SR 520 Multi-Modal Corridor Study

Richard Warren
Urban Planning Office

Stacy C. Trussler, PE
Director, Urban Planning Office

Paula J. Hammond, PE
Secretary of Transportation

Steve Reinmuth
Chief of Staff

Washington State Department of Transportation

Stakeholders' Meeting
August 16, 2012
Redmond, WA

Year 2010 - AM Peak Hour

Washington State Department of Transportation

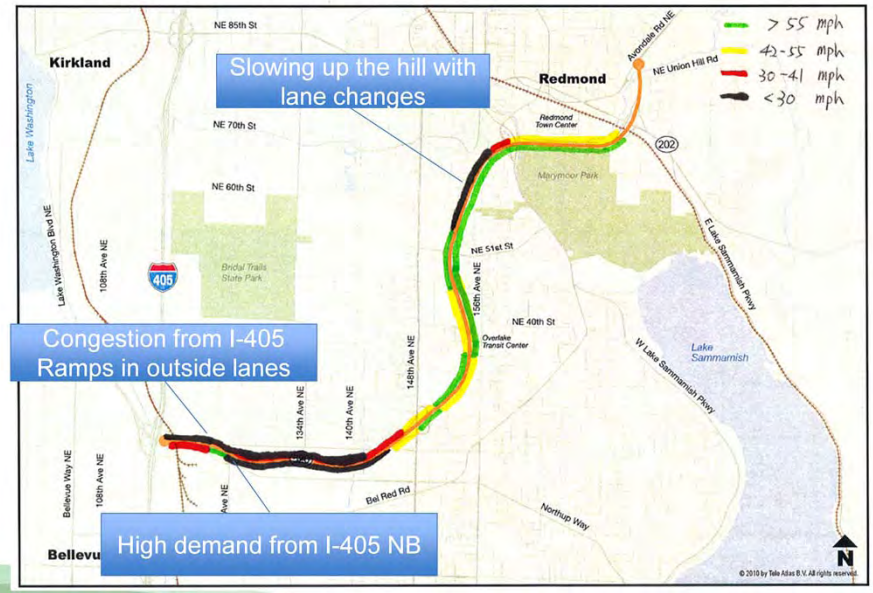
2

Year 2010 - PM Peak Hour

Washington State Department of Transportation

3

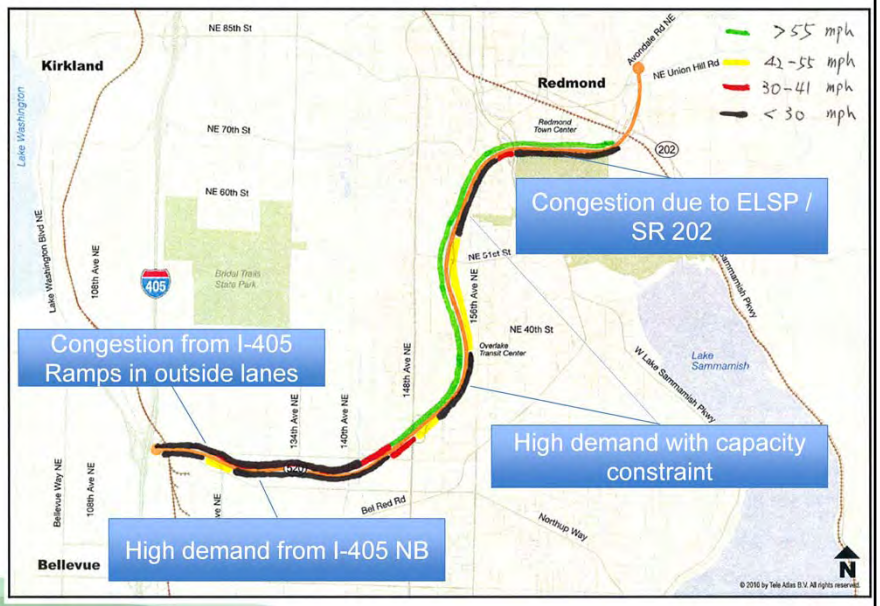
2030 Baseline - AM Peak Hour



Washington State Department of Transportation

4

2030 Baseline - PM Peak Hour



Washington State Department of Transportation

5

2030 Mainline Analysis

Baseline

- East Link Light Rail to downtown Redmond
- Inside HOV lanes 3+
- Toll on SR 520 bridge
- 2030 land use and projected developments
- No capacity improvements on mainline

