

I-405 Express Toll Lanes Nine Month Update

Washington State Transportation Commission

Patty Rubstello, Assistant Secretary of Tolling

July 19, 2016

Agenda

- I-405 Master Plan
- I-405 express toll lanes nine month update
- Next steps

I-405 EXPRESS TOLL LANES NINE MONTH UPDATE

I-405 Master Plan

Regional Consensus

- EIS Record of Decision, 2002

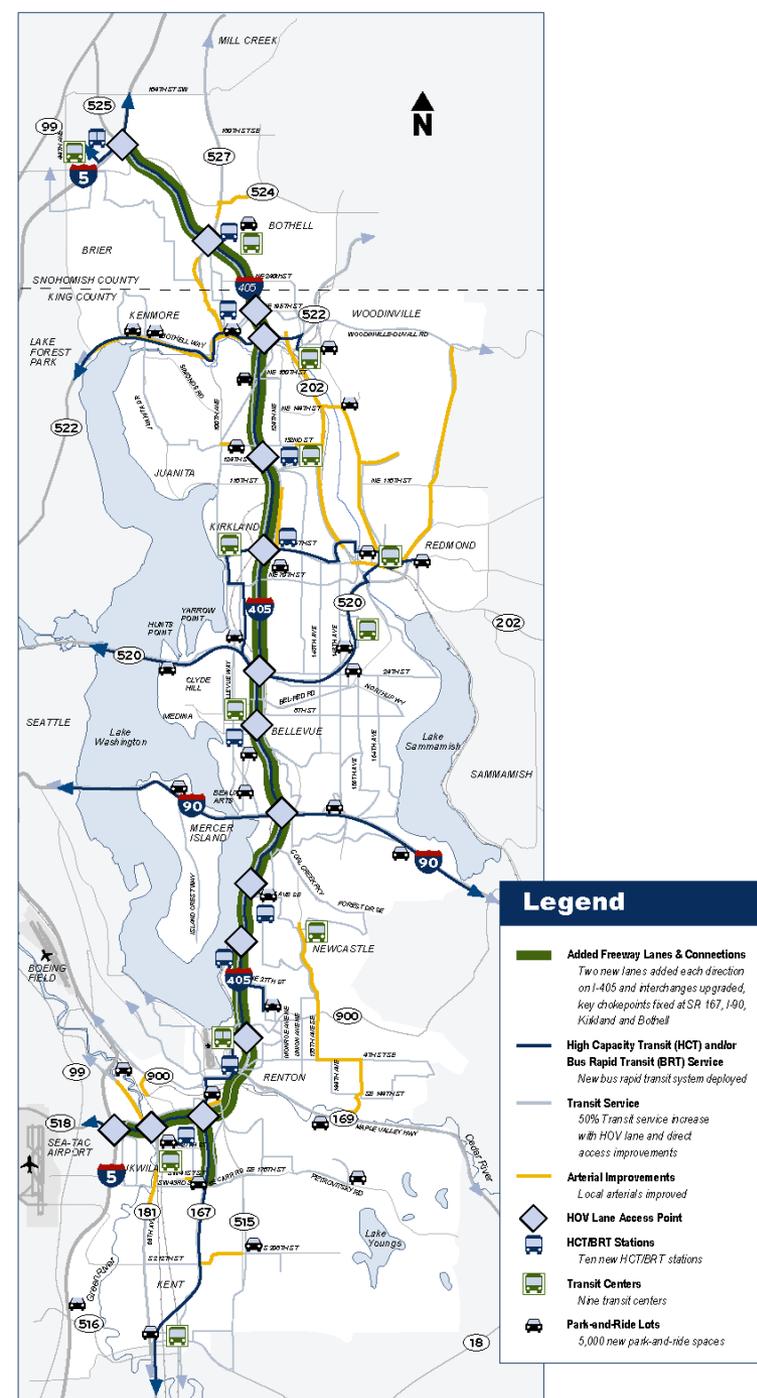
Roadways

- 2 new lanes in each direction
- Local arterial improvements

Transit & Transportation Choices

- Bus Rapid Transit system
- New transit centers
- 50% transit service increase
- HOV direct access ramps and flyer stops
- Potential managed lanes system
- 5000 new Park & Ride spaces
- 1700 new vanpools

Environmental Enhancements



I-405: What was the problem?

- **Bad traffic**
 - Drivers on I-405 experience some of the worst traffic in the state.
- **Crowded HOV Lanes**
 - I-405 HOV lanes were not meeting state requirements to operate at 45 mph 90 percent of the time during peak hours.
 - I-405 HOV lanes were often just as congested as the regular lanes.
- **Transit Suffers**
 - Congested lanes significantly delay transit trips and reduce reliability.



Goals of Express Toll Lanes

- Improve speed and reliability in the HOV lanes
- Offer more choices to drivers
- Fund future corridor improvements



Nine month trends

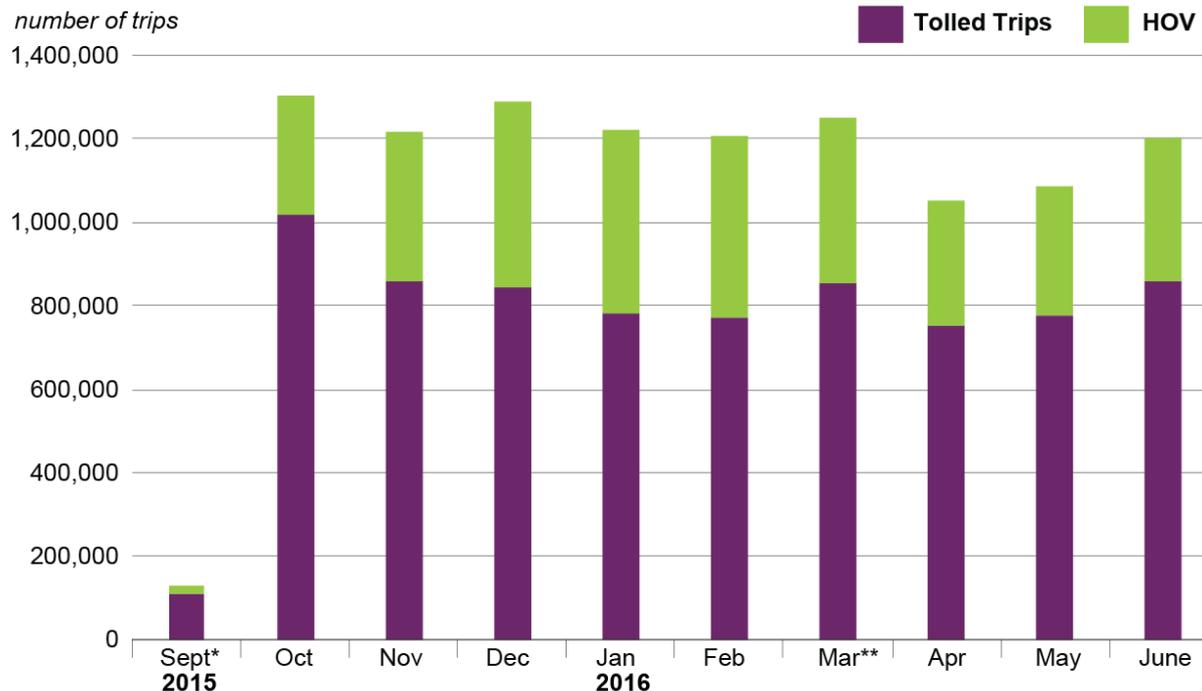
Since opening the express toll lanes:

- 
- Express toll lanes use continues to increase.
 - In most sections, during peak period commutes I-405 is moving more vehicles at faster speeds across all lanes.
 - Express toll lanes are moving more vehicles than previous HOV lanes.
 - Currently express toll lanes are meeting the performance requirement of maintaining speeds of 45 mph 90 percent of the time during peak periods. However, more drivers are using the lanes, causing toll rates to reach the \$10 maximum more often and for longer durations.
- 
- No impacts to traffic volumes on alternative routes have been found.
- 
- Northbound through Bothell, general purpose lanes continue to be more congested than prior to express toll lanes.

