

# I-5 Express Lanes Toll Feasibility Study

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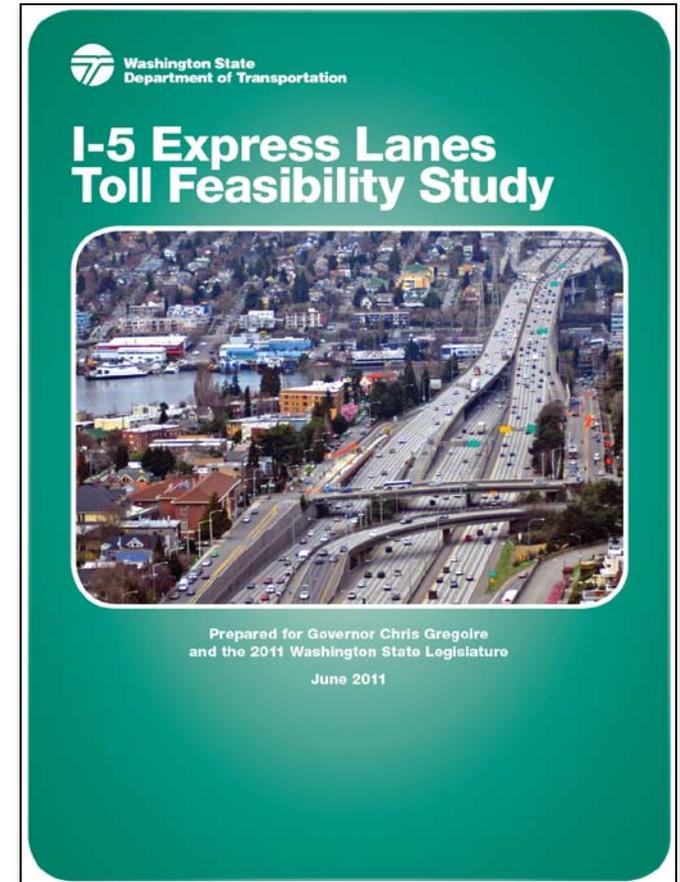
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# Presentation Summary

- Introduction
  - Legislative Proviso
  - Project Context
  - Study Approach
- Analysis Assumptions
  - Operating Concept
  - Tolling Approach
  - Traffic, Costs and Revenues
  - Financial Analysis
- Findings
- Next Steps



# Proviso Background

- Included in FY 2011 transportation budget
- Study feasibility of tolling the I-5 reversible express lane roadway between downtown Seattle and Northgate.
- Specific questions include:
  - The potential to generate funding for needed transportation facilities
  - Maximizing the efficient operation of the corridor
  - Economic considerations for future system investments
  - An analysis of the impacts to the regional transportation system
- Funded by FHWA value pricing grant for a broader study of express toll lane concept in the I-5 corridor, described in the Appendix.



# Project Context

- Reversible express lanes between Northgate and downtown Seattle
  - Southbound in AM, Northbound in PM
  - 4 lanes in central portion, 1 at each end
  - 4 downtown exits, 2 are HOV only
  - Closed during overnight hours
- About 270,000 average weekday trips on this segment of I-5 in 2010
  - Mainline: 217,370 (80% of total)
  - Express lanes: 53,720 (20% of total)
- Express Lanes operation issues
  - Bottlenecks in lane returning to mainline
  - Off peak, mainline backups in opposing direction from express lane flow
- Highest freeway transit volumes in region



# Regional and Statewide Context

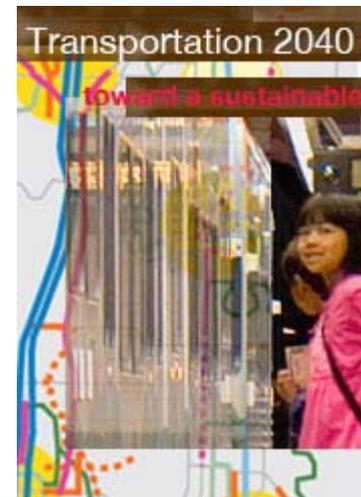


## Consistent with WSDOT's Moving Washington Strategies

- More efficient operation by reducing demand at bottlenecks re-entering mainline lanes
- Improves transit reliability through pricing
- Consistent with HOT/express toll lane strategy

