Traffic Data Customers: Performance Measurement

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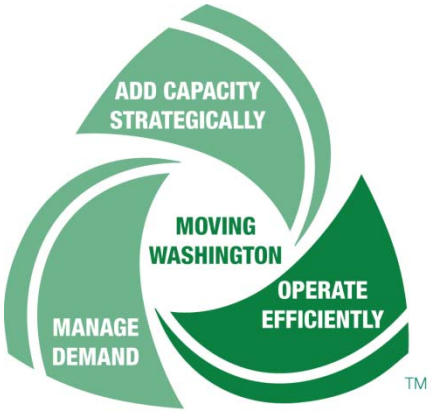
Performance monitoring and measurement: One of the many key traffic data customers

- Measuring system performance keeps the agency informed of existing system needs and emerging challenges
- Performance measurement communicates the state of the agency's infrastructure to public and legislature for further actions to operate, improve, preserve, and maintain our aging system
- Data should be treated as an asset and given due consideration in regards to funding of data collection, quality control, analysis, and storage/archive
- Data is becoming more important than ever in making informed decisions as the agency is facing budget reductions and deploys new technologies in traffic management (ATM, Open road tolling, HOT lanes, etc.,)
- Exploring new technology options in data collection and analysis, including partnering with the private sector

Moving Washington – Our plan to reduce congestion and improve mobility requires high quality data and analysis



Operating Roadways Efficiently

Moving Washington improves the system's performance and generates revenue through variable pricing and other traffic management tools

Managing Demand

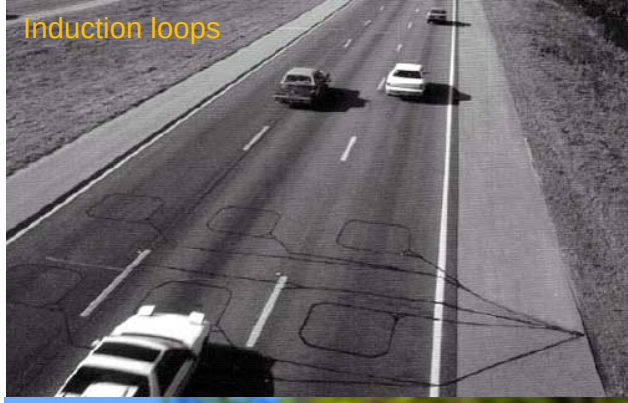
Providing more travel choices and options for people and freight helps improve the efficiency and effectiveness of our transportation system

Adding Capacity Strategically

Adding new capacity to our currently over-stressed transportation system is a critical component of Moving Washington

Measuring performance needs ‘traffic’ data!

- **Leveraging operational (ITS) data**
  - 4000+ induction loop detectors in the central Puget Sound spaced about ½ mile apart
  - Gold mine for real-time speed and volume data which are the basis for our congestion performance data. Continuous data collected every 20 seconds and aggregated in 5 minute increments for reporting purposes. Archived for the past few decades
  - Infrared traffic loggers (TIRTL)
  - Traditional tube counts (short counts) on 3-year cycle
  - License plate readers (LPR)
- **New sources of real-time data becoming available:**
  - Pilot project looking at using private sector probe data for travel time information and other performance assessments
  - Examining ‘Bluetooth’ based data collection technology



Traffic data customers

Moving Washington **program is one of our traffic data customers**

TM

Operate Roadways Efficiently

- To support variable pricing for HOT lanes
- To facilitate electronic tolling
- To implement Active Traffic Management – Smarter Highways
- To provide real time traveler information
- To apply other technologies in operations to enhance safety and system efficiency
- To optimize signal timing along with ramp metering

TM

Manage Demand

- To monitor results of various efforts to reduce VMT (for GHG and congestion)
- To track use of HOV facilities
- To perform modeling analysis to estimate impacts of TDM on congestion
- To capture Vehicle occupancy?
- To collect data during construction that can assist in providing relevant information to motorist.
- To track Commute Trip Reduction

TM

Add Capacity Strategically

- To identify locations that operate below predefined thresholds (“Before” data)
- To analyze whether an adopted strategy is addressing the identified needs (“After” data)
- To plan, prioritize, and program capital improvement projects
- To assist legislature and governor in making investment decisions
- To customize solutions for congested corridor
- To validate travel demand forecasting models and traffic analysis software applications

