

Regional ITS/Signals Inventory



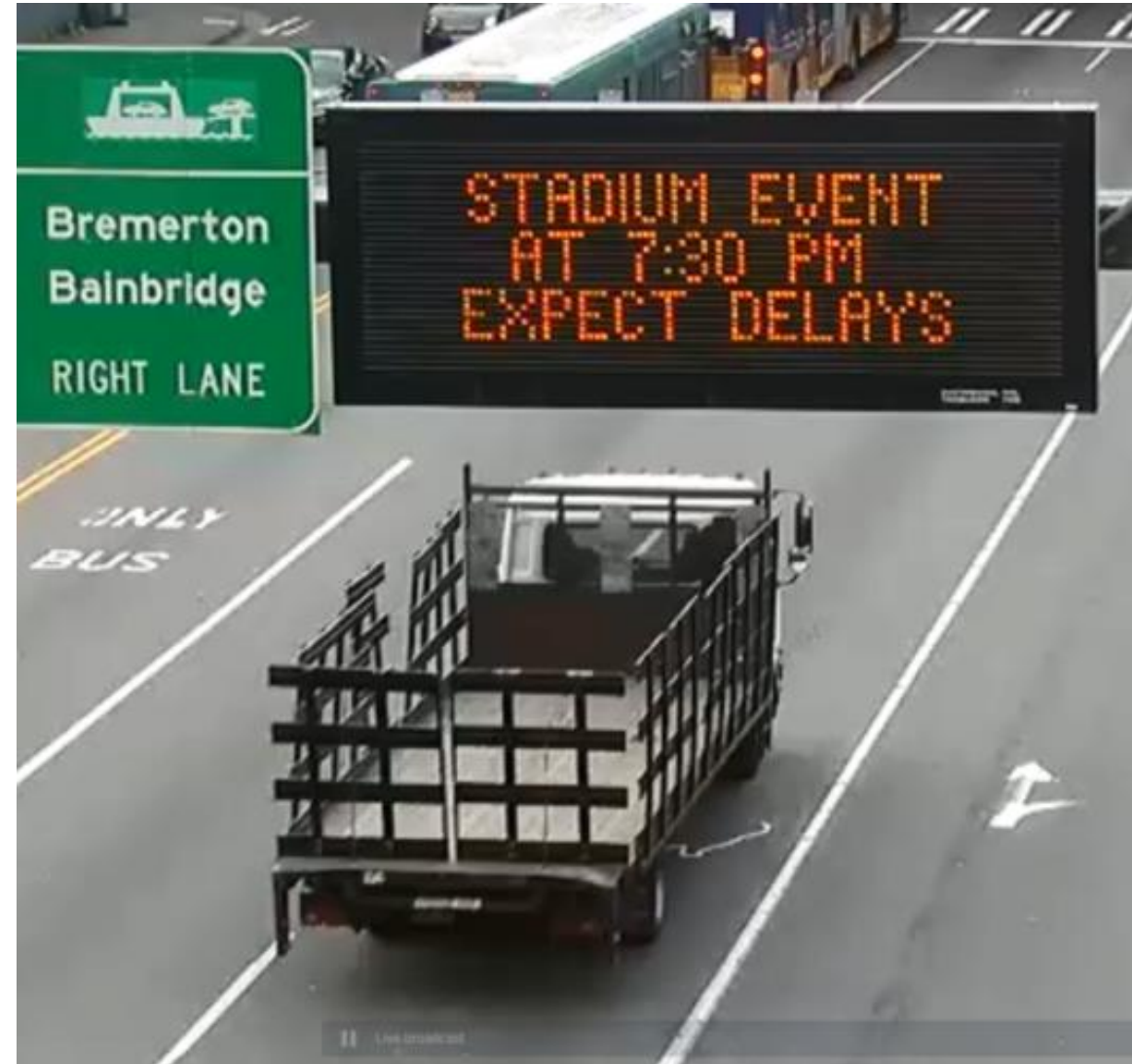
**Kitsap Regional Coordinating Council -
Transportation Policy Committee
May 28, 2020**



What is ITS?



- Stands for Intelligent Transportation Systems
- ITS includes communication and other technologies that improve traffic flow and enhance the safety, efficiency, and reliability of the transportation system
- Examples include signal coordination, transit signal priority, ramp metering, emergency vehicle preemption, etc.



Overview of ITS Planning at PSRC



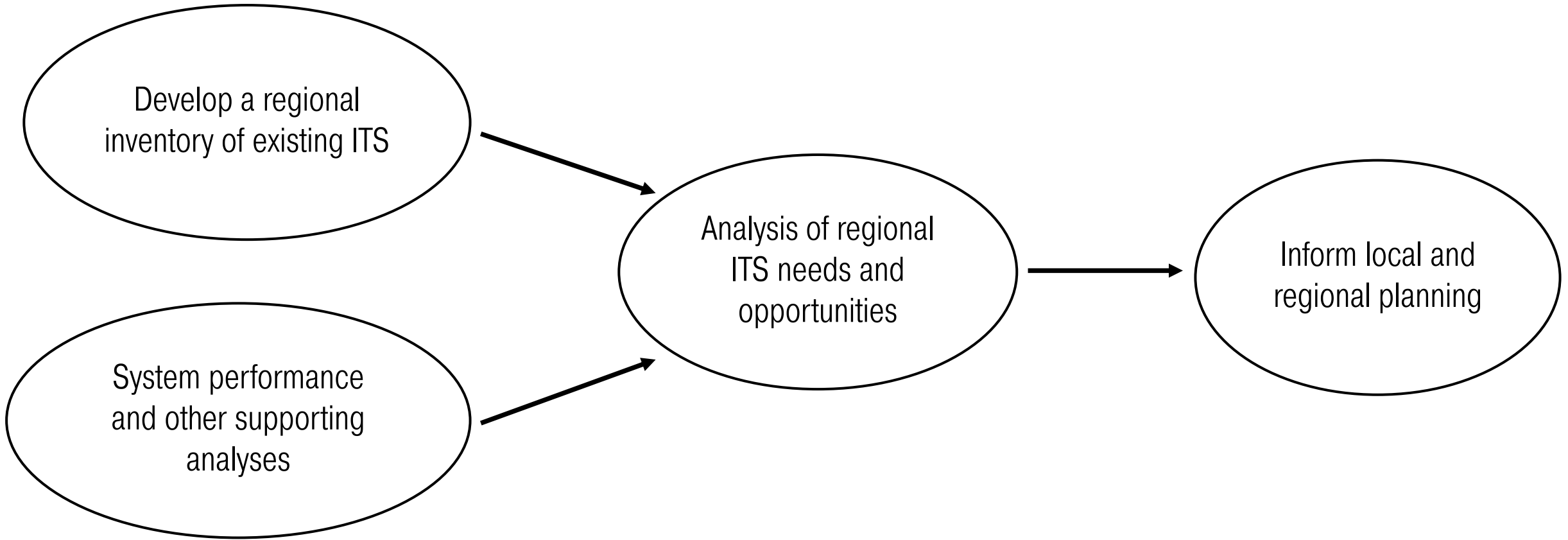
- Engaging with stakeholders on ITS topics and planning efforts through our Regional Traffic Operations Committee (RTOC)
- Maintaining the Regional ITS Architecture, which highlights existing and planned ITS systems in the region
- Incorporating ITS and emerging transportation technologies into regional planning

Regional ITS/Signals Inventory



- Identified as a key effort via stakeholder feedback and a peer review of ITS activities in other MPOs
- Why is an ITS inventory important?
 - Understanding where ITS assets are is critical to understanding where need exists
 - Will provide a consistent regional dataset that will inform local and regional planning
 - Will help regional partners facilitate coordination and cross-jurisdictional collaboration on ITS efforts

Informing Future Planning Efforts



Approach



- Conducted an online survey with stakeholder feedback to facilitate data collection on:

