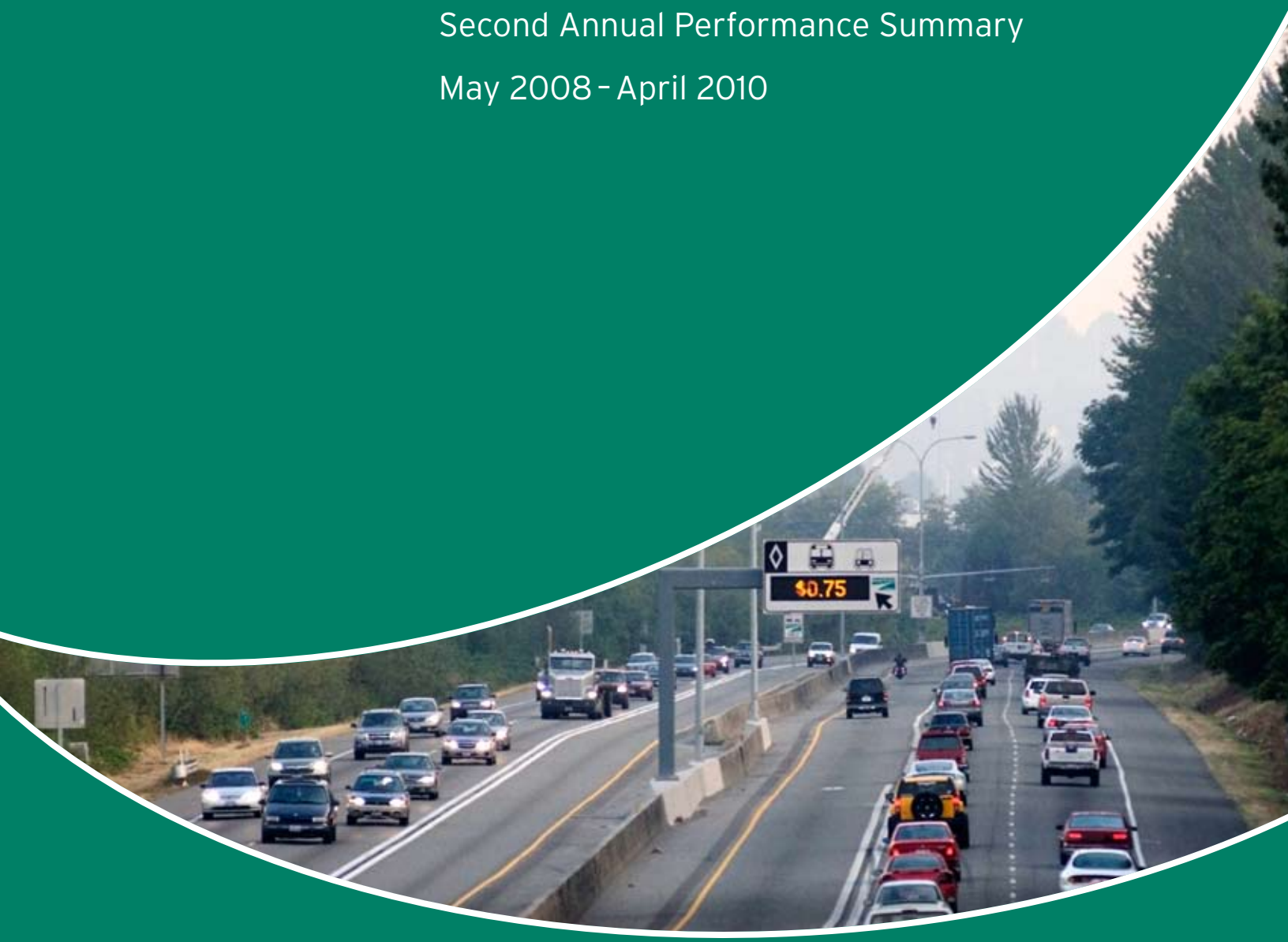
SR 167
HOT Lanes Pilot Project

Second Annual Performance Summary

May 2008 – April 2010



Washington State
Department of Transportation

HOT lanes: year two

WSDOT launched the SR 167 HOT Lane Pilot Project in 2008 with the goal of providing drivers with a faster, more reliable commute. Two years later, the HOT lanes are doing just that. Christina Chisholm, of Covington, uses the HOT lanes weekly during her drive to Renton as a Property Manager. "I always use the HOT lanes, unless traffic is really light," she said. Normally, her commute would take around 40 minutes, but she says her commute time is shortened at least 20 minutes when she uses the HOT lanes in both the north and south directions.

Being a busy mom of three, it's important for Chisholm to be on time when balancing her job with getting her kids to school and practice on time. "I don't like to be late, and without the HOT lanes, I would be late!" she said. She is willing to pay the toll to save time and not worry about traffic congestion in the general purpose lanes. "I think HOT lanes offer a great solution to traffic congestion," she said, "and I would always be willing to pay the toll if it will save me time."

Like Chisholm, some commuters choose to use HOT lanes a few times a week. The beauty of the system is that drivers can choose whether to use the HOT lanes on any given day. Their decision is based on their unique situation. As the popularity of HOT lanes continues to increase, carpoolers and bus riders still enjoy the same fast, toll-free trip they counted on in the high occupancy vehicle (HOV) lanes.

Two years after opening day of HOT lanes, we have found they are working. HOT lanes save people time, provide commuters with more choices and get the most efficient use of SR 167. This report provides elected officials, transportation professionals, and the public with a detailed review of the first two years of operations and performance.

Executive Summary

The first two years of the State Route 167 High Occupancy Toll (HOT) Lane project have yielded significant results – both for the drivers who access the HOT lanes and for those who use the general purpose lanes. People who opt to use the HOT lanes save time and minimize stress associated with their daily commute, while also reducing the burden of traffic in the general purpose lanes. The end result – free flowing traffic – benefits everyone traveling on SR 167, and illustrates how a better use of carpool lanes can effectively relieve congestion in vital corridors. The second year data indicate that the public is catching on to the benefits of HOT lanes: more people are using the HOT Lanes, and monthly revenue continues to climb. Current SR 167 HOT lane customers have become the strongest advocates, and have encouraged an expansion of the program.

