

# The City of Seattle and Our First Adaptive Signal System - One Year Later

12/11/2018

Department of Transportation



City of Seattle

# Mercer St - Then

- 80,000 vehicles per day
- One-way couplet
- Four lanes in each direction
- Semi limited access
- Main connection to I-5



# Mercer St - Now

- 60,000 vehicles
- Two-way traffic
- Three lanes in each direction
- Adjacent protected bike lanes & mixed use path
- Fully signalized



# Choosing Mercer as our pilot

- Mercer Corridor is very congested
- It is a priority corridor for freight and freeway access
- Excessive queues “gridlock” during commute times impacting all users
- Bicycles are prioritized for parallel corridors
- Pedestrians and transit cross the corridor
- Alternatives are limited; adaptive provided an opportunity to improve the effectiveness now

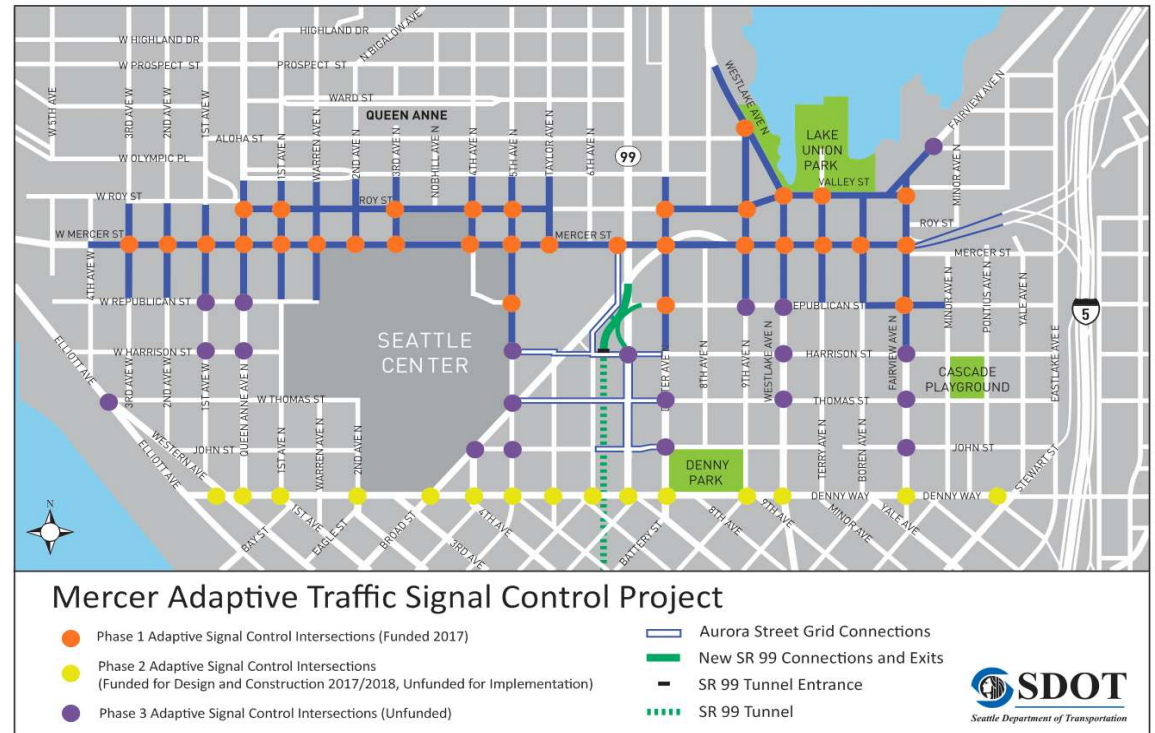


# How we Chose SCOOT

In 2015, initiated planning process including systems engineering evaluation.

Selected adaptive system in accordance with compatibility to existing signal management platform.

Developed a phased implementation plan that packages adaptive deployment into 3 separate phases.