## Consistent with PSRC Transportation 2040

- Envisions funding future transportation improvements by transitioning to user fees
- Starts with developing high occupancy toll (HOT) lanes, or express toll lanes



# Study Approach

- Analysis only; public outreach would occur at later project stage.
- Interagency coordination through project coordinating committee – includes transit, ports, PSRC, Seattle, Washington State Patrol and Transportation Commission staff.
- Beyond toll system expenses, ***no assumption regarding use of toll revenues, or costs associated with mitigating traffic diversion.*** Toll-funded improvements could help reduce diversion impacts.
- Analysis process:
  - PSRC prepared optimal toll rates
  - Consultant team and WSDOT provided capital costs
  - WSDOT produced toll and facility O&M costs
  - Consultant prepared revenue and financial capacity analysis
- Value pricing grant project tasks and budget adjusted to incorporate this analysis and report.

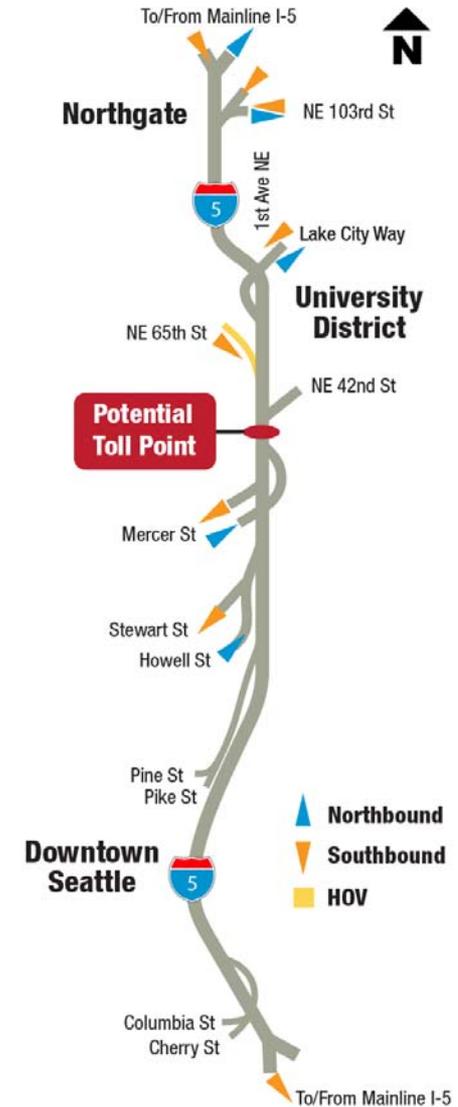
# Analysis Assumptions

## Operating Concept and Tolling Assumptions

- Single toll point mid-corridor captures all trips
- Both electronic and photo tolling, as on SR 520
- Variable (or dynamic) pricing by time of day
- Modeling assumed no toll for 3+ HOVs
- HOV restrictions on downtown Seattle ramps would be removed

## Revenue and Financial Assumptions

- Average tolls assumed (in today's dollars):  
\$4.30 AM Peak, \$5.50 PM Peak, \$1.20 Midday
- Assume 30 year debt, 7.25-8.5% interest rates
- 2.24x average debt service coverage ratio



