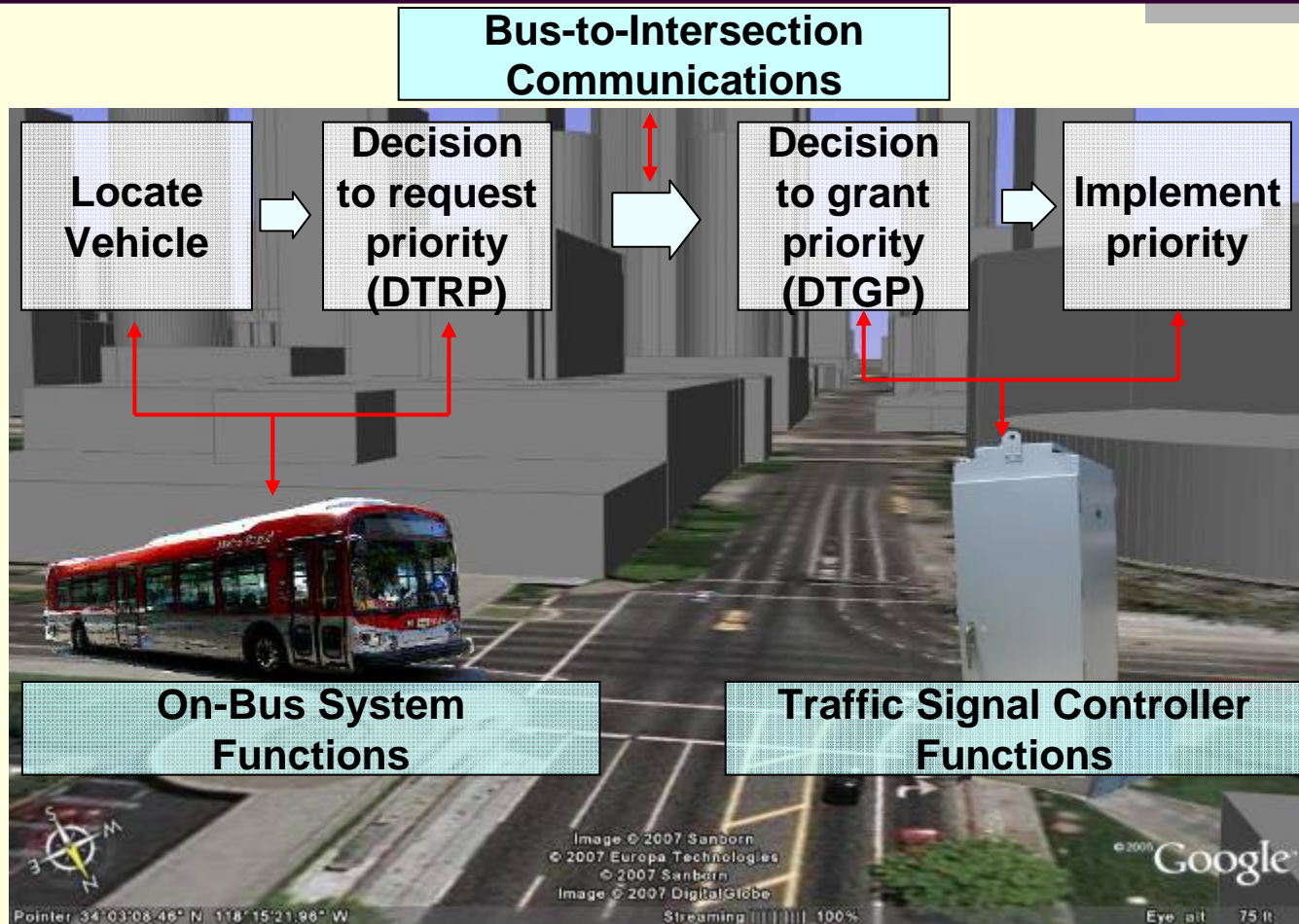


Countywide Signal Priority Evaluation Results

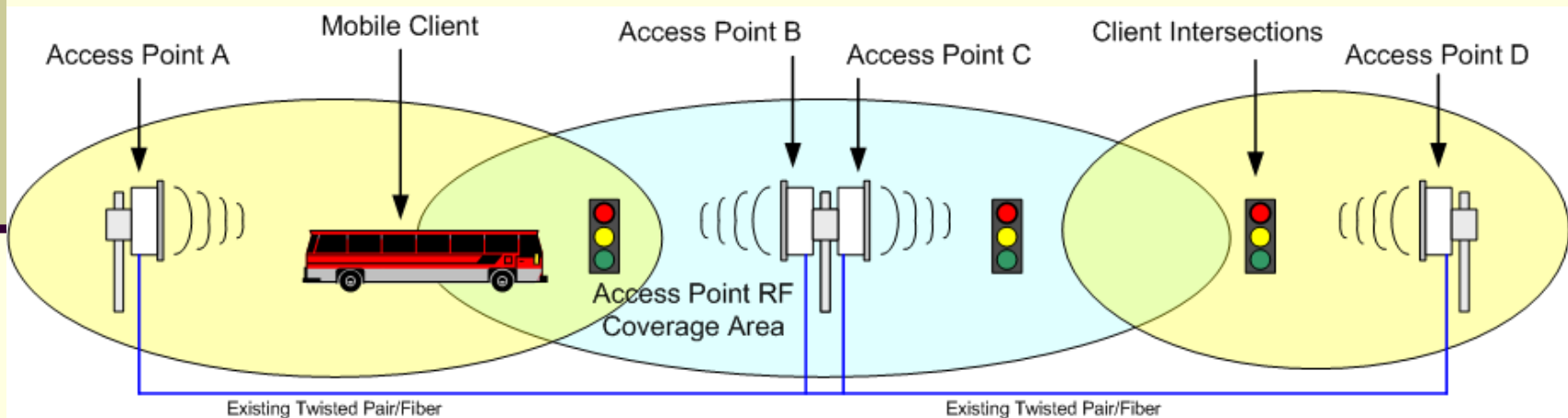
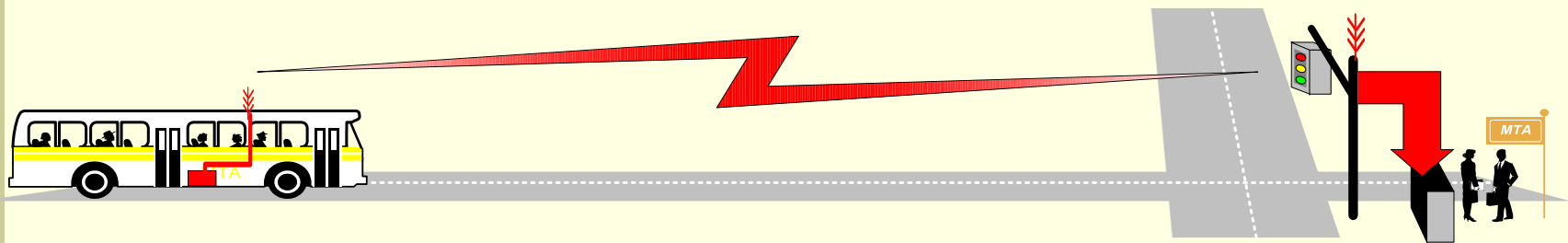
- Average Bus Travel Time
 - Up to 8.8% reduction - northbound PM peak
 - Up to 4.2% reduction - southbound AM peak
- Average Delay Due to Red Signals
 - Up to 22.5% reduction - northbound PM peak
 - Up to 12.5% reduction - southbound AM peak