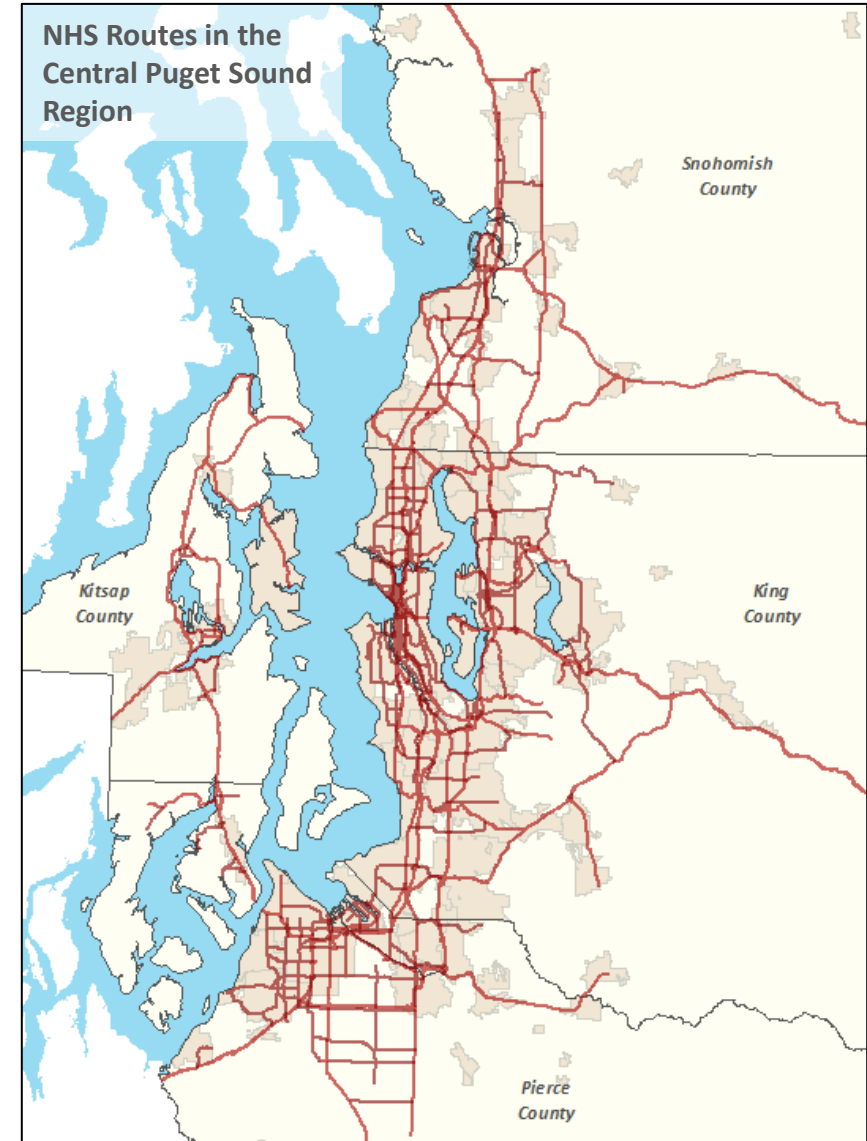
Traffic Signals*	Additional ITS Assets
<ul style="list-style-type: none">• Where are they?• Data required for various ITS features such as Transit Signal Priority and signal coordination• Optional data includes technical aspects such as hardware and communication systems	<ul style="list-style-type: none">• Where are they?• Includes Traffic Management Centers, data collection tools, and Active Traffic Management

**Only collected data for traffic signals along the National Highway System*

National Highway System



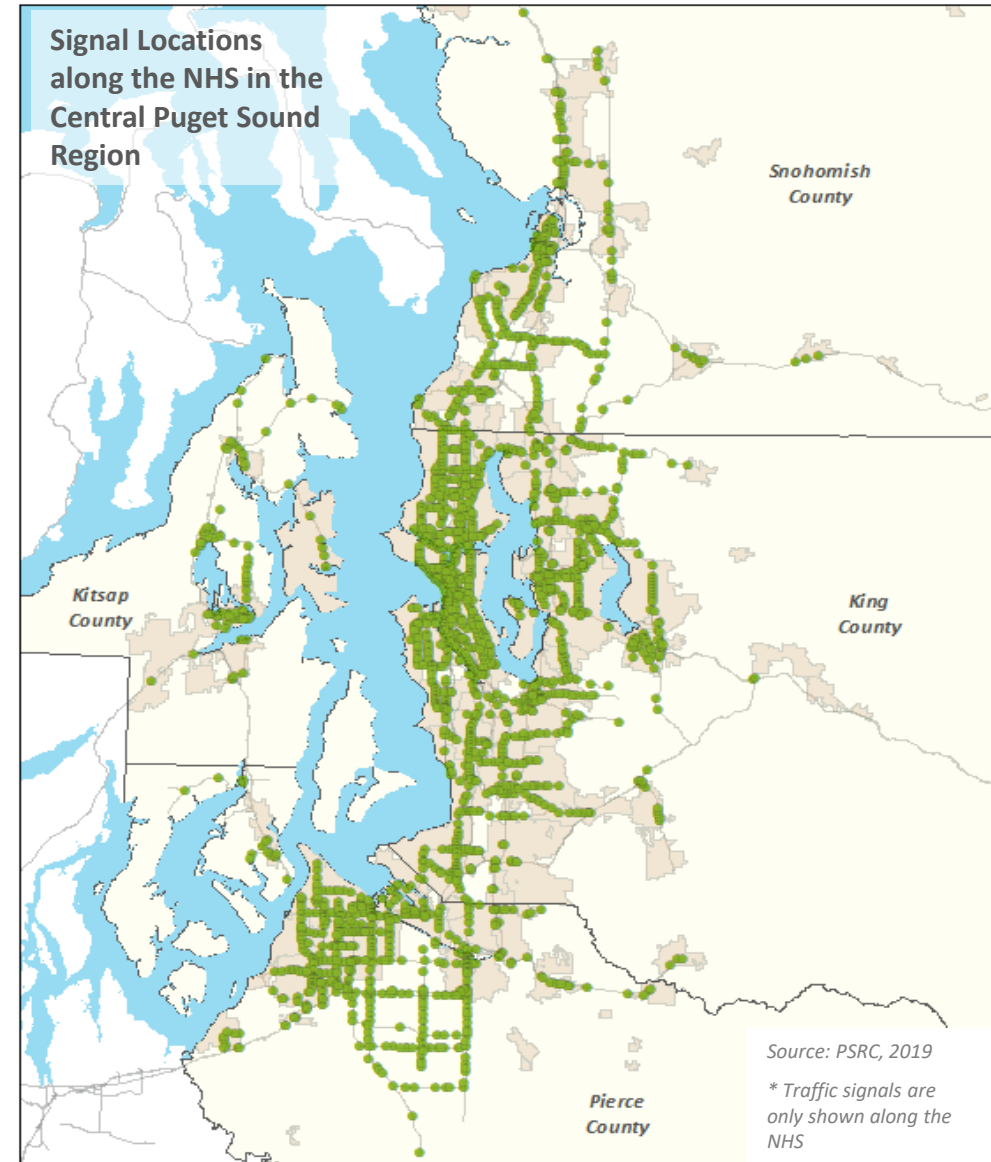
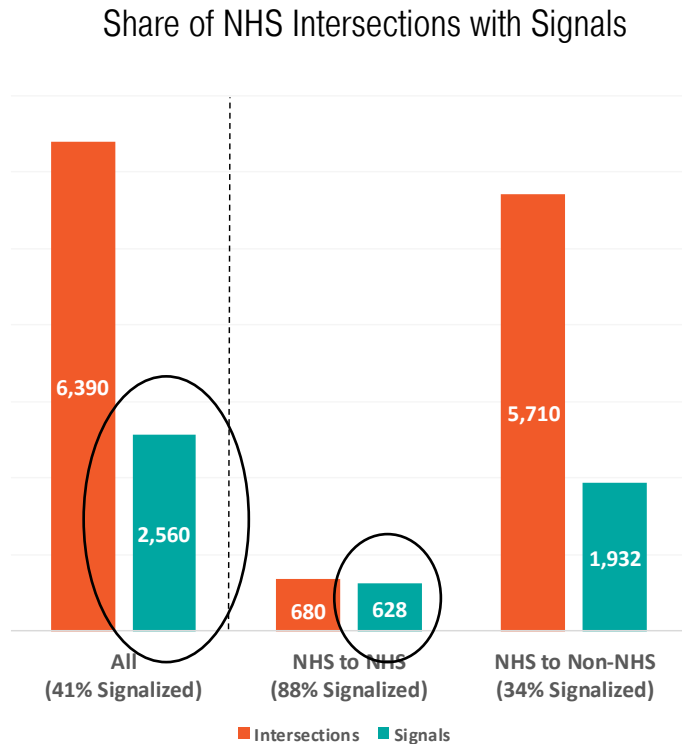
- The National Highway System (NHS) includes all roads classified as Principal Arterials or above and some additional roads that connect to intermodal terminals
- In the central Puget Sound region there are ~6,390 intersections along the NHS
 - ~680 intersecting with other NHS routes
 - ~5,710 intersecting with non-NHS arterials, collectors and local roads



