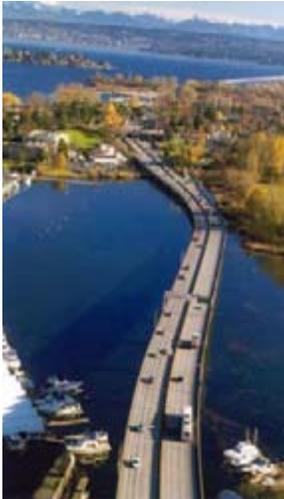




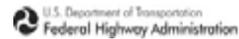
Bridge Replacement and HOV Project



Executive Committee Meeting

Museum of History and Industry
2700 24th Ave. E

January 11, 2005
1:00 p.m. – 4:00 p.m.



Special Studies

- Lake Washington Boulevard ramp closure
- 108th Avenue Direct Access
- Madison Park Bike/Pedestrian Connection
- Quieter Pavement
- Transit Operations Analysis

Quieter Pavement

- Why are we looking at pavement and traffic noise?
- What did we find in the Phase 1 evaluation?
- How do rubber pavements work?
- Additional issues that affect our choices
- Where does traffic noise come from and how does pavement affect noise?
- What happens next?

3

Why are we looking at pavement and traffic noise?

- Many residents along SR 520, I-90 and I-5 want solutions that will reduce noise
- New quieter pavements are in development
- Pavement as noise mitigation will likely be allowed in the near future

4

What did we find in the Phase 1 evaluation?

- **Four pavement options**
 - Open graded asphalt
 - Dense graded asphalt
 - Concrete
 - Rubber asphalt
- **Effects on pavement**
 - Climate
 - Studded tires
- **Strengths and weaknesses**
 - Lifespan
 - Noise reducing capabilities

5

How do rubber pavements work?

- Created when pieces of recycled tires are mixed into pavement
- Pavement more flexible, but more susceptible to studded tire wear
- May be difficult to install in most of Washington
- More study needed

6

Additional issues that affect our choices

- Pavement voids fill with dirt and sand, reducing noise reduction
- Higher lifecycle cost for open graded and rubberized asphalts than standard concrete
- Noise walls, earth berms, buffer zones and other efforts still needed to meet noise reduction criteria

7

Where does traffic noise come from and how does pavement affect noise?

- **Traffic noise**
 - Tires on pavement
 - Engine, exhaust and mechanical noise
- **Pavement effects**
 - Age and wear
 - Type of pavement (density, material)

8

What happens next?

- Phase 2 – in-depth evaluation of pavement options
- Potential Phase 3 - test new pavement materials and surface textures

9

Transportation - Key Findings

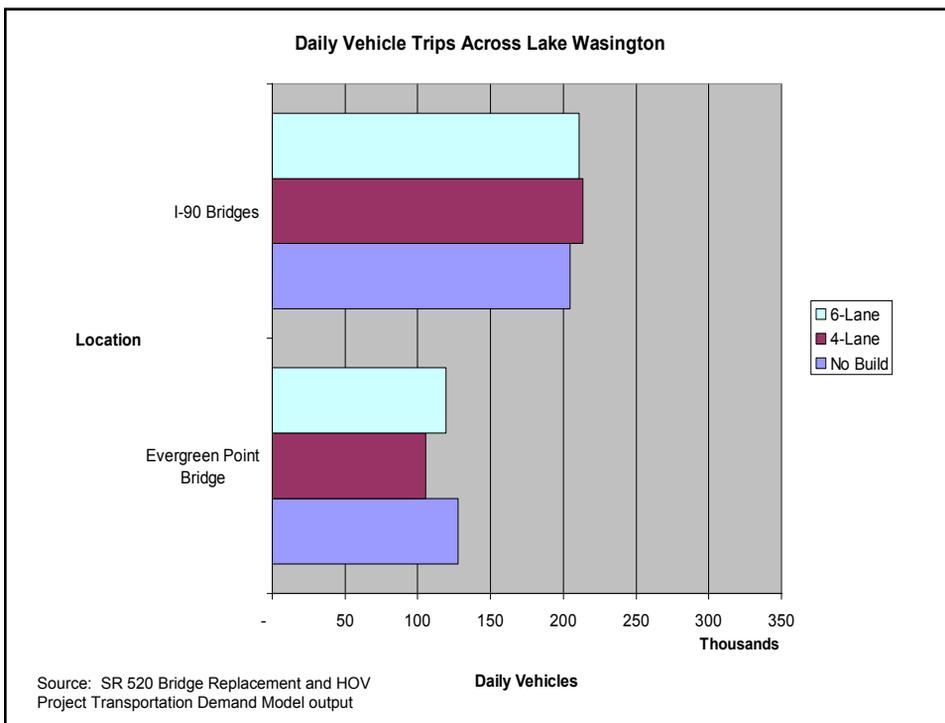
- Daily vehicle trips decrease; person trips increase
- Route diversion is low
- Shift to HOV and transit is high
- Peak traffic decreases in the 4-Lane; increases in the 6-Lane
- Person movement highest in 6-Lane