Countywide Signal Priority Process



Countywide Signal Priority WLAN Equipment



Countywide Signal Priority On-Bus Equipment

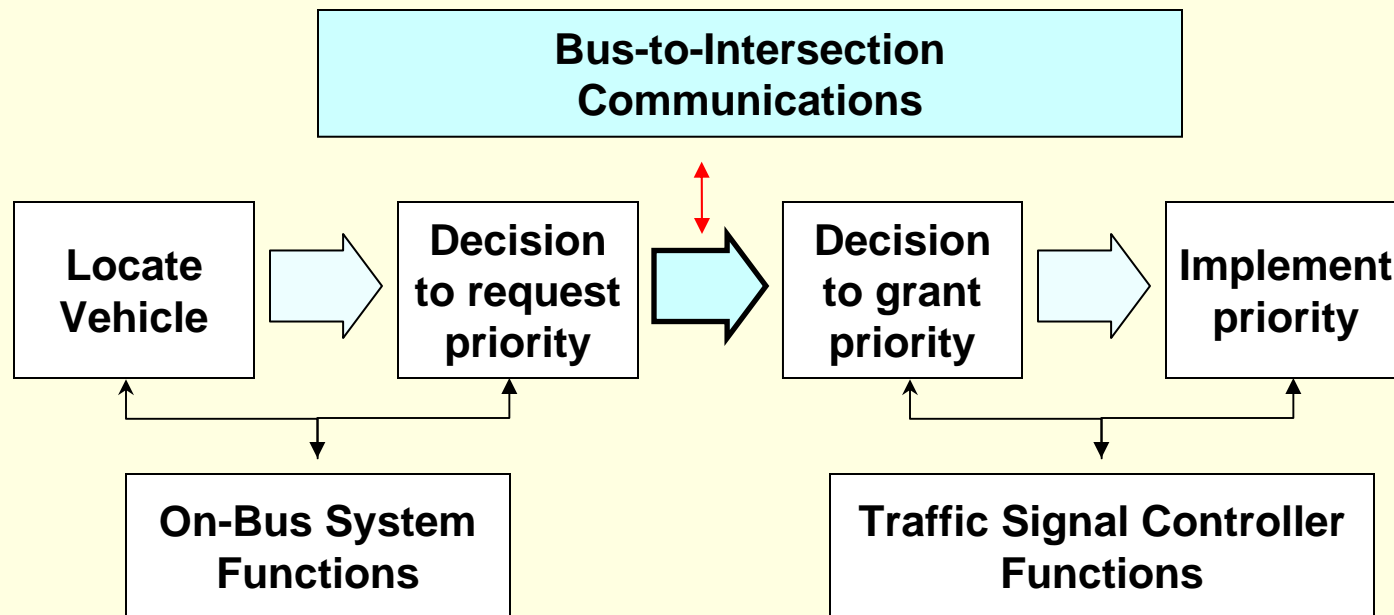


- Upper Left: Bus priority unit installed on a 45' 2004 composite NABI
- Upper Right: Bus priority unit installed on a 40' 2001 NABI
- Lower Left: Tri-Band Antenna installation for WLAN and GPS



