Update on TIGER Priority Bus Project: Transit Signal Priority (TSP) Procurement

TPB Traffic Signals Subcommittee
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TIGER Grant for Priority Bus Transit in the National Capital Region

Five implementing organizations:

- City of Alexandria, DDOT, MDOT, PRTC, and WMATA

$58.8 million (100% Federal) – 2011 through 2016

- **PRTC Buses and ITS**
- **US-1 (VA) / Potomac Yard Transitway *(Alexandria)***
- **Takoma/Langley Transit Center *(MDOT)***
- **Bus Corridor Priority Treatments *(DDOT, WMATA, MDOT, Alexandria)***
- **Franconia-Springfield and Pentagon station improvements *(WMATA)***

TIGER – Transit Signal Priority (TSP) on Bus Corridors

TSP Locations (77 total)

- 16th Street (6)
- Georgia Avenue (4)
- Wisconsin Avenue (5)
- University Blvd (20)
- US 1 - MD (7)
- Van Dorn / Beauregard (8)
- VA-7 / Leesburg Pike (25)

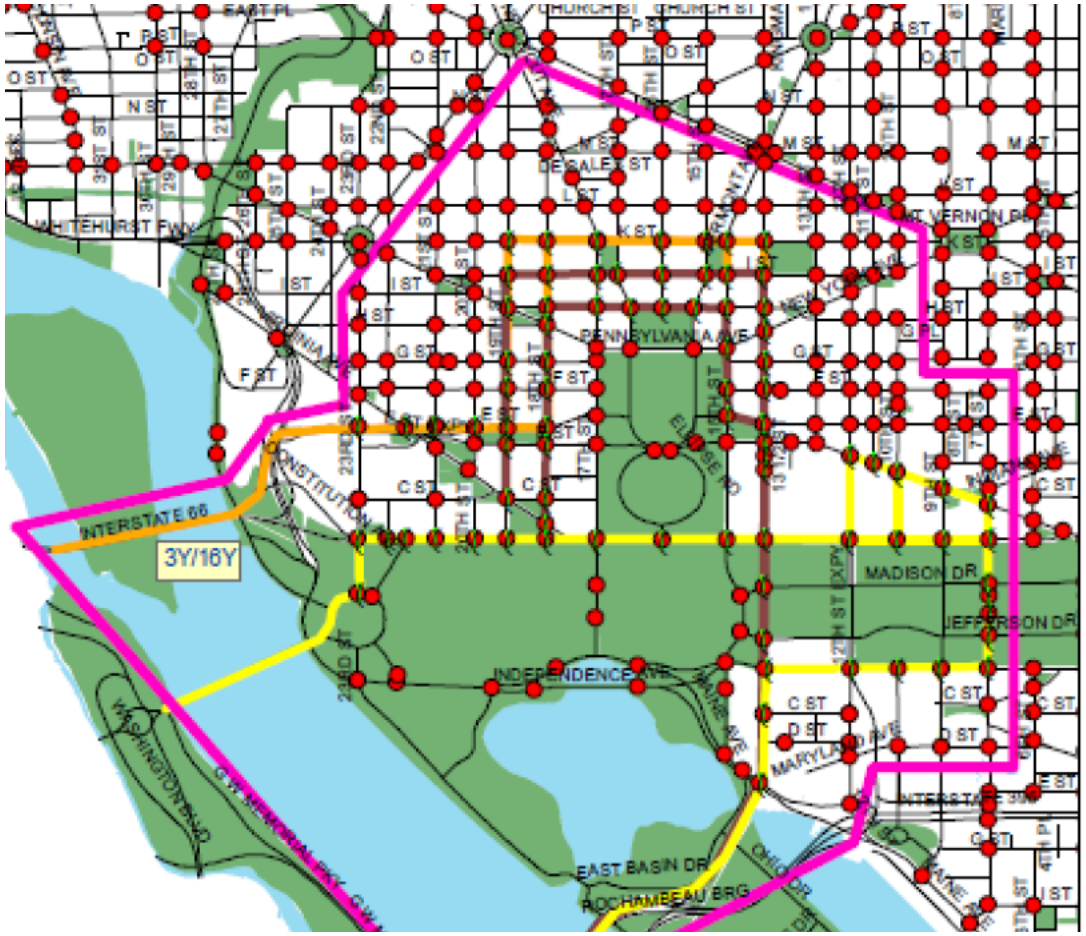
Install April 2014 – July 2016

Funding: $3.2M

TIGER - Signal Optimization & Prioritization

