



BEL-RED CORRIDOR PROJECT

TRANSPORTATION ANALYSIS AND ENVIRONMENTAL REVIEW



CH2MHILL

January 19, 2006
Steering Committee Meeting



Transportation Context

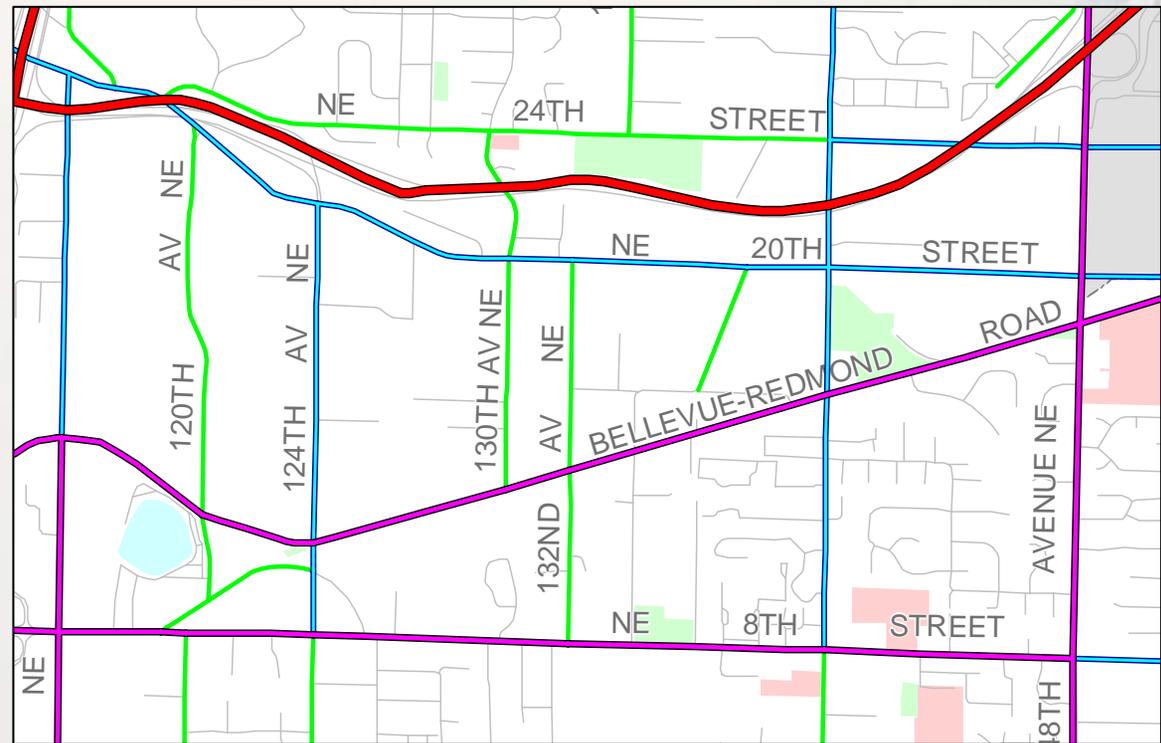
Challenge: A multi-modal system adequate to support greater Bel-Red land use intensity

- **Torsten Lienau, CH2M Hill**
 - **Transportation Concepts**
 - **Existing & Planned Local System**
 - **Capacity Constraints; Future Trip Distribution**
- **Bernard van de Kamp, Bellevue Transportation**
 - **Regional System**
 - **Council Policy Direction**
 - **System Improvements**
- **Kevin McDonald, Bellevue Transportation**
 - **Transportation System Ideas**
- **Q & A - Discussion**



Roadway – Functional Hierarchy

- Roads have differing purposes and applications
- Functional classification
 - Freeway ———
 - Major Arterial ———
 - Minor Arterial ———
 - Collector ———





