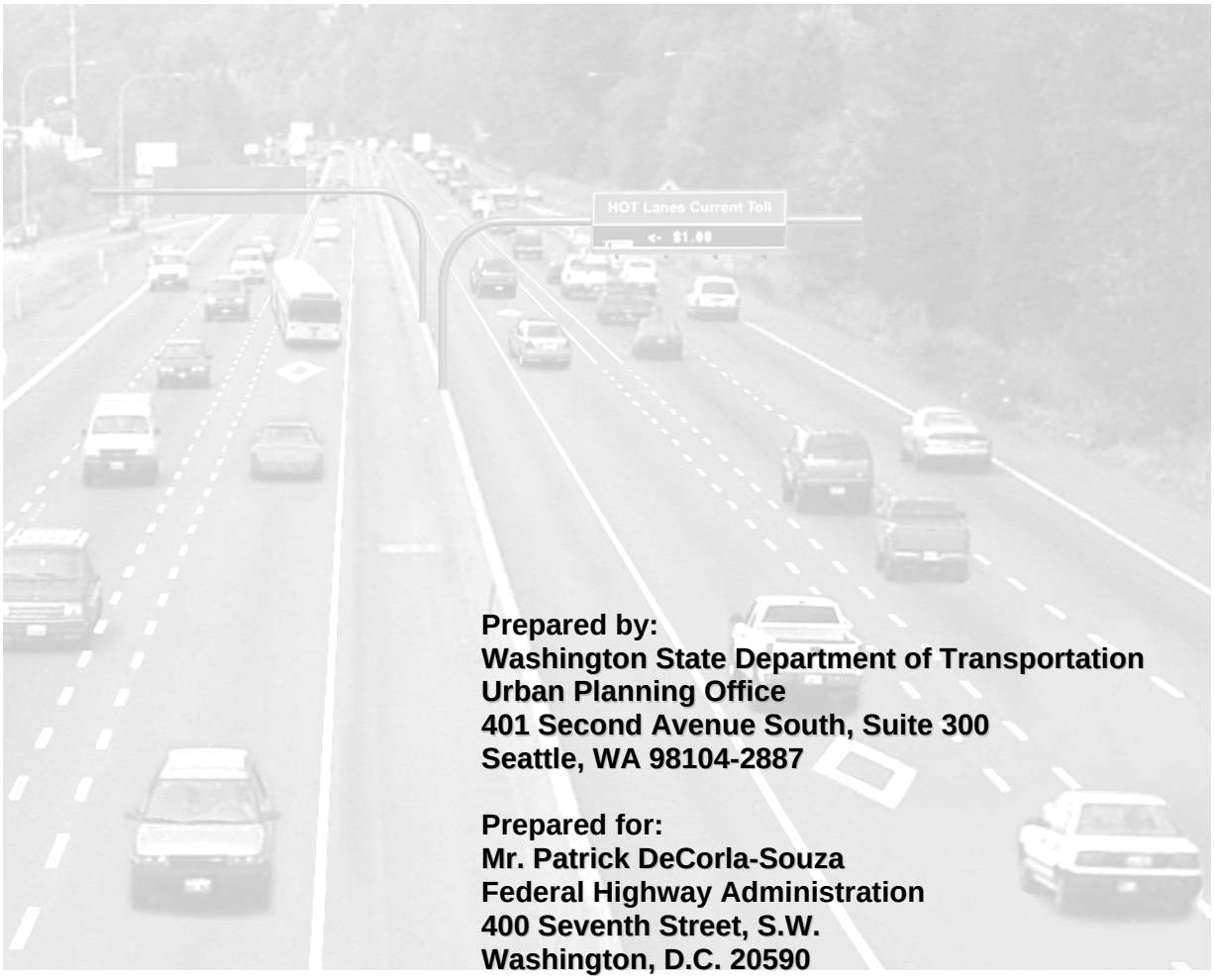
State Route 167 High Occupancy Toll (HOT) Lanes Pilot Pre-implementation Project

Proposed Scope of Work for FHWA Value Pricing Pilot Program 1.18 M grant award



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CONGESTION PROBLEM TO BE ADDRESSED

Over the last decade, congestion in the central Puget Sound region of Washington State has grown steadily worse. Currently, over 30% of the central Puget Sound's core freeway system is congested during peak periods. It is estimated that by the year 2030, over 45% of the core freeway system will be congested. Measures to alleviate the growth in congestion by adding highway capacity are constrained by the region's challenging geography and limited transportation funds. These circumstances have made it clear that innovative new approaches to highway system management – such as value pricing - will be needed to address the region's growing congestion problems.

NATURE OF THE PROPOSED PROJECT

The proposed SR 167 HOT Lane Pilot Project would convert the existing HOV lanes on State Route (SR) 167 within King County, Washington to HOT lanes – approximately nine miles in each direction from I-405 in Renton to Southwest 15th Street in Auburn. This would involve re-striping the existing lanes to create a buffer between the single HOT lane and the two general-purpose lanes. Access to the HOT lanes would be provided at the beginning of the lane and at several mid-point locations between interchanges. A minor improvement to the interchange at I-405 is also proposed.

Access into the HOT lane would remain free for transit, vanpools, and carpools while single occupant vehicles (SOVs) would pay a toll to use the lane. The toll charged for SOVs would be automatically adjusted to ensure that the average vehicle speed in the lane remained above forty-five miles per hour at least ninety percent of the time during the peak hour. SOV users would pay a single entry fee regardless of where they enter and exit the HOT lane.

Toll collection would include an electronic toll collection (ETC) system, comprising vehicle-mounted transponders, over-roadway transponder readers and dynamic toll rate signs throughout the corridor. No tollbooths would be necessary.

According to modeling results, by converting the SR 167 HOV lanes to HOT lanes, the proposed project would move more people and vehicles through the corridor without compromising the speed or travel time reliability for transit. Specifically, during peak hours, there would be an average 12.5 percent increase in the number of vehicles moving through the corridor, and an average 39 percent increase in the HOT lane volume on SR 167 from Renton to Auburn.

The preliminary cost estimate for implementation of the proposed SR 167 HOT Lane Pilot Project is $14.1 million

GOALS OF THE HOT LANE PILOT PROJECT

The primary goal of the SR 167 HOT lane project is to test the viability of the HOT lane concept and determine if and how HOT lanes can be implemented on other highways in the central Puget Sound region. The project objectives include:

- Testing the HOT lane concept's ability to maintain the speed and reliability of the HOV system without adversely impacting congestion along the project corridor and/or the regional highway system.
- Testing the ability of a HOT lane to generate a stream of revenue that can be used to pay for the operation and maintenance of the facility as well as transportation system improvements.
- Assessing the level of public interest and support for the HOT lane concept.
- Collecting performance data to help determine if HOT lanes could be used effectively in other locations and what modifications would be necessary to help ensure their successful implementation.
- Assessing the socio-economic impacts of the facility.

TIMELINE FOR PROPOSED PROJECT

The SR 167 HOT Lane Project is anticipated to open as early as June 2007 with state legislative approval in 2005. The pilot project is scheduled to operate for at least four years. If the pilot project is deemed a success, WSDOT will request authorization to continue HOT lane operations on SR 167.

PROPOSED PROJECT SIGNATORIES

The Washington State Department of Transportation is the proposed signatory for the Value Pricing cooperative agreement with the FHWA.

PROJECT SUPPORT

Since January 2003, WSDOT has been conducting HOT lane outreach activities to reach key target audiences, identify critical issues, address concerns, and ensure local and legislative support for the project. WSDOT has developed a number of project champions including the Chair of the Washington State Legislature's House Transportation Committee, senators on the State Senate's Highways and Transportation Committee, the Washington State Transportation Commission, and the mayors of the cities of Kent and Auburn. Stakeholder support for the HOT Lane Pilot Project includes the King County Department of Transportation (Metro Transit), Puget Sound Regional Council, Sound Transit, and the (PSRC) Regional HOV Policy Advisory Committee.

PUBLIC PARTICIPATION

WSDOT is already working with local, regional and state officials, rideshare organizations, transit agencies, the State Patrol and other stakeholders. Outreach activities have included: one-on-one and group presentations to key audiences; brochure distribution to public officials and via the web site; legislative updates; media relation activities; and targeted messages to constituents. WSDOT plans to expand outreach efforts and launch an educational campaign to target corridor users, and residential and employer markets.

A Stakeholder Advisory Committee comprised of affected jurisdictions, advocacy groups, corridor users, and other affected stakeholders will be consulted at key decision points during the implementation of the pilot study.

ADDRESSING EQUITY CONCERNS

WSDOT recognizes the potential concern relating to social and economic effects of HOT lanes. WSDOT plans to analyze aggregate use data and conduct, as needed, separate surveys to assess usage of the facility in relation to geographic, socioeconomic, and demographic information within the corridor. Survey results will be used to help ascertain actual and perceived questions regarding equitable use of the facility.

REQUIRED LEGAL AND ADMINISTRATIVE AUTHORITY

In order to construct and operate the proposed SR 167 HOT lane project, WSDOT is required to have administrative approval from the Washington Transportation Commission and legal approval from the Washington State Legislature.

In January of 2003, the Washington Transportation Commission passed Resolution 659 directing WSDOT to proceed with steps to advance the SR 167 HOT Lanes Pilot Project proposal for implementation.

The WSDOT will submit SR 167 HOT lane authorization legislation in the 2005 Legislative session (January – May, 2005). Legislators introduced similar legislation during the 2004 Legislative session. The bill passed out of the House but did not pass out of the Senate. WSDOT is confident that concerns expressed in the Senate have been addressed and authorization for the Pilot Project will be granted by the Legislature this session.

FINDINGS FROM COMPLETED PRE-PROJECT STUDIES

Over the last decade WSDOT has conducted both region wide and corridor based evaluations of the managed lanes concept to address the region's congestion problem. Corridor level evaluations of managed lanes in central Puget Sound have included: Interstate-405 (I-405), State Route 99 (SR 99), SR-520, SR-509, I-5, I-90 and SR-167. Managed lane concepts considered to address congestion on these facilities have included the conversion and/or construction of one or more toll lanes, High Occupancy Vehicle (HOV) lanes and High Occupancy Toll (HOT) lanes. Results of these evaluations have generally been favorable, with managed lanes facilities planned for SR 520, I-405, SR 167 and potentially others.

Beginning in February 2003, WSDOT led a comprehensive assessment of central Puget Sound's highway system for the potential site of a HOT Lane pilot project. The comprehensive assessment was a multi-stage process that included research, analysis, outreach and coordination activities at both the local and national level. Five corridors with both substantial congestion levels and surplus HOV capacity were selected as finalists for the pilot project. Of the five corridors, State Route (SR) 167 was selected as the top candidate for a proposed HOT lane pilot project because the corridor has congestion in the peak direction; available HOV lane capacity; and room to make needed improvements.