More drivers are using express toll lanes

- More drivers are using the express toll lanes, following an initial drop with the change in hours of operation mid-March.
- By June, the total trip numbers were back to similar levels prior to the change – even with operating hours reduced by 58 percent.

I-405 express toll lanes total trips since opening



* Opening date: Sept. 27, 2015

** Hours of operation changed March 18, 2016

Source: WSDOT Toll Operations

Heavy express toll lane use results in I-405 moving more vehicles at peak periods

Southbound I-405

SR 527



Peak Period	Peak Hour
+7 percent	+3 percent

SR 522



Peak Period	Peak Hour
+10 percent	+18 percent

NE 100th St



Peak Period	Peak Hour
+16 percent	+27 percent

NE 53rd St



Peak Period	Peak Hour
+20 percent	+29 percent



* **Note:** Added capacity on southbound I-405 was 7.5 lane miles for a 12% increase in lane miles.

Changes in volume include all lanes

Peak period: 5-9 a.m.

Peak hour: 7:15-8:15 a.m.

Heavy express toll lane use results in I-405 moving more vehicles at peak periods

* **Note:** Added capacity on northbound I-405 was 3.5 lane miles for a 5% increase in lane miles.



Northbound I-405

SR 527

Peak Period	Peak Hour
1 percent	0 percent

SR 522

Peak Period	Peak Hour
+4 percent	+0 percent

NE 100th St

Peak Period	Peak Hour
+17 percent	+24 percent

NE 53rd St

Peak Period	Peak Hour
+17 percent	+27 percent

Changes in volume include all lanes

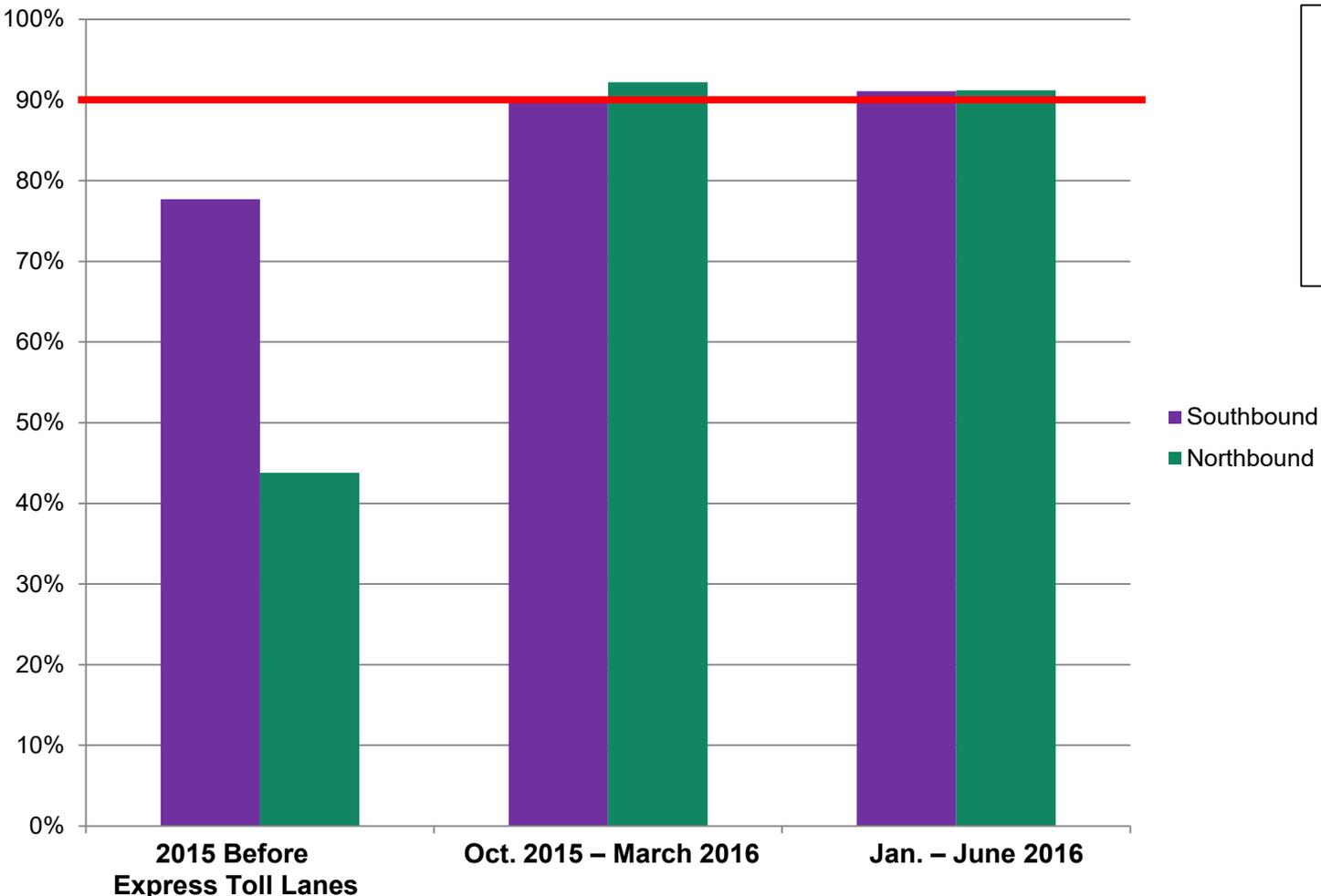
Peak period: 3-7 p.m.

Peak hour: 4:25-5:25 p.m.

Improved speed and reliability for HOV lanes

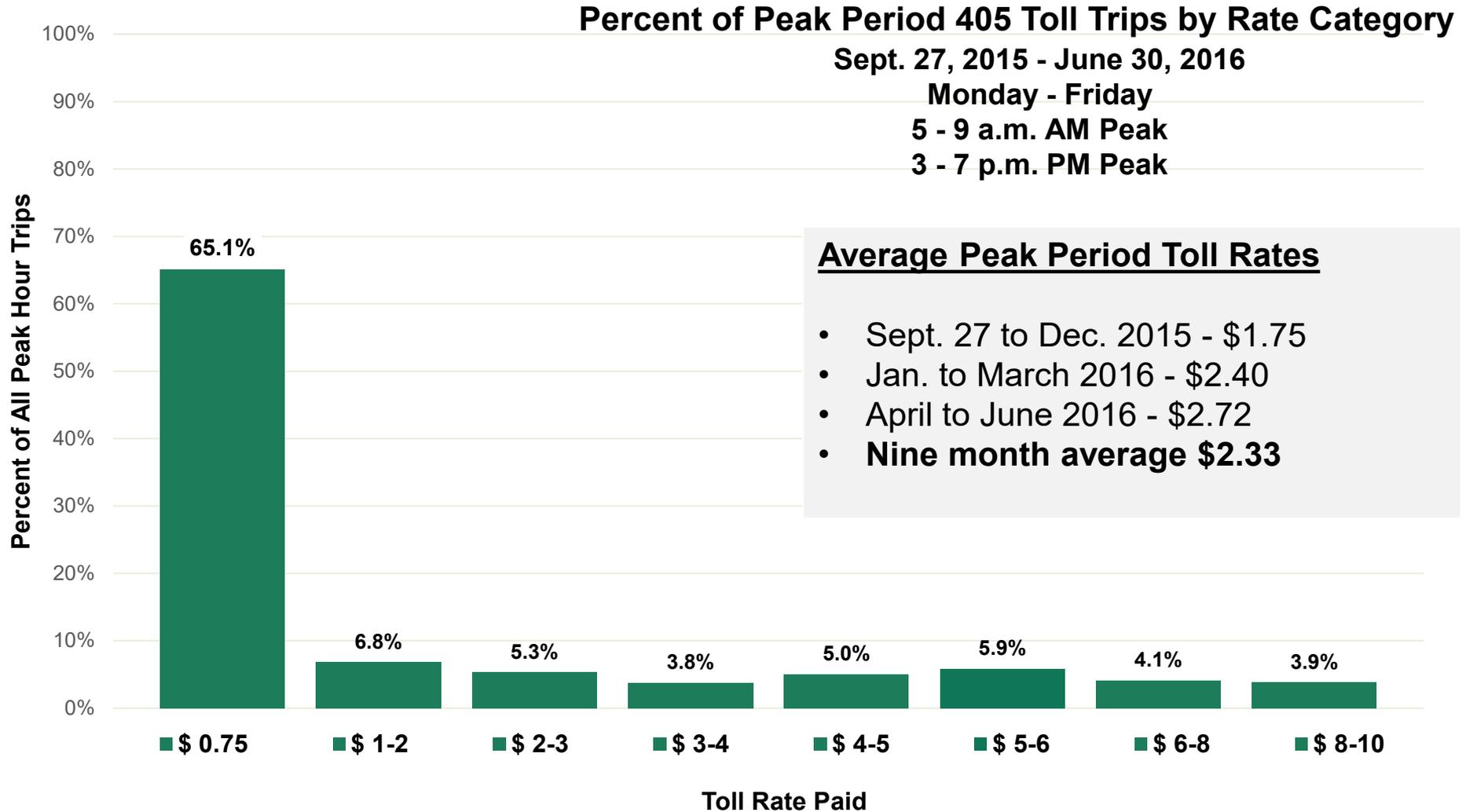
I-405 HOV Performance

Percentage of peak period when speeds are greater than 45 MPH



This metric will be measured in six month intervals over two years.