Roadway – Functional Hierarchy

	Freeway	Major Arterial	Minor Arterial	Collector
Access	Restricted, Grade Separated	Partial, At Grade	Minimal Access Control	No Access Control
Speed	60+	35-50	25-35	25
Capacity (cars/lane)	up to 2,200	up to 900	up to 900	<500
Transit Service	Intercity	Intercity	Local	Local
Traffic Volumes	Highest	Higher	Moderate	Low
Trip Length	Longest	Longer	Moderate	Short



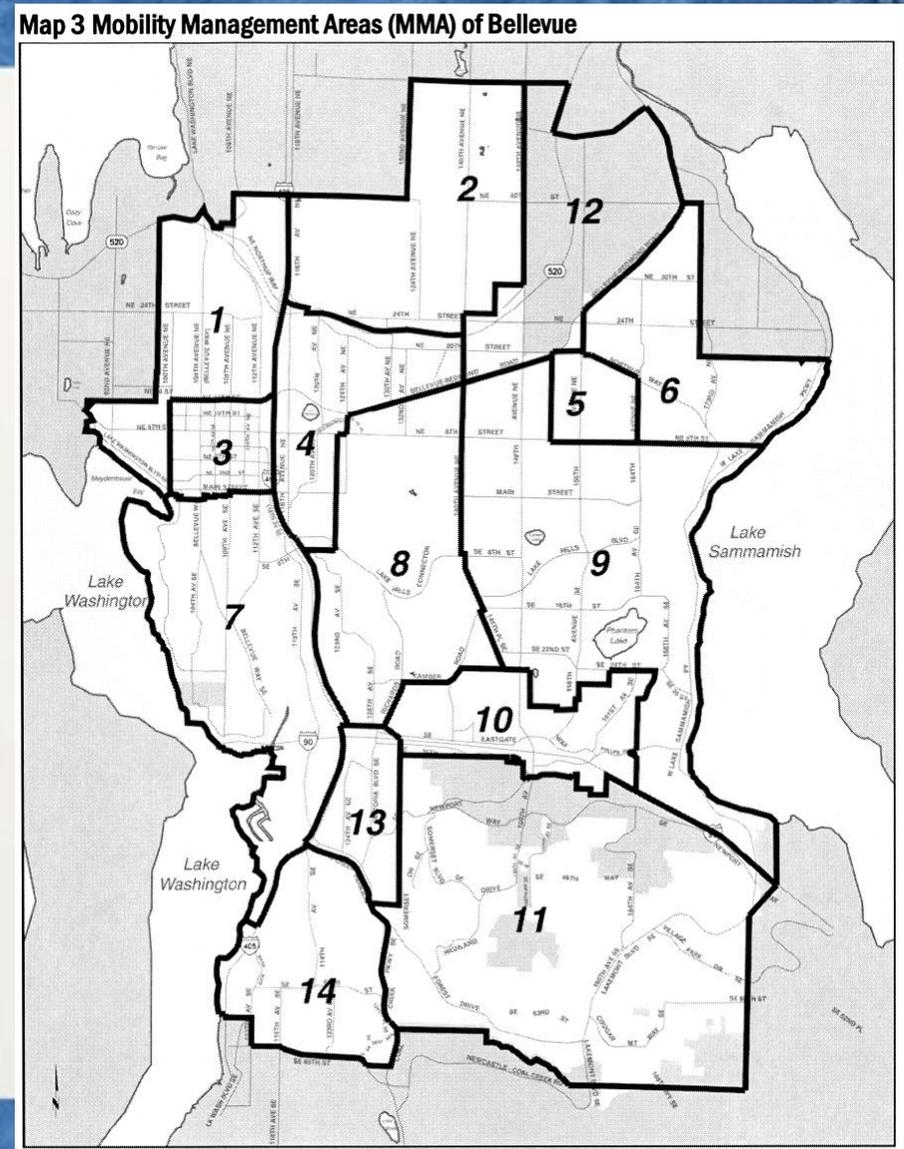
Roadway – Level of Service

- **Level of Service is a measure of comfort versus capacity**
 - Graded from A to F
 - Freeways – speed and density
 - Intersections – delay
 - Arterial Segments – speed
 - All – volume-to-capacity (V/C) ratios