The readers for electronic tolling on SR 167 HOT lanes

Performance: Everybody Benefits

- More than 60,000 unique *Good To Go!* customers have paid to drive the SR 167 HOT lanes since they opened – that is double the number from the first year.
- The average number of tolled trips continues to increase
  - 2,150 tolled trips per weekday in April 2010.
- Travel times in the general purpose lanes are more reliable.
- The average toll paid continues to float between $0.75 and $1 per trip.
- Transit ridership in the corridor has held steady.
- Since opening HOT lanes in May 2008, peak-period traffic is moving more efficiently:
  - On average general purpose lane volumes have increased two to three percent, while speeds have increased 11 percent; and
  - On average HOT lane volumes have increased 12 percent, while speeds have remained at or slightly above the posted speed of 60 mph.

Safety: Fewer Collisions

- Preliminary evidence indicates a 17 percent decrease in total corridor collisions.

Customer Service: Well Received

- Over 90 percent of surveyed HOT lanes customers stated they are likely to use the lanes in the future.
- During the second year, new transponders were purchased at a rate of 4,800 a month, up from 4,100 a month average during the first year.
- Complaints have remained infrequent.

Revenue: Steady Growth

- HOT lane revenue increased 33 percent in the second year, generating about $420,400 in gross revenue from May 1, 2009 through April 30, 2010.
- During the first year, the system averaged $26,380 per month.
- The second year's average monthly revenue has grown to $35,030.

Enforcement: Remains Effective

- Although enforcement levels have remained constant, HOT lane related citations have decreased 10 percent.
- Washington State Patrol officials continue to estimate the compliance rate at 95 – 97 percent.

The Pilot Project

On the second anniversary of Washington State's first-ever HOT lanes, more drivers are choosing to pay a toll to use the SR 167 HOT lanes to save valuable time and reduce the stress that comes with congestion. This four-year pilot project, located 12 miles southeast of downtown Seattle, provides solo drivers a reliable commute option, while continuing to offer free-flowing travel for transit and carpools (see Figure 1).

The HOT lanes run northbound and southbound on approximately 10 miles of SR 167 between Renton and Auburn. The highway's two general purpose (GP) lanes in each direction remain toll-free and open to all traffic. The HOT lanes are separated from the GP lanes by a solid double white line, which is illegal to cross. Access in and out of the HOT lanes is restricted to access zones identified by a dashed white line (there are six northbound and four southbound access zones).

WSDOT converted pre-existing SR 167 High-Occupancy Vehicle (HOV) lanes to HOT lanes to make better use of the available space in the HOV lanes. Today, solo drivers with a *Good To Go!* transponder have the option to pay a variable, electronic toll for a faster trip in the HOT lane when space is available.

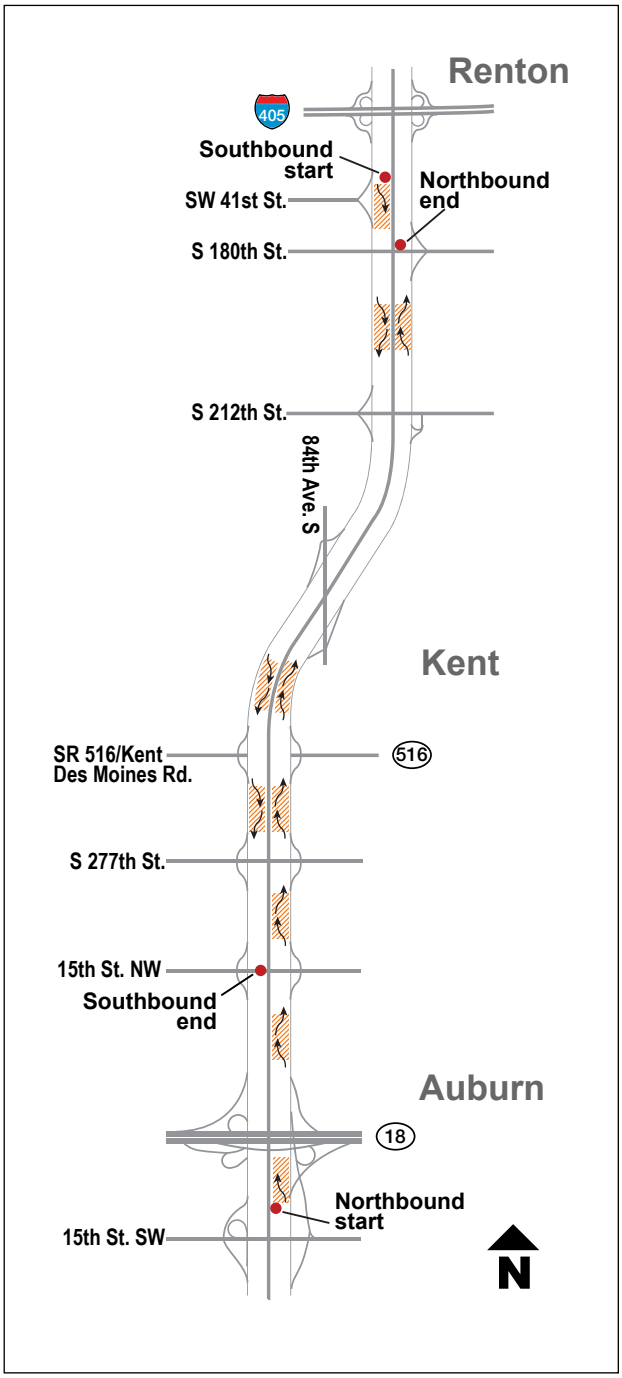
Carpools of two or more people, vanpools, buses and motorcycles use the HOT lane toll-free, just as they did in the HOV lanes, and they do not need a transponder. If the HOT lanes become too congested, they switch to HOV only.

Variable tolling

Variable tolling is a tolling structure where the toll price changes over time according to certain performance criteria. The SR 167 HOT lane pilot project uses a type of variable tolling where the toll rate adjusts dynamically based on real-time traffic data. The data, collected by sensors embedded in the roadway, measure vehicle speed and volume data. When traffic is heavy, the toll price increases, and when it's light, the price decreases – the law of supply and demand.

On SR 167, the variable toll ensures that traffic in the HOT lane always flows smoothly. The system calculates a new toll rate (via an algorithm) from 50 cents to $9 every five minutes. This helps the HOT lane make the most efficient use of carpool lane space, while ensuring that buses and carpools still have a free-flowing, reliable trip.

Figure 1: On May 3, 2008, the SR 167 HOT lanes pilot project opened north- and southbound HOT lanes between Renton and Auburn. Carpools, buses, motorcycles, and toll-paying solo drivers can access the lanes via zones (marked in orange) for a faster, more reliable trip.