Increased use of express toll lanes means higher average toll rates



Fund future corridor improvements

Financial Forecasts

- The initial gross toll revenue estimate was \$3.14 million through May 2016. Actual gross toll revenue was \$10.56 million.
- WSDOT updated revenue forecasts in June to reflect the faster than anticipated ramp-up for express toll lanes. New forecasts project an increase of about \$20 million in gross toll revenue and fees in each biennium compared to the initial forecast.
- During the last legislative session, the Legislature assumed increased toll revenue will cover capital investments in the I-405 corridor of \$29 million in the 2017-19 biennium and \$16 million in the 2019-21 biennium.

Meeting goals:

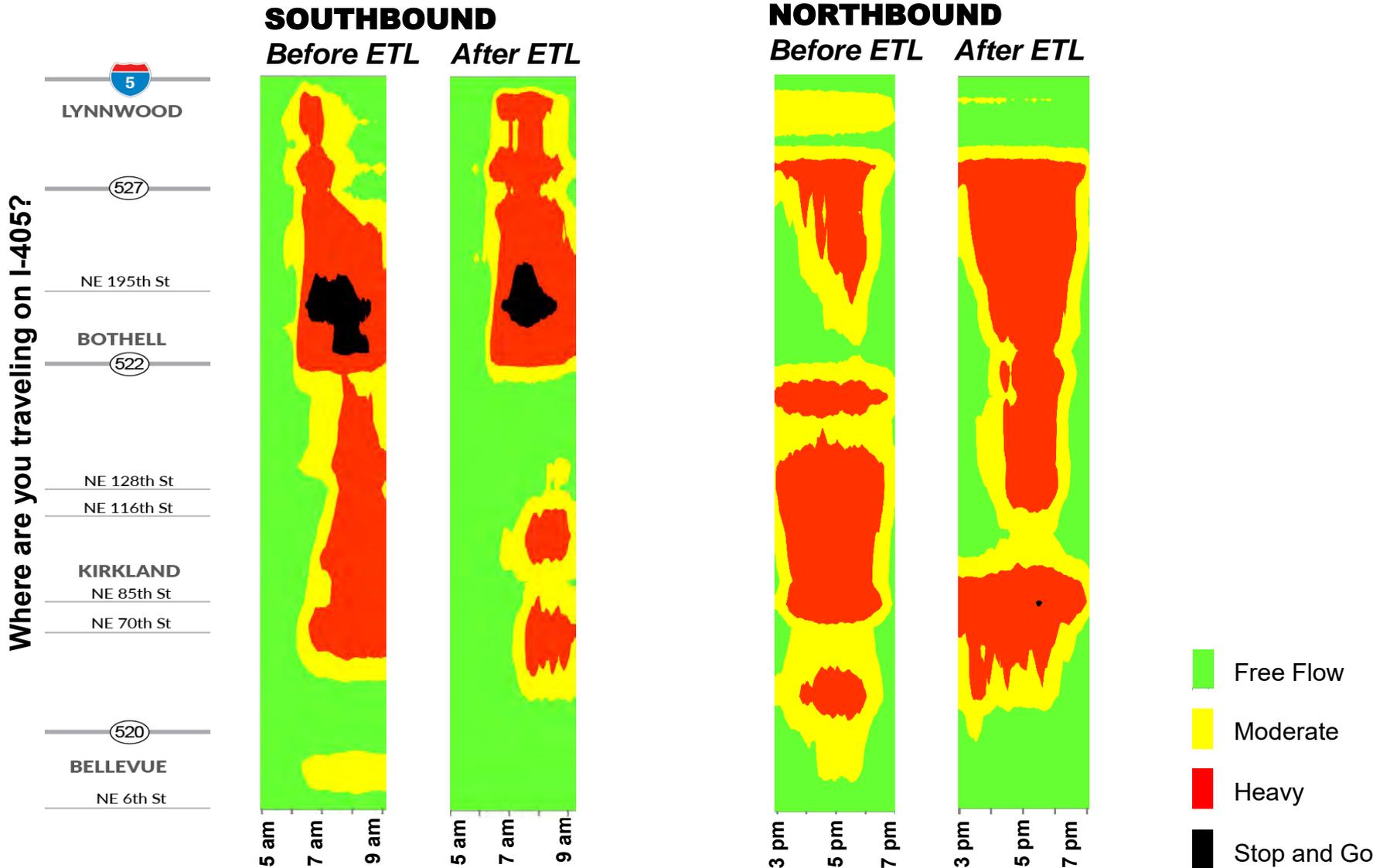
- ✓ Covering operating costs
- ✓ Funding future investments

Gross revenue covers operating costs first:

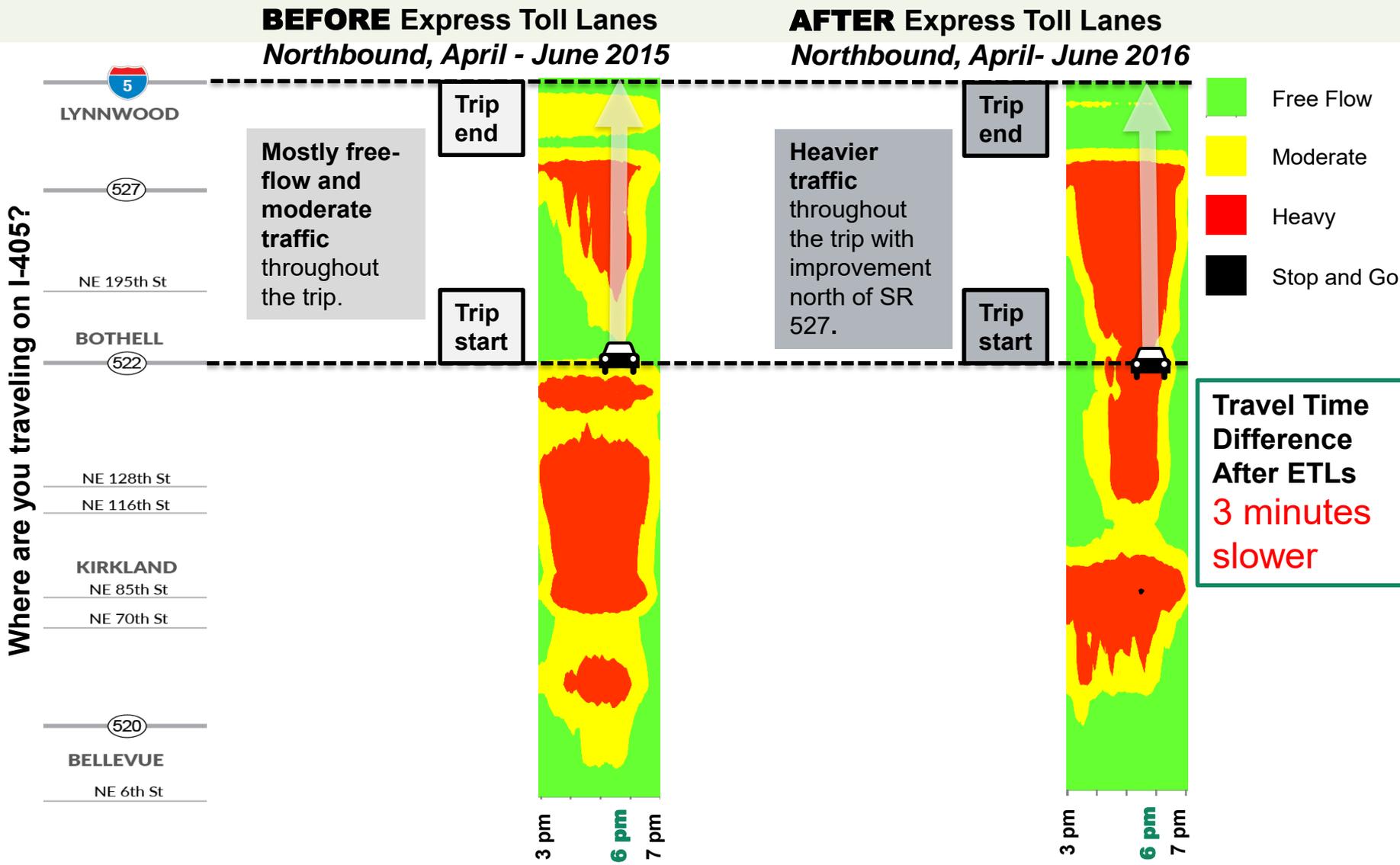
- Customer service
- Toll equipment
- Enforcement
- *Good To Go!* passes
- Pay By Mail printing and postage
- WSDOT and consultant salaries