Roadway – Level of Service

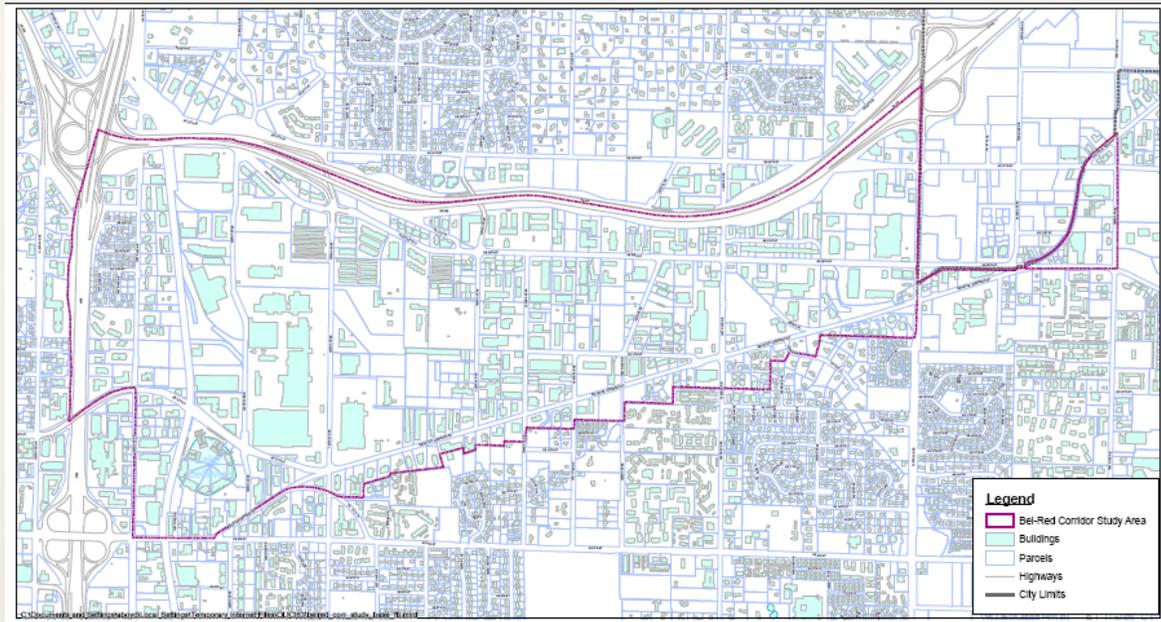
- **Bellevue Methodology**
 - **Concurrency**
 - **Intersections**
 - **2-hour average**
 - **V/C ratio**
 - **Mobility management areas (MMAs) averages**