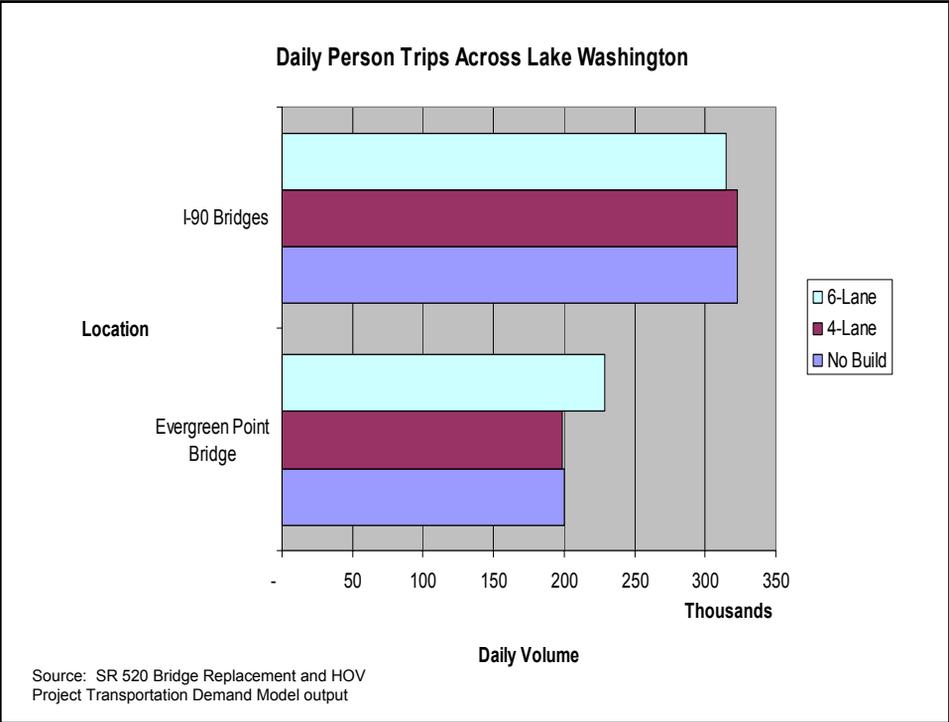
10

Project Benefits

- Improves corridor safety and reliability for GP, HOV, Transit, and Freight
- Does not add GP traffic to I-5 compared to No Build
- 6-Lane decreases Transit/HOV travel time by up to 80%
- 6-Lane ensures Transit/HOV reliability

11





Total Daily Cross Lake Forecast (SR 520 and I-90)

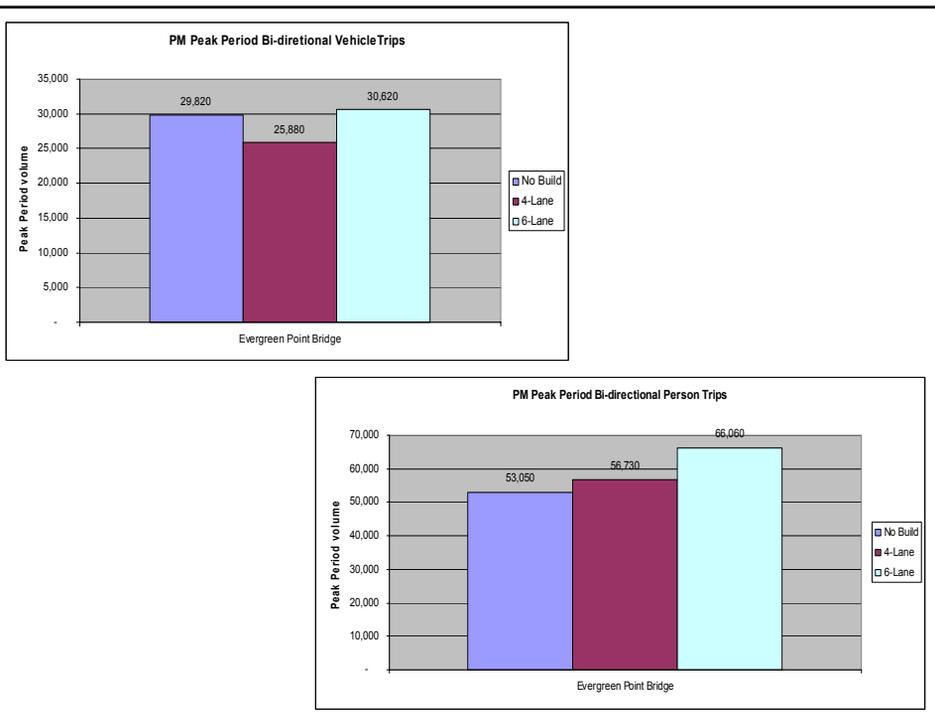
Alternative	Vehicle Trips	Person Trips
No Build	332,500	522,500
4-Lane	319,000	521,500
6-Lane	331,000	543,500

SR 520 PM Peak Performance

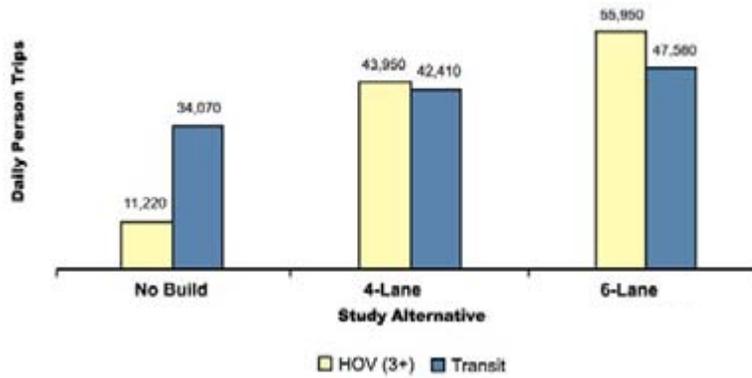
4-Lane: draws 7% more person trips in 13% fewer vehicles than No Build Alternative