Peak Period Congestion in the General Purpose Lanes

April-June 2015 vs. April-June 2016



Sample Commute: Regular Lanes, Bothell to Lynnwood, 6 p.m.



Change in travel times by segment

Summary

- The Legislature directed WSDOT to report out on travel times for smaller northbound and southbound I-405 segments. We've currently pulled data for these segments:
 - Bellevue to NE 116h St
 - SR 520 to SR 522
 - Bellevue to SR 522
 - Bellevue to SR 527
 - NE 85th to NE 195th

Segment Highlights

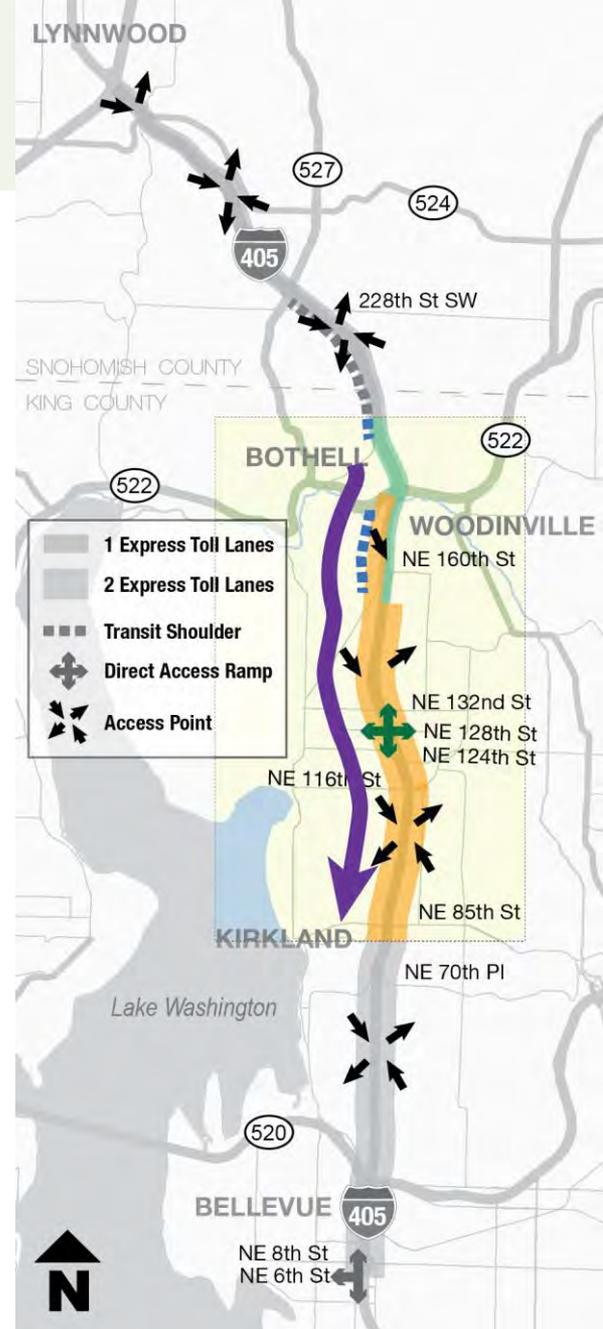
- Speeds are faster in each of the selected segments
- Travel times have improved for all selected segment trips
- 95th percentile demonstrates improved reliability in the selected segments

Change in travel times by segment

Southbound I-405 from NE 195th St to NE 85th St (AM Peak Period)

Timeframe Comparison	Express Toll Lanes	General Purpose Lanes
	Average (95 th Percentile)	Average (95 th Percentile)
October 2014 vs. 2015	6.0 (9.5) Minutes Faster	5.6 (6.3) Minutes Faster
January 2015 vs. 2016	2.3 (4.2) Minutes Faster	4.7 (5.5) Minutes Faster
May 2015 vs. 2016	2.6 (4.4) Minutes Faster	5.3 (6.8) Minutes Faster

The **95th percentile** is a measure of reliability that allows commuters to plan how much time will be required to make a trip and be on time 19 days per month on average and late on one of 20. Ninety-five percent of travel times are shorter than this duration. Faster speeds mean that commuters have more predictability and can plan less time for their commute.

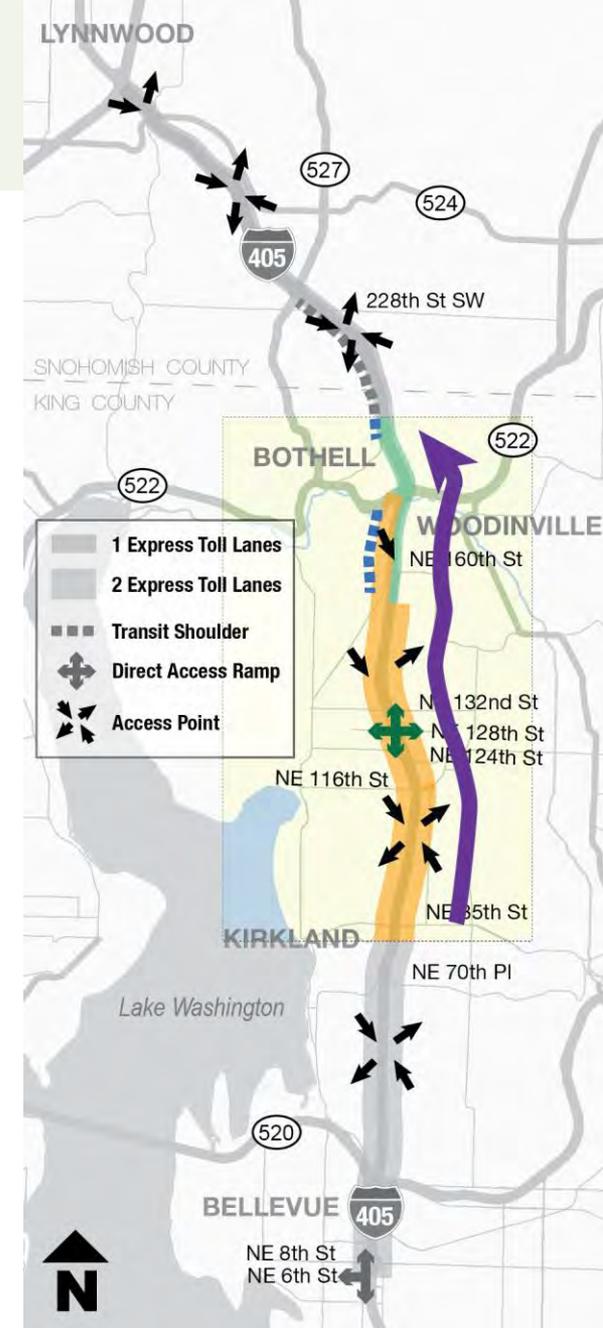


Change in travel times by segment

Northbound I-405 from NE 85th St to NE 195th St (PM Peak Period)