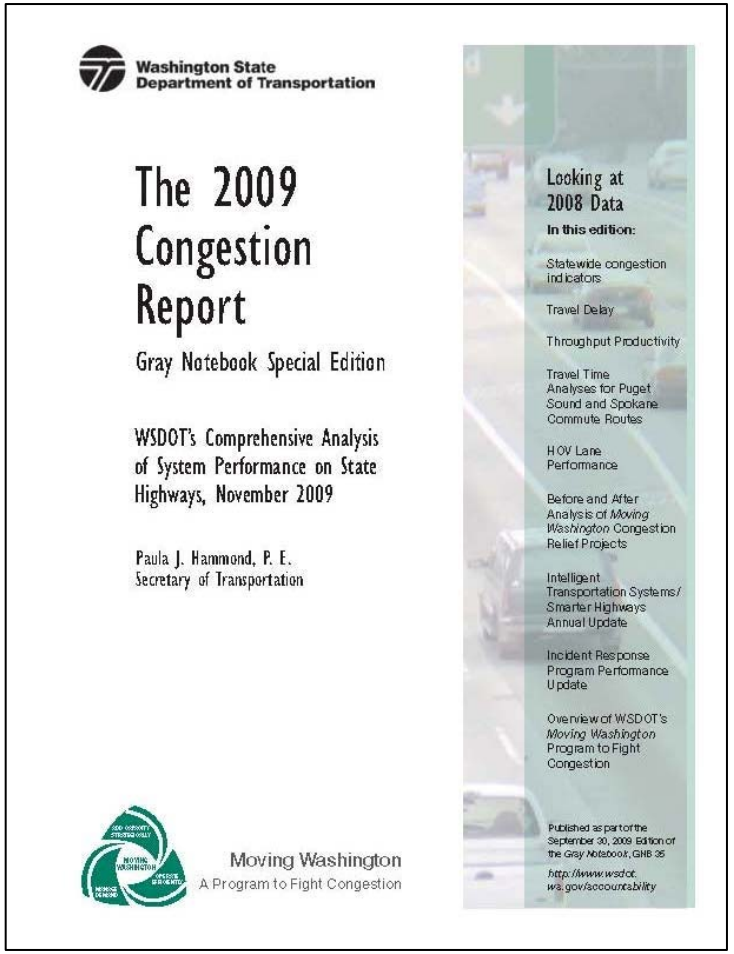
Traffic data customers…

Congestion Performance Measures used in system Monitoring and Performance Communication

Measure	Definition
Average Peak Travel Time	The average travel time on a route during the peak travel period.
95% Reliable Travel Time	Travel time with 95% certainty (i.e. on-time 19 out of 20 work days).
Maximum Throughput Travel Time Index (MT^3I)	The ratio of peak commute period travel time compared to maximum throughput speed travel time.
Percent of Days When Speeds Fall Below 35 mph	Percentage of days annually that observed speeds fall below 35 mph (severe congestion) on key highway segments.
Vehicle Throughput	Measures how many vehicles move through a highway segment in an hour.
Lost Throughput Productivity	Percentage of a highway's lost vehicle throughput due to congestion.
Delay	The average total daily hours of delay per mile based on the maximum throughput speed of 50 mph measured annually as cumulative (total) delay.
Percent System Congested	Percent of total state highway lane miles that drop below 70% of the posted speed limit.
Duration of the Congested Period	The time period in minutes when speeds fall below 45 mph.
HOV Lane Reliability	An HOV lane is deemed "reliable" so long as it maintains an average speed of 45 mph for 90% of the peak hour.
Person Throughput	Measures how many people, on average, move through a highway segment during peak periods.
Before and After Analysis	Before and after performance analysis of selected highway congestion relief projects and strategies.
Average clearance time of incidents (Statewide)	Operational measure defined as the time from notification of the incident until the last responder has left the scene for all incidents responded to by WSDOT Incident Response personnel statewide.

What are our Key Congestion Measurement Principles?

- Use real-time data (rather than computer models) whenever and wherever possible.
- Use **maximum throughput** as the basis for measurement and the goal of congestion strategies and expectations.
- Measure and report recurrent and non-recurrent congestion differently.
- Demonstrate both long-term trends and short-to-intermediate-term results.
- Use “apples-to-apples” comparisons (i.e. compare corridor travel times from year to year, use consistent Before and After methods).
- Use “Plain-English.”



Annual Congestion Report

System Monitoring and Performance Reporting- What are the benefits?