Value Pricing Pilot Program HOT Lane Pilot Proposal

1. Congestion Problem Being Addressed

Over the last decade, congestion in the central Puget Sound region has grown steadily worse. Currently, over 30% of the central Puget Sound's core freeway system is congested during peak periods. It is estimated that by the year 2030, over 45% of the core freeway system will be congested. By one estimate, the cost of this congestion to residents and businesses in the central Puget Sound region is $1.5 billion annually today and is forecasted to more than quadruple by 2030. Forecasted conditions through 2030 suggest the value of resources lost due to congestion may increase at over three times the rate of growth in personal income.

Measures to alleviate the growth in congestion by adding highway capacity are constrained by the region's challenging geography and limited transportation funds. These circumstances have made it clear that innovative new approaches to highway system management will be needed to address the region's growing congestion problems.

Over the last decade WSDOT has conducted both region wide and corridor based evaluations of the managed lanes concept to address the region's congestion problem. A managed lane can generally be defined as a transportation facility that manages the level of traffic at a steady volume before it breaks down, ensuring a reliable speed advantage when other lanes are congested.

Corridor level evaluations of managed lanes in the central Puget Sound region have included: Interstate-405 (I-405), State Route 99 (SR 99), SR-520, SR-509, I-5, I-90 and SR-167. Managed lane concepts considered to address congestion on these facilities have included the conversion and/or construction of one or more toll lanes, High Occupancy Vehicle (HOV) lanes and High Occupancy Toll (HOT) lanes. Results of these evaluations have generally been favorable, with managed lanes facilities planned for SR 520, I-405, SR 167 and potentially others.

WSDOT has found HOV lanes to be a successful method for managing the capacity of the system. The central Puget Sound region has an extensive network of freeway HOV lanes - totaling over 200 lane miles. At several key screen-line locations across the region, the HOV system effectively moves almost a third of total person trips at these locations in about 16% of the total vehicles. Despite the HOV system's success, forecasts indicate that within a decade, traffic volumes in some HOV lanes may begin to overload the system (assuming current 2+ occupancy requirements) in a number of high demand corridors.

In contrast to existing and projected strains on central Puget Sound's HOV system, there has been a public perception that some HOV lanes are "empty" lanes prompting several initiatives to convert existing HOV lanes to general-purpose (GP) lanes.

Recognizing the region's problem and HOV concerns, WSDOT is evaluating the HOT lane concept as a means to improve traffic management while maintaining the efficiency of the region's HOV system operation. As a type of managed lane, HOT lanes offer the opportunity to optimize existing highway capacity by allowing single

occupancy vehicles (SOVs) the ability to buy in to HOV lanes as long as minimum desired traffic conditions can be maintained.

2. Description of Pricing Program

The proposed SR 167 HOT Lane Pilot Project would convert the existing HOV lanes on State Route 167 within King County, Washington to HOT lanes – approximately nine miles in each direction from I-405 in Renton to Southwest 15th Street in Auburn. This would involve re-striping the existing lanes to create a buffer between the single HOT lane and the two general-purpose lanes. Access to the HOT lanes would be provided at the beginning of the lane and at several mid-point locations between interchanges. A minor improvement to the interchange at I-405 is also proposed.

Toll prices on the facility would be dynamic, varying depending on traffic volumes, and would be set to ensure HOV/HOT lane travel speed and reliability. For the SR 167 HOT lane project, access into the HOT lane would remain free for transit, vanpools, and carpools while single occupant vehicles (SOVs) would pay a toll to use the lane.

GOALS OF THE HOT LANE PILOT PROJECT

The primary goal of the SR 167 HOT lane project is to test the viability of the HOT lane concept and determine if and how HOT lanes can be implemented on other highways in the central Puget Sound region. The project objectives include:

- Testing the HOT lane concept's ability to maintain the speed and reliability of the HOV system without adversely impacting congestion along the project corridor and/or the regional highway system.
- Testing the ability of a HOT lane to generate a stream of revenue that can be used to pay for the operation and maintenance of the facility as well as transportation system improvements.
- Assessing the level of public interest and support for the HOT lane concept.
- Collecting performance data to help determine if HOT lanes could be used effectively in other locations and what modifications would be necessary to help ensure their successful implementation.
- Assessing the socio-economic impacts of the facility.

SELECTING THE LOCATION OF THE HOT LANE PILOT PROJECT

WSDOT evaluated the major HOV corridors in the central Puget Sound region as potential locations for the HOT lane pilot project. The two primary criteria used to evaluate each highway were significant peak period congestion and substantial available HOV capacity. An average travel speed of less than 60 miles per hour (MPH) was used as a surrogate for the congestion evaluation criteria. An average HOV capacity of 1500 vehicles per hour per lane (vphpl) was used as the HOV capacity evaluation criteria. This 1500 vphpl threshold was used to determine if the HOT lane could generate enough revenue to support itself[1] at this minimum level of vehicle throughput,

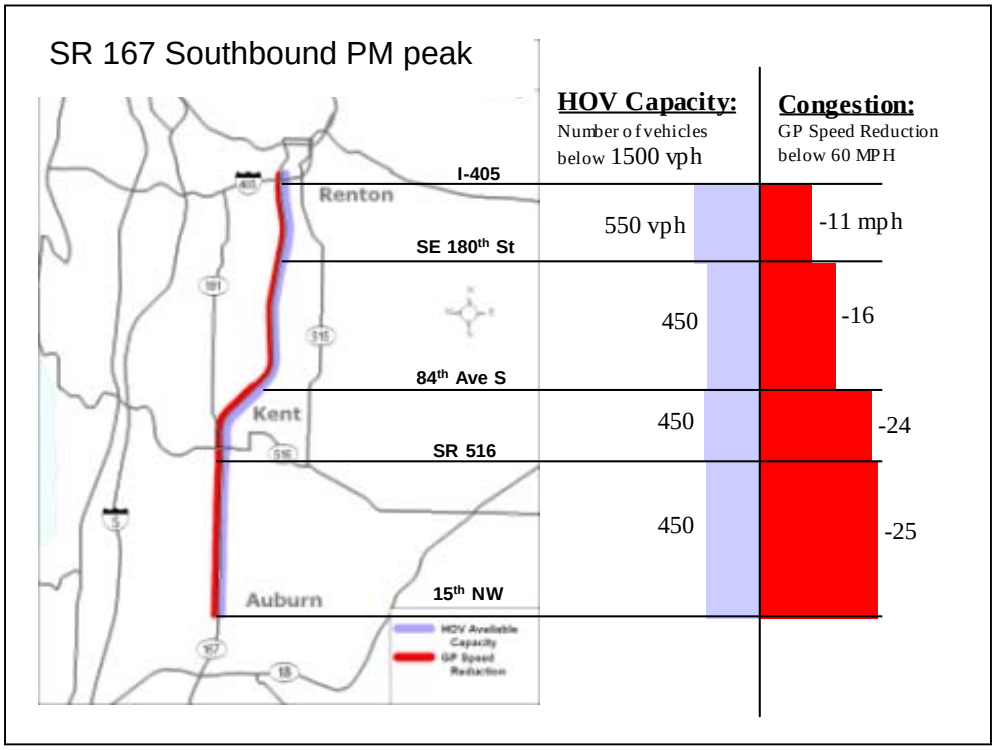
[1] WSDOT's current operating standard for an HOV lane is a minimum speed of 45 mph which is equivalent to approximately 1800 vphpl – this standard will be maintained for the HOT lane pilot. The initial screening level threshold of 1500 vphpl was used to

Five corridors with both substantial congestion levels and surplus HOV capacity were selected as finalists for the pilot project. Of the five corridors, State Route (SR) 167 was selected as the top candidate for a proposed HOT lane pilot project because the corridor:

- Has congestion in the peak direction;
- Available HOV lane capacity; and
- Room to make needed improvements.

In comparison to the other candidate corridors, the SR 167 HOV lane segment had the highest unused HOV capacity combined with substantial GP speed reductions and a consistent length of unused HOV capacity. Figure 1.0 shows that, based on a threshold of 1500 vehicles per hour, there is room for at least 450 more vehicles in SR 167's HOV lane. Combined with current peak hour speed reductions between 15 and 25 mph, SR 167 quickly became the top candidate for consideration of HOV to HOT conversion.

Figure 2.0 HOV Capacity and Congestion



DESCRIPTION OF HOT LANE FACILITY

The conceptual design proposes the conversion of the HOV lanes on SR 167 within King County to HOT lanes – approximately nine miles in each direction from I-405 in Renton to Southwest 15th Street in Auburn. This would involve re-striping the

provide a more conservative basis for the initial screening of corridors than WSDOT's minimum operating HOV standards. Using the current operating standards, it is realistic to expect the facility to operate closer to 1800 vehicles per hour – providing even more available HOV capacity.

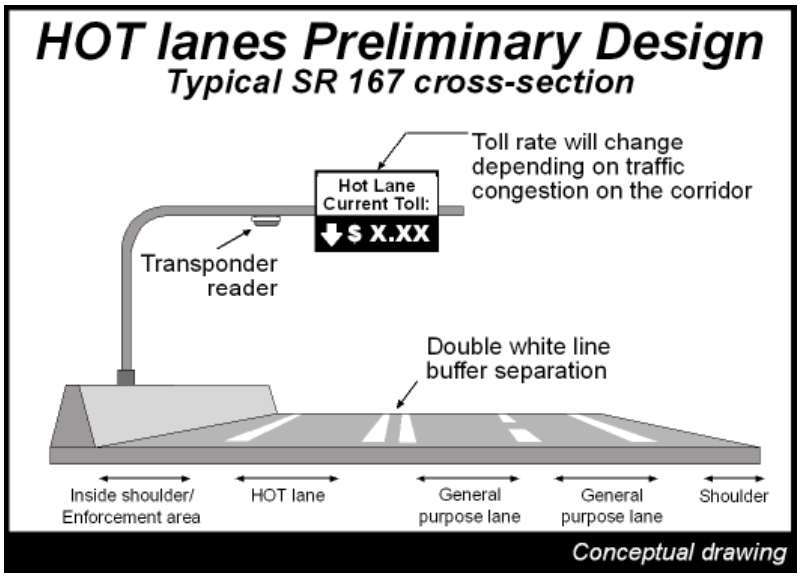
existing lanes to create a buffer between the single HOT lane and the two general-purpose lanes. A minor improvement to the interchange at I-405 is also proposed.

SOV users would pay a single entry fee regardless of where they enter and exit the HOT lane. The toll charged for SOVs would be automatically adjusted to ensure that the average vehicle speed in the lane remained above forty-five miles per hour at least ninety percent of the time during the peak hour. Peak period toll rates for 2007 are estimated between $1.30 and $3.10 per trip. Please see Appendix B for the complete estimated toll rate schedule.