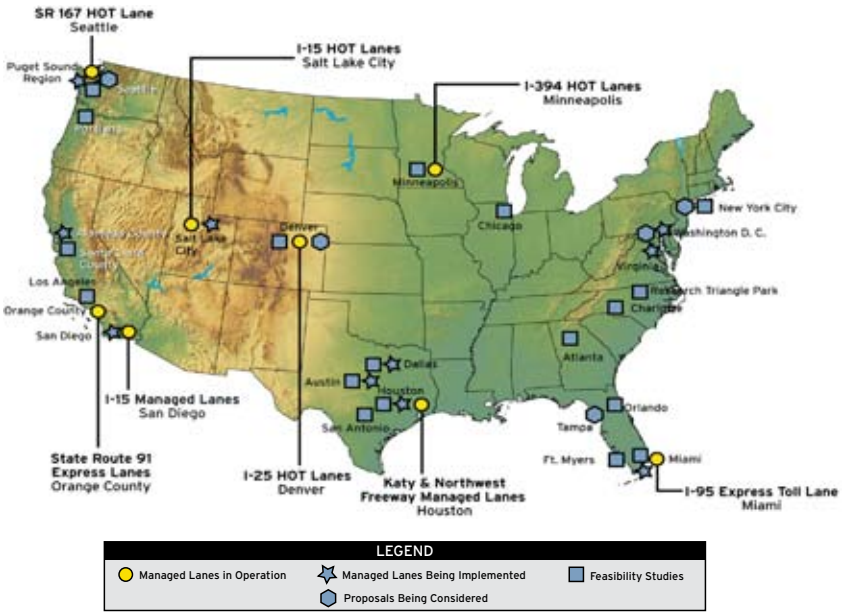


HOT lanes across America

WSDOT continues to gather information from other projects across the nation that have implemented HOT or express toll lanes, which use tolls to manage demand and reduce traffic congestion. The map shown in Figure 2 shows the location and status of toll lane projects. There are currently eight HOT or express toll systems in place, most of which are on their second phase of implementation due to the success of their initial phases. Across the nation, another 30 HOT or express toll lane projects are either being implemented or feasibility studies are being conducted for them.

Figure 2: HOT lanes across the country

Data Source: Project Websites May 2010



Why SR 167?

The SR 167 corridor runs north and south, connecting communities between Renton and Tacoma. Additionally, it provides the Puget Sound region with an alternative north-south route to I-5. Unlike most HOV lanes in the region, which operate at or above capacity during peak periods, the HOV lanes on SR 167 had available space during peak period commute times. WSDOT engineers saw HOT lanes as a tool to increase vehicle throughput without reducing the level of service enjoyed by carpools and bus riders.

Over the next 30 years, population in the Puget Sound area is expected to increase by about 1.7 million and the number of jobs by about 1.2 million, over year 2000 levels. Our general purpose lanes, and most of our HOV lanes, are congested during the peak periods, and those peak periods are becoming longer all the time. HOT lanes are a way to operate our highways more efficiently and manage traffic demand with more commute choices. These strategies are part of Moving Washington, WSDOT's statewide program to keep people and goods moving through the next decade and beyond.

HOT lanes growing in popularity

Miami: In December 2008 HOT lanes began operating on a 7-mile stretch of northbound I-95. The facility features variable, electronic tolling with the SunPass transponder. Electronic toll collection on a new southbound HOT lane began in January 2010.

Northern Virginia: The Capital Beltway, I-495, will have 14 miles of HOT lanes by 2013. The $1.4 billion public-private partnership ultimately will expand the HOT lanes to 56 miles.

Minneapolis: Minnesota has two Express Lanes facilities currently in operation. I-394 was completed in 2005 and I-35W was completed in late 2009. An extension to the I-35W Express Lanes is scheduled to be completed in 2012.

San Diego: San Diego has two reversible express lanes that currently stretch 16 miles. HOT lanes have operated on I-15 since 1996. By 2012 the facility will be extended to 20 miles.

Orange County: The 10-mile HOT facility on SR 91 December 1995 voters approved an initiative to extend the facility 10 more miles to Riverside County.

Salt Lake City: Utah DOT is converting its 38-mile HOT facility on I-15 from a $50 per month subscription service to electronic, variable tolling in fall 2010.

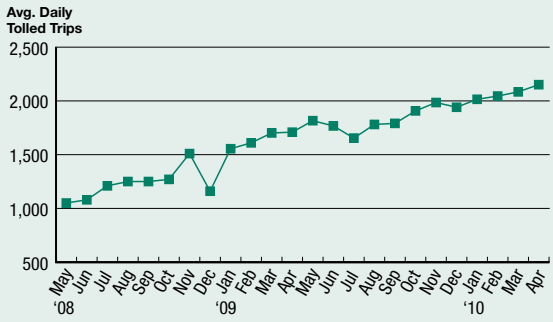
Houston: In April 2009 Harris County Toll Road Authority completed converting 10 miles of I-10 to HOT with time of day variable tolling.

Traffic Performance

More people paying a toll to use the HOT lanes

The average number of daily (Tuesday through Thursday) tolled trips continues to increase from month to month (see Figure 3). During the northbound peak-hour (7–8 a.m.), the average number of tolled trips increased from 140 in May 2008 to 270 in April 2009 to 350 in April 2010, a two and a half times increase over 24 months. The number of tolled trips in the southbound direction has doubled during the afternoon peak-hour (4–5p.m.) since May 2008. See Figure 4.

Figure 3: SR 167 HOT lanes average daily tolled trips doubled in two years



*Data Source: NW Region Traffic, Tuesday–Thursday**

Figure 4: Performance measures help WSDOT learn from the Pilot Project and design program improvements

		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Average toll paid	**Year One**	$1	$1.25	$1	$1	$1	$0.75	$1	$0.75	$1	$0.75	$0.75	$0.75
	Year Two	$0.75	$0.75	$0.75	$0.75	$1	$1	$1	$0.75	$1	$1	$0.75	$1
Highest toll paid	**Year One**	$5.75	$9	$9	$8.50	$4.25	$3.50	$6	$4	$6.50	$5.25	$3.25	$3.25
	Year Two	$4.50	$3.25	$3.25	$3.50	$4.25	$4.25	$4.25	$5.25	$3.75	$5.50	$3.50	$4.50
Average number of daily tolled trips	**Year One**	1,050	1,080	1,210	1,250	1,250	1,270	1,510	1,160	1,560	1,610	1,700	1,710
	Year Two	1,820	1,770	1,650	1,780	1,790	1,910	1,990	1,940	2,020	2,050	2,080	2,150
Highest number of daily tolled trips	**Year One**	1,220	1,260	1,390	1,460	1,390	1,560	1,740	1,910	1,850	1,820	1,880	1,860
	Year Two	2,050	1,890	2,060	1,990	2,040	2,150	2,230	2,110	2,220	2,270	2,340	2,390
Average peak-hour northbound tolled trips	**Year One**	140	140	160	180	180	190	200	160	230	250	250	270
	Year Two	260	260	240	270	280	320	310	320	340	350	360	350
Average peak-hour southbound tolled trips	**Year One**	100	100	120	110	120	120	140	100	150	150	160	160
	Year Two	180	170	140	160	170	170	170	200	190	190	200	200
Maximum peak-hour tolled trips	**Year One**	170	210	180	240	230	240	260	260	260	280	310	310
	Year Two	310	300	310	330	350	350	350	340	390	380	420	410