6-Lane: draws 25% more person trips in 3% more vehicles than No Build Alternative

15



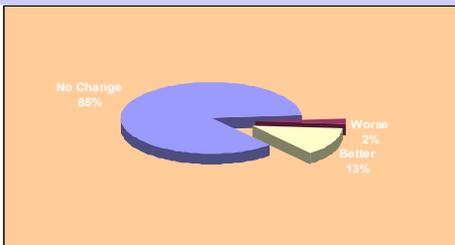
Daily HOV and Transit Ridership on SR 520



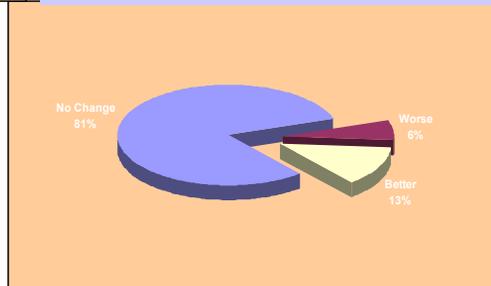
17

Local Intersection Performance

4-Lane Alternative Local Traffic



6-Lane Alternative Local Traffic



Key Intersection Performance

Worse
<i>Fairview Avenue/Valley Street (6-Lane)</i>
<i>Harvard Avenue East/East Roanoke Street/SR 520 Westbound Offramp (6-Lane)</i>
<i>92nd Avenue Northeast/SR 520 Westbound Off-ramp (4- and 6-Lane)</i>
Better
<i>Howell Street/Yale Avenue/I-5 Southbound On-ramp (4- and 6-Lane)</i>
<i>Lake Washington Boulevard/SR 520 Arboretum Ramp (4- and 6-Lane)</i>
<i>Montlake Boulevard/Lake Washington Boulevard/SR 520 Eastbound Ramp (6-Lane)</i>
<i>Montlake Boulevard/East Shelby Street (4- and 6-Lane)</i>
<i>Montlake Boulevard/Northeast Pacific Street (4-Lane)</i>
<i>Montlake Boulevard/Northeast 45th Street (6-Lane)</i>
<i>Northeast Pacific Street/15th Avenue Northeast (4-Lane)</i>
<i>Bellevue Way Northeast/Northup Way (4- and 6-Lane)</i>

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West Approach Profile

Balances many factors:

- Fish - less shading
- Wetlands – less shading
- Arboretum – does not bisect Foster Island; reduces noise dramatically
- Stormwater – drains to treatment facilities
- Visual –below tree line to reduce effect

20

New Visualizations

- East from Montlake Blvd.
- Northeast from Lake Washington
- West from Evergreen Pt. Rd.
- North from Graham Visitors Center

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Existing View

- Transit stops on outside of roadway
- 20-foot-high retaining wall along Lake Washington Boulevard
- Existing roadway about 140 feet wide



Looking east along SR 520 from Montlake Boulevard bridge toward Arboretum



Exhibit 10. View of SR 520 from Montlake Boulevard bridge—Viewpoint 14

SR 520 Bridge Replacement and HOV Project

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4-Lane Alternative

- Transit stops approximately the same locations as existing stops
- SR 520 between Montlake Boulevard and 24th Avenue East bridge about 60 feet wider to north than existing
- New elevated two-lane off-ramp and bicycle/pedestrian ramp on north side of roadway
- 24th Avenue East bridge about 13 feet higher at north end than existing bridge
- 8-foot-high sound wall on top of Lake Washington Boulevard retaining wall
- 10- to 16-foot-high sound wall (varies) on north side of westbound off-ramps



Looking east along SR 520 from Montlake Boulevard bridge toward Arboretum



Exhibit 10. View of SR 520 from Montlake Boulevard bridge—Viewpoint 14

SR 520 Bridge Replacement and HOV Project

6-Lane Alternative

- Transit stops in center of roadway
- SR 520 between Montlake Boulevard and 24th Avenue East bridge about 90 feet wider to north than existing
- Off-ramps, bicycle/pedestrian ramp, and 24th Avenue East bridge same as 4-Lane Alternative
- Lid landscape would be Olmsted-style for consistency with Arboretum and Lake Washington Boulevard landscapes
- Landscape on lid is only to indicate scale; lid design would be coordinated with Montlake community
- Stairs and elevators from lid to transit stop below not shown



Looking east along SR 520 from Montlake Boulevard bridge toward Arboretum

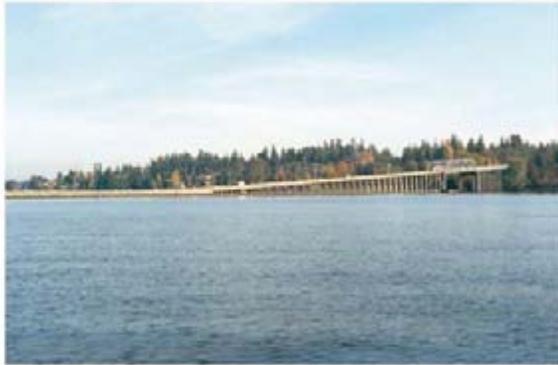


Exhibit 10. View of SR 520 from Montlake Boulevard bridge—Viewpoint 14

SR 520 Bridge Replacement and HOV Project

Existing View

- Columns 30 feet apart between floating bridge and navigation channel
- Floating bridge deck about 10 feet above water on columns
- Navigation channel 207 feet wide and 57 feet high