# Cost and Revenue Analysis Process

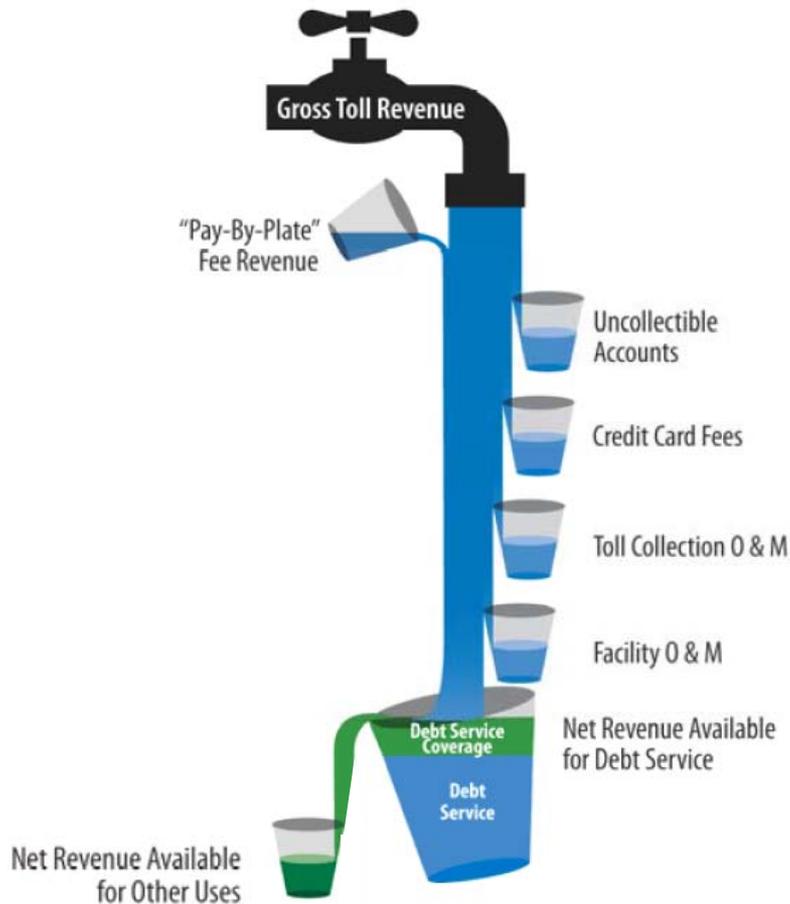
## Cost estimating

- Toll system costs based on recent procurements
- Facility O&M costs based on current expenses
- Toll system O&M based on projections for other current projects
- All costs are preliminary and conceptual

## Revenue estimating and funding analysis

- Used PSRC travel model to assess traffic volumes and impacts
- Determined optimal toll rates through multiple travel model iterations
- Gross revenues less O&M costs yields net revenues for funding
- Financial modeling determined potential toll funding contribution
- Very high level analysis to determine if further study is warranted

# Deductions from Gross Revenues



## Uses of Gross Toll Revenues:

- Credit card fees
- Toll collection O&M
  - Customer service center
  - Toll collection system
  - State operations
- Routine Facility O&M
  - Roadway O&M
  - Incident Response Team (IRT)
- O&M reserve account
- Uncollectible accounts

## Uses of Net Toll Revenues:

- Debt service on borrowed construction funding
- Other pay-as-you-go uses

# Findings – Traffic and Costs

## Traffic Effects

- Some diversion to mainline would occur
- Mainline traffic would increase ~4%, express lanes decrease ~21%
- Less than 1% of I-5 traffic would choose a different route
- Shift in traffic between downtown Seattle ramps