*Data Source: NW Region Traffic, Tuesday–Thursday**

** Monday and Friday excluded due to inconsistent traffic volumes.*

Volume

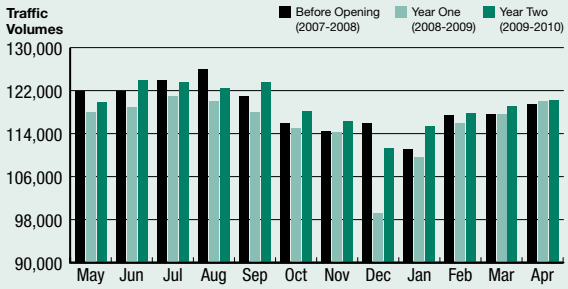
... Daily volumes rebound

During the second year of operations, the average daily traffic volumes on SR 167 rebounded to pre-opening volumes in 2007. As Figure 5 demonstrates the daily volumes in the first year of operations decreased slightly, likely in response to the spike in gas prices and faltering economy.

... Peak-hour volumes increase

The peak-hour, peak-direction traffic volumes increased compared to 2007 levels. On average HOT lane volumes have increased by 12 percent and general purpose lane volumes increased 2–3 percent. Specifically, the northbound general purpose lane volume has remained constant, while HOT lane volume increased 25 percent. The southbound general purpose lane volume increased by 5 percent, while HOT lane volumes have remained constant.

Figure 5: Average daily traffic volumes increased in the second year



*Data Source: NW Region Traffic, Tuesday–Thursday**

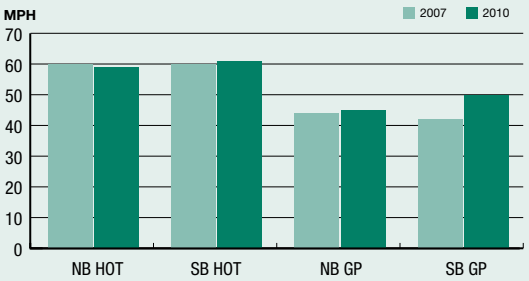
Speeds

... Peak-hour speeds increase

Southbound peak-hour speeds in the general purpose lane increased 19 percent compared to 2007; while northbound speeds increased 3 percent. Speeds in the HOT lanes remained at the posted speed limit of 60 mph (see Figure 6 for peak-hour speeds).

The Legislative mandate requires that the HOT lane maintain average traffic speeds of 45 mph during the peak-hours at least 90 percent of the time. The HOT lanes exceed this requirement, achieving the required speed over 99 percent of the time.

Figure 6: Peak-hour speeds
Speeds in general purpose lanes increase



*Data Source: NW Region Traffic, Tuesday–Thursday**

HOT lanes are successfully delivering reliable travel times and maintaining traffic speeds, even on some of the most congested days.

** Monday and Friday excluded due to inconsistent traffic volumes.*

HOT lane travel times

Throughout the first and second year, HOT lane traffic consistently flowed freely during all hours of the day. The northbound peak-hour travel time in the HOT lane was 11 minutes on average since implementation. The 95th percentile travel time (a reliability measure) was 11 minutes as well. The two equivalent travel time measures for both years indicate that the HOT lanes are successfully delivering reliable travel times and maintaining traffic speeds, even on some of the most congested days.

The results are similar during the southbound peak-hour (4–5 p.m.) for the first two years of operation: both the HOT lane travel time and the 95th percentile travel time were eight minutes. Again, the equivalent travel time measures confirm that the HOT lanes successfully delivered reliable travel times and maintained traffic speeds, despite the bottleneck caused by the lane drop at the south end of the southbound HOT lane.

Northbound travel times use data stations at SR 18 and S. 34th Street for calculations. Southbound travel time use stations at S. 34th Street and 43rd Street NW.

General purpose lane travel times

The second year average weekday northbound peak-hour travel time was 19 minutes with 24 minutes at the 95th percentile travel time. The same peak-hour travel time in year one was 19 minutes with 26 minutes at the 95th percentile travel time.

The second year average weekday southbound peak-hour travel time was 11 minutes with 15 minutes at the 95th percentile travel time. The same peak-hour travel time in year one was 12 minutes with 19 minutes at the 95th percentile travel time.

HOT lane time savings

The northbound HOT lane provided weekday (Tuesday through Thursday) drivers with an average time savings of eight minutes in the peak-hour (7–8 a.m.) for an average toll of $1.25.

The weekday southbound HOT lane provided drivers with an average savings of three minutes during the peak-hour (4–5 p.m.) for an average toll of $1.25.

Transit performance

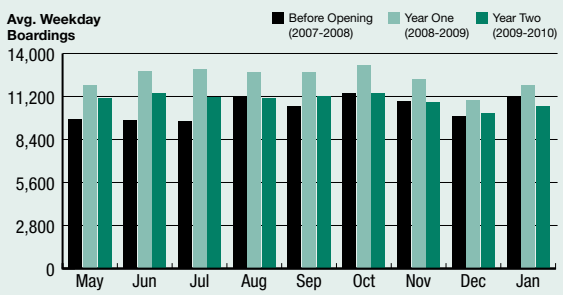
... Ridership remains constant

Sound Transit records indicate that travel times for buses within the corridor, during peak and non-peak periods stayed consistent with the HOT lanes opening. Ridership on Sound Transit's buses (routes 564 and 565) and commuter rail service (the South Sounder) increased from 10,500 weekday riders in 2007–2008 to 12,430 weekday riders in 2008–2009. Sound Transit attributes the 2008 spike to high summer gas prices (see Figure 7).

Transit officials and WSDOT engineers fine-tuned the bus routes (564 and 565), directing buses to enter SR 167 at SR 516 instead of 84th Avenue. These adjustments allowed buses to take better advantage of the HOT lanes' access zones.

In February 2010, Sound Transit combined routes 564 and 565 to create route 566 as part of a larger restructuring in South King and Pierce Counties. WSDOT has begun to follow ridership data for route 566.