Looking northeast from Lake Washington toward Evergreen Point Bridge, east highrise, and Medina



Exhibit 15. View from Lake Washington—Viewpoint 12

SR 520 Bridge Replacement and HDV Project

25

4-Lane Alternative

- Columns 75 feet apart from east highrise across lake
- Floating bridge deck about 25 feet above water
- Floating bridge alignment is shifted about 130 feet north (measured at east highrise)
- Bicycle/pedestrian path passes under bridge just west of landfall
- Operations building set into hillside under bridge, screened by vegetation
- Navigation channel is 200 feet wide and 70 feet high



Looking northeast from Lake Washington toward Evergreen Point Bridge, east highrise, and Medina



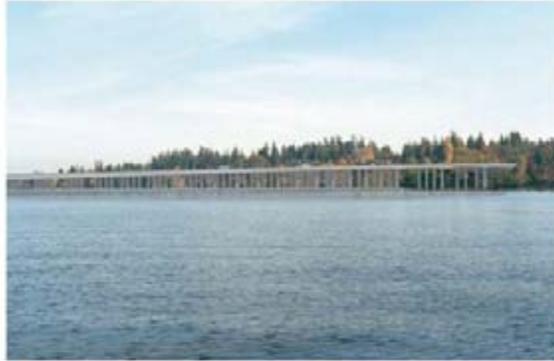
Exhibit 15. View from Lake Washington—Viewpoint 12

SR 520 Bridge Replacement and HDV Project

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6-Lane Alternative

- Same as 4-Lane Alternative



Looking northeast from Lake Washington toward Evergreen Point Bridge, east highrise, and Medina



Exhibit 15. **View from Lake Washington—Viewpoint 12**
SR 520 Bridge Replacement and HOV Project

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Existing View

- Steel frame superstructure on east highrise over navigation channel
- Roadway width about 60 feet wide



Looking west along SR 520 toward Lake Washington and Evergreen Point Bridge



Exhibit 16. **View from Evergreen Point Road Bridge—Viewpoint 10**
SR 520 Bridge Replacement and HOV Project

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4-Lane Alternative

- No superstructure over navigation channel
- Floating bridge alignment is shifted about 130 feet north (measured at east highrise)
- Roadway width about 180 feet tapering to 110 feet (including bicycle/pedestrian path) at east highrise
- 20-foot-high sound walls at Evergreen Point Road bridge stepping down to 8 feet



Looking west along SR 520 toward Lake Washington and Evergreen Point Bridge



Exhibit 16. View from Evergreen Point Road Bridge—Viewpoint 10
SR 520 Bridge Replacement and HOV Project

6-Lane Alternative

- Same as 4-Lane Alternative except roadway width about 150 feet (including bicycle/pedestrian path) at east highrise
- Landscape on lid is only to indicate scale; lid design would be coordinated with Medina



Looking west along SR 520 toward Lake Washington and Evergreen Point Bridge



Exhibit 16. View from Evergreen Point Road Bridge—Viewpoint 10
SR 520 Bridge Replacement and HOV Project

Existing View

- Graham Visitors Center is directly to right of photograph view



Looking in general direction of Foster Island (north-northeast) from just south of ornamental metal entry gate toward Graham Visitors Center



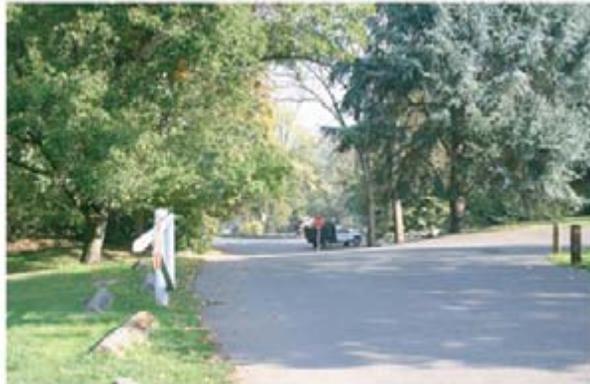
**Graham Visitors Center,
Washington Park Arboretum—
Viewpoint 11**

SR 520 Bridge Replacement and HOV Project

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4-Lane Alternative

- SR 520 approximately 1,800 to 2,000 feet north of viewpoint
- SR 520 not visible due to dense tree growth and distance from viewpoint
- Without trees obstructing view, SR 520 would appear as narrow band at level of top of stop sign



Looking in general direction of Foster Island (north-northeast) from just south of ornamental metal entry gate toward Graham Visitors Center



**Graham Visitors Center,
Washington Park Arboretum—
Viewpoint 11**

SR 520 Bridge Replacement and HOV Project

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6-Lane Alternative

- Same as 4-Lane Alternative



Looking in general direction of Foster Island
(north-northeast) from just south of ornamental
metal entry gate toward Graham Visitors Center