## Capital Costs = \$16M (year of expenditure dollars)

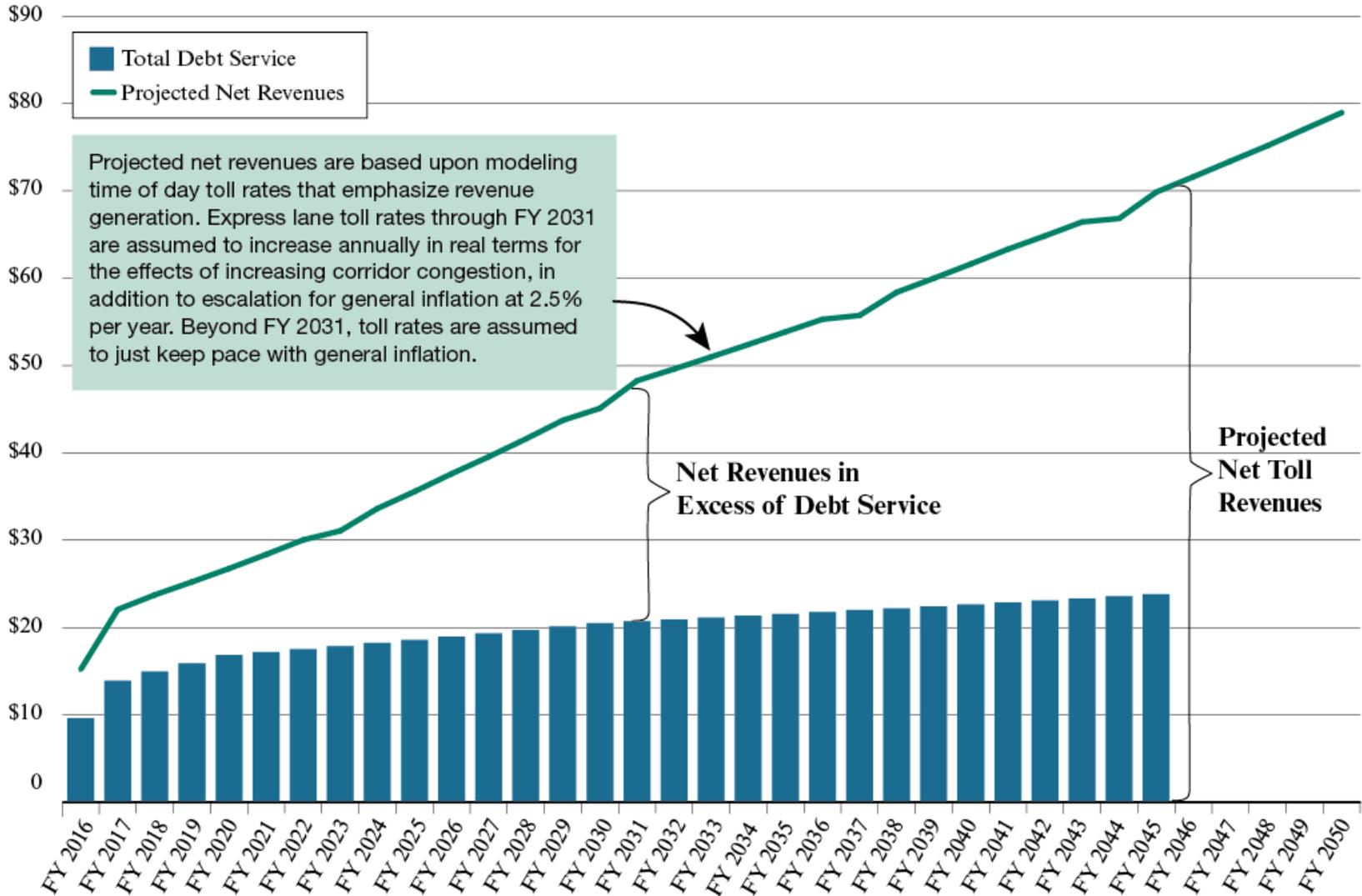
- \$5M for environmental, outreach and engineering, \$11M capital
- Includes toll system and rate signs at each entrance

## Operating and Maintenance Costs = ~\$9.6M/yr. in 2015 dollars

- Includes deductions from gross revenues
- Toll equipment O&M and periodic replacement
- Facility O&M including maintenance, incident response, etc.