- **Enhanced reporting supports positive funding considerations**
  - **2003 Washington State Gas Tax/Revenue Increase**

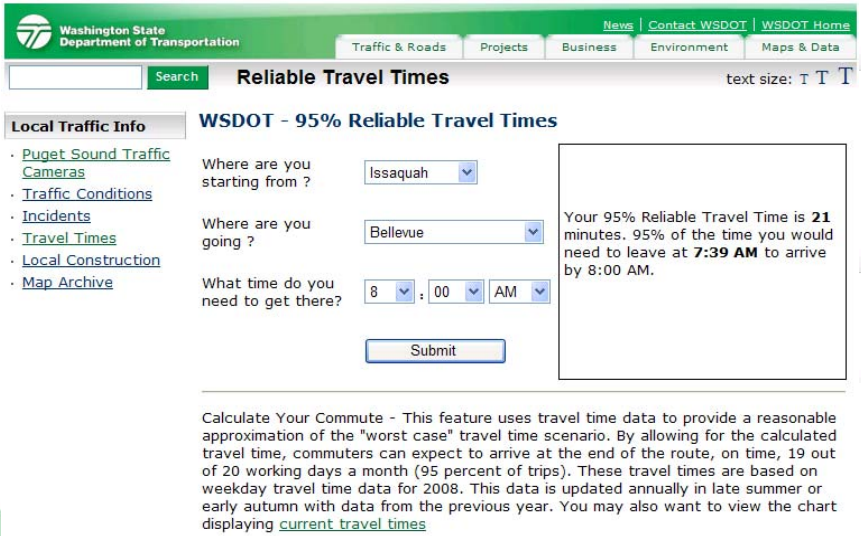
    Transportation Revenue Package 5 cents/gallon gas tax increase took effect July 1, 2003.
  - **2005 Washington State Gas Tax/Revenue Increase**

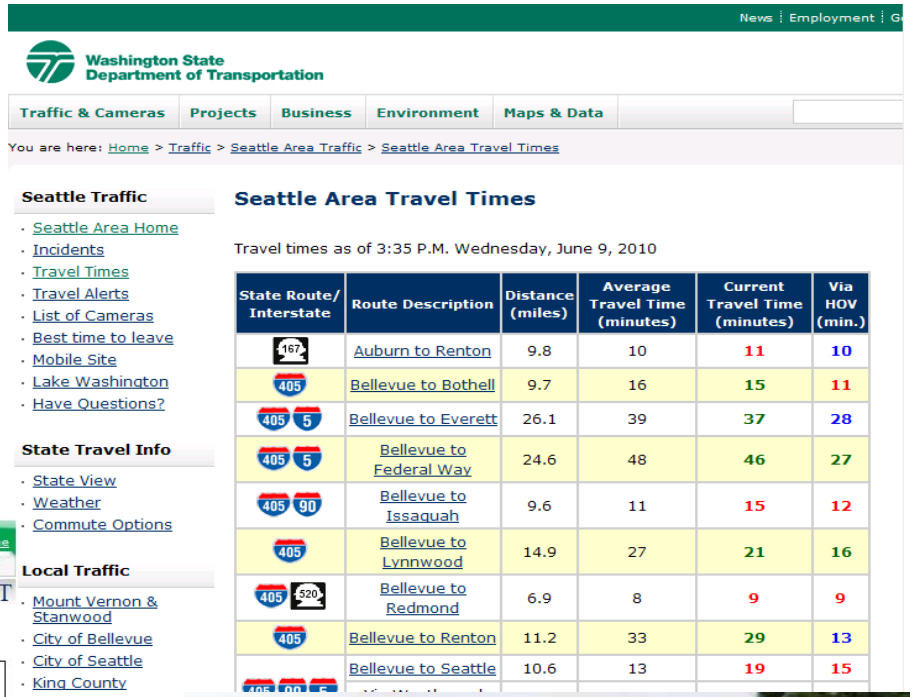
    Transportation Revenue Package. 9.5 cents/gallon gas tax increase (phased in over three years) July 1, 2005.