Survey Results Summary



- 100% response rate
- ~41% of NHS intersections are signalized (~2,600 signals)
- Almost 90% of NHS-to-NHS intersections have traffic signals



ITS Features



Today's discussion includes:

- Signal Coordination
- Adaptive Signal Control (ASC)
- Accessible Pedestrian Signal (APS)
- Transit Signal Priority (TSP)

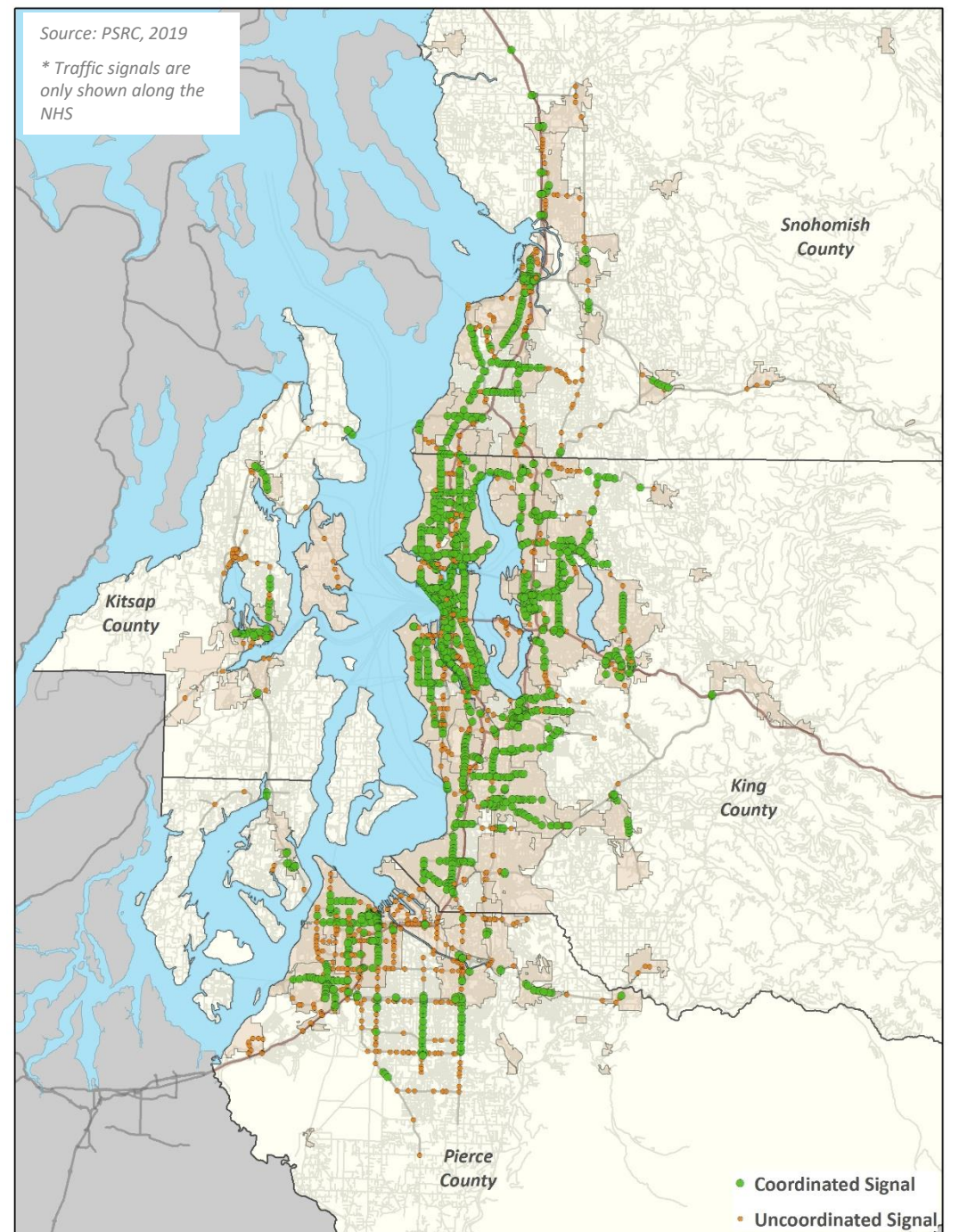
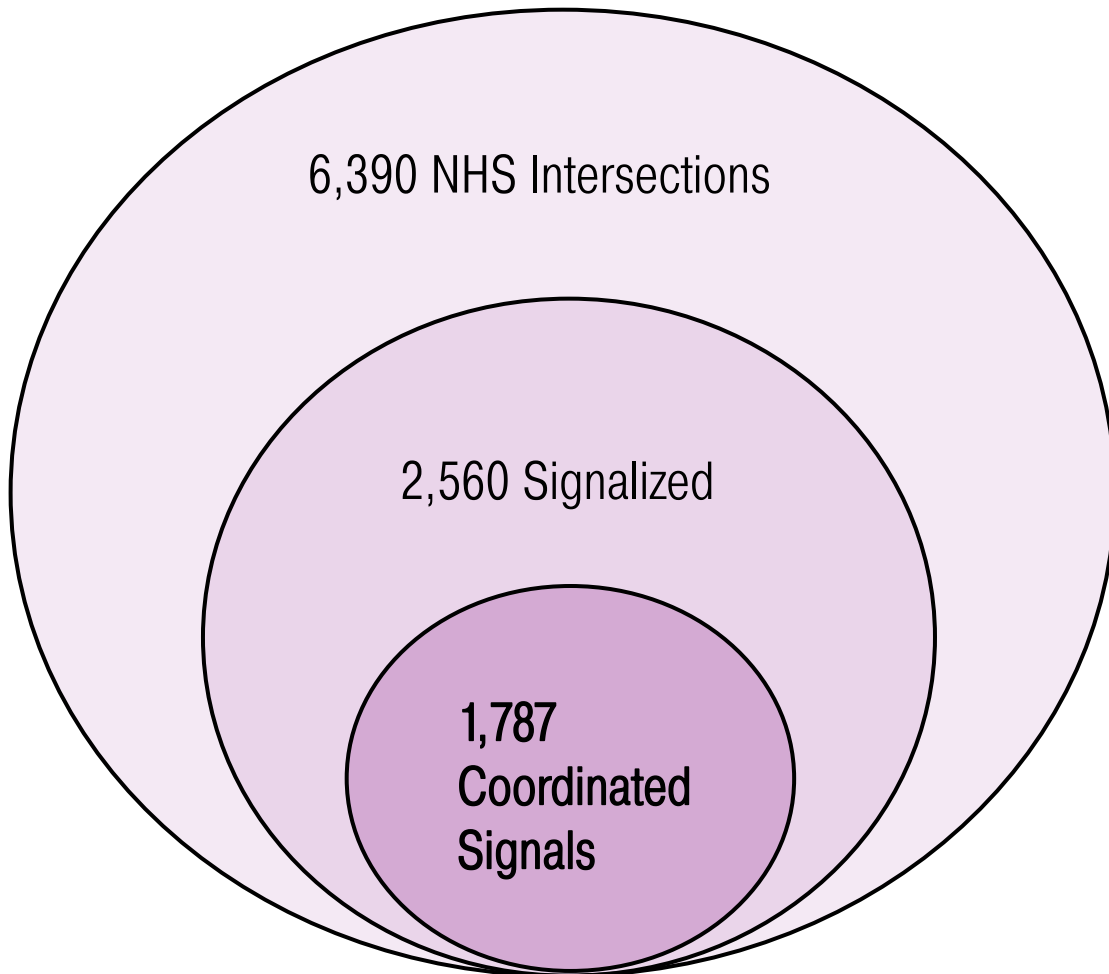


What is Signal Coordination?