# Findings - Toll Revenues and Debt Service

dollars in millions (YOY)



# Financial Analysis Results

- **Toll funding contribution of up to \$185 million**
  - Total net bond proceeds available for capital investments in FY 2015
  - Toll implementation cost could be covered by toll bond proceeds
- **Excess toll revenues available for pay-as-you-go uses**
  - Excess revenues come from debt service coverage
  - Assumed to be available in the year after they are generated
  - Cannot be used to support additional borrowing
  - Up to \$6 million in FY 2017
  - Up to \$40 million in FY 2056 (amount generated from last year of debt service; would be substantially higher after the debt is retired)

# Response to Proviso Questions

## Revenue Generation Potential of Value Pricing

- Over \$20M annually net revenue, growing over time.
- Could finance up to \$185M in capital improvements in FY 2015.
- Excess net revenues not used to pay debt service would be available for other pay-as-you-go uses.
- Tolls also assumed to pay for facility operation and maintenance (but not major preservation), freeing up existing funds for other uses.

## Maximizing Efficient Operation of the Corridor

- Congestion pricing will improve express lane speeds and reliability.
- Eliminating HOV ramp restrictions will balance distribution of traffic between ramps and between lanes.
- Reduced queuing at bottlenecks at lanes to/from mainline I-5.
- Some traffic shifted to mainline lanes or other facilities, reducing speeds.

# Response to Proviso Questions

## Economic Considerations for Future Corridor Investments

- Provides revenues available for transportation use
- Benefits depend on how revenue is used
  - Could provide seed money for I-5 capacity in Seattle or corridor build-out of express toll lanes (described in report appendix)
  - Could address preservation, maintenance and safety backlog in corridor

## Regional Transportation System Impacts

- Model shows no significant impact on other major regional facilities
- Moderate increases in volumes on nearby corridors due to 1% shift of traffic from I-5 to other routes
  - University Bridge and SR 99 Aurora Avenue Bridge

# Next Steps

## **Define/develop proposal and assess public support**

- Define the proposal – what will tolls pay for?
- Develop and refine the proposal
- Prepare tolling concept of operations
- Prepare environmental studies
- Prepare more detailed traffic operation and financial analysis
- Conduct public outreach

## **If the Legislature grants tolling authority, implement tolls:**

- Request Federal tolling authority
- Prepare and issue toll system procurement

**Appendix:**  
**Express Lanes System**  
**Pre-Design Project**

**Illustration of how express lane tolling  
could be expanded to a corridor-wide  
express toll lane program**

# Express Toll Lanes Strategy

- Moving Washington includes strategy to evolve the Puget Sound HOV lanes into tolled express lanes
  - Many current 2+ HOV lanes do not meet speed and reliability standard
  - 3+ HOV would leave lanes underused, while adding to congestion in other lanes
  - Express toll lanes with a 3+ HOV exemption (or similar policy) allow paid users to enter, and use dynamic pricing to manage traffic volumes
  - Provides all users an option for reliably fast trip when needed
  - Provides better performance for transit and carpools, while giving everyone a way to avoid congestion when it's most important
  - In some places a two-lane express facility could be provided
- PSRC Transportation 2040 also includes express toll lane strategy
- SR 167 HOT lane pilot project is early example, and I-405 express toll lanes are under development

# Express Lanes Pre-Design Study

- Funded by \$1.28M Federal Value Pricing grant
- Project funding used to prepare this proviso response
- Other questions this project will address on express toll lanes:
  - What are system objectives?
  - What users and user requirements should be accommodated?
  - What operating policies and design options should be used?
  - How could this concept be implemented on I-5?
  - How could implementation be funded and staged over time?
- Intent:
  - Develop approach that provides consistent customer experience
  - Clarify the concept before engaging in extensive public outreach
- Project is underway - **All results are preliminary**