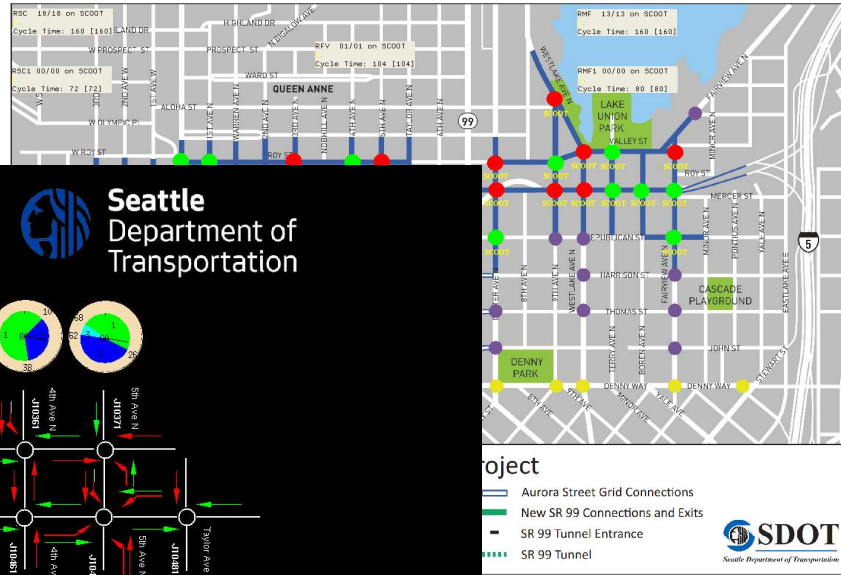
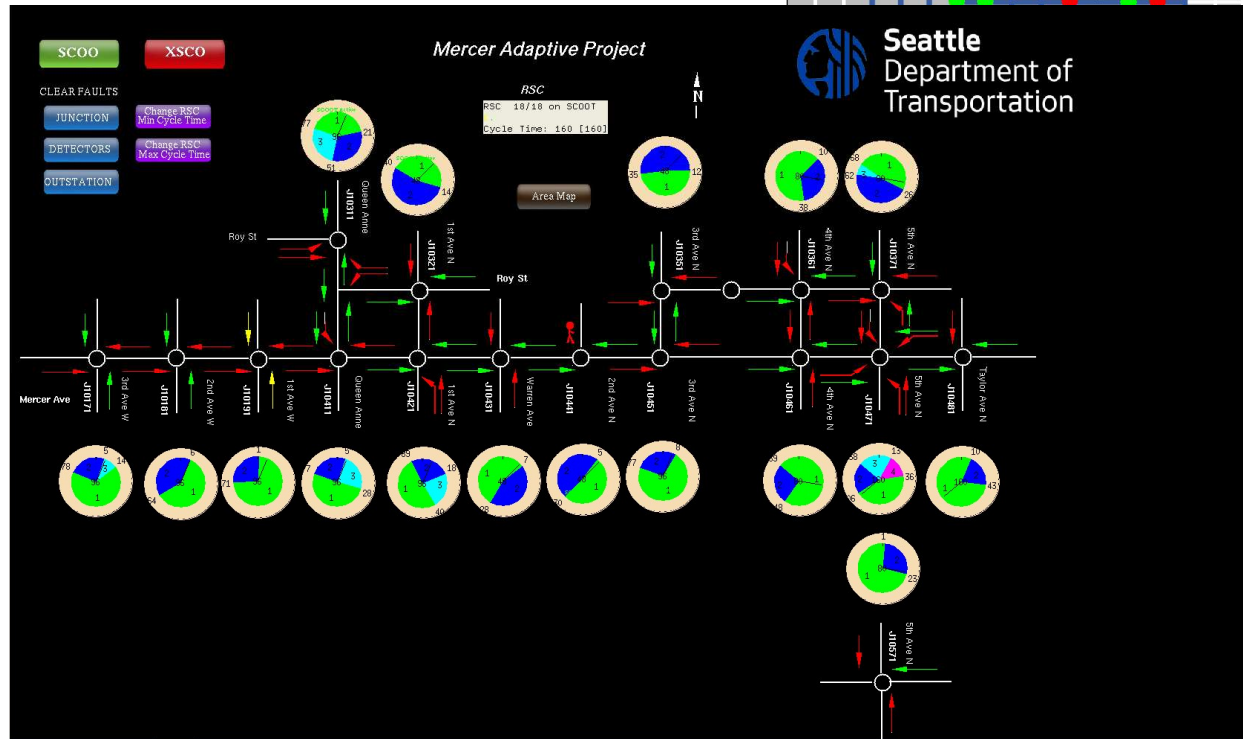