Scenario 1

- Includes first items from baseline
- 124th Ave NE full interchange
- 148th Ave NE - Overlake access ramp
- Auxiliary lanes between 124th Ave NE & 148th Ave NE in both directions
- Ramp metering
- 5 percent demand reduction

2030 Mainline Analysis

Scenario 2

- Includes all of scenario 1
- Add auxiliary lanes:
  - EB between I-405 NB on-ramp (New CD ramp) and 124th Ave on ramp
  - EB between 148th Ave on-ramp and 40th St off ramp
  - EB between 51st St on-ramp and WLSP off ramp
  - WB between WLSP on-ramp and 51st St off ramp

Scenario 3

- Includes all of scenario 1
- Assumes the managed lanes would be 80% utilized
- Uses existing HOV lane

Scenario 4

- Includes all of scenario 3
- Adds an aux lane on EB between 51st ST on ramp & WLSP off ramp

Mainline Analysis Summary

Problem Locations	Peak Hour	2030 Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4
EB between I-405 on-ramp (new CD ramp) & 124th Ave on-ramp	PM			Aux	ML	ML
EB between 148th Ave on-ramp & 40th St off-ramp	PM			Aux	ML	ML
EB between 51st St on-ramp & WLSP off-ramp	PM			Aux	ML	ML+Aux
EB between WLSP on-ramp & SR 202 off-ramp*	PM				ML	ML
WB between WLSP on-ramp & 51st St off-ramp	AM		TDM & Op. Efficiencies	Aux	ML	ML
WB between 148th Ave on-ramp & New I-405 /124th Ave ramps*	AM				ML	ML
WB between 148th Ave on- ramp & new I-405 /124th Ave ramps*	PM				ML	ML
Cost Estimate**		N/A	N/A	$47M-$61M	$11M	$31M-$37M

	> 55 mph
	42 mph - 55 mph
	41 mph - 30 mph
	< 30 mph

Washington State Department of Transportation

*Congestion due to constraints on local arterial s: SR 202/ELSP; I-405 NB/SB ramps

** 2012 planning level cost estimates; developed only for option evaluation

8

Intersection Analysis Summary

- Scenario 1
- 12 ramp termini and
- 11 local arterial intersections analyzed within immediate vicinity of mainline

Congested Intersection	Peak Hour	LOS / Delay (sec)		Conceptual Improve-ment	Cost Estimate*
		Scenario 1*	w/ Improvements		
WLSP/Leary Way/SR 520	AM	E / 58	D / 53	Turn Lanes**	$5M-$6.6M
	PM	F / 129	E / 79		
Union Hill Rd/Avondale Rd	AM	E / 68	D / 37	Flyover Ramp	$62M-$83M
	PM	F / 83	D / 52		
Union Hill Rd/Avondale Rd	AM	E / 68	C / 22**	SPUI	TBD
	PM	F / 83	C / 27**		
NE 24th St/148th Ave NE	AM	C / 34	C / 32	Additional Lanes	$3M
	PM	F / 83	D / 54		

	LOS D or better
	LOS E
	LOS F

* 2012 planning level cost estimates; developed only for option evaluation.
** City of Redmond's long range plan improvement

Washington State Department of Transportation

9

Year 2010 - AM Peak Hour - Intersection LOS

Washington State Department of Transportation

10

Year 2010 - PM Peak Hour - Intersection LOS

Washington State Department of Transportation

2030 - AM Peak Hour - Intersection LOS

Washington State Department of Transportation

12

2030 - PM Peak Hour - Intersection LOS

Washington State Department of Transportation

Draft Preliminary Staff Recommendations

Freeway Operations

Short Term
- Strategic Active Traffic Management (ATM)
- NE 51st/NE 40th St westbound collector/distributor reconfiguration
- Signal timing improvements at various intersections