Timeframe Comparison	Express Toll Lanes			General Purpose Lanes		
	Average	(95 th Percentile)		Average	(95 th Percentile)	
October 2014 vs. 2015	3.4	(5.3)	Minutes Faster	2.9	(1.6)	Minutes Faster
January 2015 vs. 2016	2.9	(4.2)	Minutes Faster	2.7	(1.9)	Minutes Faster
May 2015 vs. 2016	2.6	(3.5)	Minutes Faster	1.3	(0.2)	Minutes Faster

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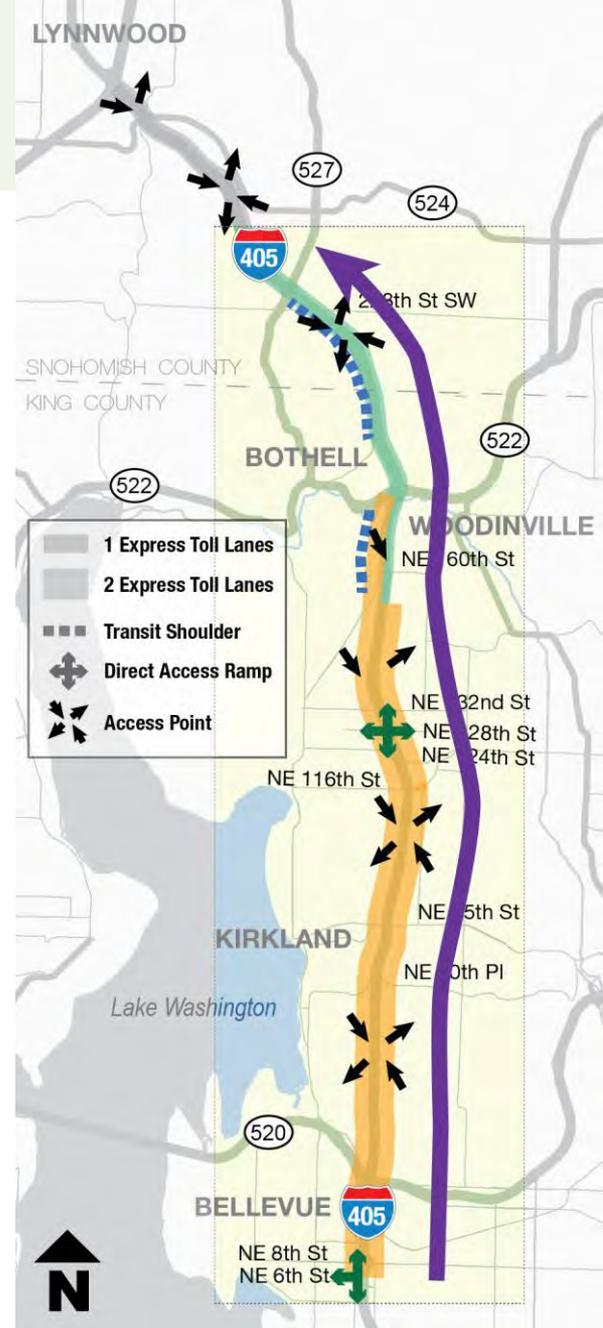


Change in Travel Times by Segment

Northbound I-405 from Bellevue to SR 527 (PM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes	
	Average	(95 th Percentile)	Average	(95 th Percentile)
October 2014 vs. 2015	6.6	(12.9)	1.7	(4.3)
January 2015 vs. 2016	5.3	(8.3)	2.7	(1.0)
May 2015 vs. 2016	4.7	(7.3)	1.4	(3.7)

The **95th percentile** is a measure of reliability that allows commuters to plan how much time will be required to make a trip and be on time 19 days per month on average and late on one of 20. Ninety-five percent of travel times are shorter than this duration. Faster speeds mean that commuters have more predictability and can plan less time for their commute.



King County Metro – Spring service period

Key Takeaways

- Ridership increased 8.2 percent
- Average travel savings of 2.1 minutes in the AM and 5.8 minutes in the PM.

Avg. Weekday Boardings			
Route	2015	2016	Change
237	106	125	17%
252	674	687	2%
257	574	592	3%
277	239	271	13%
311	1,032	1,151	12%
342	299	310	4%
952	294	347	18%
Total	3,219	3,483	8.2%

Data comparison:

2015: February 16– June 5, 2015, weekdays

2016: March 28 – May 31, 2016, weekdays

Average Travel Time in Minutes (by route by period)						
Route	Spring 2015		Spring 2016		Change	
	AM	PM	AM	PM	AM	PM
237	22.9	33.0	20.1	23.4	-2.7	-9.6
311	22.7	34.1	20.5	29.0	-2.1	-5.1
342	21.5	36.3	20.7	28.5	-0.9	-7.8
952	37.2	35.4	32.9	35.7	-4.3	0.3
Total	23.2	34.7	21.1	28.9	-2.1	-5.8

Data comparison:

2015: February 16– June 5, 2015, weekdays

2016: March 28 – June 17, 2016, weekdays

Community Transit – Spring service period

Key Takeaways

- Peak period transit ridership increased 3 percent

Summary

- Daily average time savings showed improvements for the majority of routes, with the exception of Route 424 which travels between SR 520 and SR 522.

Routes:

424, 435, 532, 535

Data comparison:

2015: April – June, weekdays

2016: April – June, weekdays



Express Toll Lanes

Successes and Challenges

Successes

- + Express toll lanes are heavily used.
- + Commuters have a faster and more reliable trip in the express toll lanes.
- + Pay By Mail use is higher than anticipated.

Challenges

- Limited capacity in the single express toll lane between SR 522 and I-5, combined with heavy demand from drivers, causes:
 - Toll rates to reach the \$10 maximum often to manage demand.
 - Speeds to drop below 45 mph frequently when at maximum toll rate.

General Purpose Lanes

Successes and Challenges

Successes

- + Southbound general purpose peak period travel times and speeds have improved with express toll lane operations.
- + Weekday peak period general purpose travel times are faster in both directions through the section of the corridor with dual express toll lanes.

Challenges

- Limited capacity in the general purpose lanes on northbound I-405 between SR 522 and I-5, due to transition from five to three lanes, has resulted in travel times being three minutes slower for that section.

Peer to Peer Workshop

- **On June 20-22 three agency peers and FHWA provided insights on the implementation of the I-405 express toll lanes, challenges and lessons learned from the experience.**
- **Feedback**
 - WSDOT has identified and adequately addressed operational challenges.
 - Express toll lanes have proven to be desirable and successful.
 - Changing occupancy rates and mandatory pass requirements for carpools were major changes and difficult to implement at the same time.
 - WSDOT should consider a regional concept of operations for how all “managed” capacity will integrate with each other.

PEER AGENCY PANEL

Nick Farber, Colorado
Department of
Transportation High
Performance
Transportation Enterprise

Kathy McCune, Los
Angeles County
Metropolitan Transportation
Authority

Lev Pinelis, Transurban

Greg Jones, Federal
Highway Administration

James McCarthy, Federal
Highway Administration

David Ungemah,
Transportation Research
Board Congestion Pricing
Committee

I-405 operations: Adjustments

- **Completed Adjustments**

- Operational hours
 - Mon-Fri 5 a.m. to 7 p.m.
- Toll rate algorithm adjustments **6**
- Striping and access adjustments at 9 locations **1 2 3 4 5 8 9 10 11**
- Additional pavement markings and signage at 3 locations **2 7 9**



What we're seeing on evenings and weekends

Hours of operation change in effect March 18, 2016

- **Evenings (April – June 2015 versus 2016):**
 - 2015: Free flow nightly traffic in the HOV and general purpose lanes.
 - 2016: Slight (0-2 percent) increase in traffic at 7 p.m. when lanes open to all. No congestion overnight either before or after express toll lanes.