# Phase 1 Implementation Timeline

Activity	2015	2016												2017				
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
System Selection Process	█																	
Consultant/Vendor Selection Process					█	█												
Align Field Devices to Support System Requirements							█	█	█	█	█							
Traffic Simulation Modeling & Performance Measures							█	█	█	█	█	█	█	█	█	█	█	
Software Integration											█	█	█					
Beta Testing (System Verification)												█	█	█	█	█	█	
System Go Live																		█

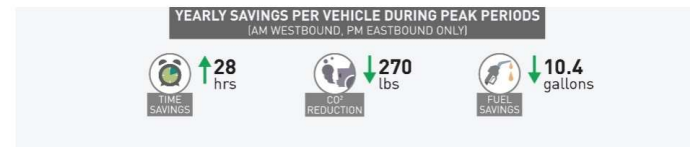
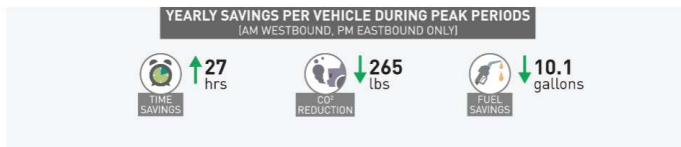


# Daily Operations



System Status	Information Index
Detector Status	Execute CAST Event
System Faults	STOP SCOOT
Clear System Faults	START SCOOT
System Log Output	
Timetable List CAST	
Junctions	
Nodes	
Link Map	
ASTRID	