- Refers to when two or more signals along a corridor are synchronized and working together
- Improves travel time and mobility along a corridor by minimizing the number of times vehicles must stop
- Considered effective when signals are within $\sim\frac{3}{4}$ a mile of each other and there are relatively high traffic volumes along the corridor
 - Signals are typically only coordinated during peak periods

70% of signals along the NHS
in the region are coordinated



Application of Signal Coordination – SW Snohomish County/Everett

- 58% of signals on the NHS in Snohomish County are coordinated
- Downtown Everett and most of the high-volume urbanized corridors in SW Snohomish County are coordinated
 - Corridors further out on the periphery and/or with wider signal spacing are less likely to be coordinated

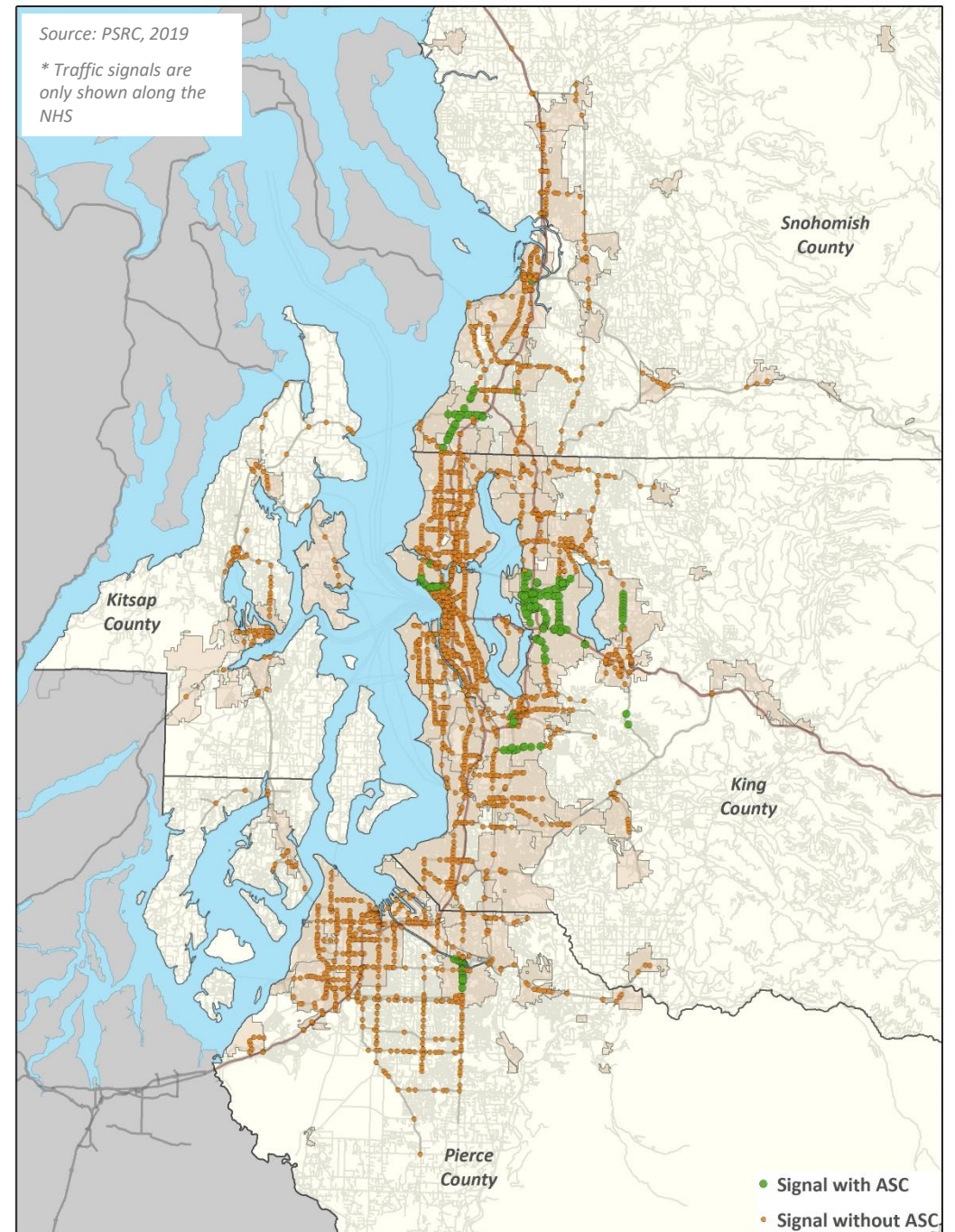
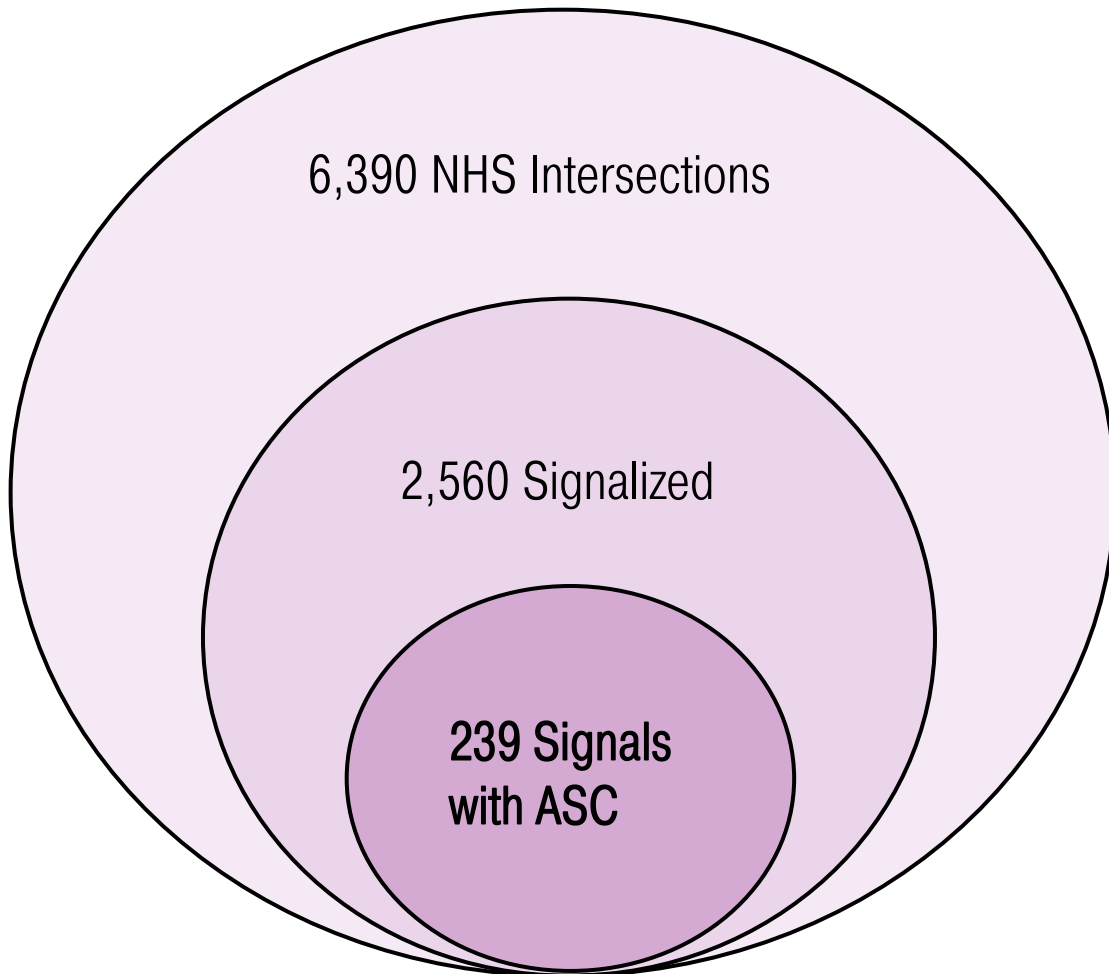


What is Adaptive Signal Control (ASC)?