HOT LANE CONCEPTUAL DESIGN

Toll collection would include an electronic toll collection (ETC) system, comprising vehicle-mounted transponders, over-roadway transponder readers and dynamic toll rate signs throughout the corridor. No tollbooths would be necessary.

Figure 2.1 Conceptual cross-section of a HOT Lane



Access

Drivers would access the HOT lanes at the beginning of the HOT lanes or at several mid-point access locations: openings in the buffer that separates the HOT lane from the adjacent general-purpose lane.

The buffer opening will be a minimum of 1,000 feet in length, allowing access both into and out of the HOT lane per FHWA standards. A total of four mid-point accesses are proposed for the northbound lane and three for the southbound. (NOTE: The HOT lane concept presented is currently in preliminary design; design refinements may result in buffer, shoulder width and mid-point access design variations.)

Enforcement and Incident Management

The project will include enhanced enforcement and incident response. Enforcement and incident response plans will include guidelines for review/modification based on the facility's observed/ perceived violation rates and the type/number of accidents. Key elements of the plans are presented below:

Disabled vehicles and incident response

The project will utilize an enhanced WSDOT Incident Management Response Service. The Incident Response teams are available 24-hours a day, seven days a week, to provide traffic control, traffic rerouting, mobile communications, and assistance in incident clearance and clean up. Teams help motorists with flat tires, jump starts, a gallon of gas, and many other types of motorist assistance. The pilot project will increase the level of Incident Response during peak periods.

Enforcement Approach

The Washington State Patrol (WSP) will enforce compliance on the SR 167 HOT Lanes Pilot Project. WSP will be able to monitor toll compliance by viewing a "light" on the toll transponder reader, which will indicate whether a valid toll transponder transaction has taken place (see Figure 2.1). If a valid toll transaction is not observed, a WSP officer will determine the vehicle's occupancy. If it does not meet the minimum required vehicle occupancy for HOV's, the officer will stop the vehicle, or radio a downstream officer for enforcement.

The HOT lanes pilot project allows vehicles flexibility to alternate between being a solo driver or a 2+ user. If a driver with a valid toll transponder chooses to use the facility while qualifying as an HOV, the transponder can be shielded by placing it in a protective "bag" before entering the toll lane so it does not get charged a toll.

PERFORMANCE

By converting the HOV lanes to HOT lanes, the proposed project would move more people and vehicles through the corridor without compromising the speed or travel time reliability for transit. Specifically, during peak hours, there would be an average 12.5 percent increase in the number of vehicles moving through the corridor, and an average 39 percent increase in the HOT lane volume on SR 167 from Renton to Auburn.

Traffic conditions for the peak travel direction during the peak traffic periods were modeled for the year 2005 with the following results:

SR 167 southbound p.m. peak hour:

- Total number of vehicles traveling through the SR 167 project corridor - all three lanes - increased 13 percent with HOT lanes.
- Total number of vehicles traveling in the HOT lane increased 59 percent.

SR 167 northbound a.m. peak hour:

- Total number of vehicles traveling through the SR 167 project corridor - all three lanes - increased 12 percent with HOT lanes.
- Total number of vehicles traveling in the HOT lane increased 20 percent.

Despite the increase in the number of vehicles traveling through the SR 167 corridor, the overall speed of the HOV/HOT lanes did not decrease. Speeds in the general-purpose lanes were unchanged or improved by up to 10 mph, depending on location and time of day. Thus, analysis indicates that conversion of the existing HOV lane to a HOT lane would yield substantial benefits. These benefits are the direct result of more efficient utilization of the facility.

OPPORTUNITIES PROVIDED BY THE HOT LANE PILOT PROJECT

In addition to improving traffic flow and person throughput on the SR 167 corridor, implementation of the SR 167 HOT lane Pilot Project would afford the following additional opportunities and benefits at the regional, state and national level.

State and Regional Benefits

- Helps preserve Washington state's HOV system. As noted in Section 1.0, numerous initiatives have been presented in the state of Washington to convert HOV lanes to general-purpose lanes. If the HOT lane concept were determined to be feasible and effective, implementation of HOT lanes would create a win-win for HOVs *and SOVs*. A successful demonstration of HOV to HOT conversion would show that a superior alternative exists to either simple HOV lanes or conversion to general-purpose use.
- Helps preserve the natural environment. The HOT lane project would yield significant environmental benefits. The facility would improve traffic flow conditions and roadway efficiency thereby deferring if not avoiding future roadway widening and associated environmental impacts.
- Provides a critical test for regional pricing policy. As the Puget Sound region struggles with large and ever expanding transportation challenges, various roadway-pricing concepts have been suggested. This HOT pilot project will help inform the regional pricing debate by answering questions about the viability and actual benefits of congestion pricing on a regional highway.

National Benefits

The SR 167 HOT lane Pilot project will add to the national knowledge base by providing additional information on the following aspects of HOT lanes:

- Performance benefits - provides a complete data set documenting before and after conditions on the facility and transit operations in the corridor. This data is being collected both for SR 167 and system-wide, allowing statistically valid comparisons with un-priced facilities.
- User characteristics – especially as it relates to Environmental Justice and equity issues
- Mid-point access – especially as it relates to enforcement, incident management, and safety

- Tolling system integration – the SR 167 project will serve as a useful case study of how HOT lane tolling for an HOT lane can be integrated with toll collection for the state ferry system, the Tacoma Narrows bridge, and possibly other transportation facilities and services.
- HOT/HOV system integration - the project will document how operation and enforcement of an HOT facility can be integrated into an existing (and expanding) HOV lane system.
- Verification of key travel behavior assumptions – because the Puget Sound Regional Council (PSRC) is conducting a GPS based study of roadway pricing in the Puget Sound region, the SR 167 HOT Lane project provides an unprecedented opportunity to cross check key assumptions about travel behavior and the value of time.

The high level of system integration and data collection already underway establishes the proposed project as an especially useful case study. Not only will the project thoroughly document solutions to technical challenges not found on most of the HOT facilities implemented to date, the SR 167 HOT Lane project will also verify key travel behavior assumptions by comparison with the PSRC's global positioning system (GPS) based value pricing study.

3. Addressing the Potential Social and Economic Effects of HOT Lanes

WSDOT recognizes the potential social and economic effects of HOT lanes. WSDOT plans to analyze aggregate use data and conduct, as needed, separate surveys to assess usage of the facility in relation to geographic, socioeconomic, and demographic information within the corridor. Survey results will be used to help ascertain actual and perceived questions regarding equitable use of the facility.

Potential equity impacts will be examined in detail. Transit service, fares, ridership trends, and changes in mode share will be included in the equity analysis. Equity will be examined in terms of toll payments relative to income, travel time savings, and transit subsidy.

To the extent data permits, equity impacts on non-users also will be assessed. WSDOT will work with the PSRC and other agencies to obtain demographic and income data needed to estimate benefits for user and non-user groups.

4. The Role of Alternative Transportation Modes and Anticipated Enhancements

Transit, vanpools and carpools would continue to have priority for the use of HOT lanes. General-purpose traffic would only be allowed to use the lanes when they can do so without causing congestion in the HOT lanes. HOT lane tolls would be set to control the number of vehicles using the lane in order to maintain 45 mph travel speed for HOVs at least 90% of the time. In the SR 167 HOT Lane Pilot Project, buses, carpools and vanpools could use the HOT lanes free of charge. The highest

current mode split in the corridor during the peak hours is 33% HOV and 67% SOV, however, the HOV lane is carrying these trips in only 20% of its total vehicles.

5. Tasks and Costs

The cost estimate for the SR 167 HOT Lane Pilot Project is approximately $14 million. This cost estimate is based on conceptual design information (1% design) and will be refined as planning and design efforts proceed. This estimate includes the capital and administration costs of implementing the pilot project's conceptual design. The facility's operation and maintenance costs have not been included since they will be paid for by revenue generated by the facility.

The cost estimate also assumes some cost savings in tolling technology design and back-office set-up by utilizing tolling technology experience from the Tacoma Narrows Bridge (TNB) Project. The TNB project, which is scheduled to open before the SR 167 HOT lane project, will utilize an ETC based tolling technology. In accordance with Washington state law, the tolling technology must be compatible with the SR 167 HOT lane project and other tolled facilities/ programs.

The project will be managed by WSDOT in close coordination with interested federal, state and local agencies including FHWA, King County Metro Transit and Sound Transit. It is anticipated that a design-build-operate process will be utilized. A Stakeholder Advisory Committee comprised of affected jurisdictions, advocacy groups, corridor users, and other affected stakeholders will be consulted at key decision points during the implementation of the pilot study.

The proposed SR 167 HOT Lane Pilot Project would convert the existing HOV lanes on State Route (SR) 167 within King County, Washington to high occupancy toll (HOT) lanes – approximately nine miles in each direction from I-405 in Renton to Southwest 15th Street in Auburn. This would involve re-striping the existing lanes to create a two-foot buffer between the single HOT lane and the two general-purpose lanes and installing a tolling system. Access to the HOT lanes would be provided at the beginning of the lanes and at several mid-point locations between interchanges

The comprehensive scope of work to move from conceptual design to operation and ultimately evaluation of the SR 167 HOT Lanes Pilot Project is presented in Appendix A. The comprehensive project scope has four major sequential and potentially over lapping phases: Planning, Design, Construction, and Operation (see Table 6.0).

PROPOSED SCOPE OF WORK FOR FHWA $1.1.8 MILLION GRANT AWARD

The following scope of work has been prepared for the $1.18 million grant from the Federal Highway Administration's Value Pricing Pilot Program awarded in November, 2004 to the Washington State Department of Transportation for the SR 167 HOT Lanes Pilot Project. This scope completes the majority of the Planning phase of the project and initiates preliminary design of the project (see Table 6.0). The primary objectives of this scope of work are to:

- Develop an overall work program and "Concept of Operations Plan" for the entire project - from the planning phase through opening of the facility

- Develop the preliminary design of the facility to approximately 15% - including a conceptual tolling system/ ITS plan, channelization plan, base mapping and survey road work
- Refine traffic, revenue and cost estimates
- Assess travel behavior on SR 167
- Assess public attitudes and concerns regarding HOT lanes on SR 167
- Complete the NEPA and SEPA environmental analyses

Specific tasks proposed to accomplish these objectives are presented below. See page 13 for an estimated budget to complete these tasks. This scope of work is estimated to take approximately six to seven months to complete. See page 14 for a proposed schedule to complete these tasks.

Project Management

This scope of work will be managed by the Washington State Department of Transportation (WSDOT) in close coordination with interested federal, state and local agencies including the Federal Highway Administration (FHWA), King County Metro Transit and Sound Transit. Scope tasks will be conducted by a combination of WSDOT staff and consultants.