Figure 7: Weekday transit ridership stays consistent



Data Source: Sound Transit

Revenue

The SR 167 HOT lanes were designed to help reduce traffic congestion and maintain free-flow traffic conditions in the HOT lane. Revenue generation is an added benefit. Nonetheless, revenue has gradually increased as drivers have grown more comfortable with tolling operations, the economy recovers and transponder ownership within the region becomes more common.

During the first year of operation, the HOT lanes generated $316,600 in gross revenue, making the average monthly revenue $26,380. Year two generated $420,400 in gross revenue, making the average monthly revenue $35,030 **– a 33 percent increase from year one** (see Figure 8).

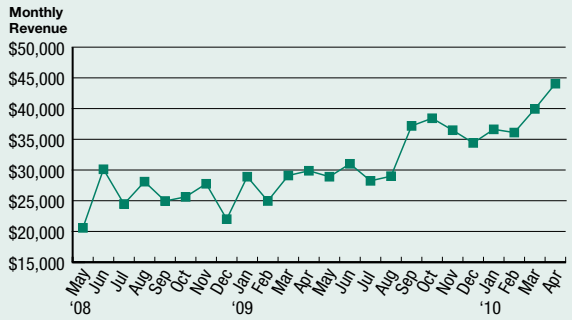
The monthly average gross revenue for the HOT lanes continues to grow as shown in these six month periods:

- $25,640: May 2008 – October 2008
- $27,100: November 2008 – April 2009
- $32,130: May 2009 – October 2009
- $37,930: November 2009 – April 2010

This trend shows a steady increase in revenue generation. March and April 2010 set the new high marks in monthly gross revenue with $39,950 in March (a 37% increase from year one) and $44,050 in April (a 47% increase from year one).

WSDOT is currently taking measures to lower SR 167 HOT Lanes Pilot Project operating costs. The agency awarded a contract to build a statewide customer service center to support all current and future Washington State tolling facilities, including the HOT lanes. This action will centralize all customer service activities and lower operating costs.

Figure 8: Revenue continues to increase



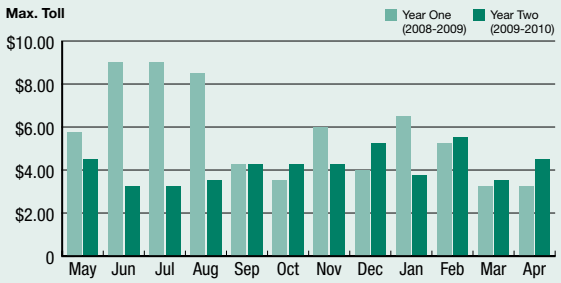
Data Source: NW Region Traffic and Customer Service Center

Toll rates
... Minimizing Price, Maximizing Value

The toll rate can range from $0.50 to $9. The average toll rate was $0.96 during the first year of operations and $0.88 during the second.

In June and July 2008, tolls reached the maximum rate of $9, however after WSDOT engineers made adjustments to the dynamic-pricing algorithm, the toll rate has not exceeded $5.50. The higher toll rates experienced during the first few months were the intentional result of sensitive pricing algorithm settings. This ensured carpools and buses premium service while traffic adjusted to the new HOT lane system. See Figure 9.

Figure 9: Maximum toll rate floats around $4



Data Source: NW Region Traffic and Customer Service Center

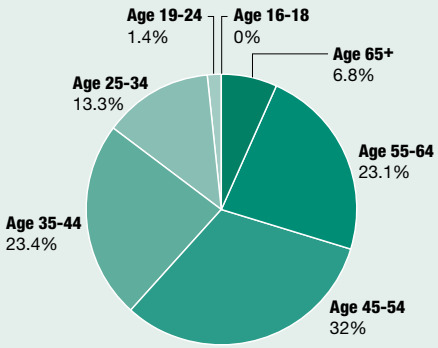
HOT Lane Drivers

Who is driving in the HOT lane?

In May 2010 an online survey was sent to all *Good To Go!* account holders with a valid e-mail address who had driven the SR 167 HOT lanes at least once. The survey helps WSDOT understand the profile of our paying customers and the results are consistent with the findings from the 2005 Baseline Survey Report and a survey performed in May 2009 after the first year of HOT lanes operation. As shown in Figures 10 and 11, the majority of HOT lane drivers are between the ages of 35 and 64 years old and have a household income of $50,000–$124,999.

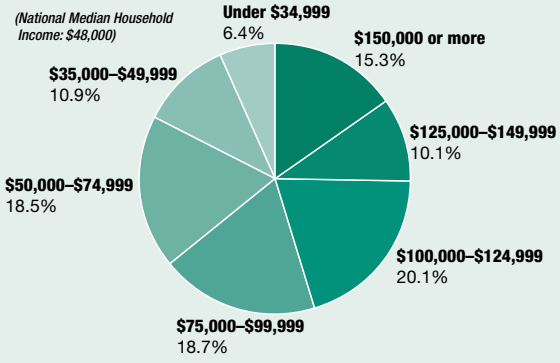
Figure 10: Age of HOT Lane Drivers

Most HOT lane drivers are between 35 and 64 years old



Data Source: Toll Division, 2010 SR 167 Online User Survey (1,813 respondents)

Figure 11: Household Income of HOT Lane Drivers

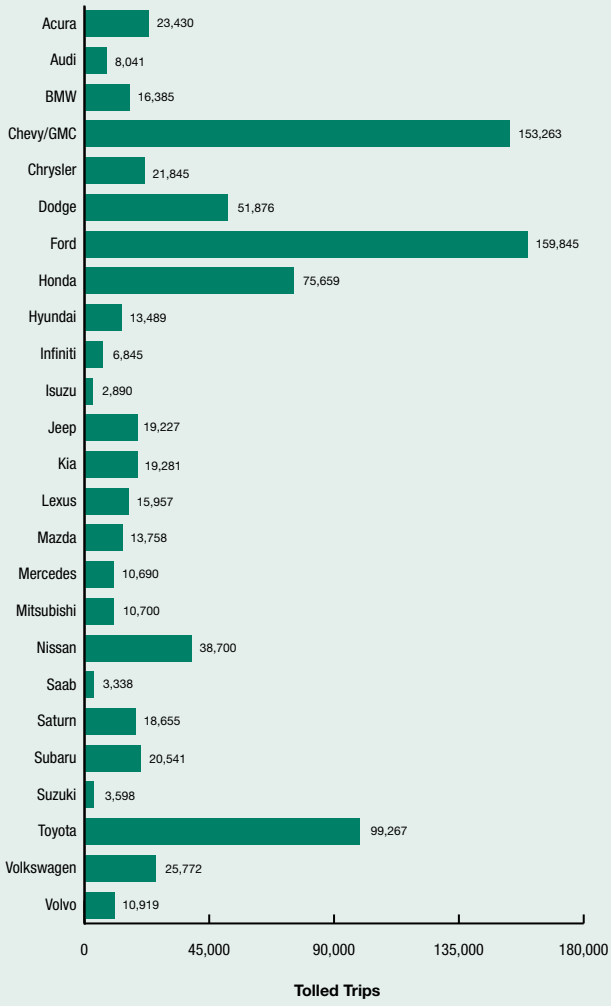


Data Source: Toll Division, 2010 SR 167 Online User Survey (1,694 respondents)