Roadway – Freeway Access

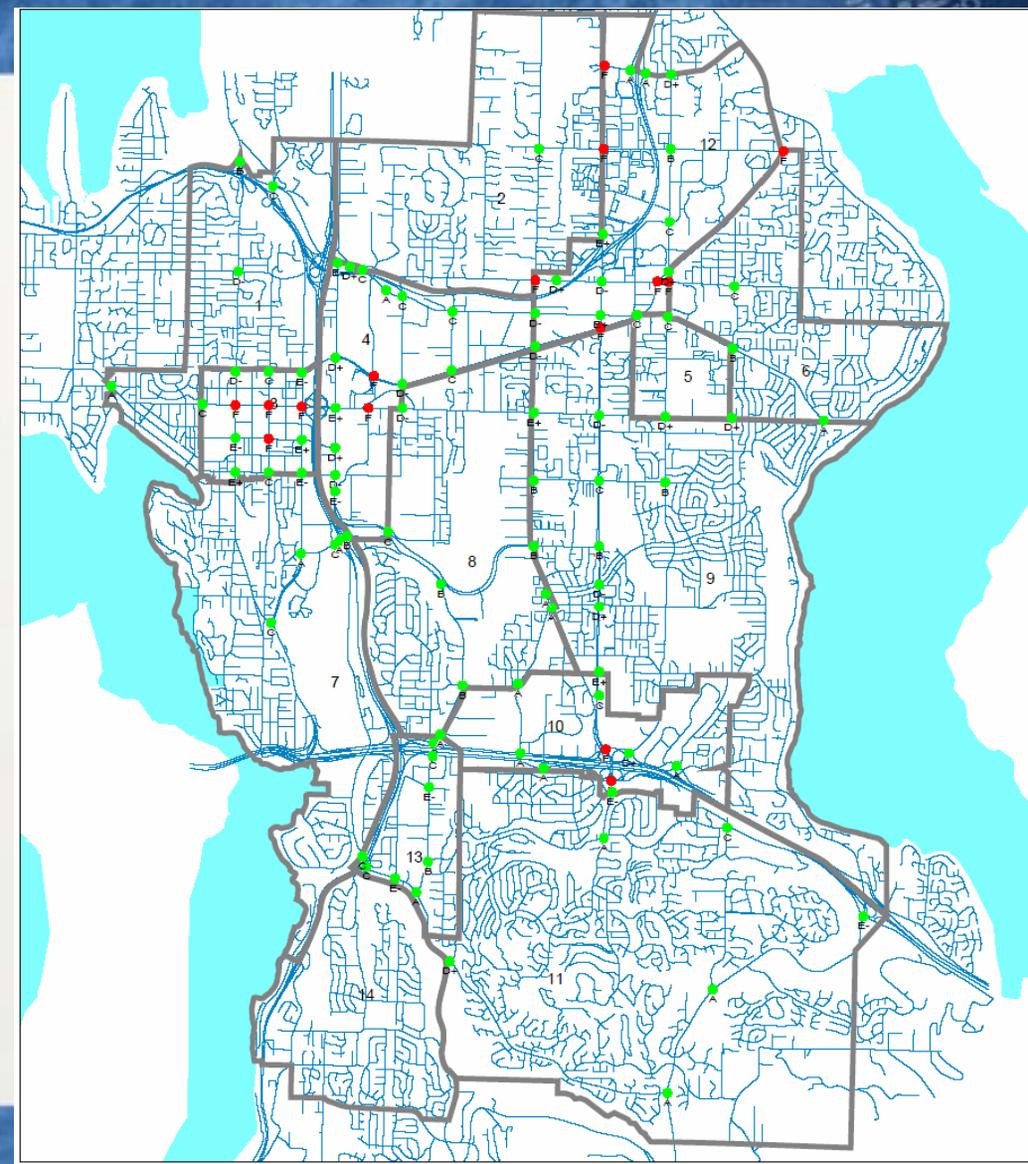
- **Freeways are restricted access**
- **Access points generally planned 1 mile apart in urban areas, 2 miles apart in rural areas**
- **Closer spacing compromises speed and reliability**
- **Closer spacing can be accommodated with frontage roads or collector/distributor (C/D) roadways**





