

Transit Performance Measures (and how to improve them)

ITS Washington Annual Conference 2017

Owen Kehoe, PE, PTOE King County Metro Speed & Reliability Group



Overview

- Why is Speed & Reliability Important?
- Metro's Data Sources
- How Transit Performance is Reported
- Strategies to Improve Speed & Reliability
- TSP as a Performance Management Tool



What are Transit Speed and Reliability?

- **Speed** is the ability of transit vehicles to move along their routes in reasonable amounts of time.
- **Reliability** is the ability for transit vehicles to arrive at stops at consistent and predictable times.
- Both Speed and Reliability help transit agencies reduce operating costs, help people travel faster and more conveniently, and help local jurisdictions make transit an attractive transportation option.



Why is Speed & Reliability Important?





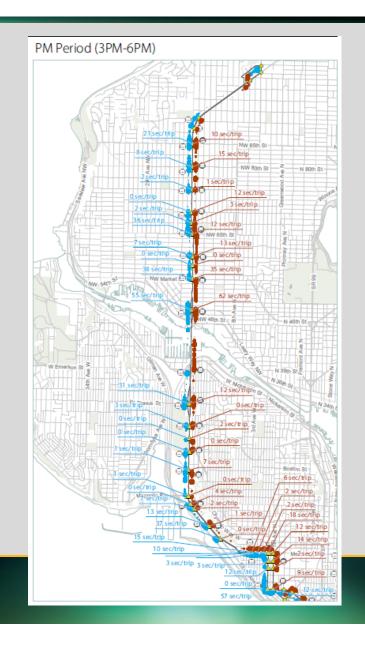
Metro's Data Sources

- On-Board System (OBS) Data
 - Time stamps at each bus stop
 - Dwell time and door open time at each stop
 - "Disturbance stop" \rightarrow Traffic delays
- Time Point Data (AVL)
 - Travel time between time points
 - Schedule performance at a time point (early/late)
- Automatic Passenger Counter (APC) Data
 - Ons/Offs at bus stops
 - Passenger load on the bus



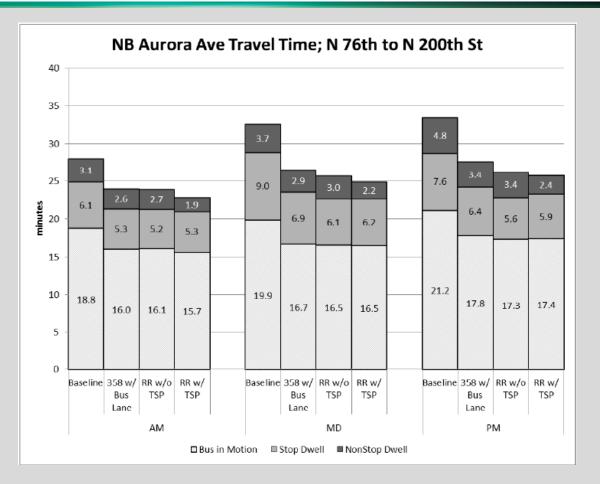
How Transit Performance is Reported

- Microscopic
 - Delay assessment
 - Before/After studies
- Macroscopic
 - Power BI





How Transit Performance is Reported



Rapid Ride E-Line before/after study



Strategies to Improve Speed & Reliability

PARTNERSHIP OPPORTUNITIES Long Range Transit Planning Local Jurisdiction Planning Long Range and **METRO CONNECTS Development** METRO CONNECTS Small Area and PLANNING Comprehensive **Program Coordination** Projects **Corridor Plans** Planning **Transit Master Plan Transit Capital and Service Planning** Capital (may be part of Improvement Plan Service Plan RapidRide and Capital Transportation Master Network Non-RapidRide Corridors Planning Plan) IMPLEMENTATION **Speed and Reliability Improvements Plans Review** Transportation Corridor Spot Capital Improvements Private development Improvements Hubs Improvements PERFORMANCE **Ongoing Performance** Balance benefits of speed and reliability Overcome barriers to implementation improvements with needs of other of a speed and reliability improvement transportation modes

Partnerships are key to implementing transit speed & reliability projects



Strategies to Improve Speed & Reliability

S&R "Toolkit"

- Reference document released March 2017
- Framework for partnerships
- Transit supportive project examples
 - Bus Lanes
 - Queue jumps
 - TSP
 - etc.
- Download a copy:
 - http://kingcounty.gov/~/media/depts/transportation/metro/about/planning/speed-reliability-toolbox.pdf



TRANSIT SPEED AND RELIABILITY GUIDELINES AND STRATEGIES



TSP as a Performance Management Tool

- Current TSP Strategy
 - Speed-focused
 - Try to give every bus TSP
 - Schedule reflects TSP
 - Traditional TSP timings:
 - Green Extension
 - Early Green

- New TSP Strategy
 - Reliability-focused
 - Late buses request higher level of TSP
 - Enhanced TSP timings:
 - Phase skipping
 - Cascading priority
 - Priority at near-side stops
 - When available: traditional TSP for ontime buses



TSP as a Performance Management Tool

- Considerations for TSP strategy/timings:
 - Intersection LOS or V/C ratio
 - Ridership; on the bus and downstream
 - Location of bus stops and other intersections
 - Pedestrian volumes and activity
 - Lateness threshold
 - Time of day







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