**Graham Visitors Center,
Washington Park Arboretum—
Viewpoint 11**

SR 520 Bridge Replacement and HOV Project

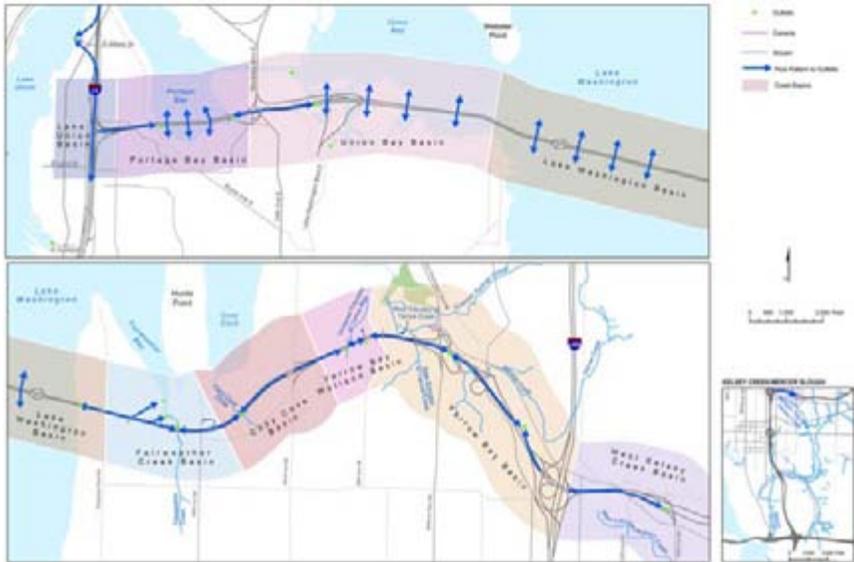
33

Water Resources – Key Findings

- Stormwater treatment meets or exceeds water quality regulations
- Pollutant loads discharging into water bodies generally reduced
- Slower flow rates into eastside streams improve stream habitat
- Some turbidity during construction

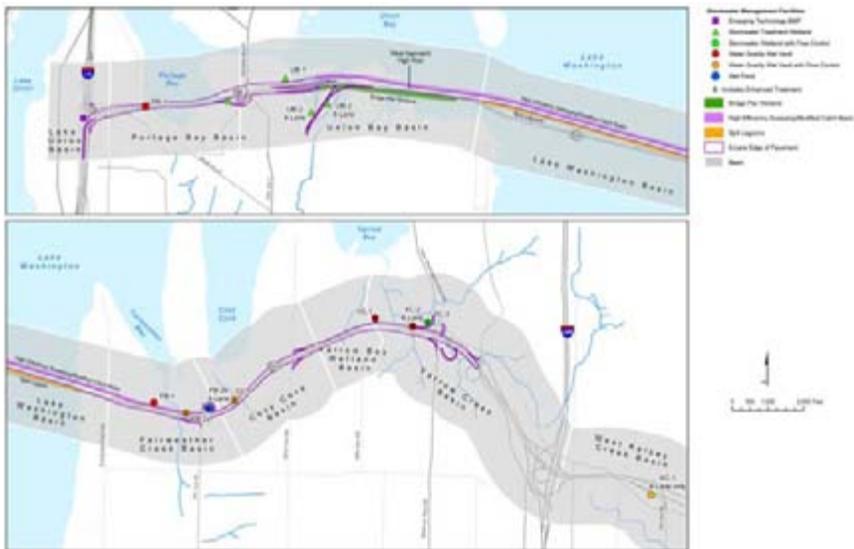
34

Water Resources – Existing Conditions



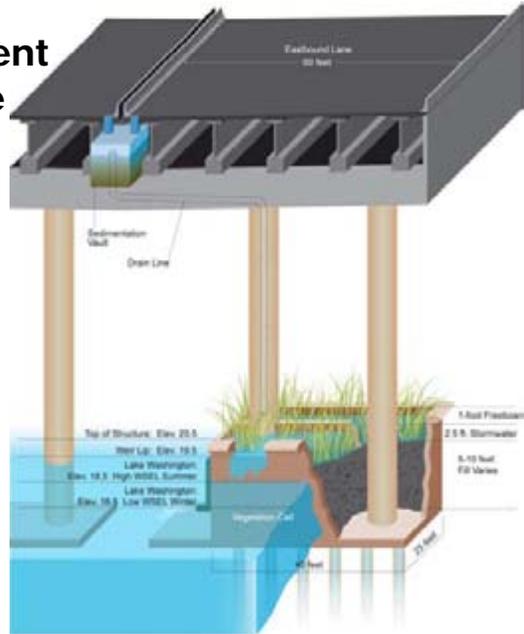
Draft for discussion: 12/8/2004

Proposed Stormwater Management Facilities



Draft for discussion: 12/8/2004

Stormwater Treatment Wetland at Bridge Column



WWSU - Water Surface Elevation
Note: Elevation is based on North American Vertical Datum 1988 (NAVD83).