Roadway – 2030 Baseline Level of Service

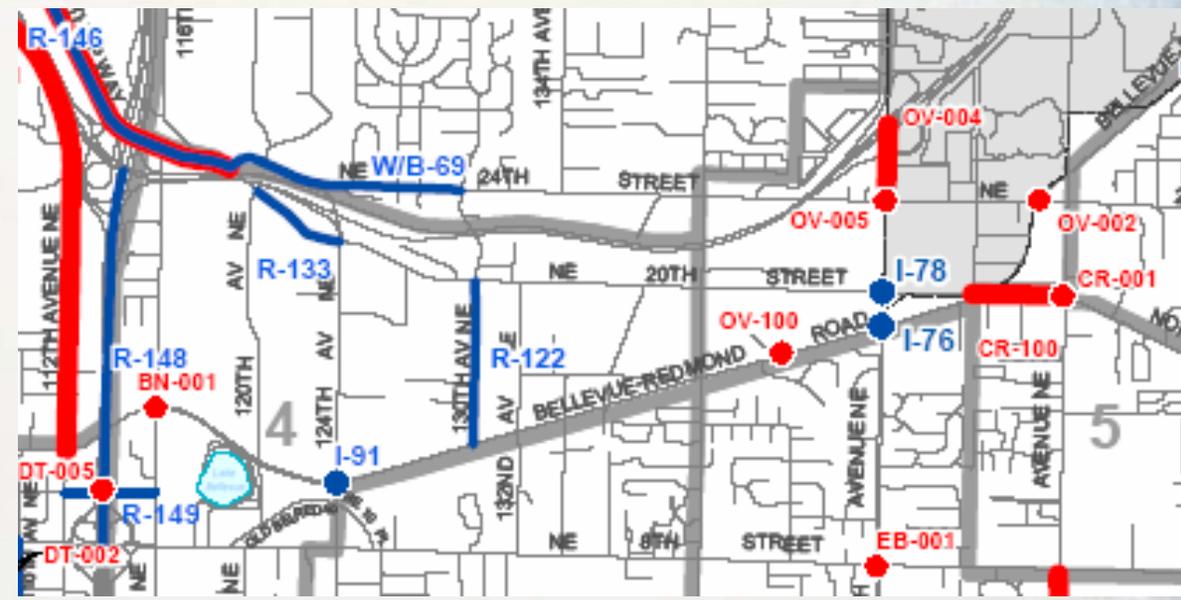
- 6 failing intersections in study area by 2030
- Concentration of congestion around NE 8th Street/I-405 and NE 24th Street and 148th Avenue NE





Roadway – Transportation Facilities Plan

- 16 projects identified in the study area
- Most projects involve intersection channelization improvements
- NE 10th Street Extension





Transit Concepts

Modes

- High Capacity Transit
 - Rail
 - Bus
- Conventional Transit
- Circulators

- All modes exist today
- Combination may be necessary for effective transit service



Trip Tips





Transit – High Capacity Transit

- **Bel-Red area strategically located along the regional system connecting Redmond, Bellevue and Seattle**
- **Connectivity to multiple regional destinations**
- **Bus Rapid Transit:**
 - **Facilities provide a degree of exclusive right-of-way to increase travel speeds and service reliability.**
 - **Transit lanes, direct access ramps, HOV lanes, bypass lanes at intersections and signal priority are some of the elements being considered.**
 - **Service is high frequency throughout the day.**
- **Higher transit speeds improve transit competitiveness with personal automobile, thus increasing ridership.**



Capacity: 30 passengers/vehicle
Travel Speed: 35-55 mph
Right-of-way: Exclusive



Transit – Conventional Transit Bus

- Existing route improvements also being considered to integrate Bel-Red area with other eastside transit destinations: Eastgate, Factoria, and S. Kirkland P&R.
- Capital investment can be phased. Bus routes can be changed as area develops.
- Route restructuring opportunities can provide some internal circulation in the area, augmenting light rail service.

Capacity: 45-70 passengers/vehicle

Travel Speed: 15-35 mph

Right-of-way: Varied



Transit – Local Circulators

- Many options available in both rail and rubber tire.
- Focus is on internal circulation between multiple destinations and nearby activity centers. (Kirkland/S. Kirkland P&R; Overlake; Crossroads; etc.)
- Generally characterized as slow speed, frequent stops and short length.