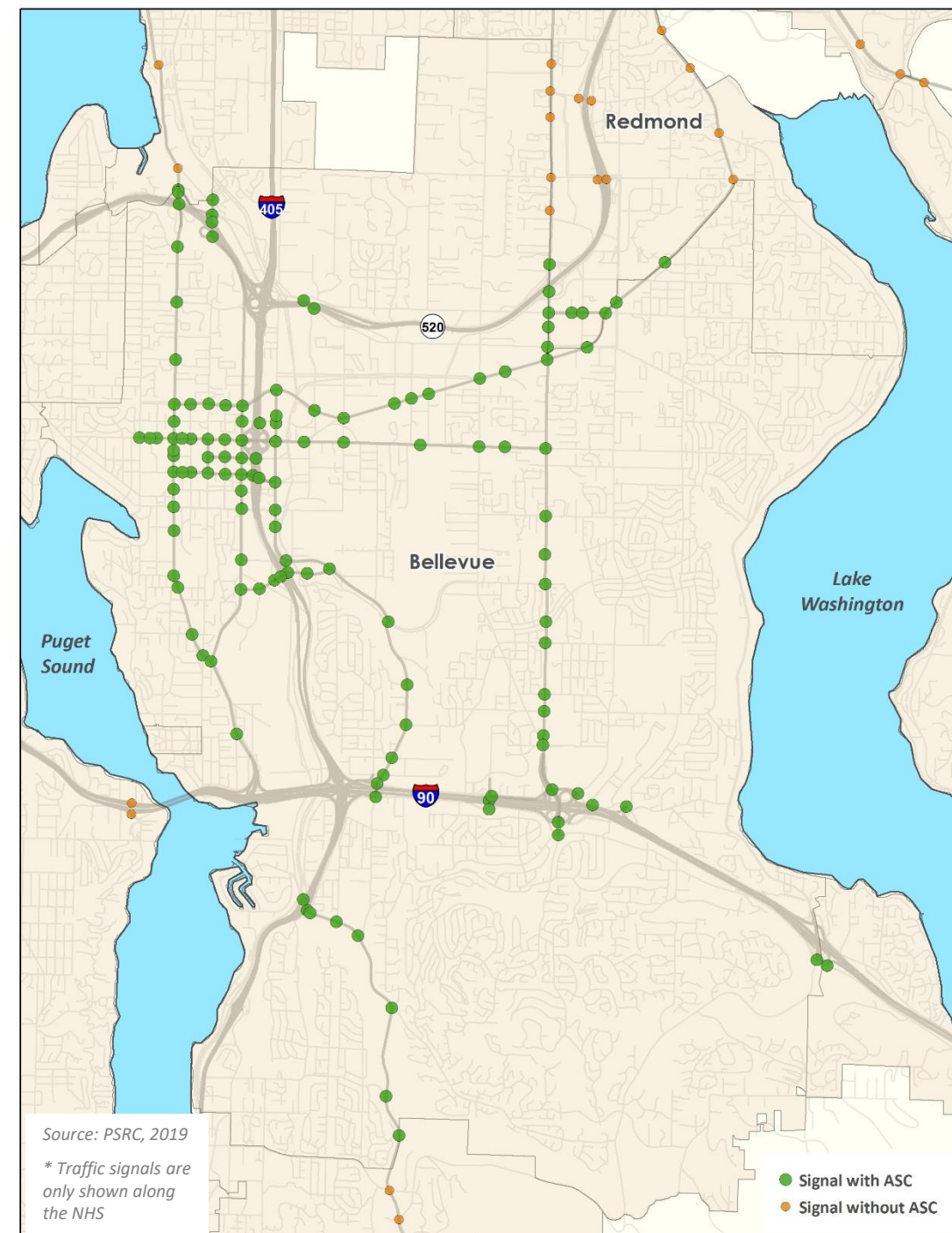
- Refers to signals that automatically and continuously adjust their signal timing to match traffic conditions on the ground
- Improves mobility and travel time by moving traffic through more quickly and efficiently, as well as adapting to unforeseen events or conditions in real time
- Most effective along heavily congested corridors and areas where traffic conditions can be inconsistent or unpredictable

9% of signals along the NHS in the region have Adaptive Signal Control



Application of Adaptive Signal Control– Bellevue

- 100% of Bellevue’s traffic signals have Adaptive Signal Control
- Allows them to respond much more effectively to unpredicted incidents and special events
 - No need to spend resources on pre-timing signals

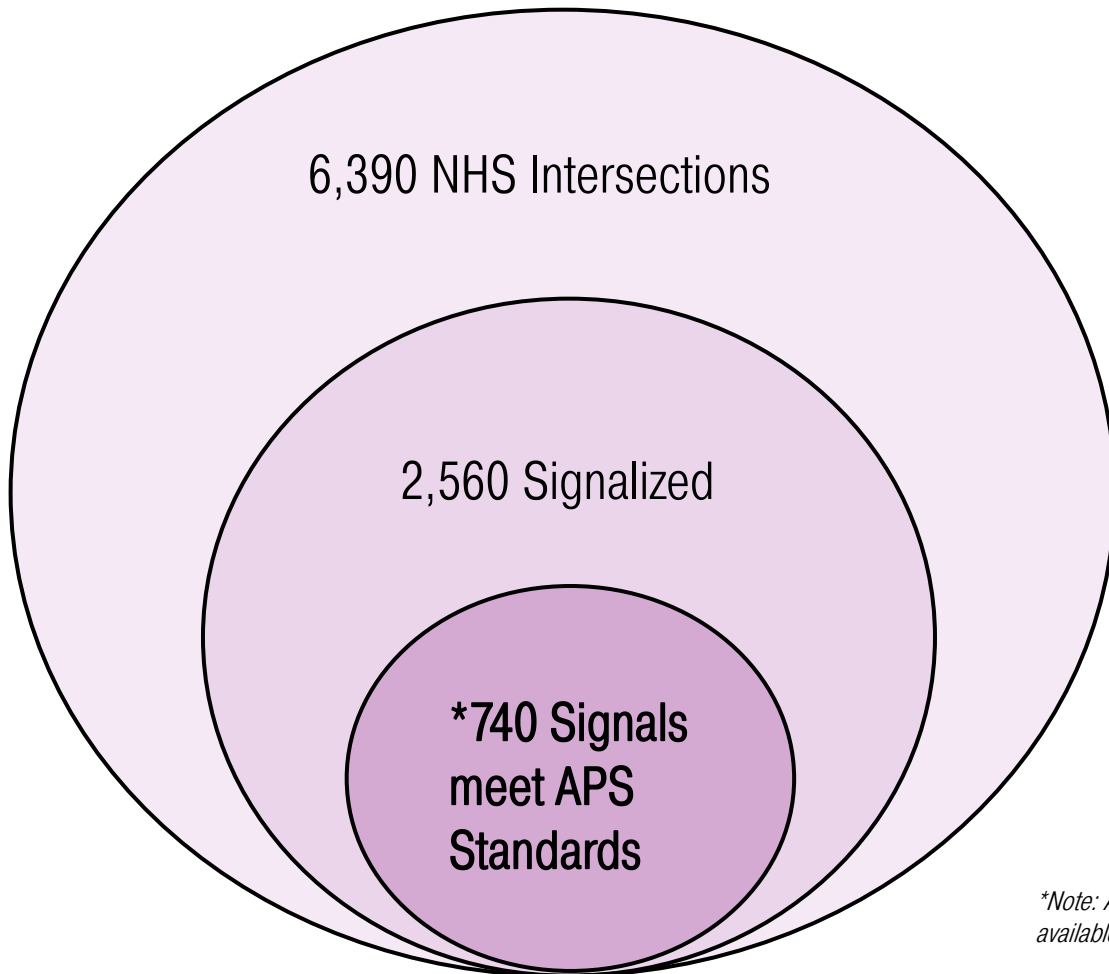


What are Accessible Pedestrian Signals (APS)?