TR Bridge and 14th Street Bridge to K Street

- **203 Traffic Signals in Downtown Core to be improved**



- **82 signals to be both optimized and prioritized**
- **121 signals to be optimized**

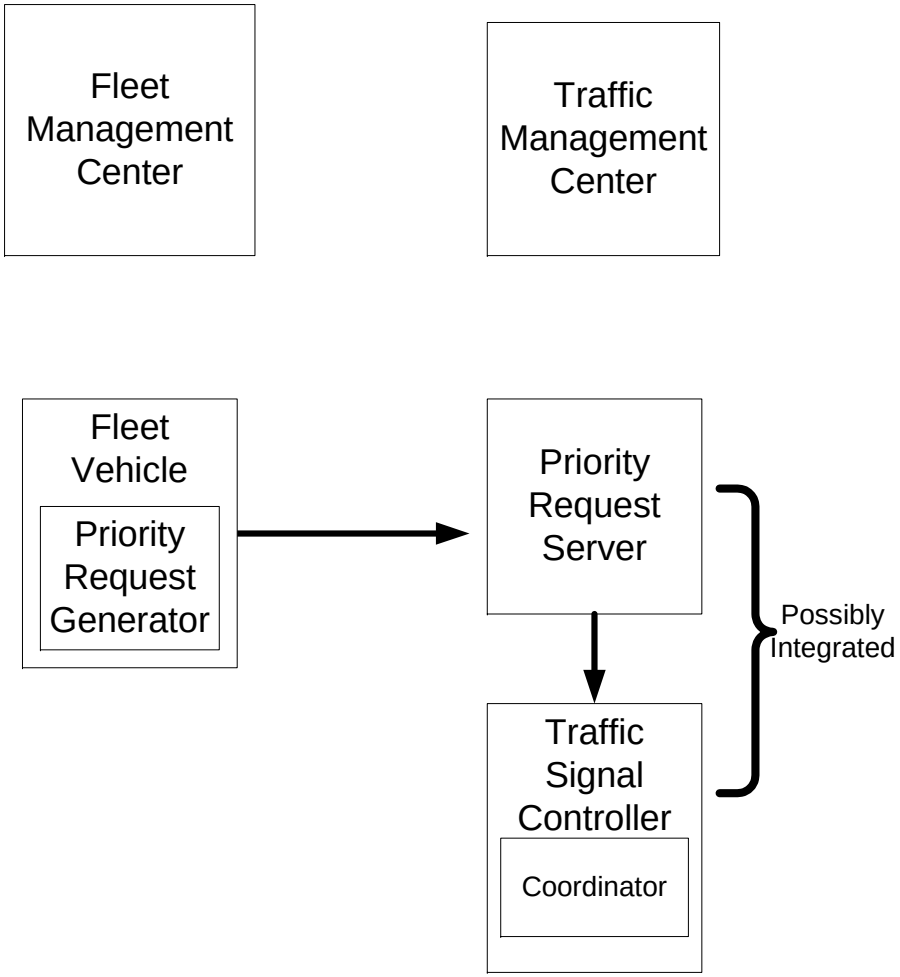
April 2014 – April 2015

Funding: $6M

Proposed TSP system follows architecture of NCTCIP 1211 Scenario 4

1. **AVL System on bus determines whether to provide priority (based on criteria).**
2. **Bus sends signal directly to traffic signal to request priority using the Priority Request Generator (PRG).**
3. **The Priority Request Server (PRS) evaluates request in terms of importance and priority.**
4. **Requests are sent to the Coordinator entity in a Traffic Signal Controller.**

- TSP system will provide communications between the Priority Request Servers (PRS) at the wayside and the TSP Management consoles at their designated locations to communicate TSP status and performance data to the TSP Management Centers/consoles for analysis and reporting purposes.