Denver Mall circulator

Capacity: Varied, small 5 passenger vehicles to capacities similar to bus

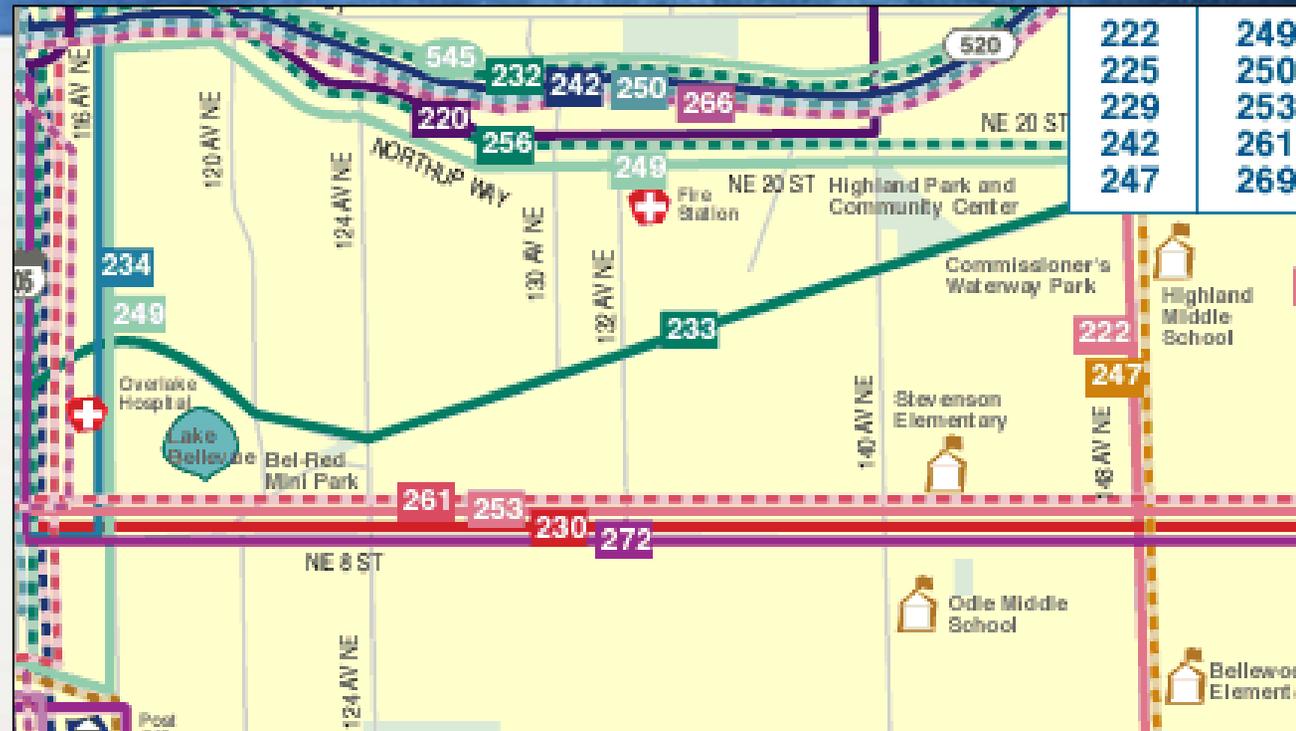
Travel Speed: 10-20 mph

Right-of-way: Varied



Transit – Existing Routes

- Most transit service is on the edges or fringes of the study area.
- One bus route serves Bel Red Road
- Three routes on NE 20th/Northrup Way
- Majority of transit service is on NE 8th Street (4 routes) and SR 520 (5 routes)





Non-Motorized – Benefits

- **Improved transportation access**
 - Everyone is a pedestrian
 - Accessible links to transit
 - Some people do not have vehicles (kids, elderly, etc.)
- **Reduced vehicle trips**
 - Environmental benefits
 - Congestion relief
- **Increased community vitality and “sense of place”**
- **Improved safety**
 - Reduced conflicts with vehicles
- **Enhanced health**
 - Commuting and recreation





Non-Motorized – Planning Basics

■ Location, location, location!

- Transit (1/4 mile walking distance)
- Schools (Safe Walk Routes)
- Commercial areas
- Parks and recreation facilities
- High-density residential development
- Other nonmotorized facilities
- Community centers & resources

■ Safety

- Locations with high levels of nonmotorized accidents
- Roadways with high traffic volumes
- Shared facilities on roadways with low volumes (< 400/day)