What we're seeing on evenings and weekends

Hours of operation change in effect March 18, 2016

- **Weekends (March – July 2015 versus 2016):**
 - 2015: Free flow weekend traffic in the HOV and general purpose lanes.
 - 2016: Traffic in the express toll lanes has returned to 2015 levels with a less than 1 percent difference. Slight improvement in weekend general purpose lane congestion with 1-2 percent reduction in moderate traffic congestion overall.

I-405 operations: Future Projects Under Evaluation

- 14 Northbound auxiliary lane between SR 520 and NE 70th Place
- 15 General purpose hard shoulder running on northbound I-405 from SR 527 to I-5
- 16 Address limited capacity in single express toll lane section (SR 522 to I-5)



Hard Shoulder Running Northbound I-405 from SR 527 to I-5

What is Hard Shoulder Running (HSR)?

- Traffic Management Strategy that uses a shoulder as a general purpose lane to provide additional capacity when needed (peak periods)
- Shoulder is preserved when traffic volumes are lower
- Dynamically controlled using electronic signs



Timeline

- Initial funding in 2016 Supplemental Transportation Budget
- Construction targeted for 2017
- Estimated project cost: \$11.5 million

QUESTIONS?

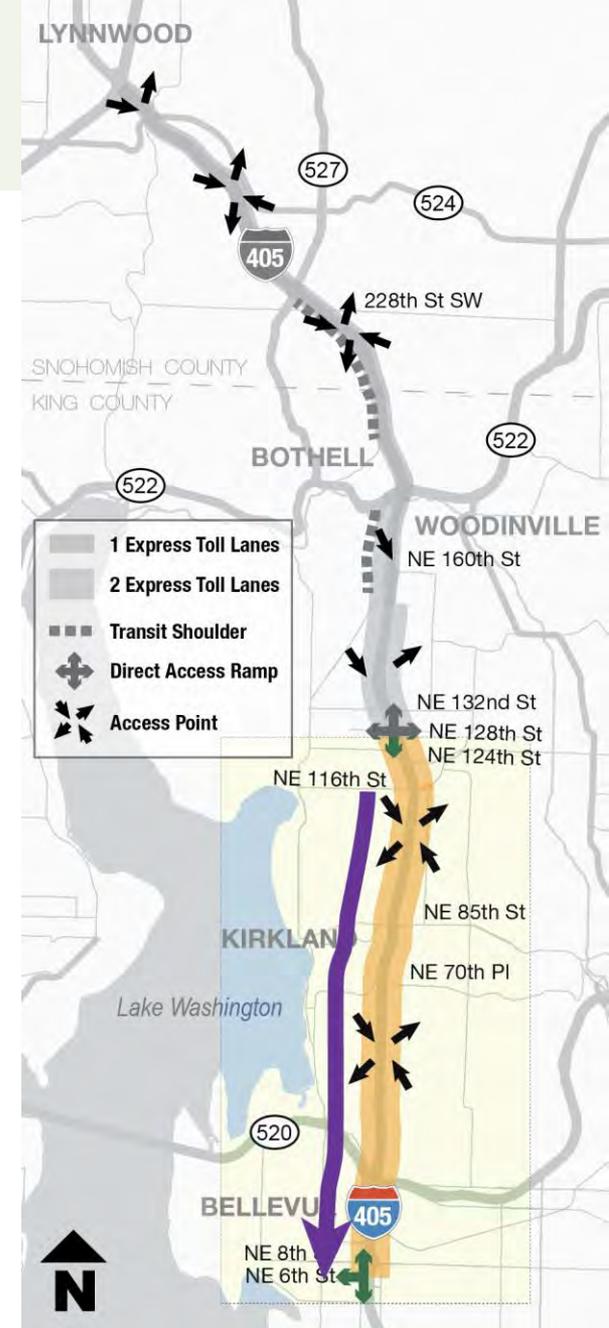
CONTACT

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Change in Travel Times by Segment

Southbound I-405 from NE 116th to Bellevue (AM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes	
	Average	(95 th Percentile)	Average	(95 th Percentile)
October 2014 vs. 2015	1.9	(2.9) Minutes Faster	2.3	(2.3) Minutes Faster
January 2015 vs. 2016	1.2	(1.8) Minutes Faster	1.8	(0.9) Minutes Faster
April* 2015 vs. 2016	0.8	(1.5) Minutes Faster	1.6	(1.8) Minutes Faster

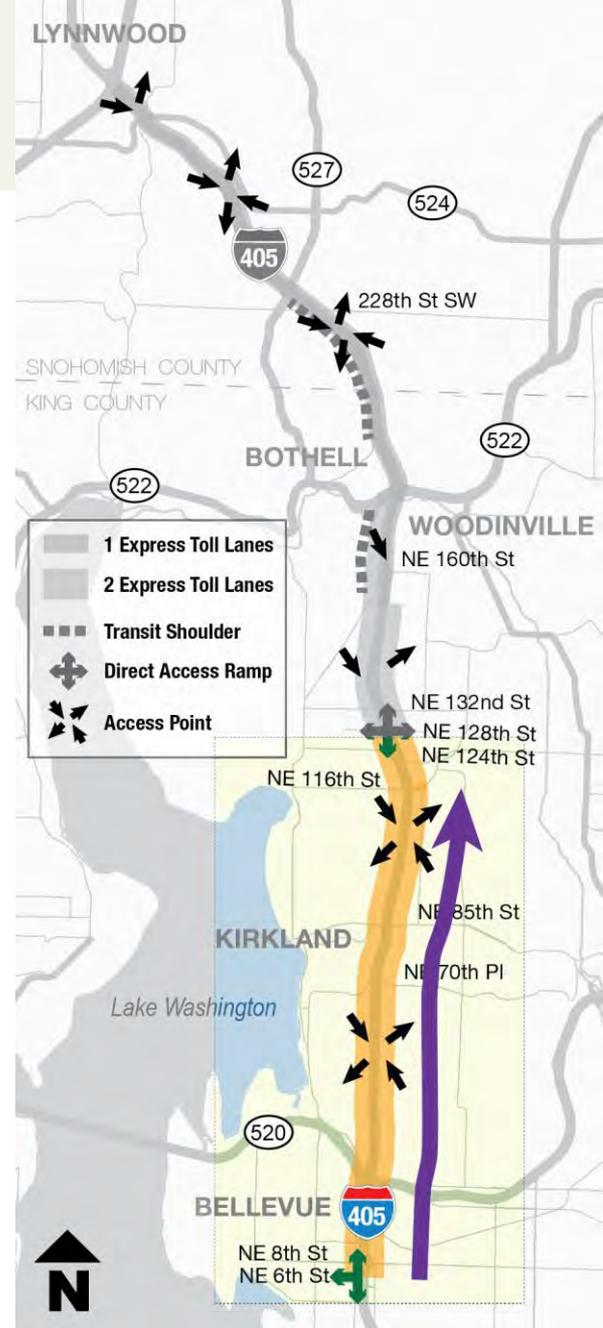


*The Data from May 2015-16 is not available in this segment

Change in Travel Times by Segment

Northbound I-405 from Bellevue to NE 116th (PM Peak Period)