National Transportation Communications for Intelligent Transportation System Protocol, Scenario 4

TSP Project: On Board and Wayside Equipment

Procurement

- WMATA developed a software upgrade to their onboard equipment which includes a Priority Request Communicator (PRC) and Priority Request Generator (PRG) patch as part of its fleet-wide Consolidated Ancillary On-Board Equipment (CoABE) project.
- The Priority Request Server (PRS) devices for the wayside equipment will be procured by WMATA for the VA-7 project in the fall 2014.
- The means by which other jurisdictions will procure PRS wayside equipment is still under review.

Testing/Installation

- WMATA will handle the development and testing of the onboard software and wayside equipment along VA-7, working with each agency/jurisdiction. This testing will also support the City of Alexandria's project on US 1, and SHA and DDOT projects.
- WMATA vendor will complete evaluation of the CoABE project, the Intelligent Vehicle Network (IVN) system, and cellular communications capabilities and coordinate activities with each jurisdiction per the TSP Design Package.

Maintenance

- WMATA will maintain on board equipment. The monthly cellular service fee associated with the wayside equipment will be provided by WMATA.
- Local jurisdictions will maintain the PRS wayside equipment.

Transit Signal Priority (TSP) Architecture

- TSP Options: active and passive, conditional and unconditional
  - WMATA working with traffic signal agencies to determine appropriate architecture

- When does the bus receive TSP?
  - Peak direction only? Or both directions?
    - Should peak-only direction be preferred? Don't want empty bus prioritized over full bus.
  - How often does TSP work?
    - For every bus? Only once every 10 minutes? Once every 5 minutes? What if buses are bunched?
  - When does TSP work?
    - Only in rush hour periods? Or 24/7?

- Each jurisdiction can set own parameters, but does regional consistency make sense?
  - Enables knowledge transfer, common standards, inter-jurisdictional operation of traffic signals and buses.
  - Limits experimentation or local optimization.

TSP Contract Status

- WMATA issued the full notice to proceed for the TSP contract through a change order to the Clever Device Contract on March 5, 2014.

- WMATA provided a prototype wayside device to DDOT and SHA in late March 2014. These agencies worked with Clever Devices and GTT to conduct a benchmark test on the equipment, which was successful. The City of Alexandria receive a prototype in April 2014 and conducted the same test on the equipment with support from WMATA and their contractor. This test also resulted in successful testing outcomes.

TSP Final Design

- WMATA held a series of TSP final design meeting the last week of May 2014 with all partnering jurisdictions. Comments from these meetings were collected and responses were distributed to VDOT, the City of Alexandria, the City of Falls Church, DDOT, and SHA in June 2014.

- WMATA plans to finalize locations of all TSP intersections, provide an excel spreadsheet with signal priority parameters for all jurisdictions to review in July 2014. WMATA will also work with their contractor to develop alternative options for installation of the wayside equipment at the signal cabinet, where challenges have arisen.

TSP Testing Process

- Clever Devices began preparing the TSP acceptance test procedure, and will conduct an acceptance test at the Clever Device New York Offices this summer.

- WMATA is working to finalize the onboard software by August 2014, at which point intersection prototype testing can begin.

- This test will involve a bus equipped with the TSP software upgrade sending a signal to a signal controller furnished with the wayside equipment. The first test will take place on VA-7; however WMATA is also working with DDOT to select a test site in the district. This prototype testing will take place in September 2014.

Next Steps

- To support the testing, start-up and maintenance process, WMATA will work to complete its memorandums of understanding with VDOT, City of Falls Church and the City of Alexandria in July 2014.

- WMATA will finalize cellular service scope of work and determination of sole source supply to begin the procurement of cellular service at intersections by the end of summer 2014.

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Questions?