

Appendix E:

Creating smarter roadways—High tech traffic tools improve safety and commute times

As a driver or rider on any Puget Sound highway, you know that traffic backups—whether caused by collisions, the weather or everyday congestion—are a real concern. Hours of freeway backups stretch commuting hours, delay freight and transit and make driving frustrating. So how can these existing roadways work as efficiently as possible? The Washington State Department of Transportation is working to make roadways smarter through “active traffic management.”

Active traffic management—smarter roads, informed drivers

Active traffic management uses high-tech traffic tools and technology to improve commutes, making them safer and less congested. These tools provide accurate, real-time information about what is on the road ahead so that drivers can make better commuting decisions.

On 520 and surrounding highways, active traffic management can enhance tolling and improve traffic flow. If given approval to implement tolling on the 520 corridor, WSDOT will expand its current use of active traffic management, or smart highways tools, to add several new traffic technology techniques to keep people and goods moving on 520, I-90 and I-5. This new traffic technology allows for low-cost projects to have high benefits for drivers.

WSDOT leads the way

WSDOT is a nationwide expert on building smarter roadways through technology to keep drivers informed and to move more traffic, safely and efficiently. This agency is considered a leader in intelligent transportation systems—including ramp meters, high occupancy vehicle (HOV) lanes, traffic cameras and detectors, and signal synchronization program.

Operating efficiently—Moving Washington

WSDOT wants to get the most out of existing highways. Using smarter roadway technology to improve traffic flow and reduce delay is a key element of WSDOT’s three-point plan for decreasing congestion. This ongoing strategy includes adding new road space where it makes the most sense, offering travelers and commuters more choices to reduce traffic demand, and making the state’s existing highways as efficient as possible. Active traffic management is a strong investment, giving taxpayers the most bang for their buck in decreased collisions and improved traffic flow.

Today’s traffic technology

Puget Sound drivers are benefiting from tried and true traffic technology. Current active traffic management tools include:

- ***Real-time driver information:*** Driver information on the go with message signs, traffic cameras, traffic centers and online traffic maps making drivers in the Puget Sound the most informed drivers in the nation. With more than 475 traffic cameras, 169 electronic driver information signs, and seven traffic management hubs, drivers have come to rely on this on-the-go information making it an expected part of every daily newscast. Drivers use this information to determine their commute times and change or postpone their trips based on this real-time traffic information.
- ***Ramp meters:*** Stop-and-go traffic signals that automatically control the frequency of vehicles entering the flow of traffic on the freeway. WSDOT's 135 ramp meters help keep traffic moving on some of the state's busiest routes. Ramp meters work like a turnstile at busy sporting event – sorting and slowing down vehicles so they merge at intervals making getting onto the freeway easier and helping keep the cars already on the freeway moving.
- ***Incident response team clear roads, help drivers:*** Washington has one of the world's best incident response programs with 55 trucks responding to more than 52,000 incidents last year. Average clearing time dropped from 33 minutes in 2001 to 16 minutes in 2007.
- ***Optimizing signal timing:*** Drivers save thousands of hours in traffic delays every year with a statewide signal timing optimization and synchronization program where traffic engineers monitor and adjust 884 traffic signals.
- ***Using HOV lanes more efficiently:*** WSDOT has been following a strategic plan to build 300 miles of functioning high occupancy vehicle (HOV) lanes. With 200 already complete, HOV lanes move more than one-third of the people in about one-fifth of the vehicles during peak traffic periods on our heaviest freeways.

HOV lanes in the peak period allows our roadways to move more people in fewer vehicles, however on some routes there are slow HOV lanes and on others extra capacity is not being used. WSDOT is currently in the first year of a four-year pilot project on SR 167 between Auburn and Renton – this pilot project is investigating how to make HOV lanes more efficient throughout the day by allowing solo drivers a choice to use the carpool lanes for a fee. When there is additional HOV space, the variable toll lanes turn on to allow solo drivers to buy their way in, managing more traffic. WSDOT continues to look further into the future to see how variable tolls could be used on other highways like 520 and I-405.

Smarter roadways tomorrow

Because of statewide success in traffic technology and worldwide and nationwide success of new traffic tools, WSDOT is beginning to expand its resume to make Puget Sound commutes safer and help keep people and goods moving.

Build off current traffic technology

Use the successes we have to build smarter roadways for the future—continue advancing our current toolkit by adding more ramp meters, HOV lanes, HOT lanes and traffic cameras.

Install overhead variable speed limit, lane closure and warning signs

Overhead signs alert drivers to slow down or move lanes because of collisions and backups upstream. Warning signs on the roadside would alert motorists of backups and signal them to carefully watch for lines of traffic upstream. The signs would improve traffic flow, decrease collisions and reduce the hours of daily delay associated with congestion-related collisions and would clear the way to for better emergency access to collision sites. Similar projects in other countries have decreased congestion-related collisions by 1/3—if we can eliminate one out of every three I-5 collisions, everyone benefits.

Using shoulders during peak traffic hours

Also called “hard shoulder running,” this tool allows drivers to use the shoulders as a travel lane during congested periods and allows drivers to move around a collision or stall. This additional lane could be used for transit only, increasing capacity when it is needed most and decrease congestion and congestion-related collisions. Hard shoulder running would only be implemented where it is safe to do so.

On-the-go driver information signs

WSDOT currently provides several of these electronic travel time signs and plans on installations at more locations soon. These signs make it possible for drivers to have real-time travel information that updates with changing traffic conditions. Similar signs currently operate on I-5 or I-405 – some of you may even have made decisions to take one route or stay where you are based on the travel time information you saw displayed on the signs. Giving drivers real-time information that updates with changing traffic conditions allows for better commute choices – perhaps a quicker trip while they are already on the road.



Junction control and variable lane signalization

Signs to alert drivers to stay in or move to specific lanes based on traffic flow and where drivers are headed. The electronic signs could also be partnered with electronic pavement markings that would change for conditions. These signs and pavement markings would reduce collisions and improve traffic flow.



Build in emergency pull off areas

Gives drivers somewhere to pull off for vehicle breakdowns or collisions. Allowing room to pull over keeps traffic moving in the other lanes and increases safety substantially.

24/7 operation—100% commitment

To operate these tools, it will require commitment to staff, maintain, upgrade and merge together these active traffic management tools and their components.

520 & I-90 high-tech traffic opportunities

All electronic tolling is also an active traffic management technique. No toll booths mean drivers do not have to slow down to pay tolls, keeping traffic moving.

WSDOT is investigating and evaluating how new and existing active traffic management techniques could be applied to SR 520. Several tools, including variable speed limits, lane control signs, traveler information and other smart roadway tools could benefit drivers with improved traffic flow and safety and better travel information.

This technology could be used to lower collision rates and congestion on surrounding routes like I-90, I-5 and I-405.