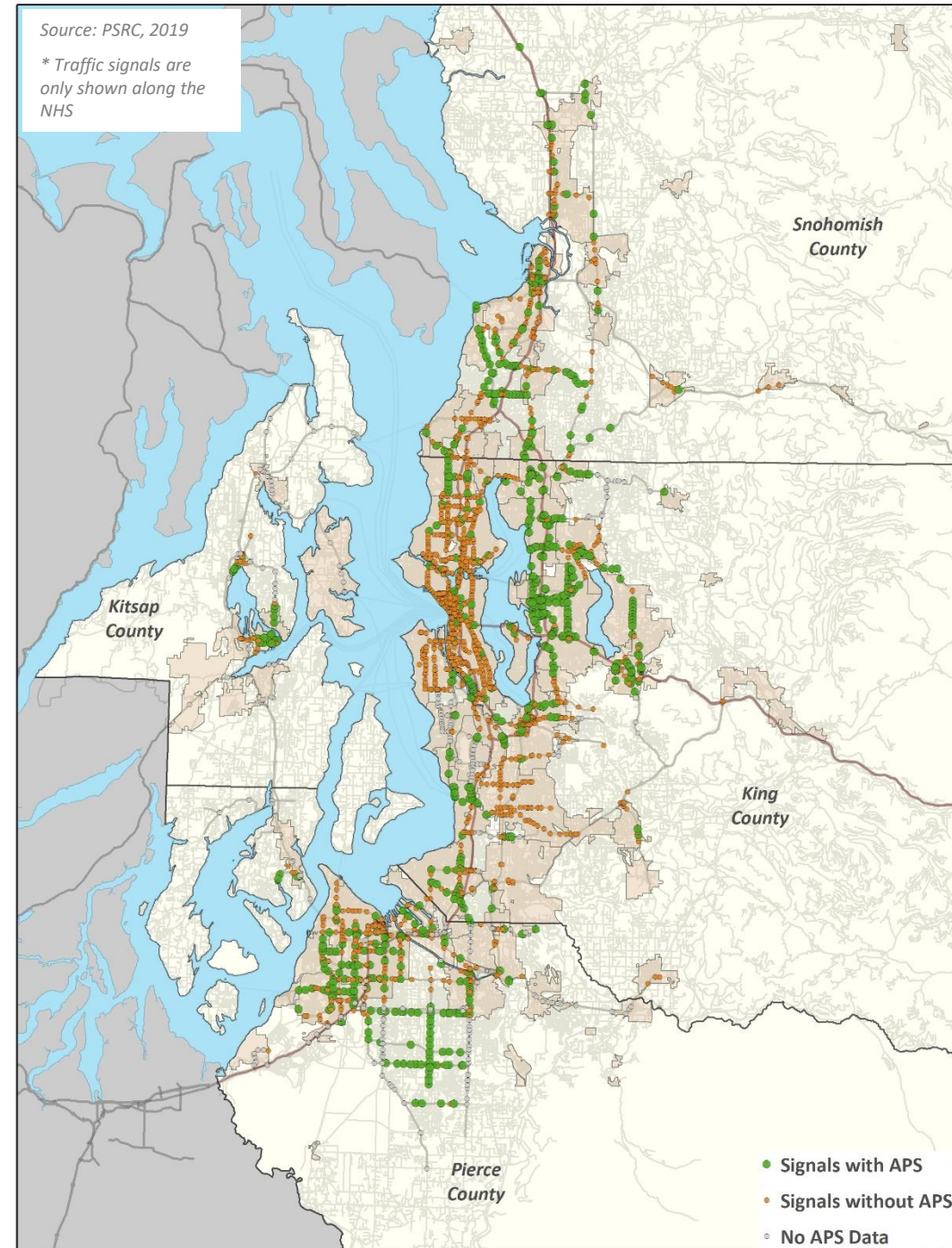


- Accessible Pedestrian Signals communicate WALK/DON'T WALK information in non-visual formats (i.e. audible tones and vibrating push-buttons)
- They make it easier and safer for pedestrians with visual impairments to cross the street and walk through an area
- Beneficial at any signalized intersection, especially those that have relatively higher volumes of pedestrian traffic

32% of signals along the NHS in the region meet Accessible Pedestrian Signal standards

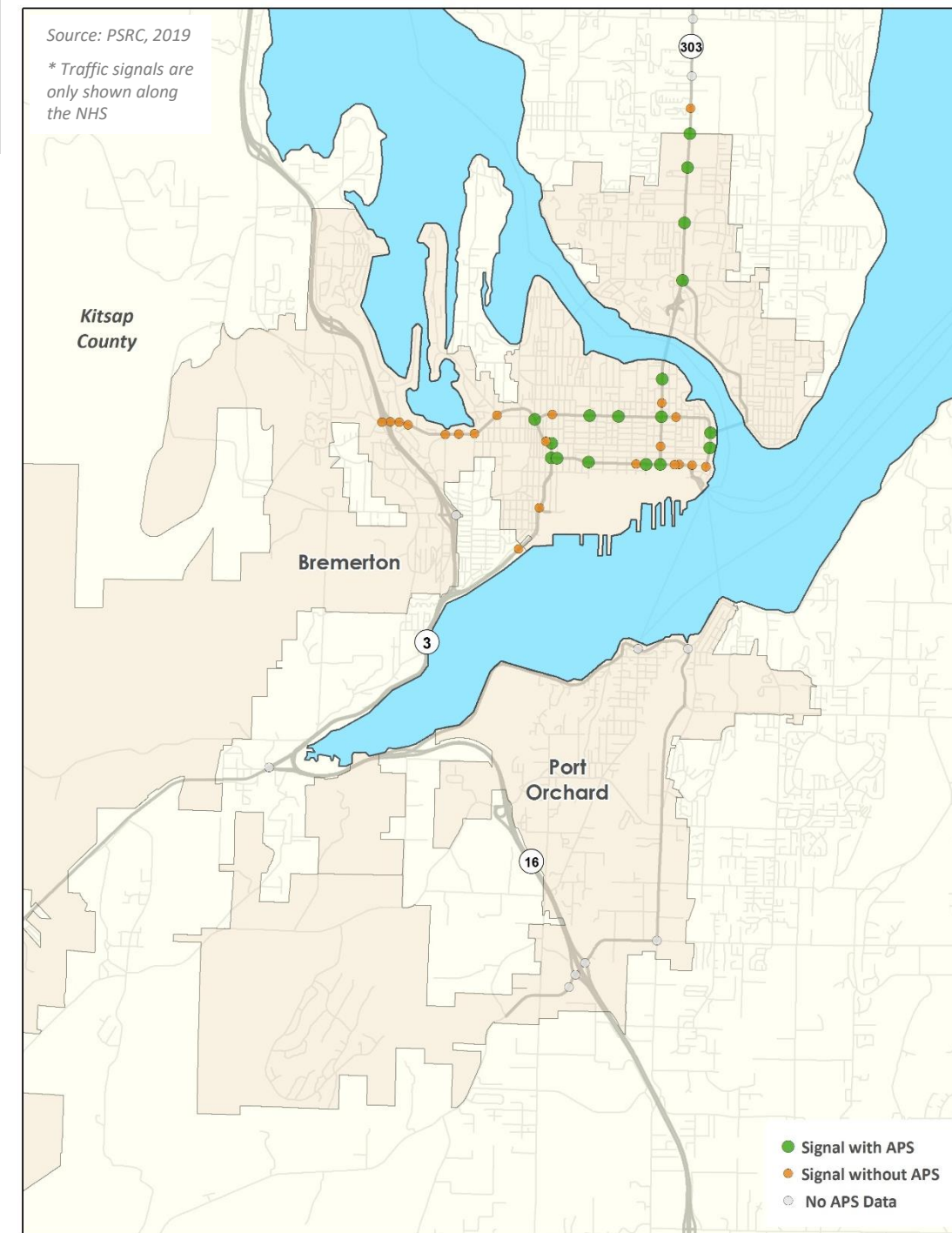


**Note: APS data is not available for ~250 signals*



Application of Accessible Pedestrian Signals - Bremerton

- 47% of Bremerton's traffic signals along the NHS meet APS standards
- All of Bremerton's new signals meet APS standards and they upgrade existing signals when possible
- Bremerton has an ADA Committee that provides feedback on where APS is most needed, where volume levels are not high enough, etc.