SR 167 HOT lanes are not "Lexus Lanes"

Throughout the country critics deride HOT lanes as "Lexus Lanes" suggesting that only the rich can afford to use them. Results from SR 167 suggest otherwise; less than two percent of trips were made by a Lexus (see Figure 12). Drivers of Chevys and Fords use the lane more than anyone else. Trips not shown on this graph were taken by vehicles that provided inconsistent vehicle make information.

Figure 12: Tolled Trips by Vehicle Make

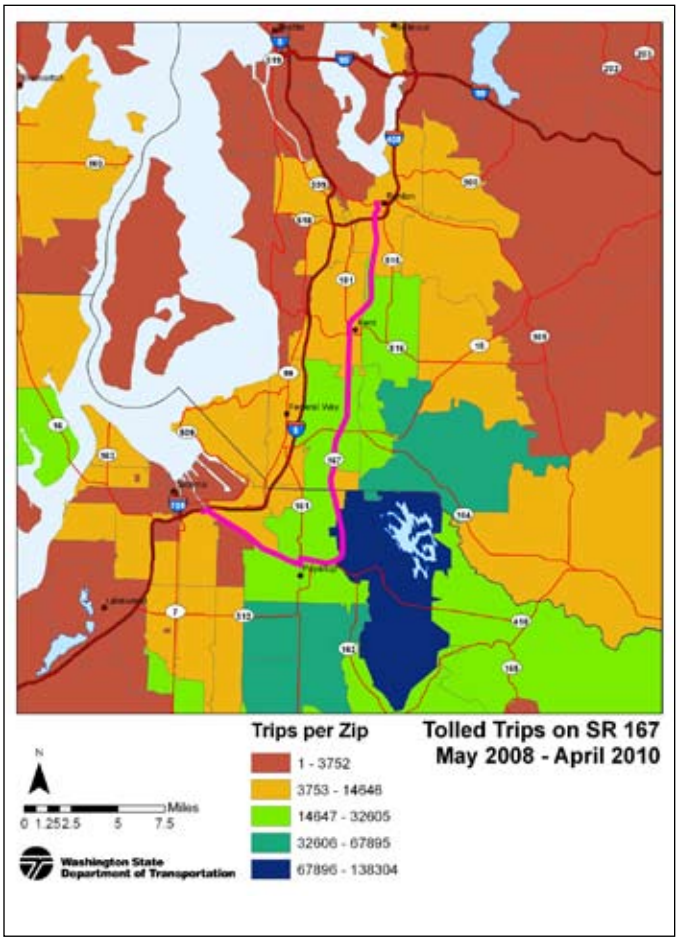


Data Source: Customer Service Center Database, May 2010

Where are they from?

The majority of tolled HOT lane trips are billed to homes in the southern, southeastern and eastern portions of the SR 167 corridor, as shown in blue and green in Figure 13.

Figure 13: Tolled Trips by Zip Code
Most tolled trips originate in the southern part of the corridor



Data Source: Customer Service Center Database, May 2010

Customer Satisfaction

… Most HOT lanes users want HOT lanes in more locations

Many users have responded positively to the HOT lanes, claiming that their primary reason for choosing them was to avoid congestion. These are the four most common responses from a recent online survey of SR 167 HOT lane users:

1. General positive:
   "I love the HOT lane concept and would pay more to see it expanded."
2. Construct more HOT lanes:
   "I'm looking forward for more HOT lanes on other highways to become available. I know I would use them. I have a very long commute for work and day care."
3. More enforcement:
   "I would like to see better enforcement of people jumping the double white lines."
4. Access change:
   "I think more areas to enter and exit the hot lanes would be helpful. Also better signs showing the next available exit…"

The project team continues to closely monitor customer feedback and is taking steps to address the concerns.

Drivers who use the HOT lanes strongly support them. The 2010 SR 167 HOT Lanes Customer Survey revealed the following highlights:

- Over 90 percent of customers stated they would likely use the HOT lanes again;
- Nearly three-quarters agreed that HOT lanes should be opened on other freeways in our region; and
- 85 percent said that they use the HOT lanes to make a faster trip when they really need to.

HOT lane use during the second year doubled from 30,000 to 60,000 vehicles making tolled trips.

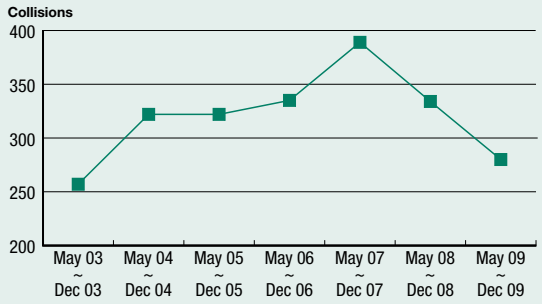
Safety and Response

Safety
... Fewer collisions

The second year of HOT lanes operation from May through December 2009 showed a 17 percent reduction in monthly collisions with an average of 35 collisions each month. This represents the lowest monthly average of collisions during the same timeframe along the SR 167 HOT lanes corridor since 2004. The collision data timeframe begins in May and ends in December because HOT lanes began in May 2008, and December 2009 is the most recent collision data available (see Figure 14).

It is still too early to definitively evaluate the effect HOT lanes have on safety within the corridor. WSDOT traffic engineers recommend evaluating three years of data to determine safety performance. Multiple factors can affect the safety record including: the double white lines preventing erratic lane changes in and out of the HOT lanes, changing traffic volumes, increasing WSP enforcement, roadway surface conditions, changes in visibility and a new law requiring the use of hands-free cellular devices. WSDOT remains confident that HOT lanes are not adversely impacting driver safety and engineers will continue to closely monitor safety data.

