

# 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?





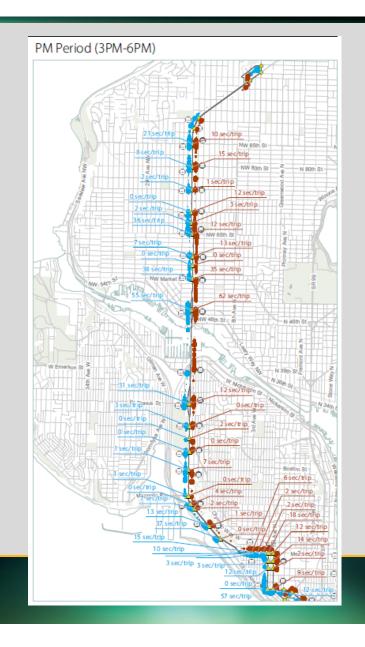
### Metro's Data Sources

- 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



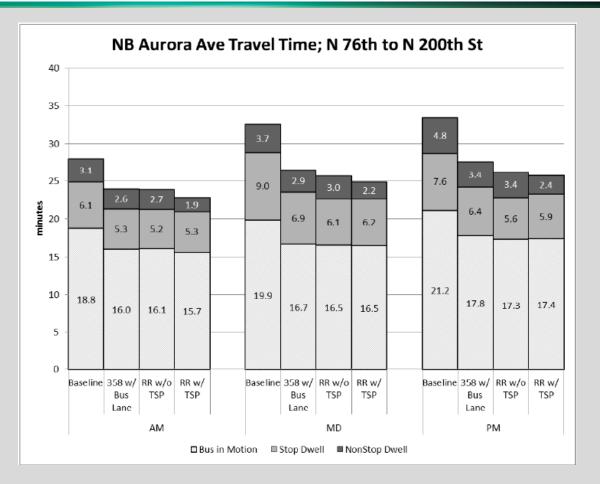
#### How Transit Performance is Reported

- 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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