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Implementing a Regional Transit Signal Priority (TSP) System in Northeastern Illinois

Transport Chicago

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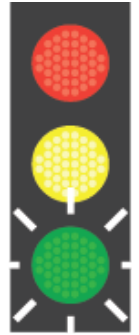


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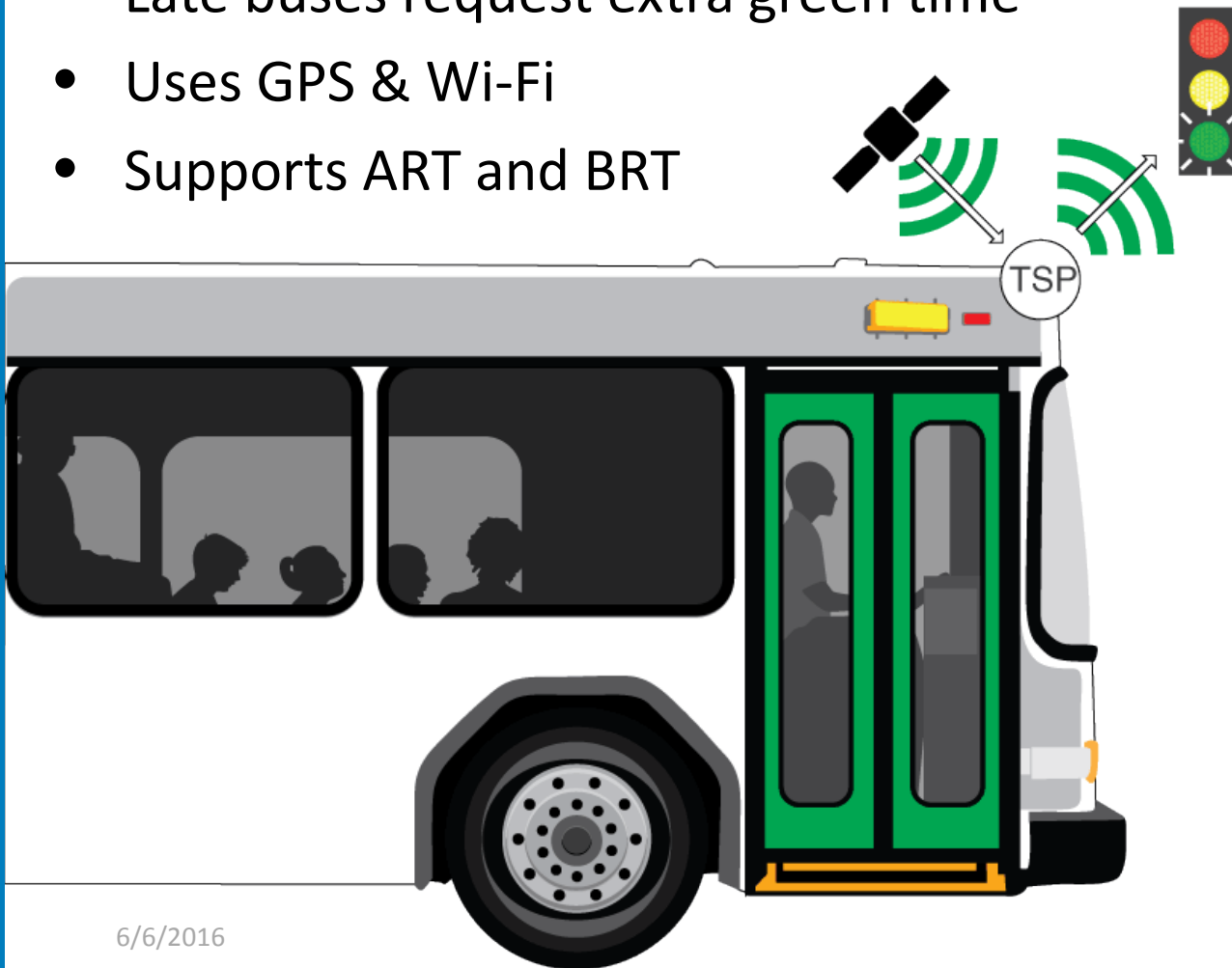
OUTLINE