Mid-term
- Enhanced ATM
- SR 520/124th Ave full interchange w/ 124th Ave – 148th Ave auxiliary lanes
- 148th Ave NE interchange improvements
- Managed lanes

Long Term
- Auxiliary lanes at various locations
- SR 520/SR 202 interchange improvements
- SR 520/WLSP various intersection improvements

RELIABLE · RESPONSIBLE · SUSTAINABLE

MOVING WASHINGTON

Washington State Department of Transportation

14

Scenario 1 - AM Peak Hour

Slowing up the hill with lane changes

Congestion from I-405 Ramps in outside lanes

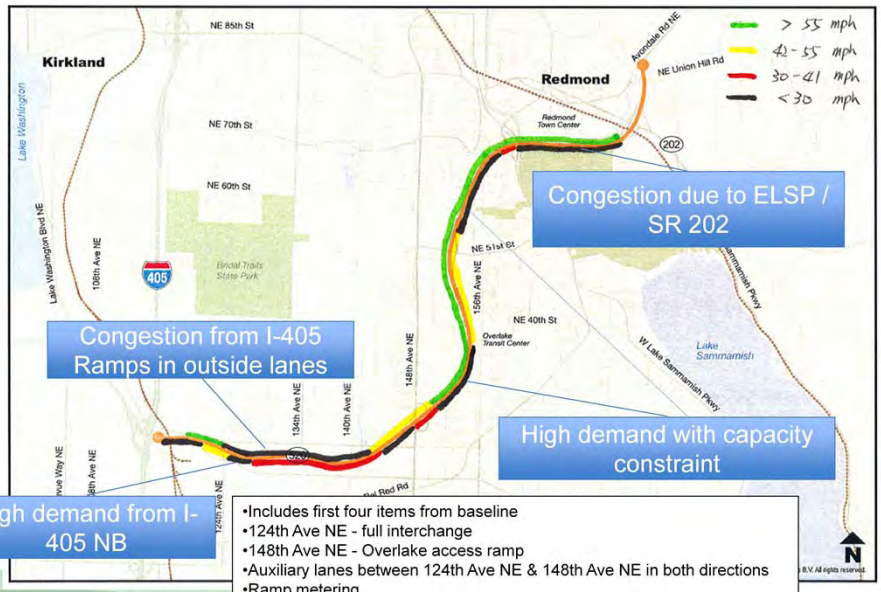
High demand from I-405 NB

- Includes first four items from baseline
- 124th Ave NE - full interchange
- 148th Ave NE - Overlake access ramp
- Auxiliary lanes between 124th Ave NE & 148th Ave NE in both directions
- Ramp metering
- 5 percent demand reduction

Washington State Department of Transportation

15

Scenario 1 - PM Peak Hour



- Includes first four items from baseline
- 124th Ave NE - full interchange
- 148th Ave NE - Overlake access ramp
- Auxiliary lanes between 124th Ave NE & 148th Ave NE in both directions
- Ramp metering
- 5 percent demand reduction