Task 1. Preliminary Engineering and Tolling System Design

The SR 167 HOT Lanes Pilot Project system design is currently very conceptual (at approximately 1% design). The "HOT Lanes System" is defined as all components of the SR 167 HOT lanes including the physical facility, tolling technology/ ITS, and back office operations and administration. Task 2 of this scope of work further develops and refines the HOT lanes tolling system design and outline how the system will be designed, constructed, operated, maintained, and administered.

Task 1 scope deliverables are as follows:
- HOT Lanes System Concept of Operations Plan (Task 1.1)
- Preliminary System Design to approximately 15% (Task 1.2)
- Updated Traffic Analysis (Task 1.3)
- Updated Revenue Analysis (Task 1.4)
- Operations, Maintenance, and Enforcement Plan (Task 1.5)
- Performance Monitoring Plan (Task 1.6)
- Project Delivery Recommendation (Task 1.7)
- Overall Project Work Program (Task 1.8)

A description of these deliverables and subtasks required to produce them are provided below.

1.1 Concept of Operations Plan: The Concept of Operations Plan will answer the questions pertaining to how the SR 167 HOT lanes system will be designed, constructed, operated, maintained and administered. The Concept of Operations Plan will serve as the "guidebook" or "roadmap" of how to get from the preliminary design to the opening of the facility and will include:
- A description of project organization/ management structure from the planning phase through operation.
- Identification of key elements/components of the planning, design, construction, and operation phases of the project as well as critical milestones/ decision points.

- Description of the proposed physical and operational changes to the existing High Occupancy Vehicle (HOV) lanes (at 15% design) and the potential impact of these changes.
- A step-by-step conceptual description of how the HOT lanes system will operate, be maintained and administered. It will include a functional description of the pricing strategies, technology functions, account management procedures, and enforcement strategies to be used. It will also include an updated financial analysis and revenue forecasts.

The Concept of Operations Plan will be supplemented with appropriate documentation sufficient to address Federal interests. As indicated in the Federal-aid Highway Program Guidance on HOV Lanes, applicable federal interests include consistency with the provisions of 23 and 49 U.S.C., mitigation commitments made pursuant to the NEPA process as described in 23 C.F.R. Part 771, any authorization documents and project (funding) agreements from past Federal-aid projects in the corridor, transportation planning requirements, and transportation conformity requirements under the Clean Air Act (40 C.F.R. Parts 51 and 93).

1.2 Preliminary System Design: The system requirements for the SR 167 HOT Lanes Pilot Project will be defined and documented based upon the Concept of Operations Plan. System requirements to be defined include the functional, performance, interface, operational, data, administrative, maintenance and enforcement requirements of the proposed system. Using these requirements, a preliminary system design (to approximately 15%) will be developed for the proposed HOT lanes system.

Specific deliverables to be completed under this task include the following:

- Channelization Plan
- Road surveys and base mapping
- Conceptual Plan for Tolling System ITS architecture – including the preliminary design for the electronic roadside toll system and all necessary system components including toll readers, transponders, electronic message signs, enforcement technology, software and necessary geometric improvements required for the project.
- Revised project cost estimate

The design of the SR 167 pilot project tolling system will be compatible with the WSDOT's regional/statewide ITS architecture and consistent with the National ITS Architecture guidelines of the Federal Highway Administration. The system design will include an open system architecture to allow for future system expansion and enhancements.

1.3 Updated Traffic Analysis: The initial traffic analysis conducted in 2003 will be updated, refined, and will reflect the preliminary system design outlined in Task 2.2. The traffic analysis will include assessing baseline operations and performance of the facility. Data collected will include traffic counts, occupancy counts, travel speeds, HOV and transit utilization, travel time/delay, incidents and user infractions along the corridor.

The initial traffic operations analysis and simulation modeling conducted in 2003 to determine traffic impacts to the SR 167 HOV lanes and general lanes with the presence of a HOT lane facility will be refined. As necessary, this task will include

additional validation of the traffic data/operations of the SR 167 corridor, determination of the extent of any traffic queues during HOT lane operations, analysis of corridor traffic entrance/exit points to help identify HOT lane entrance and exit points.

The traffic operational analysis will quantify the benefits of modifying the current HOV operation, and will ensure that it will be possible to allow single-occupant vehicles to "buy in" to the HOT lanes without significantly degrading the level of service for carpools and transit vehicles. The traffic operational analysis will also identify potential weaving patterns between anticipated points of access and egress from the HOT lanes and downstream or upstream ramps to and from the general-purpose lanes. The traffic analysis will be performed for the four-year duration of the project (assumed to be 2007 through 2011).

1.4 Updated Revenue Analysis: The revenue analysis will refine the initial revenue estimate for the HOT lane project performed in 2003. The revenue analysis will estimate demand for the facility, revenue forecasts and the range of pricing strategies and rates needed to effectively manage demand. It will also provide estimates of entering and exiting traffic at each access point for input to the traffic operations impact analysis. The revenue analysis will be performed for fiscal year (FY) 2008 to FY 2028 – with an emphasis on FY 2008 to FY 2016.

1.5 Operations, Maintenance and Enforcement Plan: A conceptual operations, maintenance and enforcement plan will be developed using the system requirements outlined in task 1.2. This plan will identify and document a strategy to operate, administer, enforce, maintain and subsequently monitor the performance of the HOT lane system. This plan will incorporate appropriate findings from the Concept of Operations Plan and define and describe personnel and financial resources needed to effectively operate, administer, maintain and monitor the subsystems deployed as part of this Project. Monitoring activities will be consistent with those outlined in Task Performance Monitoring Plan.

This plan will specifically document policies and procedures to interact with current Washington State Patrol operations and a strategy and administrative procedures to allow for proper enforcement of the HOT lanes by the Washington State Patrol and other local enforcement agencies.

1.6 Performance and Travel Response Monitoring and Evaluation Plan: WSDOT intends to annually monitor both the performance of the SR 167 HOT Lanes and the impact of the HOT lanes conversion on corridor users. The Performance Monitoring Plan will identify the process and procedures for collecting and reporting the results of monitoring activities. In accordance with the proposed SR 167 HOT Lanes legislation, annual monitoring activities will at a minimum include reporting on facility use data and a review of the impacts on:

- Freeway efficiency and safety;
- Effectiveness for transit;
- Person and vehicle movement by mode;
- Ability to finance improvements and transportation services through tolls; and
- Corridor users – with a focus on the equitable use of the facility.

The plan will identify how to modify the pilot project to address identified performance and safety issues and how to mitigate negative impacts on corridor users.

Prior to opening the facility, baseline corridor performance and public opinion of SR 167 HOT Lanes will be assessed. Once the facility becomes operational, baseline performance and public opinion research will be compared to operational data.

1.7 Project Delivery : An evaluation of the pros and cons of different project delivery options will be provided. This evaluation will include a description of the alternative organizational structures, schedules, and cost estimates of project delivery under a traditional project delivery approach, a design-build approach, and a design-build-operate approach. This task will include a recommendation on the best project delivery approach for the project.

1.8 Work Program: A project work program will be developed to guide the overall sequence of activities and management approach for the project outlined in the Concept of Operations Plan (Task 1.1). The work program will include a project schedule of each task including establishing institutional agreements, developing the ITS project architecture, deploying system components, system operations and maintenance. This plan will also include a conceptual deployment plan with schedules that show when and where each component of the system will be deployed. The work plan will address systems engineering and software acquisition practices to be followed, including the risk management, configuration management, software acquisition, and system acceptance testing approaches to be used throughout the project.

Task 2. NEPA and SEPA Environmental Analysis

A National Environmental Policy Act (NEPA) Document Categorical Exclusion (DCE) and a SEPA Expanded Checklist will be prepared. These documents will include a detailed analysis of potential effects to traffic, air quality, noise, and economically disadvantaged populations. Public opinion research and outreach activities described in Tasks 3 and 4 will be coordinated with the NEPA and SEPA analysis. Public opinion research and outreach results will be integrated into the NEPA DCE and SEPA development process and documentation as applicable.

Task 3. Public Opinion Research

WSDOT recognizes that in order to have a successful pilot project that is understood and supported by the public, a substantial public involvement and education campaign must be implemented. As a part of the Scope of Work, WSDOT will conduct several public opinion research activities including an origin and destination study and a telephone survey. This research will serve as input into the later development of the education/marketing plan as well as provide modeling inputs about motorist preferences and attributes. Specific deliverables to be completed under this task include reports on the results of the origin/destination and mail-back surveys, literature review, and public opinion phone surveys. These reports will include recommendations on how to address the issues and concerns identified by these research activities. A more detailed description of the scope of work for this task is included in Appendix D.

Task 4. Public Outreach

Public outreach and education will continue to occur during this phase of the project. Public outreach and education activities will utilize information collected from the public opinion research activities described in Task 3. Public outreach activities will include meetings with stakeholders, media outreach, presentations to interested organizations and agencies, and involvement in public meetings and other events. Public input received through these activities will be incorporated into the design, planning, and other elements of the project as deemed appropriate.