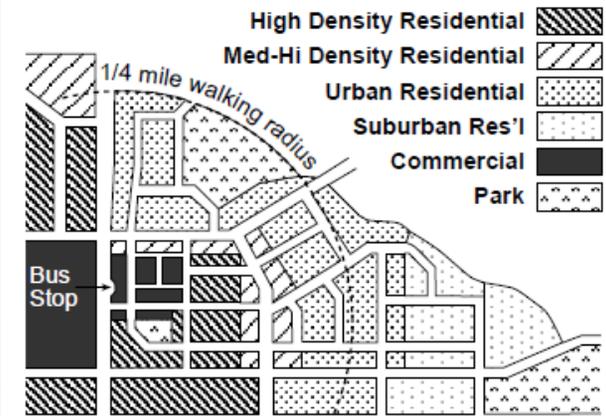


Figure 3: Mixed land use encourages walking, bicycling and transit



Non-Motorized – Types of Facilities

■ Pedestrian

- Sidewalk
- Walkway
- Shoulders
- Recreational trails



Walkway



Shared Use Path



Sidewalk

■ Bicycle

- Bicycle Lanes
- Signed shared roadway
- Shared Roadway



Signed Shared Roadway



Bicycle Lane

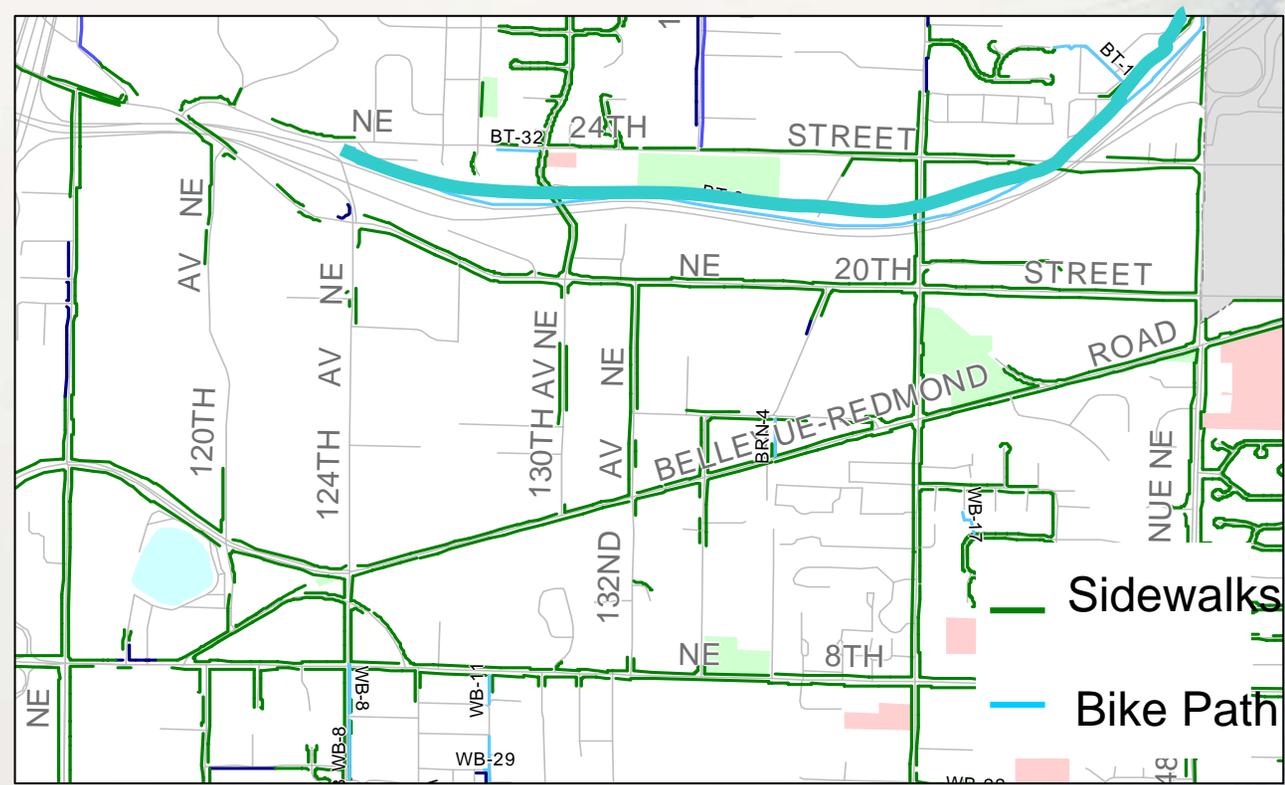
■ Facility enhancements

- Landscaping, aesthetics, wayfinding, lighting, crossings, bike parking, street furniture, public art, etc.