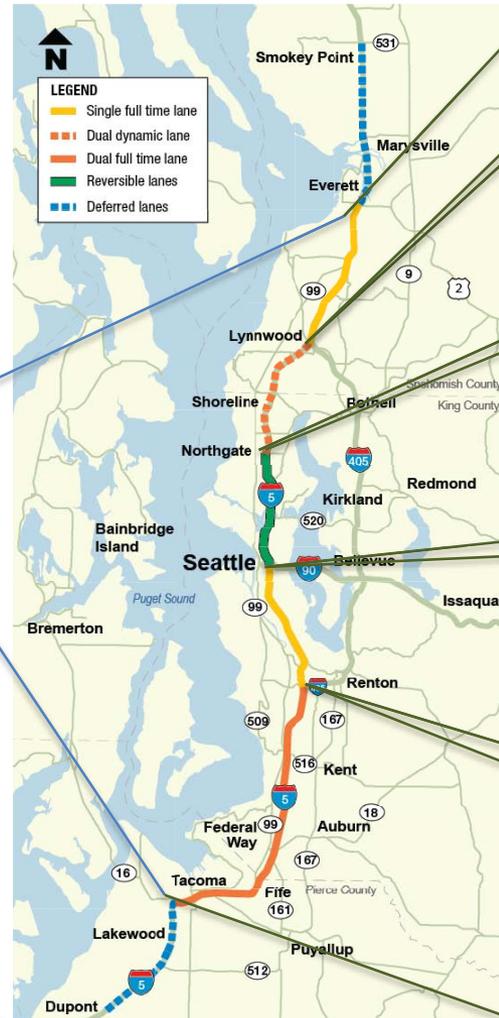
# Initial I-5 Express Toll Lane Concept

All projects include

- Active Traffic Management
- Operation and Maintenance

**Project limits:**  
SR 16 in Tacoma  
To US 2 in Everett

Segments north and south of these limits cost more than they generate in revenues.



## Lynnwood to Everett:

- 1 lane in peak direction

## Northgate to Lynnwood:

- 2 lanes in peak direction
- Maintain same number of general purpose lanes

## Seattle to Northgate:

- Consider southbound contraflow lane
- Add NB mainline capacity

## Tukwila to Seattle:

- 1 lane each direction
- Investigating whether further widening is possible

## SR 16 to Tukwila:

- 2 lanes each direction
- Widening in King County
- Use existing pavement in Pierce County

# Phasing Plan Used in Financing Analysis

To assess how much funding could be generated from express lane tolls, these phasing assumptions were used