- What – Transit Signal Priority (TSP)
- Why – Improve Bus Performance
- How – Regional TSP Program & Standards
- Where – 400 Intersections, 13 Corridors, 1 System
- When – Implementation in 2016 to 2018
- Who – TSP Working Group
- Challenges & Opportunities

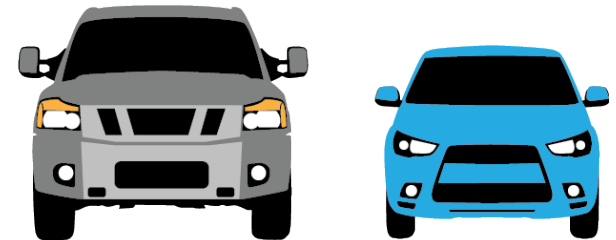
TRANSIT SIGNAL PRIORITY (TSP)

- Late buses request extra green time
- Uses GPS & Wi-Fi
- Supports ART and BRT



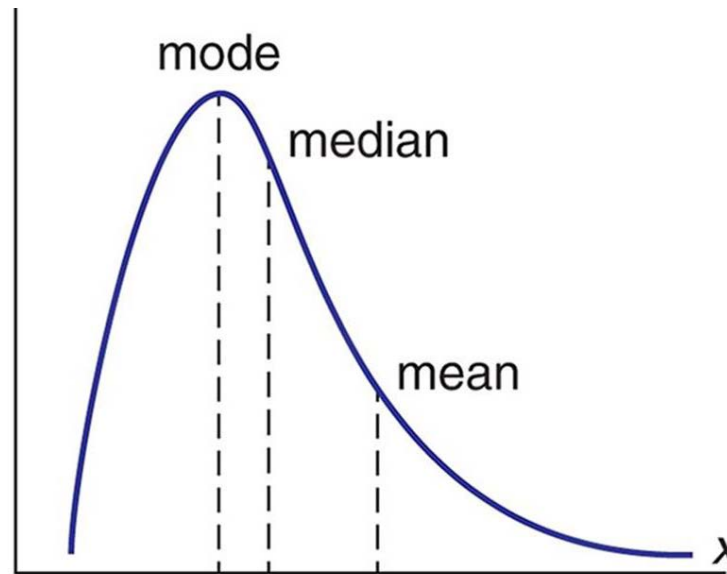
PERFORMANCE MEASURES

- General vehicle travel time
- Bus travel time
 - Travel time variability
 - Bus stops due to red signals
 - Bus delay at traffic signals
- Data collection & analysis
 - Baseline (before improvements)
 - After traffic signals are optimized
 - After TSP is operational

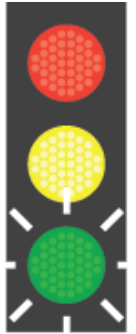


PERFORMANCE MEASURES

- Distribution Plot of Travel Time Variability

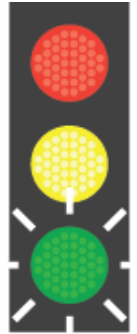


REGIONAL TSP PROGRAM



- Builds on previous TSP Demos in the region:
 - Cermak Road (IDOT, CTA, Pace) in 1997
 - Western Avenue (RTA, CTA, CDOT) in 2008-2010
 - Harvey Transp. Center (RTA, Pace, IDOT) in 2010-2011
 - Washington Street (Pace, Lake Co.) in 2014
 - Jeffrey Jump (CTA, CDOT) in 2014
- Need to develop & implement a regional program
- \$40 million CMAQ grant (90% federal, 10% RTA)
- Plus other federal and local grants