Draft for discussion: 12/8/2004

Ecosystems

- Wetlands
- Fish Resources
- Wildlife and Habitat

Wetland Effects in Seattle – 6-Lane Alternative



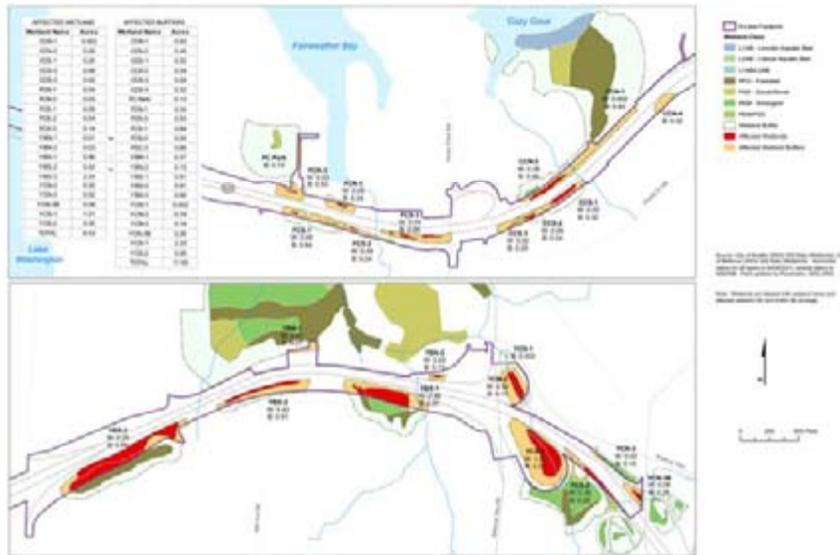
Draft for discussion: 12/8/2004

Wetland Effects on Eastside – 4-Lane Alternative



Draft for discussion: 12/8/2004

Wetland Effects on Eastside – 6-Lane Alternative



Fish Resources

- Long-term benefits
 - Less shading over water and shoreline improves habitat
 - Fewer columns reduces habitat for predators
 - Generally better water quality
 - Fish-passable culverts remove fish barriers
- Long-term adverse effect
 - Potential loss of sockeye spawning site
- Short-term adverse effects
 - Sound pressure from pile driving could harm fish
 - Water turbidity and sediment from construction

Wildlife and Habitat

- 3 Bald Eagle nests in Broadmoor/Arboretum area
- 2 Bald Eagle nests on Eastside
- Pile driving could be restricted during the early part of nesting season

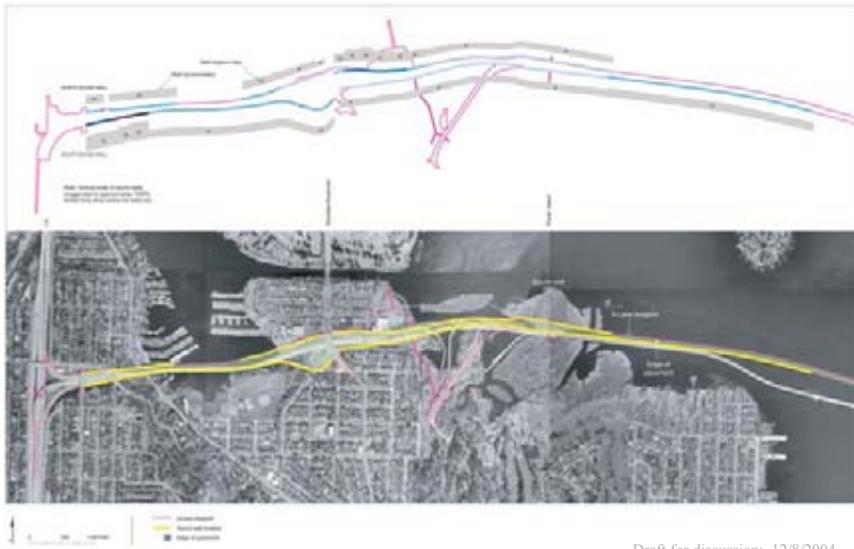
45

Understanding the Noise Analysis

- **Assumed worst case** – peak period traffic volumes moving at posted speed
- **Washington State Noise Abatement Criteria – 66 dBA or greater** – level at which conversation between two people 3 feet apart would be impaired
- **Human perception of noise level changes**
 - 3 dBA change is minimum ear can perceive
 - 10 dBA change halves or doubles the sound level