FHWA 1.18 MILLION GRANT AWARD BUDGET PROPOSAL

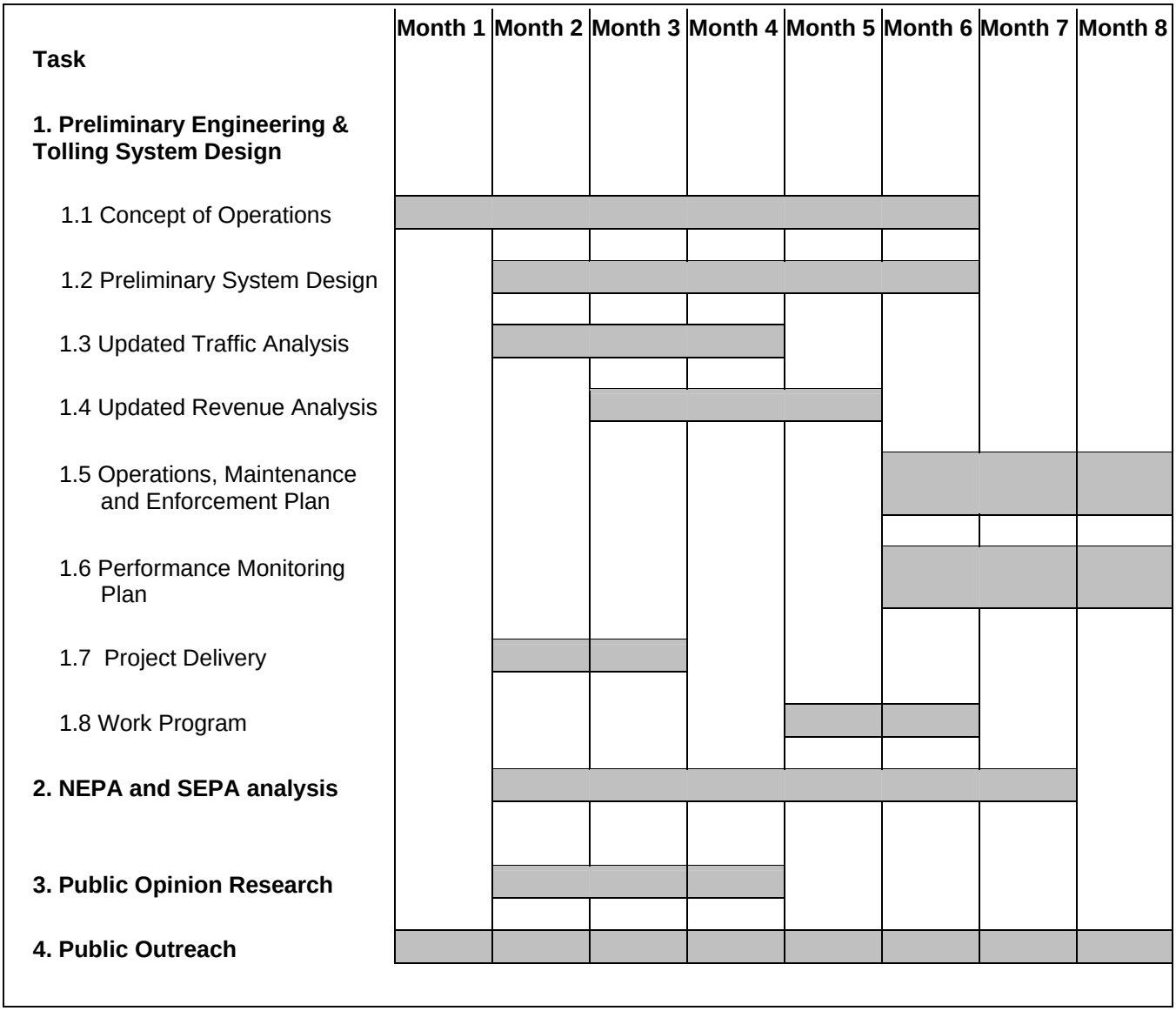
The following budget is proposed to complete the tasks presented in the scope of work for the $1.18 M grant award.

Proposed Budget for $1.18 M FHWA Grant Award		
Task	**Cost[1]**	**Details/ Comments**
1. Preliminary Engineering & Tolling Operations Concept	$ 900,000	Concept of Operations Plan, overall work program, channelization plan, base-mapping, survey work
1.1 HOT Lanes System Concept of Operations Plan	$ 100,000	
1.2 Preliminary System Design - with facility design to approximately 15%	$ 600,000	
1.3 Updated Traffic Analysis	$ 97,000	
1.4 Updated Revenue Analysis	$ 65,000	
1.5 Operations, Maintenance, and Enforcement Plan	$ 10,000	
1.6 Performance Monitoring & Evaluation Plan	$ 10,000	
1.7 Project Delivery Recommendation	$ 8,000	
1.8 Overall Project Work Program	$ 10,000	
2. NEPA and other regulatory requirements	$ 150,000	Assumes NEPA DCE w/ discipline reports
3. Public Opinion Research	$110,000	Phone Survey Origin & Destination Study
4. Public Outreach	$ 20,000	Public meetings, outreach materials
TOTAL	$1,180,000	

[1] Approximately 90% of total project costs are for consultant services with approximately 10% for WSDOT oversight and management.

PROPOSED SCHEDULE FOR SCOPE OF WORK

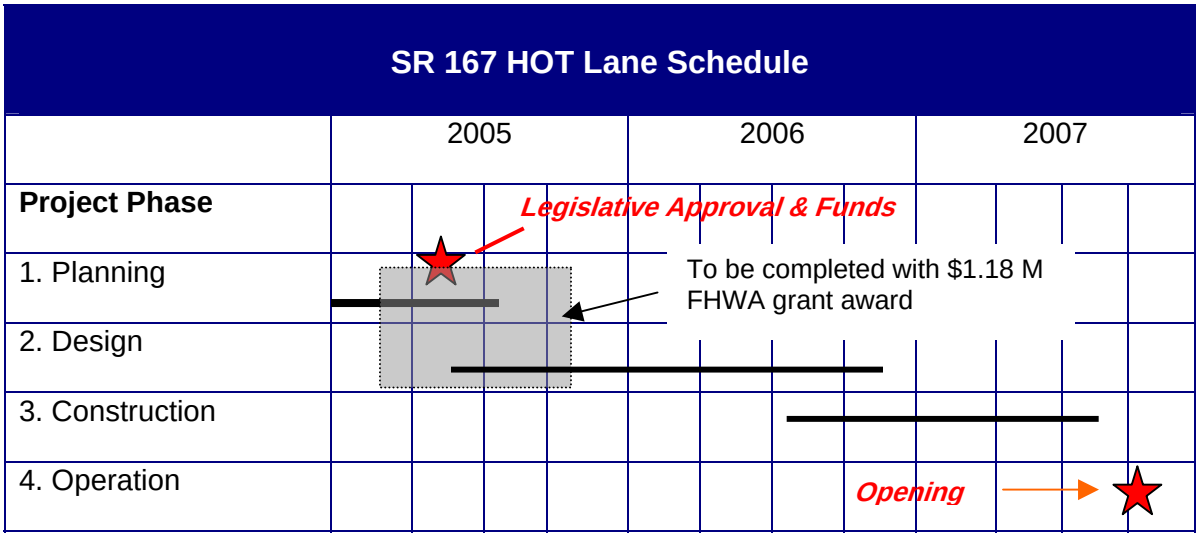
The following scheduled is proposed for the scope of work. This schedule assumes all contract agreements and other administrative procedures required to complete this scope work have been completed. This schedule is subject to change if unexpected schedule altering events/issues occur.



6. SR 167 Project Timeline

With state Legislative approval, the SR 167 HOT Lane Project is anticipated to open as early as in June 2007 (using a design/build approach) and operate for at least four years. If the pilot project is deemed a success, WSDOT will request authorization to continue HOT lane operations. Table 6.0 below outlines the major phases of the project - with project planning beginning in early 2005.

Table 6-0. Preliminary Pilot Project Schedule



The proposed schedule is an optimistic estimate of the time required to implement the HOT lane project and assumes a design-build project delivery approach. Some efficiencies and timeline reductions could be gained by utilizing a design-build-operate approach. This schedule assumes project approval by the state Legislature in 2005. Delays to the schedule could occur if WSDOT does not receive state Legislative approval, sufficient funding, or if a design-bid-build approach is utilized.

7. Monitoring and Evaluation

Monitoring and evaluation of the SR 167 HOT lane's performance is a critical element of the project. Data collected from the HOT lane project will be not only be used to optimize the design and operations of the facility, but will also help determine if HOT lanes are a viable concept on other travel corridors in central Puget Sound and elsewhere in the state.

WSDOT is required to monitor the project and report annually to the state Transportation Commission and Legislature on its performance. At a minimum, WSDOT will provide facility use data and review the impacts of the project on:

- Freeway efficiency and safety;
- Effectiveness for transit;
- Person and vehicle movement by mode;
- Ability to finance improvements and transportation services through tolls; and

- The impact on all highway users. Specifically, WSDOT will analyze use data and conduct needed Origin/ Destination and other surveys to assess usage of the facility in relation to travel behavior, geographic, social economic, and demographic information. Information will also be used to ascertain actual and perceived questions of equitable use of the facility.

The following project performance and user data will be collected for the duration of the project – from the Planning Phase through operations:

- Traffic counts
- Occupancy counts
- Travel speeds
- HOV and transit utilization
- Vehicle throughput
- Number/ type of incidents
- Number/type of infractions
- Demographic characteristics
- Employment characteristics

WSDOT will collect data from January 2005 until the opening of the facility to establish the baseline characteristics of the corridor. Once the facility becomes operational in the summer of 2007, baseline data will be compared to collected operational data.

8. Finance and Revenue Plan

FINANCE PLAN

The preliminary cost of the pilot project is approximately $14.1 million. This cost estimate does not include maintenance and operation costs which will be funded by revenue generated by the facility. There are no secured sources of funds at this time. To date, WSDOT has conducted its extensive managed lane analyses and HOT Lanes Pilot Project development within its existing planning program budget.

Table 8.0 HOT Lane Project Implementation Costs and Funding

Activity	Amount	Source
Planning & Design*	$3,655,750	• FHWA Value Pricing Program • WSDOT
Construction	$10,445,000	State Funding**
Maintenance and Operations	$850,000***	Toll Revenues

* Several of the tasks presented under the Planning Phase and Design Phase in Section 7 will begin or continue into other phases the project (e.g. project management and outreach). The estimated costs for each phase in Section 7 takes this expenditure approach into account. In contrast, Table 8.0 presents the total cost of all tasks for the three activities: Planning; Design; and Maintenance and Operations - regardless of the specific phase where the money will be spent.

** It is anticipated that the State Legislature will require that net toll revenues be utilized for debt reduction associated with the project. The pilot project is set for 4 years. As shown in the chart below, given projected net revenues, it would take approximately 12 years to repay bonded dept associated with state bonding of construction.

*** See Maintenance & Operations cost below.

The remaining required funding ($11.1 million) to implement the project will be sought from the Washington State legislature in spring 2005. Toll revenues will fund maintenance and operation costs. The facility is expected to be operationally self-sustaining within the first full year of operation.

USE OF GENERATED REVENUE

Use of the toll revenues generated from the project will be strictly controlled. The proposed state tolling authorization legislation establishes a separate multi-modal fund in the State Treasury for toll revenues from the project. These toll funds can only be allocated by the State Legislature and may only be used for: "…debt service, planning, administration, construction, maintenance, operation, repair, rebuilding, enforcement, and expansion of high-occupancy toll lanes and to increase transit, vanpool and carpool, and trip reduction services in the corridor. A reasonable proportion of the moneys in this account must be dedicated to increase transit, vanpool, carpool, and trip reduction services in the corridor."

As presented in Table 8.1 below, Wilber Smith Associates conducted a preliminary toll revenue estimate in 2003. Tolling projections will be updated during the principle engineering and design phase of the project. The adjacent chart shows the revenue projections for the project and estimates for maintenance and operations.

It is anticipated that the State Legislature will utilize a majority of net toll revenues for debt reduction associated with the project with a portion of these revenues to be used to increase transit, vanpool, carpool, and trip reduction services within the SR 167 corridor.