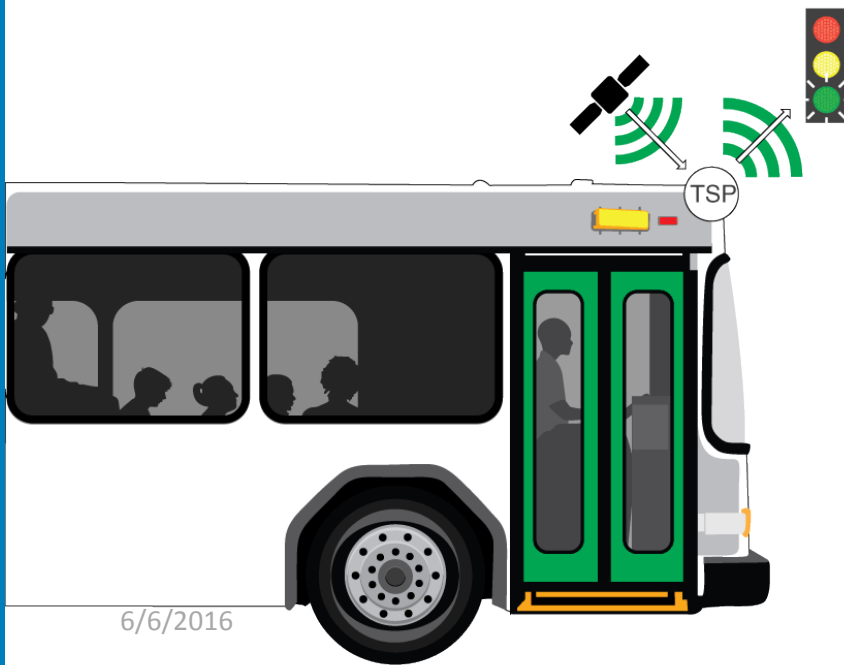
GUIDING PRINCIPLES



- Interoperable System
 - Different transit and highway jurisdictions
 - Any bus, any traffic signal (properly equipped)
- Open Architecture
 - Industry standard communication protocols
 - Vendor neutral, off-the-shelf equipment
- Use Existing Equipment if possible
 - Bus Automatic Vehicle Location (AVL) systems
 - Traffic Signal Controllers
 - V-2-I, I-2-I and I-2-C Communication