- **Ability to tell your story and report on condition and needs**
  - Informed media
  - Informed officials and decision makers
  - Informed managers and employees

- **Allows for better management of the system and enhanced operations**
  - Squeeze every ounce of productivity out of your existing investments
  - Understand effectiveness of various strategies and investments when applying limited resources

Communicating system performance to travelers using real-time and historic traffic data





State Route/ Interstate	Route Description	Distance (miles)	Average Travel Time (minutes)	Current Travel Time (minutes)	Via HOV (min.)
167	Auburn to Renton	9.8	10	11	10
405	Bellevue to Bothell	9.7	16	15	11
405 5	Bellevue to Everett	26.1	39	37	28
405 5	Bellevue to Federal Way	24.6	48	46	27
405 90	Bellevue to Issaquah	9.6	11	15	12
405	Bellevue to Lynnwood	14.9	27	21	16
405 520	Bellevue to Redmond	6.9	8	9	9
405	Bellevue to Renton	11.2	33	29	13
	Bellevue to Seattle	10.6	13	19	15

Washington State Department of Transportation

SR 167 HOT Lanes Pilot Project – Before and After Analysis

Project Overview: On May 3, 2008, Washington State converted an existing high occupancy vehicle (HOV) lane to a high occupancy toll (HOT) lane on State Route 167. This conversion allows solo drivers to use the lane by paying an electronic toll.

Project Limits: SR 167 between Auburn and Renton

Performance Update: The SR 167 HOT Lanes Pilot Project is successfully demonstrating that variable tolling can make better use of existing carpool lanes and improve traffic flow.

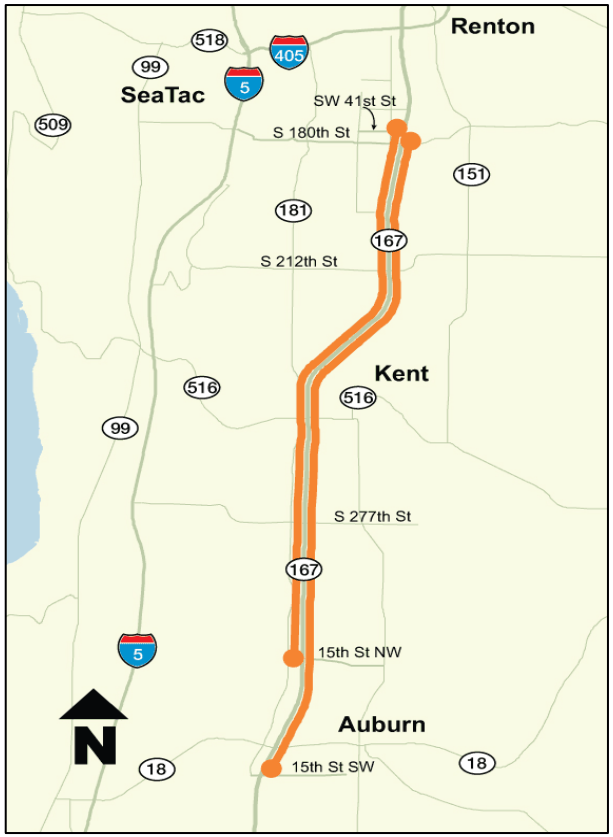
Performance Metrics:

<u>General Purpose Lanes:</u>

- **Speeds** increased by **10**%
- **Volumes** increased by **2-3**%
- **Travel times** improved (NB = 19 min, SB = 11 min)
- **Reliability** improved (NB = 24 min, SB = 15 min)

<u>HOT Lanes:</u>

- **Speeds** remained at posted speed (60 mph)
- **Volumes** increased by **12**%
- **Travel times** improved (NB = 11 min, SB = 8 min)
- **Reliability** improved (NB = 11 min, SB = 8 min)



Washington State Department of Transportation

Transforming traffic operations through the use of new and innovative technology

Smarter Highways *"Summer 2010"*

- Variable message signs
- Traffic cameras
- Variable speed limits
- Lane control
- Automatic, instant traffic information
- Traffic Management Centers

- Signs every half mile warn of slower traffic and blocked lanes ahead to prevent collisions that cause at least 25% of congestion.
- Information instills trust; trust means compliance, keeping drivers safe
- Making highways safer and more efficient

Active Traffic Management Projects
When will drivers see Smarter Highways?

Conclusions and Lessons Learned:

- A strong and reliable transportation system is the backbone of a healthy economy
- Moving Washington – Our plan to reduce congestion and improve mobility requires enhanced data and analysis
- System performance measurement is a high priority at WSDOT
- Many traffic data needs, many customers, and many uses
- Moving forward – Looking towards efficient and innovative solutions and partnerships to meet our data needs
- Data is an asset and investments in traffic and travel time data are critical to our ability to make good decisions and report results