# Early Operations a Travel Time Changes



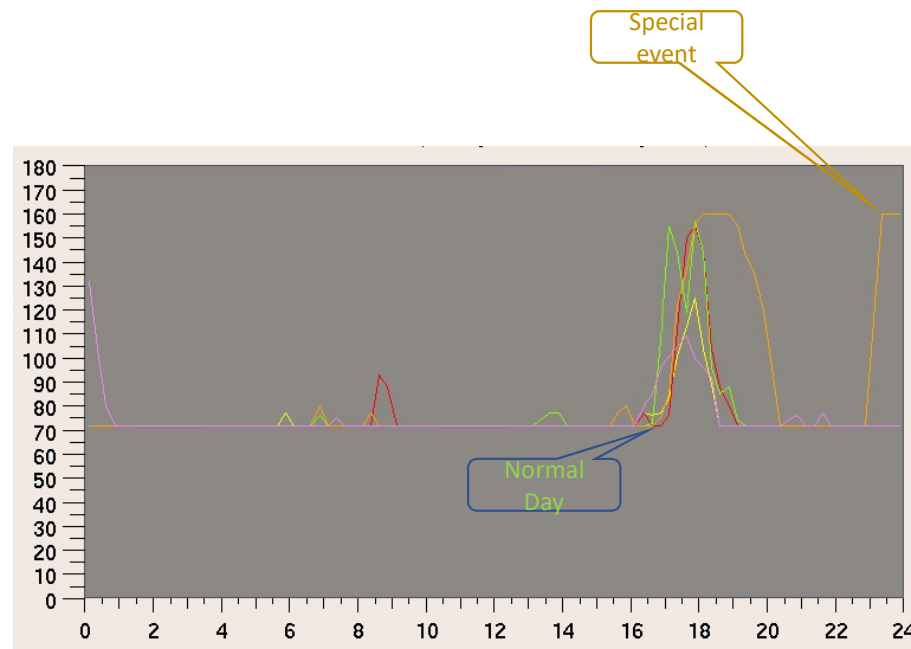


# Early Successes

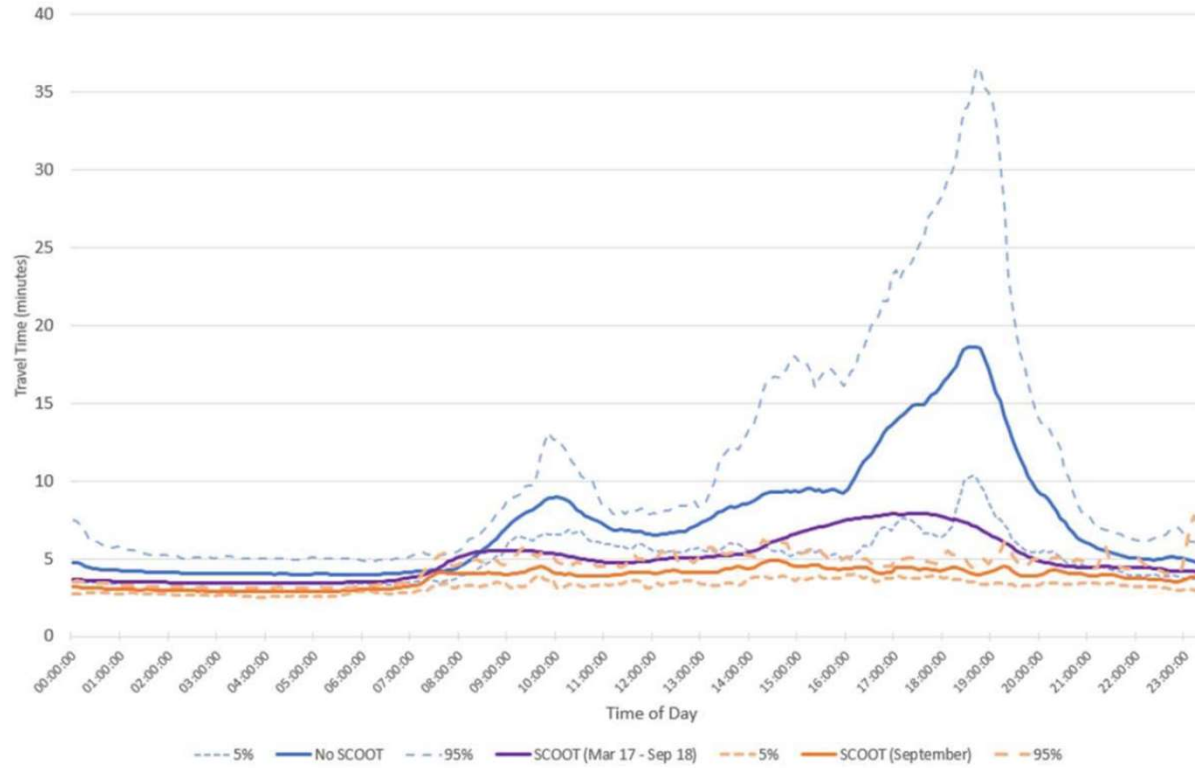
Event timing

Travel Time Reduction

Reliability Improvement



WEEKDAY Travel Time on Mercer St Eastbound from Queen Anne Ave N to Fairview Ave



# Early Limitations

Multimodal Mobility

Detection

User Interface

Troubleshooting

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List Status (LSTS)
Tu 15:13:11 23-MAY-17 Equipment status listing
J10351 Roy & 3rd N is on SCOOT plan 41
J10361 Roy & 4th N is on SCOOT plan 41
J10411 Mercer & Queen Anne is on SCOOT plan 41
J10451 Mercer & 3rd N is on SCOOT plan 41
J10461 Mercer & 4th N is on SCOOT plan 41
J10471 Mercer & 5th N is on SCOOT plan 41
J10311 Roy & Queen Anne is on SCOOT plan 41
J10321 Roy & 1st N is on SCOOT plan 41
J10171 Mercer & 3rd W is on SCOOT plan 41
J10181 Mercer & 2nd W is on SCOOT plan 41
J10371 Roy & 5th N is on SCOOT plan 41
J10491 Mercer & 6th N is on SCOOT plan 41
J10441 Mercer & 2nd N is on SCOOT plan 41
J10431 Mercer & Warren is on SCOOT plan 41
J10191 Mercer & 1st W is on SCOOT plan 41
J10421 Mercer & 1st N is on SCOOT plan 41
J10571 Republican & 5th N is on SCOOT plan 41
J10481 Mercer & Taylor is on SCOOT plan 41
J11311 Dexter & Roy is on SCOOT plan 41
J11411 Dexter & Mercer is on SCOOT plan 41
J11431 9th & Mercer is on SCOOT plan 41
J11331 9th & Broad/Roy is on SCOOT plan 41
J11131 9th & Westlake is on SCOOT plan 41
J11341 Westlake & Broad is on SCOOT plan 41
J11441 Westlake Mercer is on SCOOT plan 41
J11451 Terry & Mercer is on SCOOT plan 41
J11351 Terry & Valley is on SCOOT plan 41
J11461 Boren & Mercer is on SCOOT plan 41
J11471 Fairview & Mercer is on SCOOT plan 41
J11511 Dexter and Republican is on SCOOT plan 41
J11571 Fairview & Republican is on SCOOT plan 41
J11371 Fairview & Valley is on SCOOT plan 41
Tu 15:13:11 23-MAY-17 End of status listing
Close Copy Redisplay

```