Figure 14: Collisions on SR 167
HOT lanes are not adversely impacting safety



Data Source: NW Region Traffic

Incident response
... Incident amounts and response times stay stable

An important component of HOT lanes operations is the addition of incident response team (IRT) vehicles along SR 167 to assist drivers (e.g. change flat tires, supply emergency gas, etc.) and clear traffic-blocking vehicles. Comparing the February to April time period for 2008 (baseline), 2009 (year one) and 2010 (year two):

February - April	2008	2009	2010
Monthly Incidents Responded To	130	195	180
Average Response Time (in minutes)	10.3	9.3	9.9

By funding more IRT vehicles along the corridor, the HOT lanes project enabled IRT to respond to incidents more quickly. This reduced the congestion and delay caused by incidents, minimized associated safety risks and helped keep the HOT lanes free flowing.

The incident response team provides additional assistance on SR 167.

Enforcement

Washington State Patrol

As part of the SR 167 HOT Lanes Pilot Project, the Washington State Patrol (WSP) provides enforcement to ensure drivers are complying with the law. Specific WSP shifts are dedicated to HOT lane enforcement, and emphasis patrols are paid for with HOT lane operations funding. Since opening day, WSP has maintained a visible presence in the project area.

The decrease in traffic stops and citations could be the result of multiple variables.

- Drivers have had time to become comfortable with the HOT lanes corridor and rules of the road
- Drivers are deterred from breaking the rules of the road by visible WSP vehicles
- Drivers are learning that the WSP is limited in the north by narrow shoulders, giving them an opportunity to break the rules and not get caught

WSP officials say they are pleased with the compliance rate, which is estimated to be 95 to 97 percent. An independent verification study is currently being conducted by the University of Washington and is anticipated to be completed by early 2011.

... HOT lanes related traffic violations down by 10%

The first year (May 1, 2008 – April 30, 2009) resulted in 2,744 traffic stops, yielding 732 citations for HOV/HOT violations and 322 citations for crossing the double white line that separates the HOT lanes from the GP lanes. (These numbers were incorrectly reported in the 'SR 167 HOT Lane Pilot Project First Annual Performance Summary May 2008 – April 2009')

The second year (May 1, 2009 – April 30, 2010) resulted in 2,005 traffic stops, yielding 663 citations for HOV/HOT violations and 290 citations for crossing the double white line.

HERO

... HERO calls decrease slightly

The HERO program was included as an element of the HOT lanes project to provide drivers an opportunity to report vehicles that they saw improperly use the lanes.

During the first year, May 2008 through April 2009, there was an average of 53 SR 167 HERO calls each month. Year two showed a slight reduction to an average 42 calls per month. From May 2007 to April 2008, the year before HOT lanes were operational, there was an average of 252 calls per month. Possible reasons for this sharp drop in HERO calls include: a legal option for solo-drivers to use the HOT lane, increased law enforcement, the new law requiring hands-free cellular phone devices, the unstable economy and the assumption that a single driver has a transponder.

The Washington State Patrol provides additional enforcement on SR 167. Compliance is estimated to be 95 – 97 percent.

Operations and Maintenance

Traffic management center

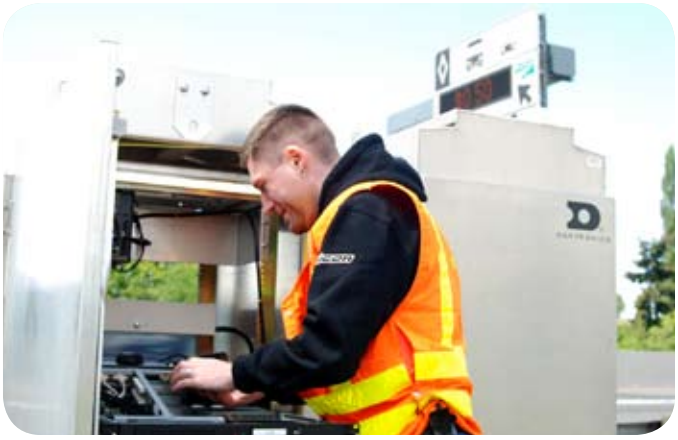
At WSDOT's Northwest Region offices in Shoreline, WA, team members monitor HOT lanes in the Traffic Management Center. Inside this central operations center, team members pay close attention to SR 167 traffic using remote control cameras and data collected from traffic speed and volume sensors. They monitor the variable toll rate and HOT lane traffic data using software that creates a dashboard displaying all the HOT lane variables, including traffic volumes, lane speed and toll rates. If anything goes awry, the designated engineer works with the toll system integration vendor and WSDOT maintenance to troubleshoot the problem and find a solution.

Inside the traffic management center, WSDOT engineers monitor the HOT lanes, variable toll rates, and traffic data to ensure smooth operations.

Maintenance

To assist WSDOT in monitoring, maintaining and ensuring optimal performance of the HOT lanes system, WSDOT is partnered with a toll system integration vendor. Aided by software, both partners watch the system for error and alert messages. When errors are detected, the toll vendor and WSDOT engineers collaborate to diagnose and usually solve the problem remotely. If the issue cannot be addressed remotely and a visit to the field equipment is required, WSDOT field technicians are dispatched to replace the failed component.

While minor errors and alerts occur weekly, the fully redundant system does not falter. Should the central system fail the toll data (which is collected and stored at each tolling location independently) would simply be uploaded and processed when the system recovered. The partnership has enabled WSDOT to ensure the delivery of a reliable system while at the same time building the internal knowledge of WSDOT engineers and technicians.



WSDOT HOT lanes technician Allen Mushatt checks the electronic equipment cabinet, saying, "For the most part, the system monitors itself."

Public Outreach and Communications

Listening: Customer feedback

WSDOT continues to take feedback from drivers and make adjustments to the HOT Lanes program. Examples include:

- Adding signs along the HOT lanes to help drivers better navigate the roadway;
- Improving the HOT lanes website with better and easier-to-find information; and
- Reaching out to *Good To Go!* customers with informative materials included in their billing statements.

Learning: Continuing education

Effective communication with the public is critical for the success of this project. WSDOT plans to increase HOT lanes education in Summer and Fall 2010, and through a statewide tolling outreach program beginning with the SR 520 bridge toll project. Tolling on the existing bridge is scheduled to start in Spring 2011.

The improved WSDOT website facilitates the distribution of information. http://www.wsdot.wa.gov/GoodToGo/

Customer Service Center

... New statewide customer service center coming soon

The *Good To Go!* program includes all customer service related to electronic tolling accounts.

- SR 167 HOT Lane and Tacoma Narrows Bridge drivers use the same transponder on both facilities.
- Monthly account statements contain toll transaction information for both facilities.