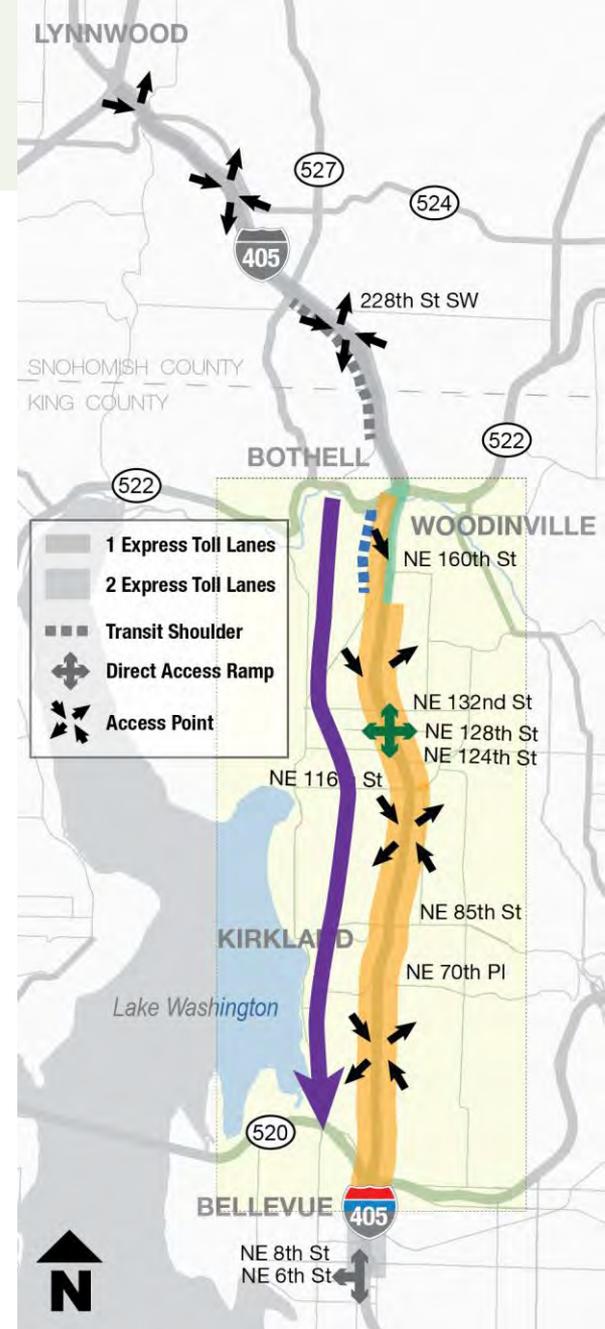
Timeframe Comparison	Express Toll Lanes		General Purpose Lanes		
	Average	(95 th Percentile)	Average	(95 th Percentile)	
October 2014 vs. 2015	6.1	(12.7)	3.2	(6.7)	Minutes Faster
January 2015 vs. 2016	5.0	(8.7)	3.7	(3.9)	Minutes Faster
May 2015 vs. 2016	5.1	(8.5)	3.5	(6.8)	Minutes Faster



Change in Travel Times by Segment

Southbound I-405 from SR 522 to SR 520 (AM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes		
	Average	(95 th Percentile)	Average	(95 th Percentile)	
October 2014 vs. 2015	6.0	(8.7)	5.8	(5.8)	Minutes Faster
January 2015 vs. 2016	3.1	(5.0)	4.8	(4.8)	Minutes Faster
May 2015 vs. 2016	3.3	(5.2)	5.1	(6.0)	Minutes Faster



Change in Travel Times by Segment

Northbound I-405 from SR 520 to SR 522 (PM Peak Period)

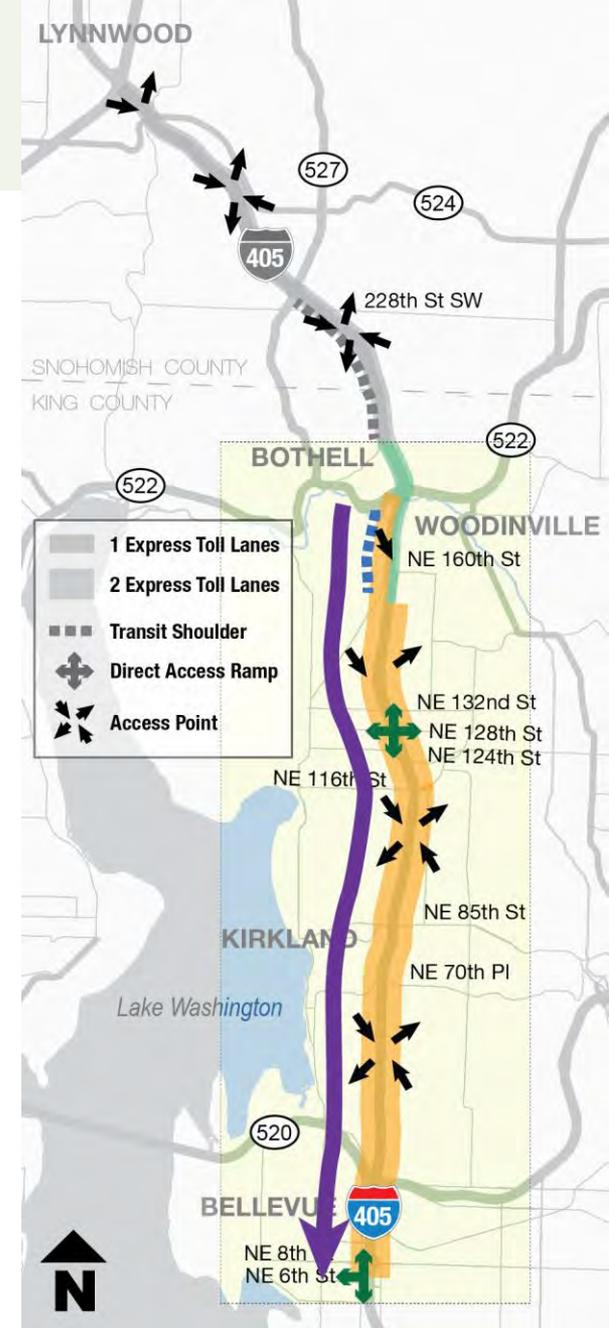
Timeframe Comparison	Express Toll Lanes	General Purpose Lanes
	Average (95 th Percentile)	Average (95 th Percentile)
October 2014 vs,2015	7.8 (14.3) Minutes Faster	6.9 (11.0) Minutes Faster
January 2015 vs. 2016	7.1 (10.0) Minutes Faster	6.2 (3.7) Minutes Faster
May 2015 vs. 2016	8.6 (14.1) Minutes Faster	6.4 (11.5) Minutes Faster



Change in Travel Times by Segment

Southbound I-405 from SR 522 to Bellevue (AM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes		
	Average	(95 th Percentile)	Average	(95 th Percentile)	
October 2014 vs. 2015	5.5	(8.3)	6.0	(6.1)	Minutes Faster
January 2015 vs. 2016	2.6	(4.6)	4.8	(4.9)	Minutes Faster
April* 2015 vs. 2016	1.7	(3.1)	3.9	(5.5)	Minutes Faster

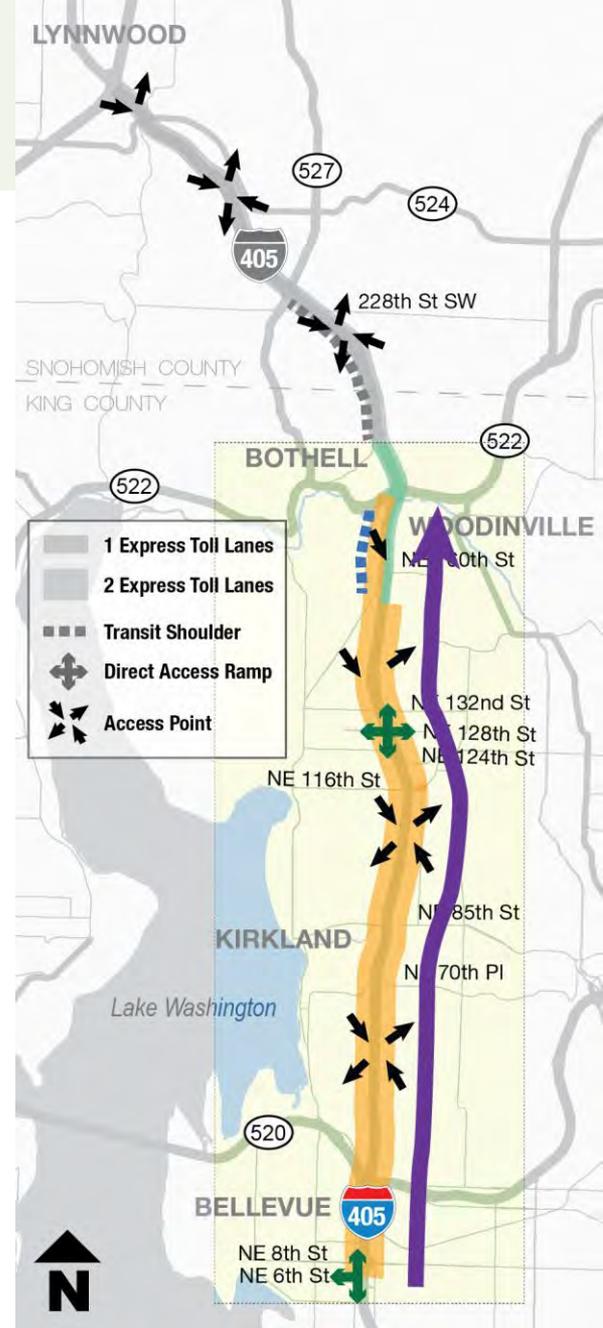


*The Data from May 2015-16 is not available in this segment

Change in Travel Times by Segment

Northbound I-405 from Bellevue to SR 522 (PM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes	
	Average	(95 th Percentile)	Average	(95 th Percentile)
October 2014 vs. 2015	7.0	(14.1)	4.8	(7.0)
January 2015 vs. 2016	5.9	(9.6)	5.0	(3.6)
May 2015 vs. 2016	5.8	(9.3)	3.8	(6.7)