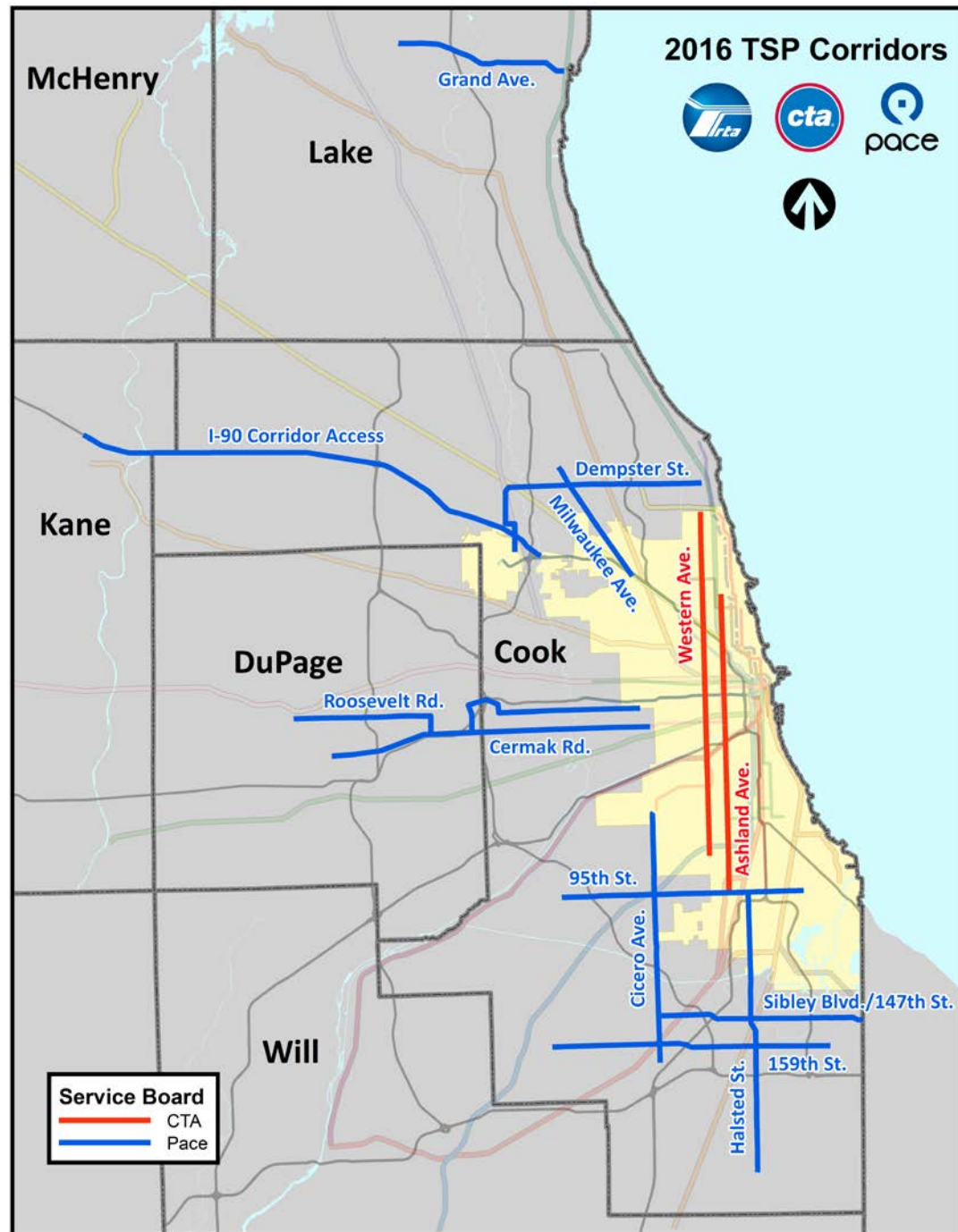
REGIONAL TSP STANDARDS

- Vehicle-to-Intersection TSP Message Set
 - Defines the information communicated between the bus and the traffic signal controller
- 5.0 GHz Wi-Fi with 802.11n (or 802.11ac) protocol



WHERE?

- 400 Intersections
- 100 Miles of Roads
- 13 Corridors
- 1 TSP System



TSP PRIORITY CORRIDORS

- CTA TSP Corridors (\approx 200 signals)
 - Ashland Avenue
 - Western Avenue
- Pace TSP Corridors (\approx 200 signals)
 - Milwaukee Avenue
 - Dempster Street
 - Roosevelt Road
 - Cermak Road
 - Grand Ave. (Lake Co.)
 - I-90 Corridor Access
 - Cicero Avenue
 - Halsted Street
 - 95th Street
 - Sibley Blvd./147th St.
 - 159th Street



TSP IMPLEMENTATION SCHEDULE

- CTA/CDOT implementing TSP on S. Ashland Ave. in spring 2016 and on Western Ave. in late 2016
- North and Central Ashland require traffic signal modernization and will follow in 2017/2018
- Pace proof-of-concept test with IDOT, CDOT, and CTA in late 2016/early 2017 on Milwaukee Ave.
- Pace/IDOT implementing TSP on Milwaukee Ave. and 10 other corridors in 2017 and 2018



TSP IMPLEMENTATION ON S. ASHLAND

- New signal controller (ATC) -- Ashland @ 95th St.



TSP IMPLEMENTATION ON S. ASHLAND

- New Communication Box (C-Box) – Ashland @ 35th St.



TSP WORKING GROUP & ROLES

- RTA – Program Management
- CTA and Pace – Primary TSP Implementers
- CDOT and OEMC – City traffic signals & communication upgrades
- IDOT – Traffic signals & permits
- County DOT's (Lake, Cook, DuPage) – Traffic signals & permits as necessary
- CMAP and FTA – Funding partners
- Various consultants



Chicago Metropolitan Agency for Planning



U.S. Department of Transportation
Federal Transit Administration



CHALLENGES / OPPORTUNITIES

- Lot's of agencies / cooperation has been great
- Field data is cumbersome / AVL data is promising
- Many traffic signal controllers are dated / testing new Advanced Traffic Controllers
- Intersection-to-Center communication is limited / TSP could help fill some communication gaps



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