## Phase 1:

- Install toll equipment on reversible roadway



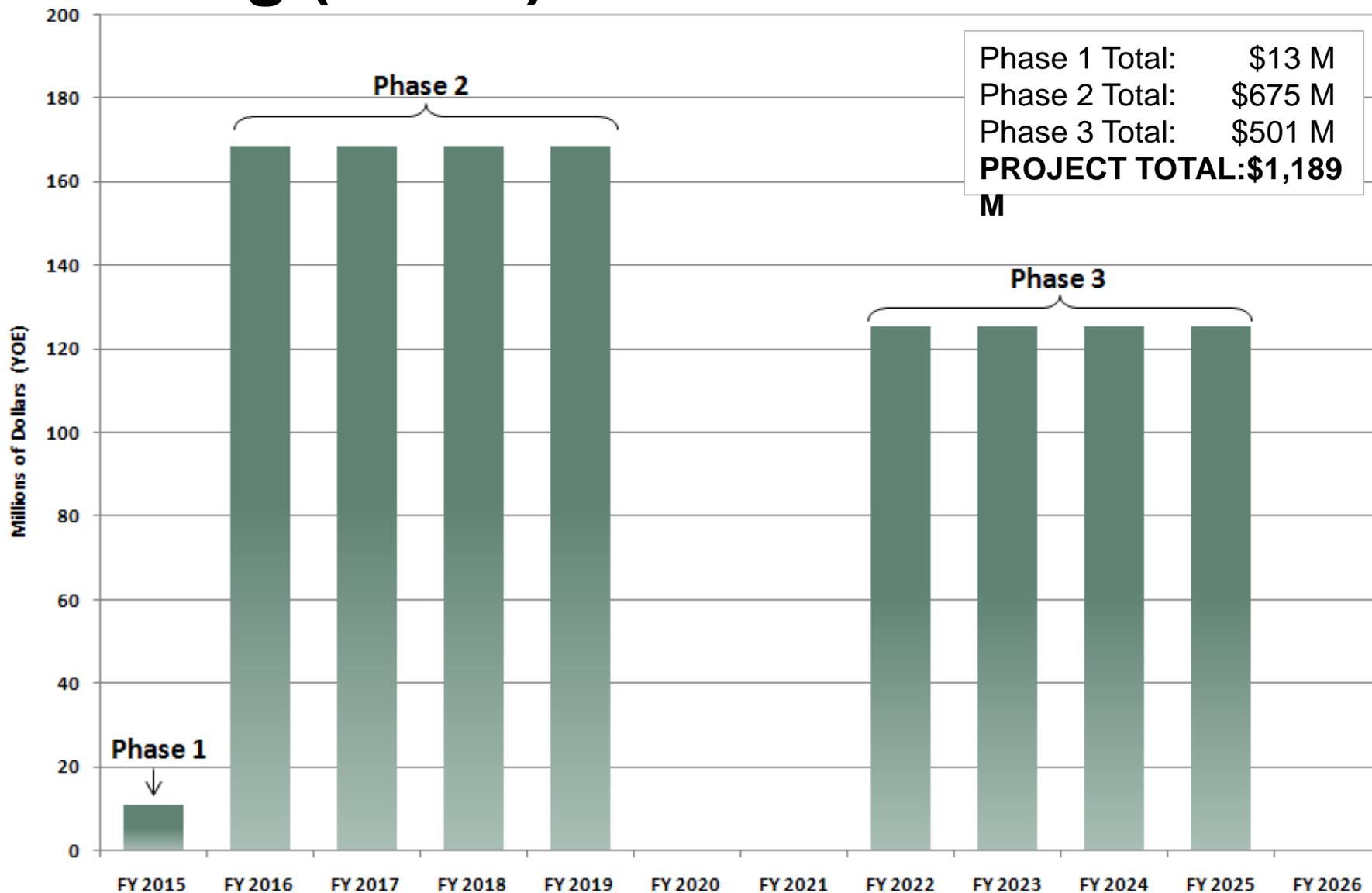
## Phase 2:

- Convert HOV lanes to express toll lanes from Everett to Tacoma
- Add second peak-direction only express toll lane from Northgate to Lynnwood
- Install active traffic management throughout the corridor