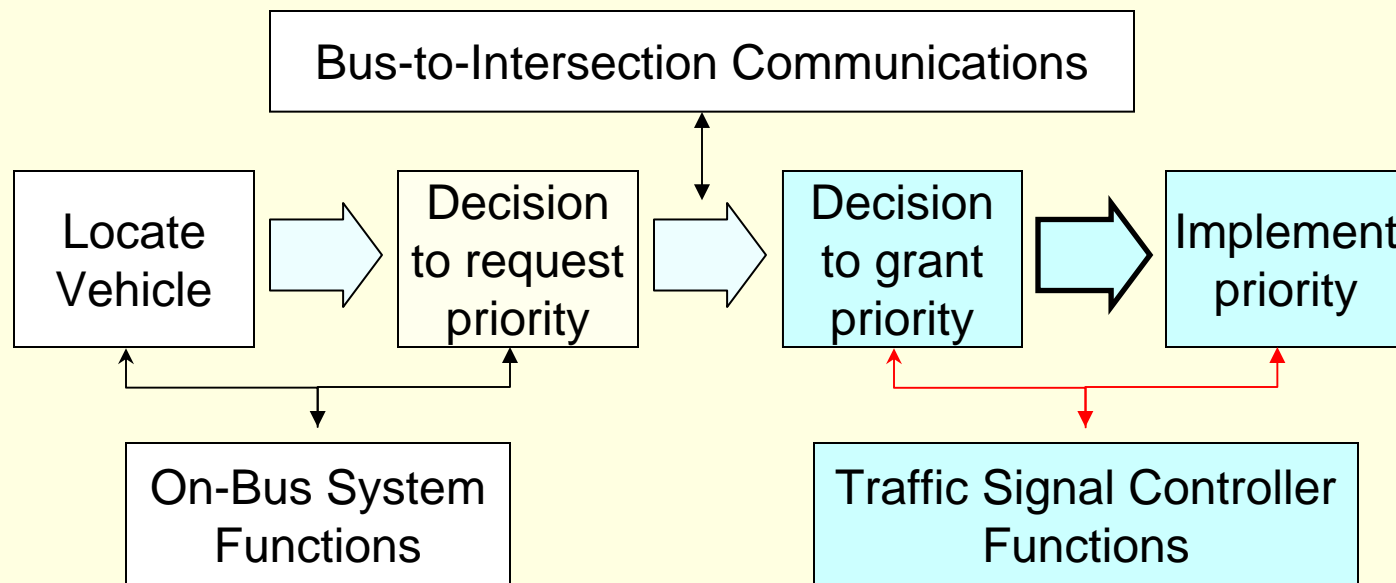
Countywide Signal Priority Technologies

- On-Bus Equipment
- Intersection Check-In Technologies
- Intersection Controller Equipment



Countywide Signal Priority Technologies

- On-Bus Equipment
- Intersection Check-In Technologies
- Intersection Controller Equipment



Countywide Signal Priority WLAN Equipment



- Upper Left: Wireless Access point/bridge pole-mounted hardware
- Lower Left: Full CSP WLAN cabinet mounted hardware at access point/bridge locations
- Lower Right: Additional network equipment to provide power over Ethernet for pole mounted equipment



Countywide Signal Priority WLAN Equipment



- Upper Left: Typical WLAN antenna installed on traffic signal control cabinets at client intersection locations
- Lower Left: Wireless device at client intersection providing serial connection to traffic signal controller
- Upper Right: Pole-mounted client device installed at intersections where cabinet line of site is limited