Table 8.1 Preliminary Estimated Toll Revenue, M&O, and Net Toll Revenue

Year	Annual Gross Toll Revenue Lagged Two Years	Estimated Operations & Maintenance Costs	Net Toll Revenue
2005			
2006			
2007	$1,147,000	$850,000	$297,000
2008	1,521,000	$875,500	$645,500
2009	1,743,000	$901,765	$841,235
2010	1,798,000	$928,818	$869,182
2011	1,855,000	$956,682	$898,318
2012	1,914,495	$985,383	$929,112
2013	1,966,000	$1,014,944	$951,056
2014	2,018,000	$1,045,392	$972,608
2015	2,072,000	$1,076,755	$995,245
2016	2,127,205	$1,109,057	$1,018,148
2017	2,191,021	$1,142,329	$1,048,692
2018	2,256,752	$1,176,598	$1,080,154
	22,609,473	$12,063,223	$10,546,250

Source: Toll revenue based on Wilbur Smith Associates August 19, 2003

Notes:

- Start of toll revenues are lagged two years to 2007 to reflect estimated project completion.
- First year revenues have been reduced by 30% to take into account the effects of ramp-up in demand. 2007 tolls will be lower due to mid-year start of operations. Second year revenues have been reduced by 10%

Maintenance & Operations cost are estimate at $600,00 per year w/ 3% annual inflation rate. Enhanced enforcement, incident response, and project management are an estimated additional $250,000 per year w/ 3% inflation rate 3%.

9. Stakeholder Involvement and Public Outreach

WSDOT is planning an intensive public outreach and marketing campaign for the SR 167 HOT Lane Pilot Project. Public involvement efforts have been ongoing since the early planning phases of the HOT lane project. WSDOT plans to expand outreach efforts and launch an educational campaign to target corridor users, and residential and employer markets. WSDOT is already working with local, regional and state officials, rideshare organizations, transit agencies, the State Patrol and other stakeholders.

The public outreach and education campaign will be continuous within each of the four phases:

- Planning
- Design
- Construction
- Operations

PRE-PLANNING ACTIVITIES

Since January 2003, WSDOT has been conducting HOT lane outreach activities to reach key target audiences, identify critical issues, address concerns, and ensure local and legislative support for the project. WSDOT has developed a number of project champions including the Chair of the Washington State Legislature's House Transportation Committee, senators on the State Senate's Highways and Transportation Committee, the Washington State Transportation Commission, and the mayors of the cities of Kent and Auburn.

WSDOT has worked with key stakeholders to address their issues and concerns. Stakeholder support for the HOT Lane Pilot Project includes local cities, King County Department of Transportation (Metro Transit), Puget Sound Regional Council, Sound Transit, and the Regional HOV Policy Advisory Committee. Please see Appendix E for a sampling of SR 167 HOT lane letters of support.

The central Puget Sound region's major newspapers have published editorials supporting the project: The Tacoma News Tribune, King County Journal, The Seattle Times and Seattle Post-Intelligencer.

Outreach activities have included: one-on-one and group presentations to key audiences; brochure distribution to public officials and via the web site; legislative updates; media relation activities; and targeted messages to constituents. In addition to these activities, WSDOT is supporting a HOT lane web site with email correspondence capabilities.

PLANNING

During the Planning Phase of the project, WSDOT will expand current outreach efforts, begin market research activities, and develop legislative and media strategies for the 2005 legislative session. Activities to be conducted include:

- Expand audiences to include commute trip reduction (CTR)-affected employers in south King County and Chambers of Commerce.
- Customize outreach to environmental and rideshare groups to address their interests.
- Provide stakeholder updates at milestones, educational information and media materials for the legislative session.
- Begin researching baseline corridor conditions and user characteristics, including conducting an origin and destination (O&D) survey to establish baselines for technical and communications issues.
- Develop media messages.

DESIGN

Activities to be conducted during the Design Phase of the project include the following:

- Conduct public opinion polls to establish baselines and aid product design, communications messages and distribution methodology.
- Test creative concepts in focus groups.
- Seek ongoing input from stakeholders to shape design.
- Organize open houses and create website "virtual" viewings.
- Identify hard-to-reach and/or low-income populations for Environmental Justice and communication tactics.
- Develop Marketing and Education Plan, including media and promotional strategies for the project launch.

CONSTRUCTION

The Marketing and Education Plan developed during the design phase will be launched prior to opening the HOT lanes. This will provide an opportunity to educate highway users, public officials, and stakeholders about the project's goals and benefits. Activities to be conducted during the Construction Phase of the project include the following:

Construction Communications & Campaign Kick-off

- Provide timely information and updates to broadcast and print media.
- Use rideshare employer network to reach rideshare travelers.
- Distribute brochures through transit racks and other key locations.
- Mail flyers to residential areas.
- Target other audiences as identified in an Origin and Destination survey and Marketing and Education Plan.
- Kick off promotional campaign during construction for public-at-large.
- Include creative components in the promotion: theme, advertisements, and freeway signs – more details will be crafted from market research.

Media Relations

Media coverage will likely be triggered by the beta test of the facility. Both the media and volunteers will be invited to demonstrate usage. This opportunity for widespread media coverage will be carefully crafted.

OPERATIONS

The promotional campaign will spike with the beta test phase and opening of the project. The marketing program will be ongoing during the operations of the pilot project. Activities will include:

- Creating a feedback loop to ensure that adjustments are made to the system based on user input.
- Conducting a corridor survey: HOT and general-purpose lanes, collecting usage data, demographic characteristics.
- Providing informational materials on performance/ evaluation data to stakeholders and media.
- Continuing to run advertisements through early operations.

REGULATORY REQUIREMENTS

WSDOT will develop and implement the Marketing and Education Plan and public involvement activities in accordance with state and federal requirements including Title VI, Environmental Justice and the American Disabilities Act.

10. Plans for Meeting Federal, State and Local Implementation Requirements

The SR 167 HOT Lane Pilot Project will fulfill all federal, state, and local requirements. A description of the major requirements and WSDOT's strategy to address these requirements is presented below. All identified requirements will be incorporated into future implementation plans.

Federal Requirements

FHWA. Washington State is one of 15 states approved by the Federal Highway Administration (FHWA) for the Value Pricing Pilot Program.

National Environmental Policy Act. WSDOT is in the process of preparing NEPA documentation for the SR 167 HOT Lane Pilot Project. The majority of the proposed project is expected to be implemented within the existing footprint of the HOV lane and is expected to have negligible impacts on the adjacent natural environment.

Based on initial discussions with FHWA, WSDOT is planning on preparing a NEPA Document Categorical Exclusion (DCE) including an Air Quality, Transportation and Environmental Justice discipline report.

FCC Approval. WSDOT will take the appropriate steps to obtain Federal Communications Commission (FCC) approval for the use of electronic transponders in the corridor.

Federal permit and other federal approvals. As noted earlier, the proposed project is expected to have a negligible impact on the natural environment. If any potential adverse impacts to the environment are identified, applicable federal permits will be submitted and other approvals requested. Monitoring, and any other ongoing activities required during operation or after completion of the project, will be implemented.

State and Regional Requirements

Washington State Legislative authority. The Washington State Legislature must authorize the SR 167 HOT Lanes Pilot Project and the use of tolls. As of April 6, 2005 both houses of the Washington State Legislature have passed the required authorization legislation for the project. The next steps required before formal authorization is given include final reconciliation of the House and Senate versions of the legislation and the governor's signature.

Washington State Transportation Commission. The Commission passed Resolution 659 directing WSDOT to proceed with steps to advance the SR 167 HOT Lanes Pilot Project proposal for implementation including the following actions:

- WSDOT will seek State Legislative approval and authority to implement the SR 167 HOT Lanes Pilot Project;
- WSDOT will develop, propose and pursue funding options to implement the SR 167 HOT Lanes Pilot Project; and
- WSDOT will report to the Commission on progress in carrying out this resolution.

State Environmental Policy Act. WSDOT will prepare a State Environmental Policy Act (SEPA) Expanded Checklist for the SR 167 HOT Lane Pilot Project. The Checklist will include expanded sections on air quality and transportation.

Metropolitan Transportation Plan amendment. WSDOT will request an amendment to PSRC's Destination 2030 to include the HOT lane pilot project.

State Implementation Plan (SIP). In June 2004 the Environmental Protection Agency, Puget Sound Clean Air Agency, and the Washington State Department of Ecology agreed that a State Implementation Plan (SIP) amendment will not be required for the SR 167 HOT Lane Pilot Project.

Transportation Improvement Program (TIP). WSDOT will request a TIP amendment from the Puget Sound Regional Council (PSRC) for the HOT lane pilot project.

State permits and other state approvals. As noted earlier, the proposed project is expected to have a negligible impact on the natural environment. If any potential adverse impacts to the environment are identified, applicable state permits will be submitted and other approvals requested. Monitoring, and any other ongoing activities required during operation or after completion of the project, will be implemented.

Local Requirements

Critical/ Sensitive Area Ordinance compliance and other permits and approvals. If any potential adverse impacts to the environment are identified, applicable permits will be submitted and other approvals requested. Monitoring, and any other ongoing activities required during operation or after completion of the project, will be implemented.

APPENDICES

Appendix A: Comprehensive Scope of Work for SR 167 HOT Lanes Pilot Project

The scope of work to move from conceptual design to operation and ultimately monitoring and evaluation of the SR 167 HOT Lanes Pilot Project is presented below. As presented in *Section 6.0 Timeline*, the project schedule consists of the following four sequential and potentially over lapping phases: Planning, Design, Construction, and Operation.

The project will be managed by WSDOT in close coordination with interested federal, state and local agencies including FHWA, King County Metro Transit and Sound Transit. It is anticipated that a design-build-operate process will be utilized. A Stakeholder Advisory Committee comprised of affected jurisdictions, advocacy groups, corridor users, and other affected stakeholders will be consulted at key decision points during the implementation of the pilot study.

PLANNING PHASE

The Planning Phase will begin in January 2005 and will cost approximately $990,000. This phase will refine the work program, conduct public outreach, collect baseline assessment data, evaluate available tolling technologies, and conduct preliminary design work.

Work Program

WSDOT will engage appropriate governmental agencies, technical experts and the Stakeholder Advisory Committee in developing a work program for project implementation. Tasks will include refining the scope, schedule and budget for the HOT Lane pilot project and procuring necessary consultant technical expertise.

Outreach & Market Research

Public outreach and education are critical elements of the pilot project. Outreach activities that are already underway to reach key target audiences and identify critical issues will be expanded during the Planning Phase of the project. Specific activities include coalition building and origin/ destination surveys. Please see Section 9 .0 for an overview of public outreach activities during the Planning Phase of the project.

Federal, State and Local Requirements

A number of federal, state and local approvals will be required to implement the SR 167 HOT lane pilot project. Tasks to be accomplished in the Planning Phase of the project include receiving state legislative authority, amendments to regional and state planning documents, and National Environmental Policy Act (NEPA) review. Please see Section 10 .0 for an overview of actions to be taken to address all federal, state and local approval requirements for project implementation.