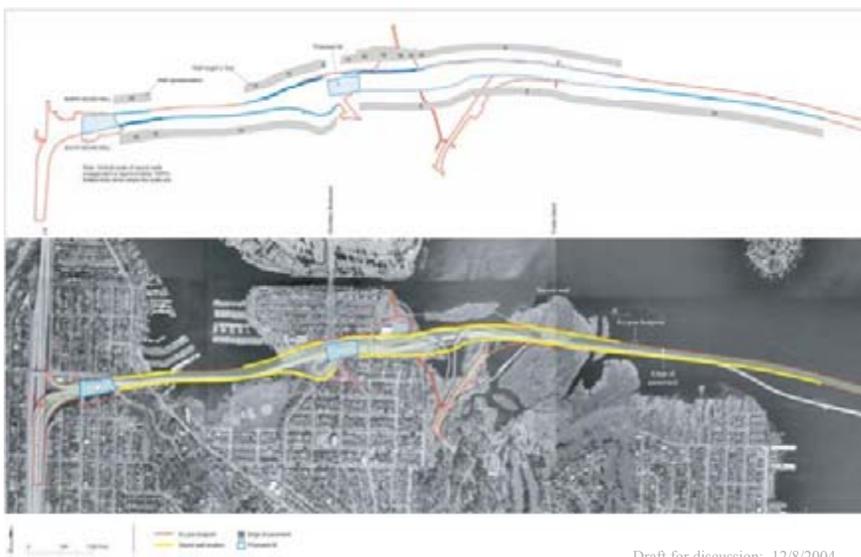
46

Sound Walls in Seattle – 4-Lane Alternative



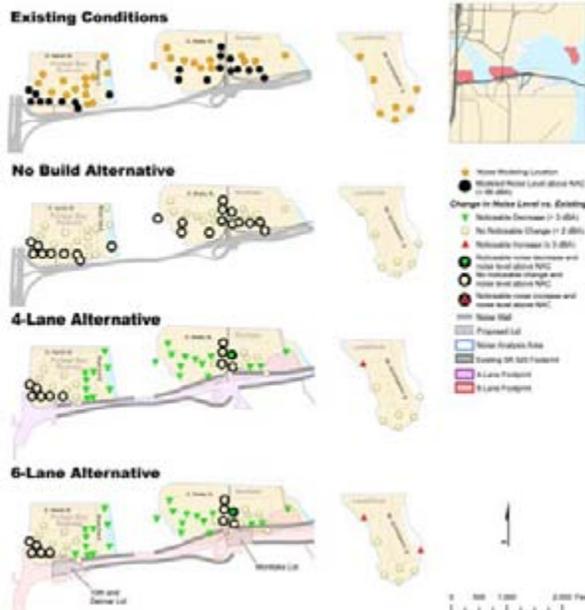
Draft for discussion: 12/8/2004

Sound Walls in Seattle – 6-Lane Alternative



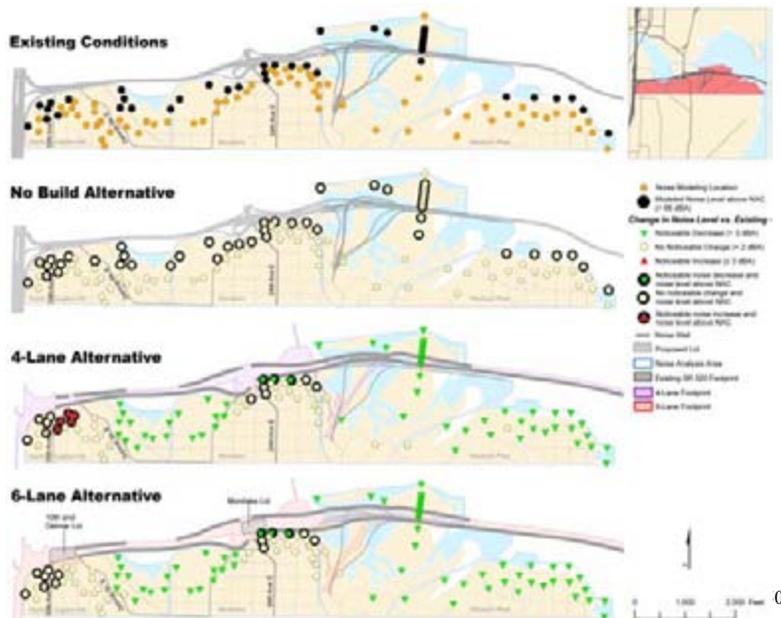
Draft for discussion: 12/8/2004

Noise Levels in Seattle North of SR 520



49

Noise Levels in Seattle South of SR 520



0

Sound Walls on Eastside – 4-Lane Alternative



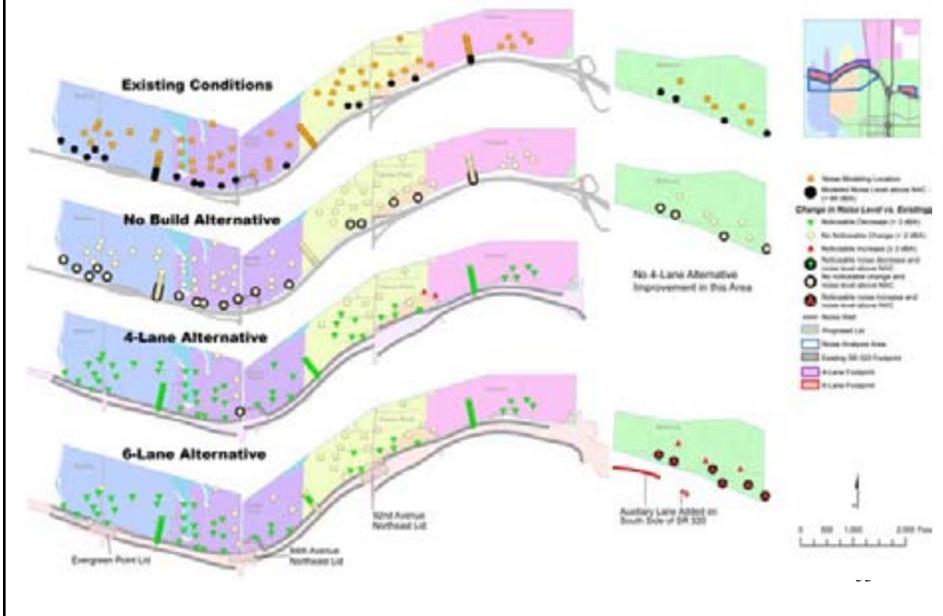
Draft for discussion: 12/8/2004

Sound Walls on Eastside – 6-Lane Alternative

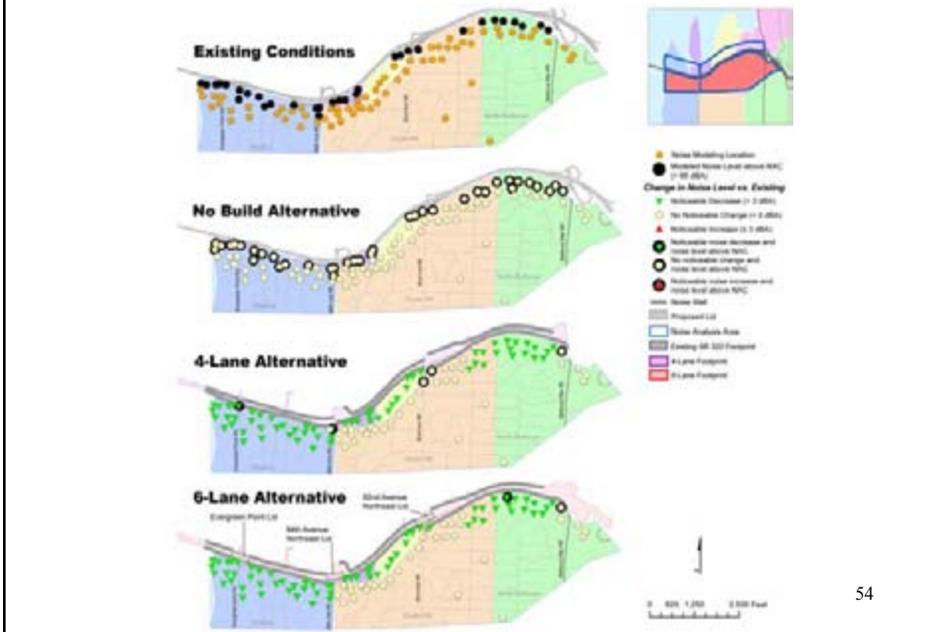


Draft for discussion: 12/8/2004

Noise Levels Eastside North of SR 520



Noise Levels Eastside South of SR 520



Why can't we reduce noise levels to below Noise Abatement Criteria for every residence?

- Adjacent to noisy local street
- Adjacent to I-5
- High on hill above highway

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Noise – Key Findings

	4-Lane vs. Today (residences)	6-Lane vs. Today (residences)
Substantial Reduction	378	438
Noticeable Reduction	431	358
No Noticeable Change	442	476
Noticeable Increase	46	21

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Air Quality – Key Findings

- Regional air quality is better than No Build for both 4-Lane and 6-Lane
- Carbon monoxide levels reduced by half and well below the standard