## Phase 3:

- Add second express toll lane in each direction between Tacoma and Tukwila

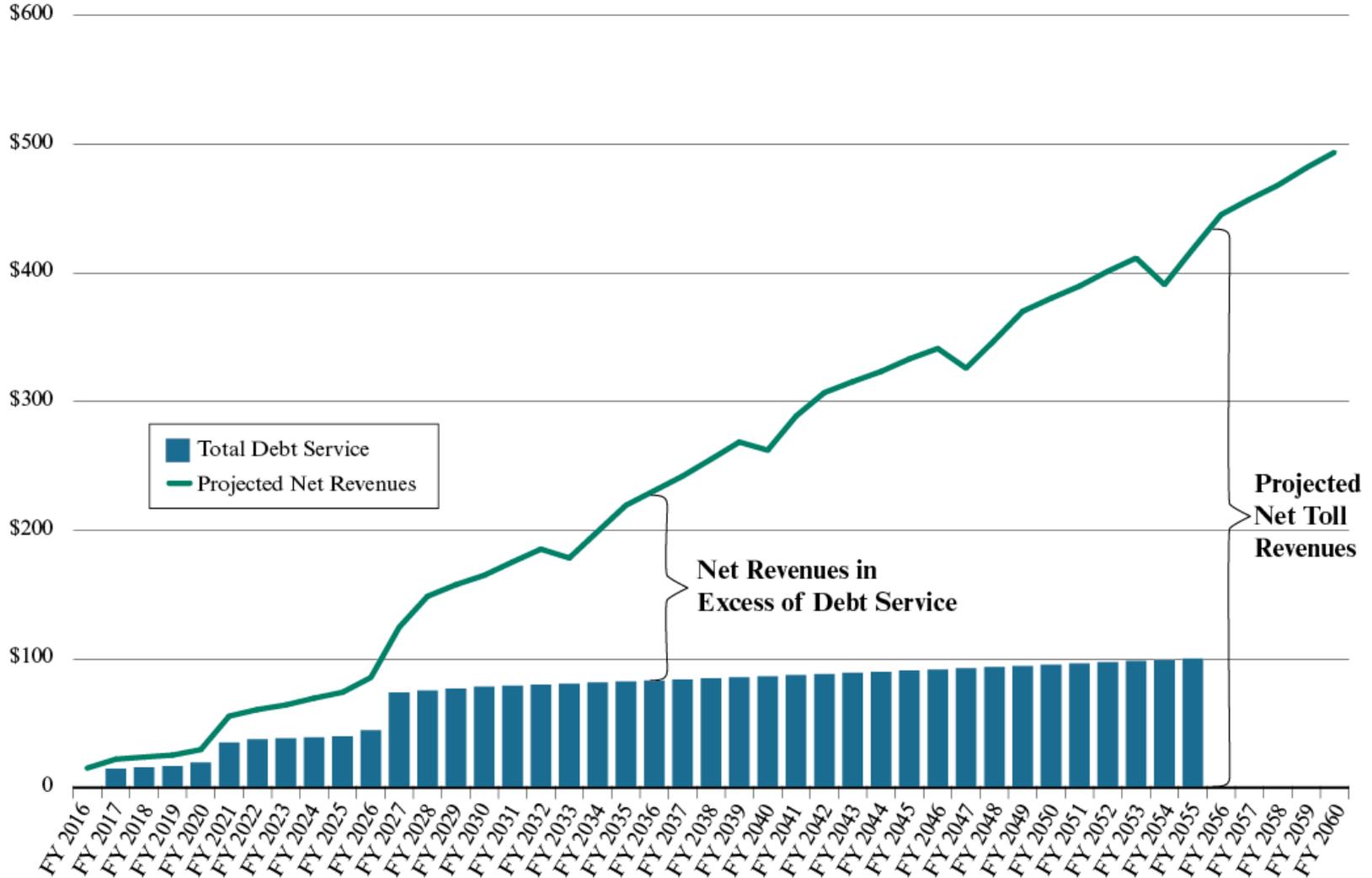
# Capital Costs and Assumed Construction Phasing (YOE \$)



# Findings - Toll Revenues and Debt Service

## I-5 Express Toll Lanes System

dollars in millions (YOY)



# Financial Analysis Results

## I-5 Express Toll Lanes System

- **System toll funding contribution of up to \$870 million**
  - \$11 million reversible express lane (Phase 1) implementation cost, funded with a short term loan in FY 2015 and repaid with tolls in FY 2016
  - \$480 million net bond proceeds available for Phase 2 construction costs (partial system) in FY 2016-19 (80% of Phase 2 construction)
  - \$375 million net bond proceeds available for Phase 3 construction costs (full system) in FY 2022-25 (84% of Phase 3 construction)
- **Excess toll revenues available for pay-as-you-go uses**
  - Excess revenues come from debt service coverage, are assumed to be available in the year after they are generated, and cannot be used to support additional borrowing
  - Up to \$4 million in FY 2017
  - Up to \$11 million in FY 2021 (from first year of Phase 2 operations)
  - Up to \$32 million in FY 2027 (from first year of Phase 3 operations)
  - Up to \$285 million in FY 2056 (from last year of debt service; would be substantially higher after the debt is retired)

# Remaining Questions

- Project is not complete, and many questions remain
  - Operating policies and concept of operation
  - Feasibility and cost of I-5 design concepts
  - Proposed phasing plans for system development
- More work will be needed in further work effort(s):
  - Environmental analysis
  - Preliminary design and cost refinement
  - Transit and freight elements
  - Proposed uses for excess revenues, with cost estimates
  - Public outreach program
  - Policy adoption
  - Federal and state toll authority
  - Staging plan / program development

# Questions?

For more information,  
please contact

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