```

List UTC/SCOOT parameter values (VALU DSTS N**)
Tu 15:20:13 START OF REPORT
Tu 15:20:13 STATUS FOR DETECTOR N10361G1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10361C1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10361E1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10361A1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10351C1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10351A1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10351E1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10351G1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10171A1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10171C1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10171E1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10171G1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10181A1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10181C2 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10181C1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10181E1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10181G1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10191A1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10191C2 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10191C1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10191E1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10191G2 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10191G1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10371A1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10371C1 : OK
Tu 15:20:13 STATUS FOR DETECTOR N10371G1 : OK
Close Copy Redisplay Filter Help

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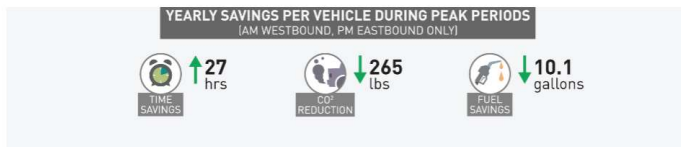


# Multimodal Improvements for Adaptive

- Pedestrian recall added along Mercer – “Walk” phase on crossing side streets
- Reduced cycle lengths west of 5<sup>th</sup> Ave N – pedestrians shorter waits to cross
- Increased the “Walk” time – Improves safe crossing
- Bicycle Signal Passive detection and clearance interval extension
- Transit Signal Queue Jump Lanes
- Reduced Maximum Cycle Length



# Current Operations a Travel Time Changes



# Further and Ongoing Assessment

- Monitor person delay and revise signals to maximize mobility
- Identify and improve detection for all modes (Currently testing 2 technologies for bike and peds)
- Continued Integration of network in a around existing system
  - new intersection to be added with North Portal project and Arena project
  - Denny ITS project to implement Adaptive Signals



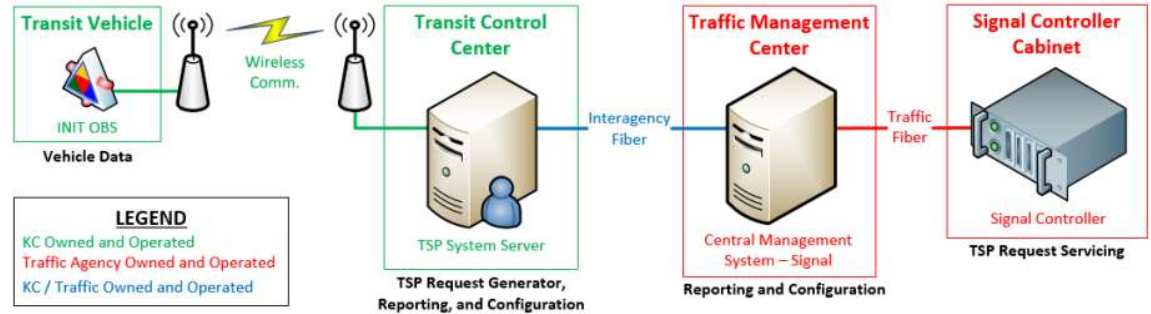
# Future Interest

Passive Detection

Next Gen Transit Signal Priority

Data Collection

Expansion



**Thanks!**



**Question ?**



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