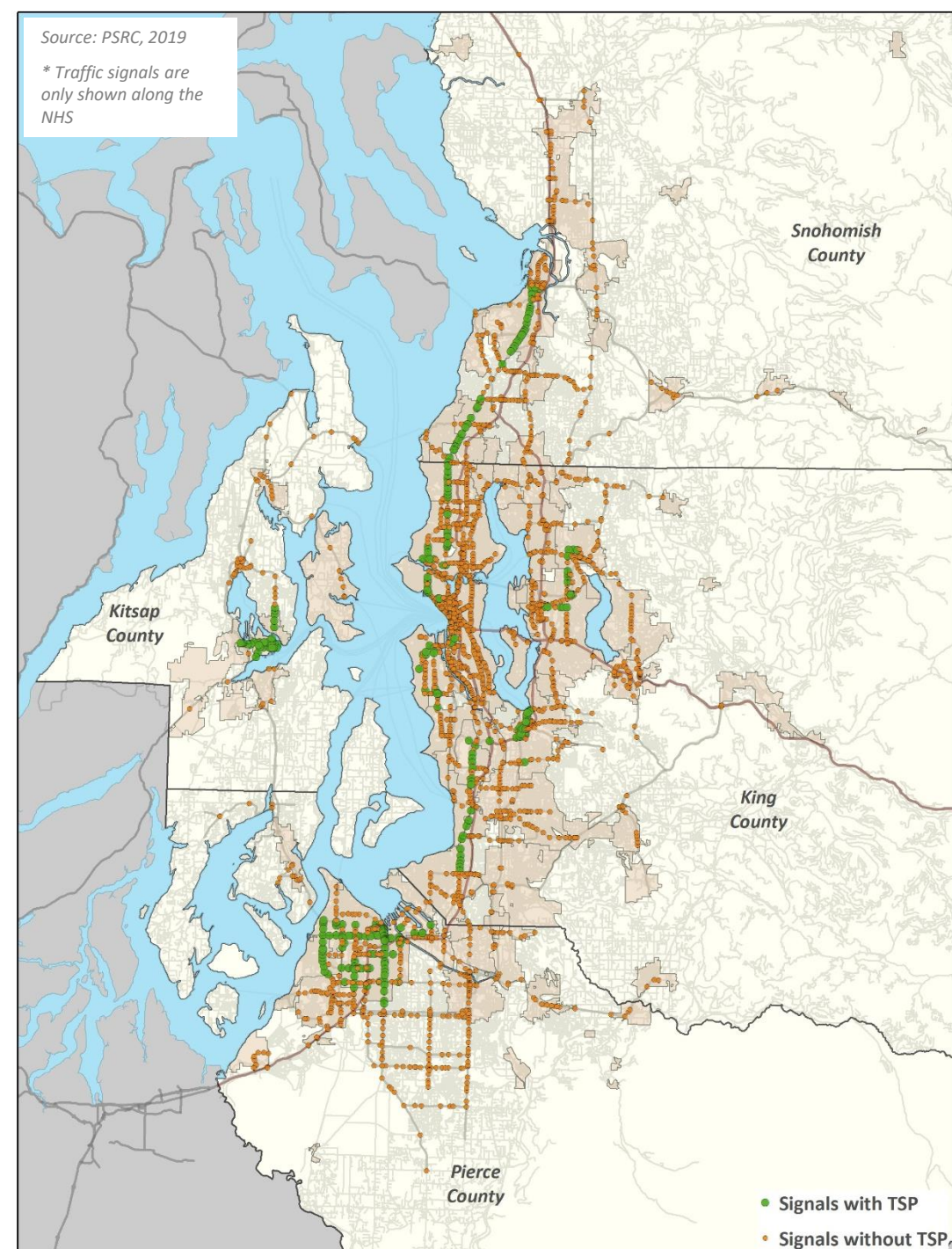
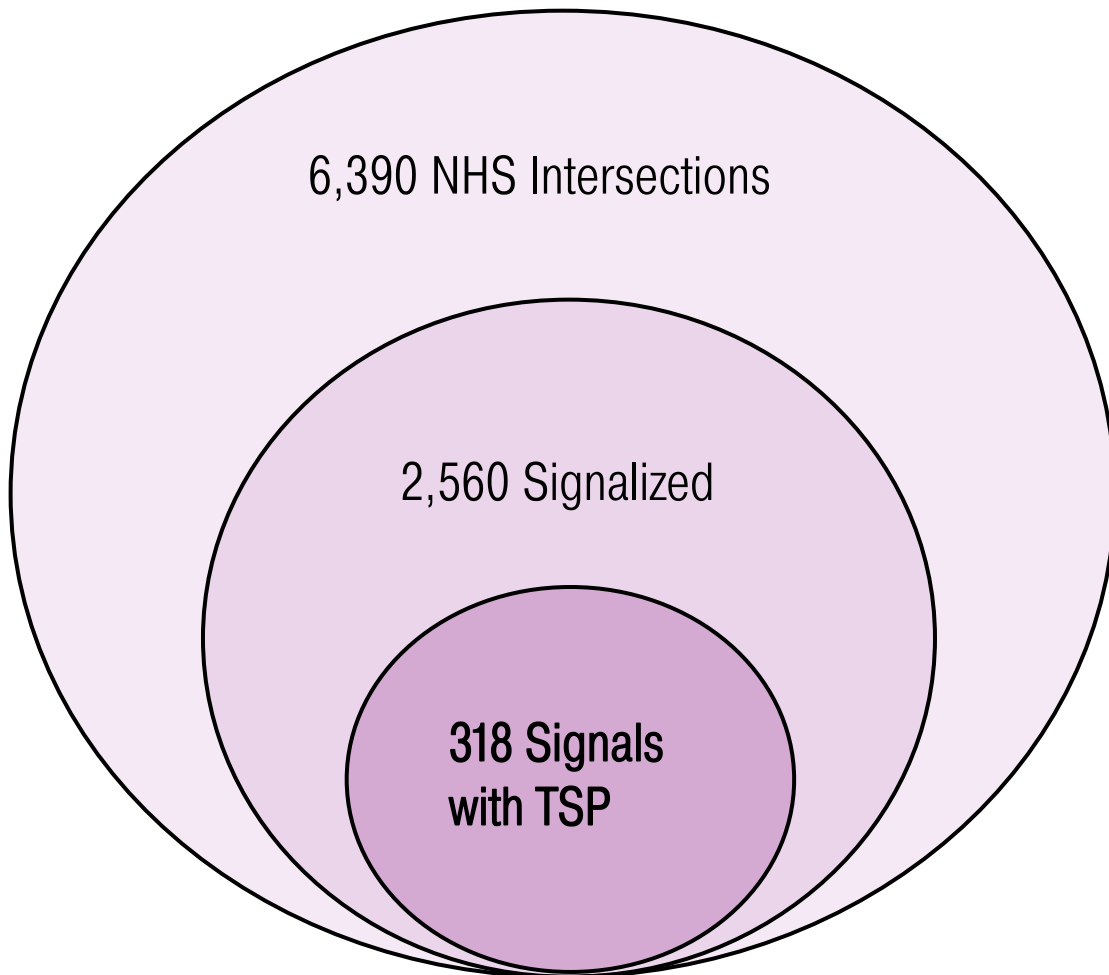




What is Transit Signal Priority?