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Cultural Resources – Key Findings

- Historic structures directly affected
 - Evergreen Point Bridge
 - MOHAI
- Historic districts and structures whose setting would be affected (both positively and negatively)
 - Roanoke Park historic district
 - Montlake historic district
 - Mason House
 - NOAA Northwest Fisheries Science Center
 - Bellevue Christian School
 - 2891 and 2851 Evergreen Point Road residences

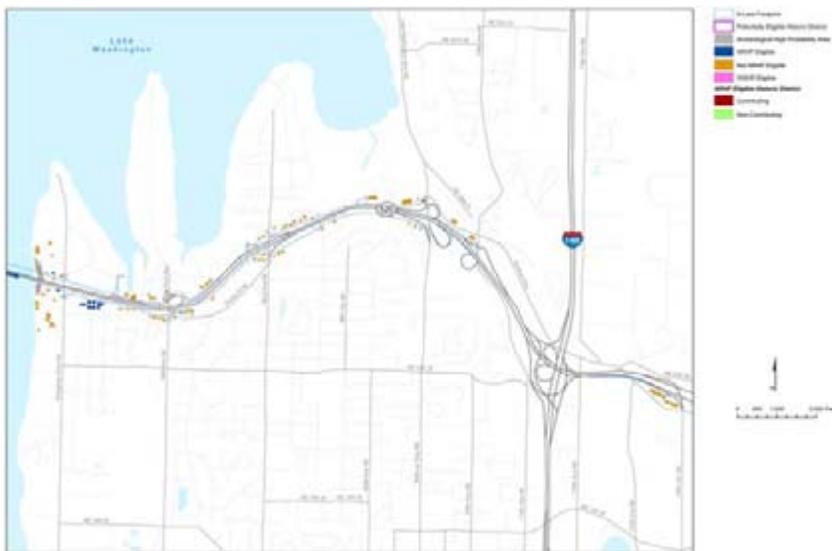
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Historic Resources in Seattle



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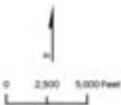
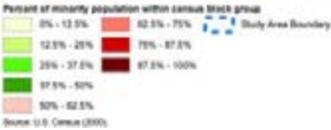
Historic Resources on Eastside



Draft for discussion: 12/8/2004

Environmental Justice

Minority Population



Low Income Population



Environmental Justice – Key Finding

Question: Does the project result in disproportionately high and adverse effects on minority and/or low-income populations?

Answer: No.

The safety benefits of replacing the bridges and improving bus service would outweigh any adverse effect of the toll on low-income populations.

Indirect and Cumulative Effects – Key Findings

No discernable environmental difference
between alternatives