Data Collection

WSDOT will begin collecting baseline travel and performance data for the SR 167 corridor during the Planning Phase of the project. Data collected will include traffic counts, occupancy counts, travel speeds, HOV and transit utilization, travel time/delay, incidents and user infractions. These data will be used when refining initial toll rates and schedules, in development of the marketing plan, and will serve as a baseline for post-implementation comparison. Please see Section 7 .0 for an overview of monitoring and evaluation activities to be conducted during operation of the pilot project.

Tolling Technology Development

The specific tolling technology to be used on the facility will be selected during the Planning Phase of the project. The selection of tolling technology will include choosing the type of electronic toll collection (ETC) system, outlining the tolling administration program and outlining necessary interagency agreements for tolling administration. In accordance with state law, WSDOT will ensure that the selected tolling technology is compatible with the Washington State Ferry system, other public transportation systems, and other toll collection systems to the extent that technology permits.

DESIGN PHASE

The Design Phase is anticipated to cost approximately $1,970,000.

Detailed project design and implementation will be developed in consultation with FHWA and other affected government agencies. This will include developing the sequence and scheduling of activities, developing the appropriate type and siting of technology, development of administrative operations processes, and planning of possible transit and other transportation enhancements.

Physical Design

The conversion of a section of the SR 167 from an HOV lane to a HOT lane will include the following design modifications:

- Restriping the existing lanes;
- Adding barrier separation between the HOT lane and the GP lanes;
- Creating new mid-point access points;
- Providing new signage;
- Installing new data collection infrastructure;
- Designating enforcement areas; and
- Making a minor alteration to the SR 167/I-405 northbound on-ramp.

Tolling Technology Development

The design of the HOT lanes will include all technology and infrastructure required to implement dynamic pricing. Requirements include, but are not limited to:

- Selecting the location of ETC readers and determining the appropriate software needs;
- Developing a tolling administration program that will include user registration, the distribution of transponders, management of user accounts, and the collection of payments;
- Developing a back office for tolling administration, data collection, and customer service compatible and coordinated with tolling administration for other tolling facilities;
- Developing the location and design of project related signing and marketing; and
- Identifying enforcement requirements and developing an enforcement plan.

Enforcement and Incident Management Plan

The project management team will work with the Washington State Patrol (WSP) and WSDOT Incident Response to develop enforcement and incident management plans for the facility. The project will contract with WSP for increased enforcement of HOT Lane infractions and Incident Response to provide enhanced assistance within the corridor. These plans will provide guidelines for review/modification based on observed/ perceived violation rates and type/number of incidents.

Outreach and Market Research

During the Design Phase of the project, WSDOT will seek input from stakeholders and conduct market research to establish baselines for attitudes, preferences and demographic information. Market research will aid the design of the project and be used to create the Marketing and Education Plan. Open houses and website "virtual" viewing will be arranged to gather input, along with outreach activities to make contact with hard-to-reach and/or low income publics for Environmental Justice. Please see section 9.0 for more details.

Federal, State and Local Approvals

During the Design Phase, all federal, state and local approvals will be obtained. Legal and environmental staff will track key issues pertaining to approvals and will closely coordinate with the design team.

Data Collection

Baseline data collection activities will continue during the Design Phase of the project. A Monitoring and Evaluation Plan will also be developed for implementation during the Construction and Operation phases of the project. See Section 7.0 for more details.

CONSTRUCTION PHASE

The construction phase is estimated to cost $11,140,000. The bulk of activity is related to the installation of new infrastructure for the electronic toll collection system (ETC), lane realignment, establishment of 'back-office' operations, and establishing customer service operations.

Tolling Technology

This task will include the establishment of an account management system to track charges by users, establish a payment system, and distributing transponders. This will include the implementation on an internet-based service center and/or walk-in service center.

Beta Testing

Prior to opening the facility, a series of beta tests will be run to ensure the facility's physical design and tolling technology are operational and user friendly.

Outreach

The Marketing and Education Plan developed during the design phase will be launched prior to opening the HOT lanes. This will provide an opportunity to educate public officials and stakeholders about the project's goals and benefits. The promotional campaign will help educate the public about HOT lane use, resources and benefits. WSDOT will utilize its communications network to inform the media, communities and users of the SR 167 corridor of the construction impacts and benefits of HOT lanes. Heightened media interest will occur with the beta testing of the facility. A media strategy will be developed in conjunction with the marketing plan. Please see section 9.0 for more details.

Performance Data Collection

The collection of baseline data will be completed during this phase and will transition into set-up for the collection of operational performance and user data.

OPERATION PHASE

Implementing Pricing Program

The program will provide transponders for purchase by HOT lane participants. The project operator will be responsible for distribution and maintenance of transponders, account management and billing. WSDOT will maintain the in-lane electronic equipment, and manage enforcement with WSP.

Outreach

A promotional campaign activity spike will occur with the opening of the facility. The marketing program will be ongoing during the operations of the pilot project. Marketing techniques will be used to address customer satisfaction issues and keep drivers well informed of any planned operational changes. Post-operations surveys will be conducted to evaluate user satisfaction, performance data and demographic information. The survey results will be shared with stakeholders.

Monitoring and Evaluation

WSDOT will conduct all monitoring and evaluation activities, as identified in Section 7.0. WSDOT will use the information gathered through the monitoring and outreach efforts to make refinements to the HOT lane program. Changes will be made in consultation with the affected government agencies and Stakeholder Advisory Committee.

Maintenance

HOT lane operations will require continuous maintenance activities including the repair, rehabilitation and replacement of equipment, pavement, shoulders, signs, pylons and markings. The cost associated with these activities will be paid for by revenue generated by the project.

Appendix B: Toll Rate Schedule

Toll Rates to Maximize Usage of HOT Lanes

Year	Time Period	Dollar Cost Per-mile Northbound	Dollar Cost Per-mile Southbound
2005	AM Peak	$0.12	$0.06
	Midday	$0.06	$0.06
	PM Peak	$0.06	$0.12
2007	AM Peak	$0.13	$0.06
	Midday	$0.06	$0.06
	PM Peak	$0.06	$0.31
2010	AM Peak	$0.15	$0.06
	Midday	$0.06	$0.06
	PM Peak	$0.06	$0.60
2014	AM Peak	$0.29	$0.06
	Midday	$0.06	$0.06
	PM Peak	$0.06	$0.60

Appendix C: Preliminary Cost Estimate

HNTB The HNTB Companies	Job Number 36401/35096	Sheet 1 of 1
	Made by	Date 11/6/20
HOT Lanes Pilot Project - Preliminary Cost Estimate	Checked by	Date

PRELIMINARY COST ESTIMATE*

Project Description: HOT Lanes Pilot Project
Project Alternative: SR 167

Washington State DOT
Date: Nov-03
Date of Cost Index: 2003
Made By:
Checked By:

I.	RIGHT OF WAY			
II.	CONSTRUCTION			
1.	Traffic		$859,152	
2	Toll Collection System		$1,572,000	
3	Removals (striping etc.)		$1,179,239	
4	Other		$514,312	
5.	Traffic Services & Safety (MOT)		$742,447	
	18% Of sections 1, 2 & 3	$742,447		
6	Roadside Development		$62,000	
	12% of Line 4	$62,000		
	Construction Subtotal Items 1,2,3,4, 5 and 6	(Round to nearest 1000)		$4,930,000
7.	Contingencies	50% of Subtotal	$2,465,000	
8	Construction Subtotal (Lines 1 through 7)			$7,395,000
9.	Mobilization -	10% of Line 8	$739,500	
10	Subtotal (Lines 6 & 7)			$8,135,000
11.	Sales Tax -	8.80% of Line 10	$715,880	
12	Subtotal			$8,851,000
13.	Construction Engineering & Contingency	18% of Line 12	$1,593,180	
14	Construction Total (Lines 10 and 11)			$10,445,000
	III. DESIGN & PLANNING	5% of Line 14	$3,655,750	
IV.	TOTAL ESTIMATED COST	Lines I, 14 and III		$14,101,000

*See assumptions.

Appendix D: SR 167 HOT Lanes Usage and Public Opinion, Scope of Work

The following proposed scope of work describes public opinion and user impact assessment activities to be conducted in support of the potential conversion of the SR 167 HOV lanes to High Occupancy Toll (HOT) lanes.

PROBLEM DEFINITION

Understanding both the attitudes and response of different income levels to pricing is a key element in developing a public information campaign for elected officials and the public. Existing work on pricing has identified different responsiveness of economic groups for other corridors but no specific work has been conducted on the SR 167 corridor.

OVERVIEW OF GOALS AND PROPOSED TASKS

The primary goals of this study are to:

- Determine the public's level of awareness and knowledge about HOT lanes
- Collect data on the demographic characteristics and trip purpose(s) of SR 167 corridor users
- Assess public acceptance of the HOT lane concept on the SR 167 HOV lanes
- Identify issues to address when crafting HOT lanes public information and education activities and materials
- Identify actual and perceived issues regarding the equitable use of the HOT lanes by different demographic groups - including identification of any potential adverse equity impacts to specific demographic groups (e.g. low income) and potential strategies to address these impacts

The specific tasks to accomplish these goals are described below.

Task 1. Origin and Destination Survey

Conduct an origin and destination survey and subsequent public opinion mail-back survey on SR 167 in order to characterize users of the facility, trip purpose(s), potential issues or concerns perceived using the facility, and perceived benefits.

Procedure or methodology:

1. Develop a 25 question mail-back survey. This survey will have approximately 20 substantive questions addressing the travel behavior of selected respondents. In addition, approximately 5 questions will measure pertinent respondent demographics – including identification of low-income users of the facility.
2. Conduct the videotape recording of non-commercial vehicle license plate numbers along the SR 167 corridor during one weekday. O&D of HOV will not tell us who might use the HOT, the HOV are already using the HOV lane.

3. The proposed origin-destination data collection and analysis procedure is designed to provide an unbiased estimate of trip making through the SR 167 corridor. The procedure uses advanced video-based technology to quickly collect and accurately process a large number of video images of vehicle license plates into a computer readable format. A random sampling of this vast amount of license plate data is then used to quickly mail out surveys to obtain origin-destination data, as well as other travel and attitudinal information.
4. All videotaped license plate images collected will be processed and transferred via an AASCII file of license number information to the contractor who will transfer this file to the Department of Motor Vehicles. The DMV will process the data and have an address file ready by the next morning. We will then forward the file to a mail house on the same day. The mail house will use laser printers to imprint each survey with the name and address of the vehicle owner along with the time and direction their vehicle was observed.

   A random sample of matched entries based on DMV match rates, will be selected and a survey will be sent to the address of each registrant so selected. The survey will be mailed out and received within 7 days of the recorded trip. Recipients would fill out the survey and mail it back with prepaid postage. Surveys would then be electronically scanned for accurate and efficient data entry into a database for further analysis.

