

NCHRP 20-7: Operations Performance Measures

University of Maryland, Center for Advanced Transportation Technology

Synopsis of Pilot Testing Scenario

Organization: Washington State Department of Transportation (WSDOT)

Description of the transportation network managed by WSDOT:

The Washington State Department of Transportation (WSDOT) is responsible for maintaining 20,003 lane miles of highway and 3,559 bridges and tunnels. WSDOT also operates the Washington State Ferries, with a fleet of 28 vessels carrying more than 26 million passengers annually. In addition, WSDOT is a partner with Amtrak in providing the Amtrak Cascades passenger rail service, connecting western Washington cities in the Vancouver, British Columbia/Portland, Oregon corridor. With local transit agencies, the agency helps provide bus, vanpool, and other transit services. WSDOT also runs 89 freight railroad cars that carry grain in eastern Washington and operates 16 emergency airfields. WSDOT's Intelligent Transportation Systems inventory includes 117 ramp meters, approximately 5000 traffic data collectors, 8 Traffic Management Centers (TMCs), 478 Closed Circuit Television Cameras (CCTVs), 172 Variable Message Signs (VMSs), 44 Highway Advisory Radios, and 79 Road/Weather Information Systems.

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Performance measures WSDOT already obtains and uses in its annual performance reporting:

- | | |
|--|---|
| <input type="checkbox"/> Recurring Delay | <input type="checkbox"/> Non-Recurring Delay |
| <input checked="" type="checkbox"/> Extent of Congestion - Spatial | <input checked="" type="checkbox"/> Extent of Congestion – Temporal |
| <input checked="" type="checkbox"/> Travel Time – Facility - <u>Corridor</u> | <input type="checkbox"/> Travel Time – Trip |
| <input checked="" type="checkbox"/> Travel Time – Reliability | <input checked="" type="checkbox"/> Speed |
| <input checked="" type="checkbox"/> Incident Duration | <input type="checkbox"/> Customer Satisfaction |
| <input checked="" type="checkbox"/> Throughput - Vehicle | <input checked="" type="checkbox"/> Throughput – Person |

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WSDOT's Synopsis of Pilot Testing Scenario

Brief description of the pilot test: locations, types of facilities, data requirements, data collection techniques, and anticipated dates of data collection (or dates of archived data) as appropriate.

This data collection effort is part of WSDOT's annual Congestion Report published as part of the department's quarterly performance reporting publication *Measures, Markers and Mileposts*, also referred to as the *Gray Notebook*. To access this report online, see <http://www.wsdot.wa.gov/NR/rdonlyres/3E501E2B-6E0A-4FD9-8801-2400A9194A45/0/WSDOTCongestionReport.pdf>

WSDOT tracks mobility performance data for 35 important commutes in the Central Puget Sound region and two commutes in Spokane. WSDOT reports on Average Travel Time, 95% Reliable Travel Time, traffic volume, the duration of peak period congestion, and the percent of weekdays when average travel speeds fall below 35 mph. These routes are tracked for changes in traffic conditions on a yearly basis. Additionally, incident data are provided for 9 key highway segments. This incident data are compiled in the WSDOT Incident Response Tracking System and the Washington State Patrol's Computer Aided Dispatch System.

WSDOT primarily relies on loop detectors embedded in pavement to collect traffic data. WSDOT has amassed a large archive of speed and volume data. This data is continuous in time, 24 hours per day 365 days per year, broad in geographic coverage, available for individual lanes or sets of lanes, and available in increments of time as short as five minutes. In the Puget Sound region, operational data are collected from more than 4,000 induction loops embedded in the pavement of the highway system. These loops are arrayed to gather data for each lane at roughly 360 highway locations. Loops provide two measurements: vehicle count and the length of time each vehicle occupies the loop. This data is then used to estimate traffic volumes and speeds. Speed estimation using single loops is accurate to 5 or 10 mph (8 to 16.1 kph) in free-flow steady speed conditions. Also, WSDOT has installed "speed stations" (double loops) at about 100 locations in the freeway system in the Puget Sound region. These stations provide accuracy to within 1 or 2 mph (1.6 to 3.2 kph) at ordinary driving speeds. The Washington State Transportation Center (TRAC) at the University of Washington has developed detailed quality control procedures that WSDOT uses to detect loop failures, exclude bad data, and support the level of accuracy that is needed for traffic management and for reporting traffic conditions.