A new statewide customer service center that handles all *Good To Go!* accounts and allow cost efficiencies on:

- SR 167 HOT Lanes
- Tacoma Narrows Bridge
- SR 520 bridge which will be converted to a toll facility in Spring 2011.

Customer service highlights include:

- In the first year of HOT lanes operations, new accounts opened at an average monthly rate of 1,500. New transponders sold at a rate of 4,100 per month. During the second year, new accounts opened at an average monthly rate of 1,400 (7 percent decrease), while new transponders sold at a rate of 4,800 a month (15 percent increase).
- SR 167 HOT lane-related phone calls dropped from 2,500 in the first year to 650 in the second year.
- Disputes regarding use of the transponder disabling devices (shields) decreased from 14 disputes per month in the first year to six per month the second year.
- No complaints were received via email since October 2009.

Citizen correspondence

After opening, the HOT lanes project team witnessed a steady decline in public questions and comments (1,200 in May 2008 to fewer than 60 in April 2009). This trend has stabilized at about 55 public comments a month during year two (May 2009 to April 2010). Comments have been both positive and negative. The communications team responded to each of these e-mails, letters and phone calls.

Project Management

Project funding was provided for a total of $17.8 million. The final estimated cost of completion for the HOT lanes was $18.7 million. The increase in cost was the result of higher than expected construction-related traffic control expenditures. The civil construction component of the HOT lanes reached the substantial-completion milestone in May 2008. The toll collection component earned system acceptance in December 2008. An annual Performance Evaluation of the tolling equipment was executed in the winter 2009–2010 to verify the continued operational success of the system.

Problem Solving

The SR 167 HOT Lanes is a four-year pilot project; the project team approaches its development and operation as a learning experience.

The 2010 Washington State Legislature directed WSDOT to study methods that could make the HOT lanes corridor safer and easier to understand. These include:

- review and revision of the current signage and access locations.
- continue to work with the Washington State Patrol for public education on HOT Lane rules
- monitor the high occupancy toll lane performance

WSDOT is addressing these items as shown in Figure 15. As part of its philosophy for the pilot project, the team approached each problem as an opportunity to improve the system and make it more responsive to the unique needs of SR 167 and its commuters.

WSDOT continues to study and improve the HOT lanes system.

Figure 15: Issues and Solutions

Issue	Solution
Driver complaints about restricted lanes	- Public outreach messaging explains safety and flow benefits of restricted lanes - Lengthened northbound access point north of Highway 18
Sensitive algorithm caused toll rates to increase too fast and took too long to reduce	- Adjusted the dynamic-pricing algorithm
Drivers unsure of where to exit HOT lanes in time to catch their highway exit	- Additional signs now indicate where drivers should leave to catch their highway exit
Some drivers do not understand rules	- Public outreach, including the web, YouTube, media reports and correspondence, now explain the rules more clearly - New signs, "◊ or *Good To Go!*" help explain that carpools ride free and solo drivers need a transponder - WSDOT will provide additional public education on HOT lane rules
Driver complaints about transponder shield cost	- Public outreach and correspondence explains why WSDOT could not offer shields free of charge and how this is the most economical option available
Driver complaints about shield placement	- *Good To Go!* is investigating use of new transponders that can be removed and/or temporarily deactivated
HOT lanes still have space available for more vehicles	- Initiated promotional campaign with advertising at gas stations within HOT lanes corridor and directly mail postcards to target zip-codes - HOT lane information added to signs with an easier phone number to remember
Drivers illegally cross over the double-white line; Legislature direction to educate public on the rules related to crossing a double white line	- WSDOT will collect data on double white line crossing violations - WSDOT will test the effectiveness of pylons placed in the buffer area on a section of road within HOT lanes corridor - WSDOT will provide additional public education on HOT lane rules
Drivers not accustomed to the HOT lanes corridor are unsure of the facility; Legislature direction to review and revise appropriate signage	- WSDOT engineers will review and revise appropriate signage

WSDOT improves signage based on customer feedback

In an ongoing effort to help drivers clearly understand how to use the SR 167 HOT lanes, WSDOT is improving signage along the corridor. Drivers were frustrated that they did not know to leave the HOT lanes prior to their destination exit, so WSDOT installed signs indicating the access point to use for each exit (sign on right). The sign on the left helps answer the question, "Who can use the HOT lanes?" WSDOT continues to make improvements based on useful feedback from customers.

Informational sign

Access information sign added by WSDOT in response to citizen requests.

Conclusion

HOT lanes on SR 167 are working. This technology is redefining the use of tolling on our highways and bridges by demonstrating that it is not only a means for funding infrastructure. Tolling now does what additional lane space alone cannot – it gets people safely to where they need to go when they cannot afford to be late.

In the second year of the pilot project, the HOT lanes continued to make SR 167 smarter and more efficient by opening road space that often went underused as an HOV lane even when the general purpose lanes were heavily congested. The HOT lane effectively manages the flow of additional traffic into the carpool lane when space is available. This system preserves free-flowing traffic conditions for carpools and buses at virtually all times, and benefits traffic flow through the entire corridor.

Next Steps

The purpose of this four-year pilot project is to learn how HOT lanes and other forms of variable tolling could be used in Washington to make our highways more efficient at moving people and reducing congestion. It will take Legislative action to extend toll authority for SR 167 HOT lanes after the pilot project period concludes in May 2012.

If WSDOT receives authority to continue using HOT lanes on SR 167, the southbound HOT lane will be extended south to 8th St. E. If authority is not granted, an HOV lane will be built instead. This project to add the new lane to SR 167 is scheduled to be advertised for construction in 2012 and completed in December 2014.

The pilot project on SR 167 is just one tolling application. In addition to expanding the HOT lanes south, WSDOT is considering connecting the HOT lanes to I-405 Express Toll Lanes to create a 50 mile system from Puyallup to Lynnwood. In 2009, the Legislature granted authorization for tolling the SR 520 bridge, which will use a similar *Good To Go!* transponder system as the SR 167 HOT lanes and Tacoma Narrows Bridge. In addition, tolling on the SR 520 bridge will include license plate identification billing for vehicles not equipped with a transponder. Tolling on the SR 520 bridge will differ from HOT lanes as the toll rate will vary based on a preset, time-of-day schedule, and all lanes in both directions on the bridge will be tolled. The WSDOT web site contains updated information on future projects.

Tolling on the SR 520 bridge (potential design)

For more information

SR 167 HOT lanes Web page:
www.wsdot.wa.gov/Tolling/SR167HotLanes/

Tolling Web page:
www.wsdot.wa.gov/tolling/

***Good To Go!* Web page and to open an account:**
www.wsdot.wa.gov/GoodToGo/

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