Deliverable:

The primary deliverable to be completed under this task is a report on the results of the origin and destination study and the SR 167 users' mail-back survey and recommendations on how to address the issues and concerns identified in the mail-back survey. The analysis of the survey results will include providing origin and destination traffic analysis zones. In addition, data analysis will include developing cross-tabulation tables and graphs that describe direction, trip purpose, frequency, vehicle occupancy, as well as attitudes toward HOT lanes, responsiveness to pricing, etc.

Task 2. Assess public opinions, concerns, and opportunities

Using the results of the origin and destination study, and data from recently completed local research, develop public opinion research activities to assess pubic opinion of users and residents adjacent to the SR 167 corridor. These public opinion research activities should:

- Identify/ confirm the demographic characteristics of potential users of the corridor
- Ascertain peoples perceptions of HOT lanes and willingness to use them
- Identify the preferred means of different populations to obtain information on transportation services and facilities available
- Economic Equity will be examined in terms of toll payments relative to income, travel time-savings, and transit usage. Equity questions regarding transit service, fares, ridership trends, and changes in mode share will be included.

Tactics:

Literature review

A review of completed public opinion surveys and other research findings regarding HOT lanes will be conducted. The literature review will focus on public opinion research conducted on operational and planned facilities comparable to SR 167.

Telephone survey

1. Develop a 12-minute telephone survey.
2. Purchase targeted sample lists with a focus on those who reside in areas likely to use the SR 167 corridor
3. Assure anonymity to respondents in order to obtain good response rates and accurate information.
4. Include adequate pre-testing to ensure that survey questions are understood and that the
   surveys are not experienced as an intrusion to respondents.
5. Field the survey to a stratified random sample of 400 households. Respondents will need to
   be 18 years of age or older.
6. In order to control for sampling bias, at least ten attempts to contact each randomly selected
   household will be made at different times of the day and different days of the week.
7. Provide top-line results within 24 hours of receiving the data file.
8. Analyze the data using appropriate descriptive and inferential statistical techniques.
9. Write a summary report of the survey results.

Deliverables:

The primary deliverable to be completed under this task is a report on the results of the public opinion literature review and telephone survey and recommendations on how to address the issues and concerns identified by these activities. The report will include a summary of opinions, issues, and concerns regarding use of HOT lanes and recommendations on type of management strategies and outreach/ education to address these concerns.

TIMELINE

It is estimated that this project can be completed over a three-month period. See timeline below for more detail.

BUDGET

It is estimated that this project can be completed for $90,000. See budget below for details by specific tasks and sub-tasks.

SR 167 HOT Lanes Research Timeline												
	week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12
Literature Review												
Review past research												
Write brief summary report												
License Plate Video Mail Survey												
Develop survey questions												
Pre-test survey and revise												
Videotape license plates												
Extract license plate numbers from videotape												
Develop mailing list												
Design mail survey												
Print, label, tri-fold, tab and mail surveys												
Data entry through electronic scanning												
Data management												
Data analysis												
Origin and destination maps												
Write report												

Attitudinal Telephone Survey (12 minutes)												
Develop survey questions												
Pretest and revise survey												
Program CATI system												
Purchase targeted sample												
Field survey												
Data management												
Data analysis												
Write report												

SR 167 Hot Lanes Public Opinion Research

			Expenses	Labor and Expense Subtotals	Task Totals
Task II		Literature Review			
		Review past research	$ -	$ 1,435	
	B:	Write brief summary report	$ -	$ 1,154	
		Subtotal	$ -		$ 2,589
Task I		License Plate Video Mail Survey			
	A:	Develop survey questions	$ -	$ 3,125	
	B:	Pre-test survey and revise	$ -	$ 584	
	C:	Videotape license plates (n = 14,000)	$ 25,000	$ 25,819	
	D:	Develop mailing list		$ 923	
	E:	Design mail survey	$ 1,000	$ 1,000	
	F:	Print, label, tri-fold, tab and mail surveys (n = 12,000)	$ 7,000	$ 7,584	
	G:	Business reply postage costs ([25%] 3,000 @.47)	$ 1,410	$ 1,410	
	H:	Data entry through electronic scanning	$ 2,000	$ 2,277	
	I:	Data management	$ -	$ 491	
	J:	Data analysis		$ 3,275	
	K:	Write report	$ -	$ 5,686	
		Subtotal	$ 36,410		$ 52,173
Task II		General Public Telephone Survey (12 minutes)			
	A:	Develop survey questions	$ -	$ 3,125	
	B:	Pretest and revise survey	$ -	$ 328	
	C:	Program CATI system	$ 1,080	$ 1,244	
	D:	Purchase sample targeted to general public & enviro justice populatio	$ 1,500	$ 1,500	
	E:	Field survey (n=1000)	$ 17,500	$ 17,664	
	F:	Data management		$ 277	
	G:	Data analysis		$ 1,845	
	H:	Write report	$ -	$ 4,389	
		Subtotal	$ 20,080		$ 30,372
Task III		Consultant Project Management			
	A:	Client meetings (3)	$ -	$ 2,703	
	B:	Project team meetings	$ -	$ 1,668	
	C:	Miscellaneous (copies, postage, phone, etc)	$ 170	$ 170	
	D:	Administration	$ -	$ 325	
		Subtotal	$ 170		$ 4,867
	Total Hours				
	Consultant Staff & Expenses Total		$ 56,660		$ 90,000
	WSDOT Oversight				$20,000
	TOTAL BUDGET				$110,000

Appendix D: Letters of Support

King County

Ron Sims
King County Executive
516 Third Avenue, Room 400 Seattle,
WA 98104-3271 206-296-4040 206-296-
0194 Fax TTY Relay: 711
www.metrokc.gov

June 22, 2004

Patrick Decorla-Souza
Team Leader
Highway Pricing and System Analysis Team
Federal Highway Administration
Office of Transportation Policy Studies
400 - 7th Street, SW
Washington, DC 20590

Dear Mr. Decorla-Souza:

I enthusiastically support the proposal submitted by the Washington State Department of Transportation to study highway pricing. The grant request is for $3 million from the Federal Highway Administration's Value Pricing Pilot Program, as authorized by section 1012(b) of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), as amended by 1216(a) of the Transportation Equity Act for the 21st Century (TEA-21).

King County and this region are searching for new and innovative solutions to our transportation problems, which include congested highways and arterials and lack of funds for construction and maintenance of transportation facilities and services. Pricing offers an opportunity to address many aspects of these problems. The proposed SR 167 High Occupancy Toll (HOT) Lane demonstration project would provide the region and other areas of the country with valuable information about the combined function of High Occupancy Vehicle (HOV) lane and toll facilities.

Thank you for your positive consideration of this request. If you have any questions, please do not hesitate to contact me, at 206-296-4040, or Harold Taniguchi, Director of the King County Department of Transportation, at 206-684-1441.

Sincerely,

Ron Sims
King County Executive

cc Michael Cummings, Manager, Urban Planning Office, Washington State Department of Transportation
Harold Taniguchi, Director, King County Department of Transportation

The Honorable Jay Rodne
Representative - 5th District
Washington State Legislature
P.O. Box 40600
Olympia, WA 985040600

November 19, 2004

Dear Representative Rodne:

On behalf of the South County Area Transportation Board (SCATBd), we are writing this letter of support for funding to implement the Washington State Department of Transportation's (WSDOT) High Occupancy Toll (HOT) Lane pilot project on SR 167. In July of this year, SCATBd supported a request for Federal Highway Administration (FHWA) funding for the planning and design of a HOT Lane pilot project on SR 167. We were pleased when the project recently received FHWA funding for planning and design, and are closely following the development of this pilot project through regular briefings from WSDOT's HOT Lane project staff. State Route 167 is a vital north-south corridor in south King County, and managing congestion in this corridor will have a positive impact on our quality of life and our region's economic vitality.

Given the existing congestion on our freeways and our limited transportation dollars, we need to explore all potential options to address congestion on our freeways. We need to find ways to use our existing facilities more efficiently. Previous studies have indicated that HOT lanes can improve traffic flow in congested corridors such as SR 167. While SR 167 is congested during the peak hours, it has available capacity in the HOV lanes and has sufficient right-of-way to make the needed improvements to support HOT lanes. We were encouraged by initial analysis that showed that converting the SR 167 HOV lane to a HOT lane would allow 13% more vehicles to move through the corridor without impacting speed or travel time reliability for transit and carpools. We believe that the SR 167 HOT Lane Pilot Project is an important first step in determining the value of congestion pricing.

Our citizens are demanding that we provide real answers as to how government will address traffic congestion on our roads. SCATBd supports user fees for transportation; the general public opinion also supports this concept. We cannot afford any delay in investing in our transportation future, and we sincerely hope that you will support funding to implement the SR 167 HOT Lane pilot project in the upcoming legislative session.

Thank you for your consideration.

Sincerely,

Pete Lewis
Chair, SCATBd

Jim White
Vice Chair, SCATBd

PSRC letterhead

June 16, 2004

Patrick DeCorla Souza, Team Leader
Highway Pricing and System Analysis Team
Federal Highway Administration
Office of Transportation Policy Studies
400 7th Street, SW
Washington, DC 20590

Signed original on PSRC letterhead sent to FHWA on 6/16/04

Dear Mr. Decorla Souza,

I am writing to express support from the Puget Sound Regional Council for a proposal submitted by the Washington State Department of Transportation to study highway pricing. The proposal is before the Federal Highway Administration's Value Pricing Pilot Program for consideration of funding, as authorized by section 1012(b) of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), as amended by 1216(a) of the Transportation Equity Act for the 21st Century (TEA-21).

The central Puget Sound region of Washington State is being adversely affected by growing traffic congestion. The magnitude of traffic congestion in this region is placing in question our long-term ability to maintain a healthy economy and a high quality environment for residents and businesses. Our region has come together to identify needed investments in vital transportation systems. The unanimously adopted Metropolitan Transportation Plan, Destination 2030, outlines these priority investments. When implemented, these investments will vastly improve mobility within, and through, urban areas. Yet, making these necessary improvements will be a major challenge, as public resources available for these purposes are a scarce and shrinking commodity.

The proposed SR-167 HOT Lane demonstration project is completely consistent with the goals and policies contained in our adopted regional transportation plan and looks to set the stage for a thorough consideration of specific road pricing applications. There has been ongoing coordination between the Puget Sound Regional Council and the Washington State Department of Transportation in the development of the two project proposals (this proposal and the already funded GPS-based Pricing Pilot) submitted to the Value Pricing Program. Continued coordination and information sharing will be a key component of these projects as they are implemented.

Our region is currently in the process of making important decisions about highway financing. Timely funding and implementation of this project could have a significant formative effect on the future of our transportation system. Thank you for your consideration of this project for funding.

Sincerely,

Bob Drewel, Executive Director
Puget Sound Regional Council
Cc: Michael Cummings, Director, WSDOT Urban Planning Office