Countywide Signal Priority Traffic Signal Integration



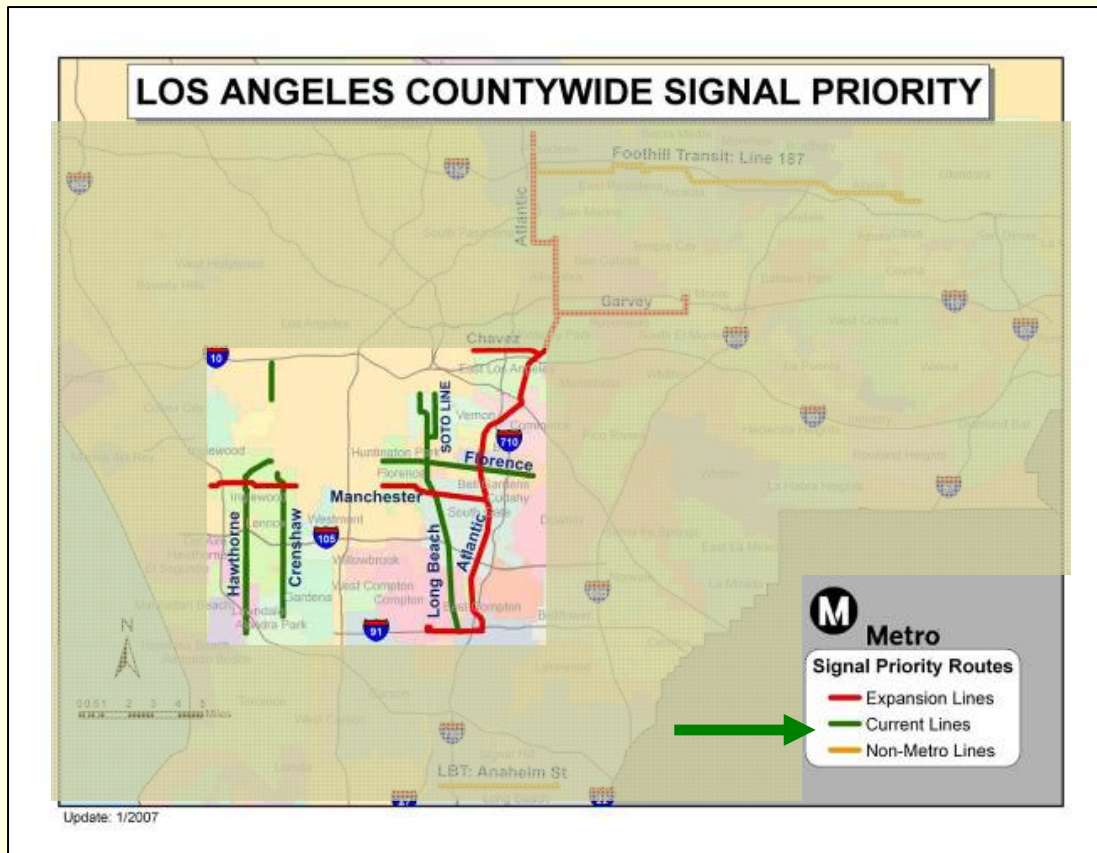
- Upper Left: Type 170 controller running CSP-modified LACO or BI-Trans 233 firmware
- Upper Right: Type 2070 controller running CSP-modified LADOT firmware
- Lower Left: ASC-2 NEMA controller running CSP-modified Econolite firmware

Countywide Signal Priority Depot WLAN Equipment



- Upper Right: WiMAX antenna provides wireless broadband connection to allow off-site monitoring of CSP-equipped buses
- Left: WLAN equipment installed at Division 18 to monitor and provide wireless file updates to on-bus CSP units

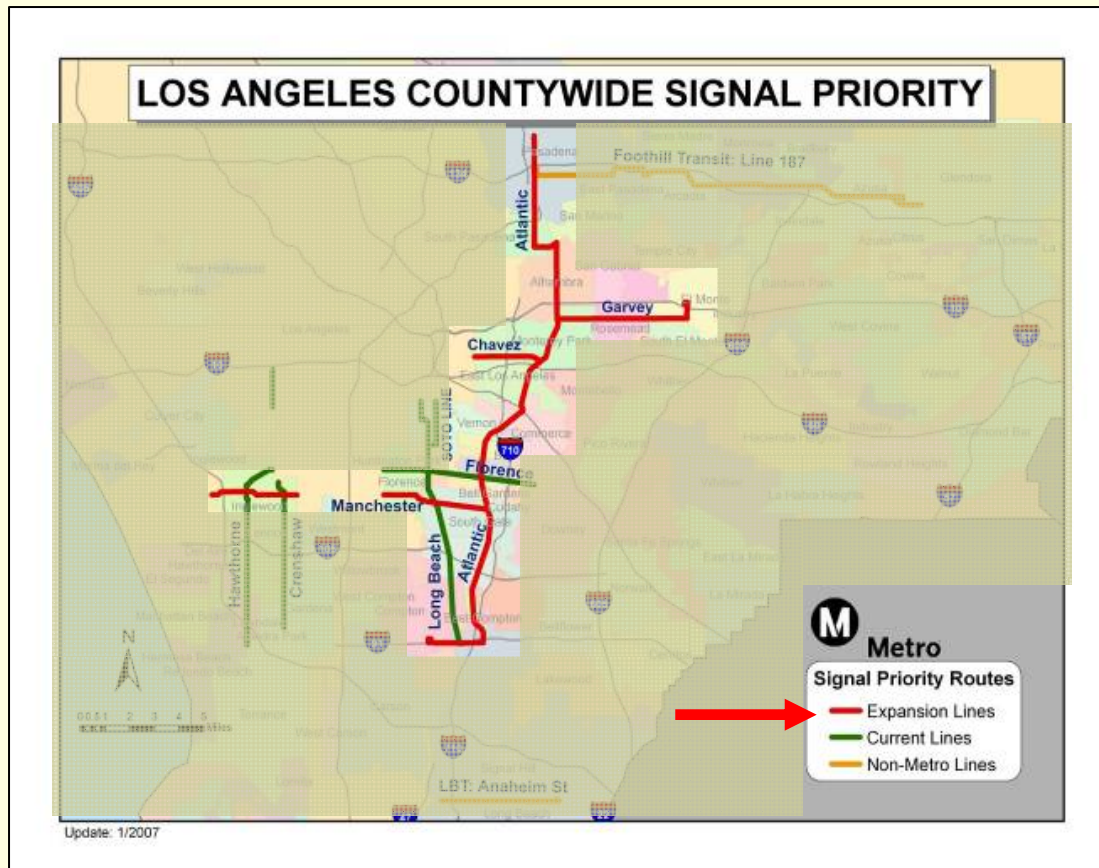
Countywide Signal Priority Expansion Phase I