- Refers to technology that reduces delay for transit vehicles at intersections by modifying the signal timing
- Improves transit travel time, reliability, and efficiency
- Most effective along congested corridors where transit routes are frequently delayed

12% of signals along the NHS in the region have Transit Signal Priority





Application of Transit Signal Priority – Tacoma

Tacoma Transit Signal Priority

- 48% of signals on the NHS in Tacoma have Transit Signal Priority
- Pierce Transit is currently upgrading the technology for some TSP signals, which will allow for better data analysis and more efficient maintenance and operations



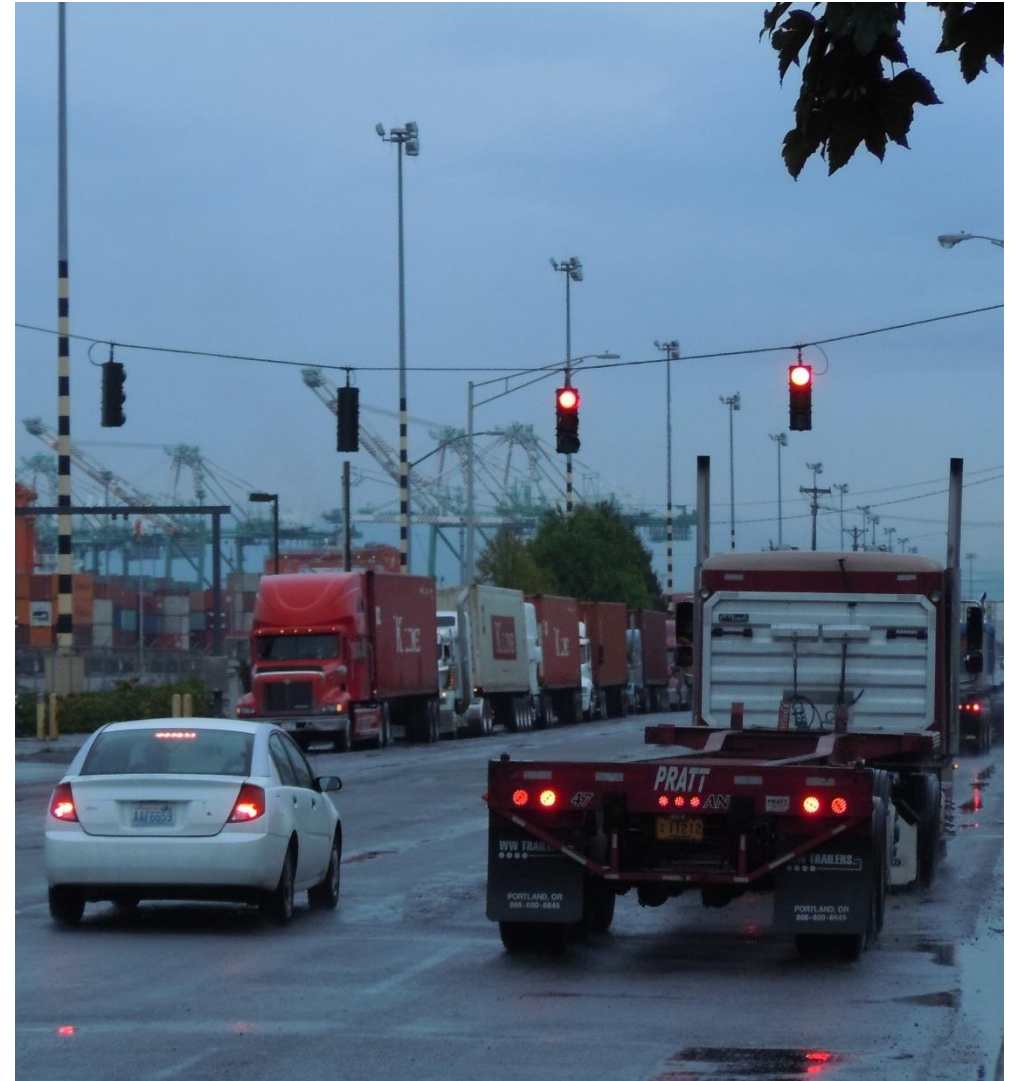
Source: PSRC, 2019; Tacoma, 2019

* Traffic signals are only shown along the NHS

Integration With Other Datasets



- The ITS inventory is intended to be integrated with other data as part of a broader needs and gaps assessment
 - Potential datasets include travel time, congestion, transit routes, traffic volumes, etc.



Integration With Other Datasets



- Example on the right shows Pierce Transit's bus network in Tacoma overlaid with Transit Signal Priority signals

Tacoma Transit Signal Priority and Bus Transit Routes



Source: PSRC, 2019; Tacoma, 2019; Pierce Transit, 2017

* Traffic signals are only shown along the NHS

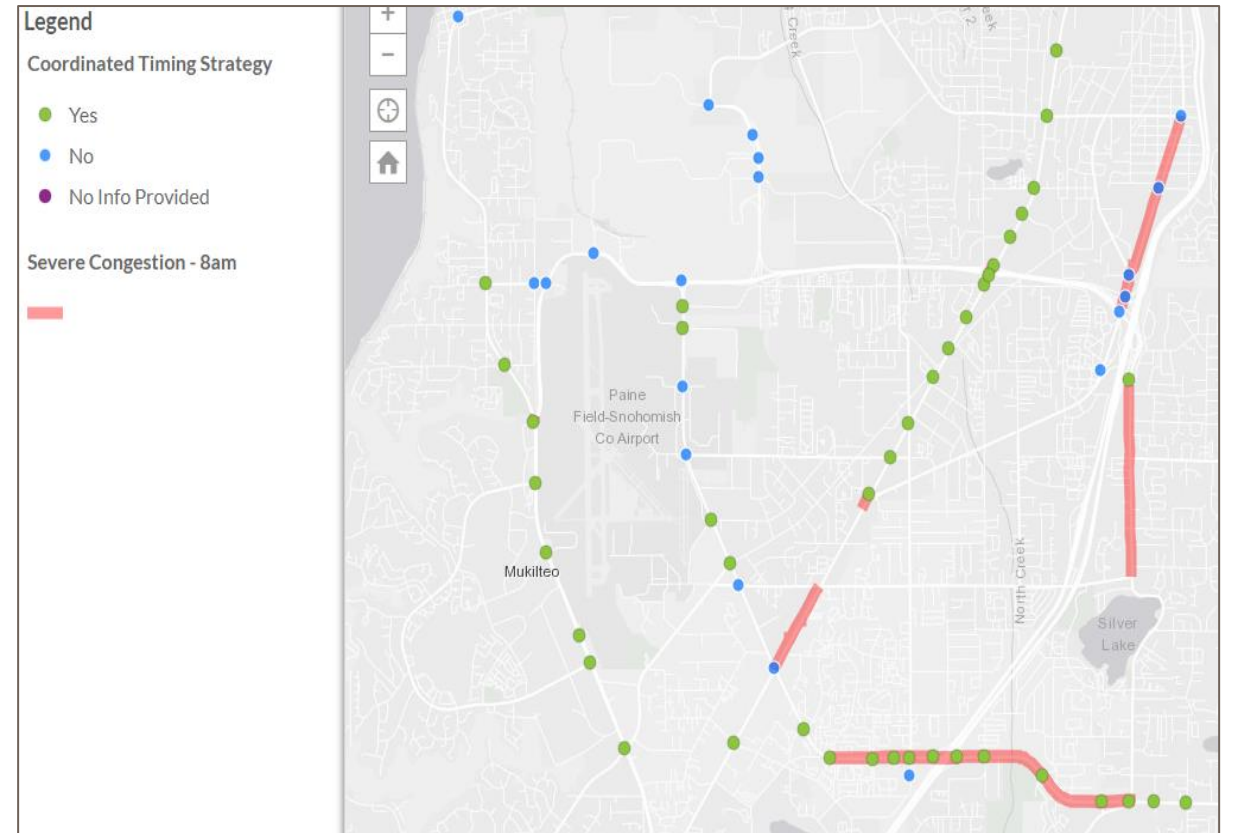
** Frequent routes come every 10-15 minutes throughout the day. Local routes do not come as frequently.

Next Steps



- Continue exploring ArcGIS online and other programs to develop an interactive tool to visualize ITS data and integrate with other datasets
- Use findings to inform local and regional planning efforts

ArcGIS Online Screen Grab





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