Change in Travel Times by Segment

Southbound I-405 from SR 527 to Bellevue (AM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes	
	Average	(95 th Percentile)	Average	(95 th Percentile)
October 2014 vs. 2015	7.6	(12.1)	9.0	(11.0)
January 2015 vs. 2016	2.3	(3.4)	4.9	(5.9)
April* 2015 vs. 2016	1.2	(1.7)	4.8	(7.5)

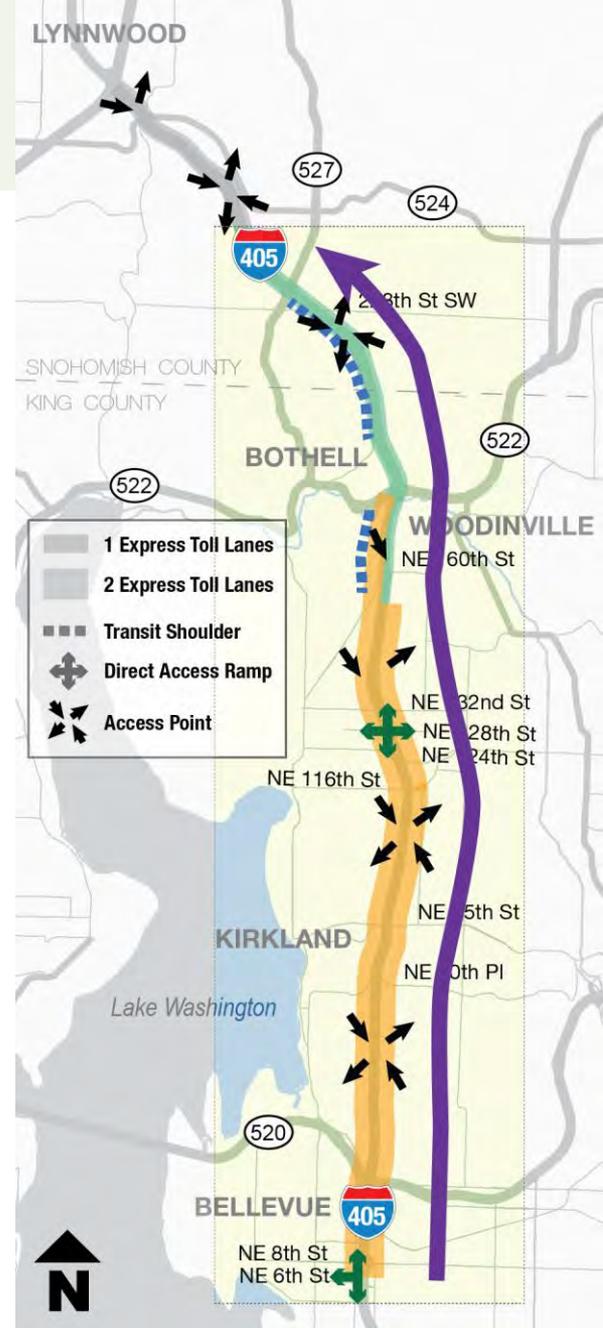


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Change in Travel Times by Segment

Northbound I-405 from Bellevue to SR 527 (PM Peak Period)

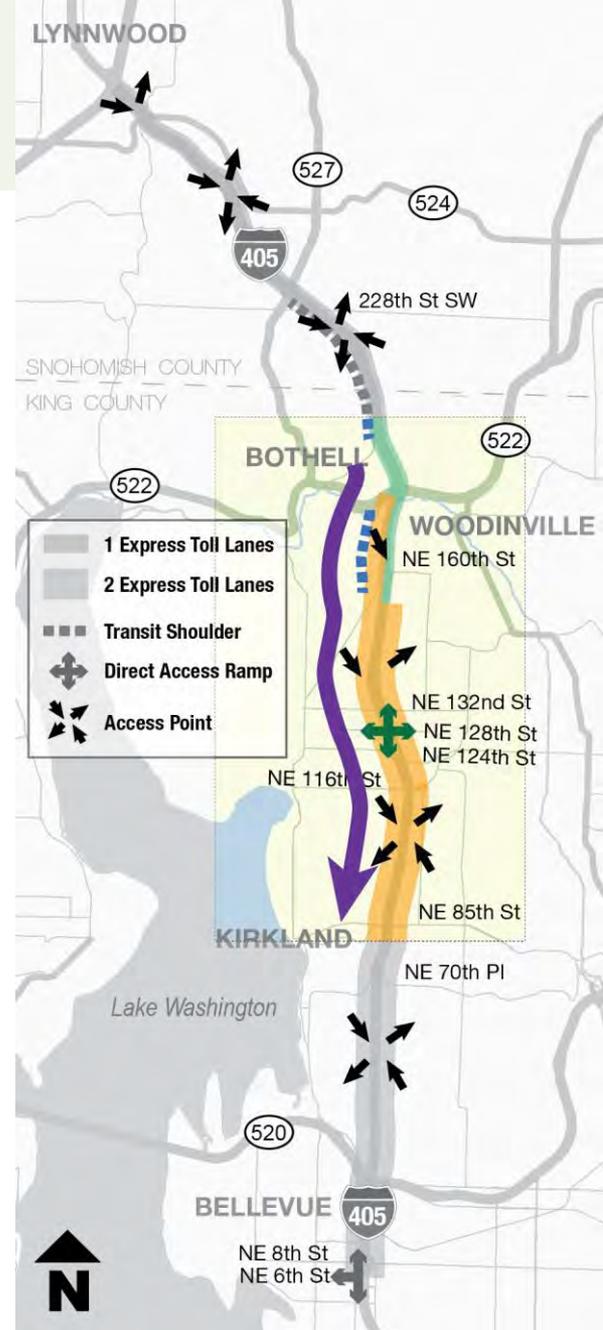
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October 2014 vs. 2015	6.6 (12.9) Minutes Faster	1.7 (4.3) Minutes Faster
January 2015 vs. 2016	5.3 (8.3) Minutes Faster	2.7 (1.0) Minutes Faster
May 2015 vs. 2016	4.7 (7.3) Minutes Faster	1.4 (3.7) Minutes Faster



Change in Travel Times by Segment

Southbound I-405 from NE 195th to NE 85th (AM Peak Period)

Timeframe Comparison	Express Toll Lanes	General Purpose Lanes
	Average (95 th Percentile)	Average (95 th Percentile)
October 2014 vs. 2015	6.0 (9.5) Minutes Faster	5.6 (6.3) Minutes Faster
January 2015 vs. 2016	2.3 (4.2) Minutes Faster	4.7 (5.5) Minutes Faster
May 2015 vs. 2016	2.6 (4.4) Minutes Faster	5.3 (6.8) Minutes Faster



Change in Travel Times by Segment

Northbound I-405 from NE 85th to NE 195th (PM Peak Period)

Timeframe Comparison	Express Toll Lanes		General Purpose Lanes		
	Average	(95 th Percentile)	Average	(95 th Percentile)	
October 2014 vs. 2015	3.4	(5.3)	2.9	(1.6)	Minutes Faster
January 2015 vs. 2016	2.9	(4.2)	2.7	(1.9)	Minutes Faster
May 2015 vs. 2016	2.6	(3.5)	1.3	(0.2)	Minutes Faster