4 Metro Rapid Corridors Equipped with CSP

- **Long Beach Blvd.**
11.3 Miles / 59 Intersections
6 Jurisdictions
- **Florence Blvd.**
7.6 Miles / 41 Intersections
5 Jurisdictions
- **Hawthorne Blvd.**
7.7 Miles / 39 Intersections
5 Jurisdictions
- **Soto St.**
6.6 Miles / 36 Intersections
5 Jurisdictions

Countywide Signal Priority Expansion Phase II



Expansion

- **Atlantic Ave.**
25 Miles
128 Intersections
14 Jurisdictions

- **Garvey-Chavez St.**
10.7 Miles
52 Intersections
4 Jurisdictions

- **Manchester Blvd.**
7.8 Miles
45 Intersections
3 Jurisdictions

Multijurisdictional Project Implementation: Challenges and Lessons Learned

■ Project Oversight and Coordination

- Allocation of necessary staff resources
- Project schedule to accommodate jurisdictional coordination Issues

■ Consensus Building

- Schedule/time management
- No “One size fits all” approach
- Management, administrative, and technical staff must all be included in the decision making process
- Work with your jurisdictional partners both collectively and individually to resolve implementation questions and concerns

Multijurisdictional Project Implementation: Challenges and Lessons Learned

■ Legal Agreements

- Respective legal counsels and technical staff must coordinate with one another to address legal concerns
- Project scope, roles and responsibilities, on-going operations and maintenance, cooperation, communications, and liability are key elements
- Legal impasse can become a showstopper

■ Corridor Synchronization

- Signal timing update

Multijurisdictional Project Implementation: Challenges and Lessons Learned

■ Technology Migration

- Work with participating jurisdictions to ensure system-upgrade compatibility
- Develop an operations and maintenance plan that accommodates potential hardware and software upgrades
- Continually evaluate the existing system and look for opportunities to improve performance

Contact Information

Steven Y. Gota

Transportation Planning Manager
San Gabriel Valley Area Team
LA Metro
One Gateway Plaza
Mail Stop: 99-22-8
Los Angeles, CA 90012-2952

213-922-3043

GOTAS@metro.net

Reinland Jones

Transportation Planner
San Gabriel Valley Area Team
Los Angeles County Metro
One Gateway Plaza
Mail Stop: 99-22-8
Los Angeles, CA 90012-2952

213-922-2231

JONESRE@metro.net