Washington State Department of Transportation

16

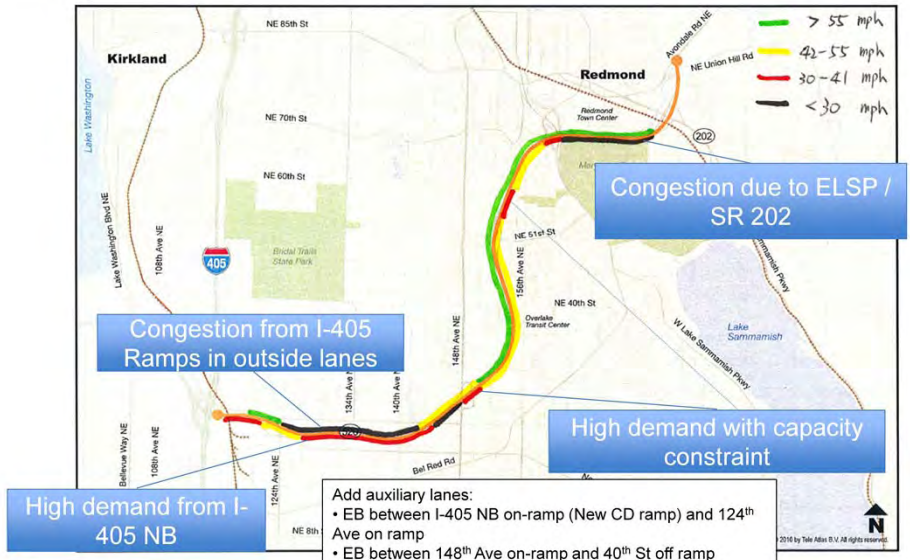
Scenario 2 - AM Peak Hour

Add auxiliary lanes:
- EB between I-405 NB on-ramp (New CD ramp) and 124th Ave on ramp
- EB between 148th Ave on-ramp and 40th St off ramp
- EB between 51st St on-ramp and WLSP off ramp
- WB between WLSP on-ramp and 51st St off ramp

Washington State Department of Transportation

17

Scenario 2 - PM Peak Hour



Congestion due to ELSP / SR 202

Congestion from I-405 Ramps in outside lanes

High demand with capacity constraint

High demand from I-405 NB

Add auxiliary lanes:
- EB between I-405 NB on-ramp (New CD ramp) and 124th Ave on ramp
- EB between 148th Ave on-ramp and 40th St off ramp
- EB between 51st St on-ramp and WLSP off ramp
- WB between WLSP on-ramp and 51st St off ramp

Washington State Department of Transportation

18

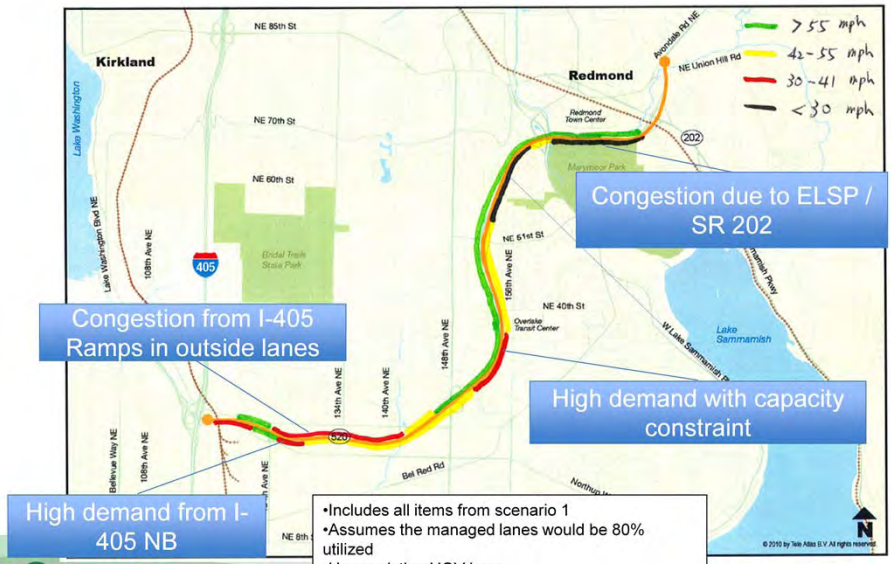
Scenario 3 - AM Peak Hour

- Includes all of scenario 1
- Assumes the managed lanes would be 80 percent utilized
- Uses existing HOV lane

Washington State Department of Transportation

19

Scenario 3 - PM Peak Hour



- Includes all items from scenario 1
- Assumes the managed lanes would be 80% utilized
- Uses existing HOV lane

Washington State Department of Transportation

20

Scenario 4 - AM Peak Hour

- Includes all items from Scenario 3
- Adds an aux lane on EB between 51st ST on ramp & WLSP off ramp

Washington State Department of Transportation

21