Non-Motorized – Existing Facilities

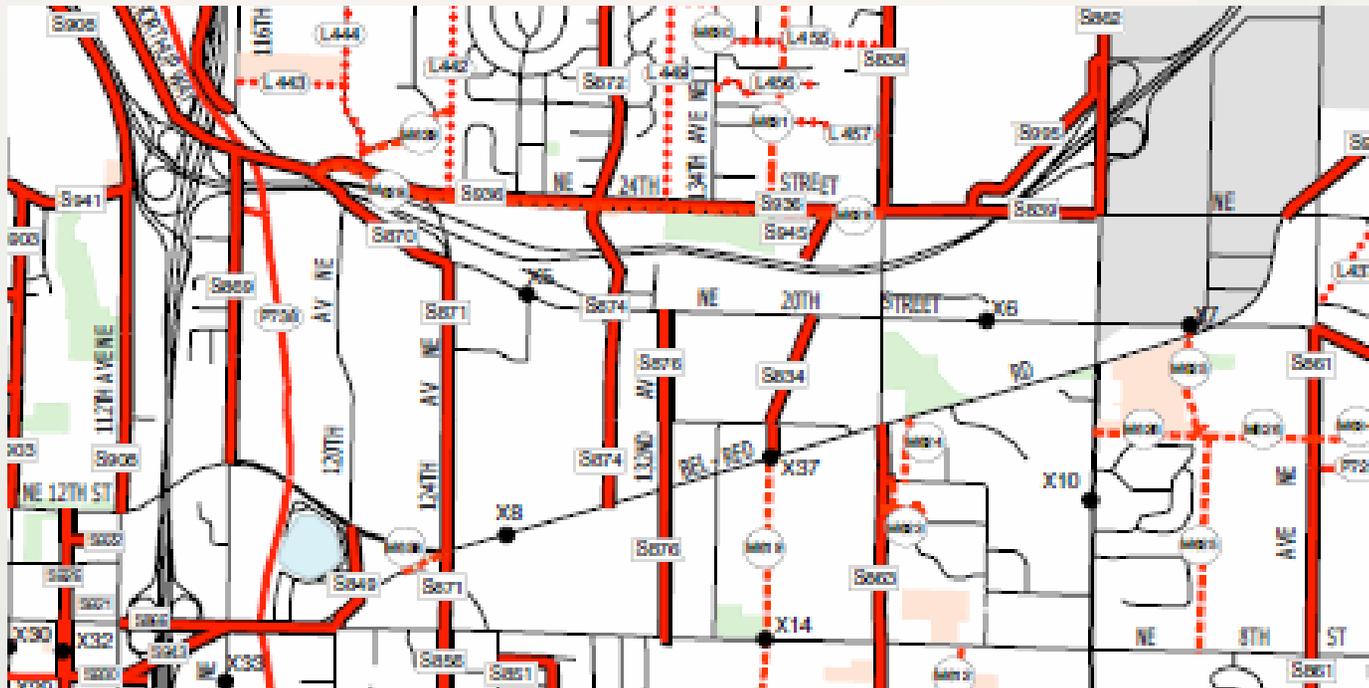
- Sidewalks appear on many of the arterial roads, but is sporadic, and many times adjacent to high speed traffic.
- Blocks range in size from 1/8 to 1/2 mile.
- One bike path





Non-Motorized – Planned Facilities

- The ped/bike plan calls for a more extensive system, including a paved path on the BNSF rail line





Our Region's Urban Centers

Downtown Bellevue

Dense development
12 X 12 City block area - mixed use, transit-oriented

Population
2000 = 2,890
2020 = 14,000 414% growth

Employment
2000 = 34,250
2020 = 60,650 77% growth

Existing system insufficient to serve anticipated growth

Regional Center
Downtown Seattle-Seattle Center-First Hill/Capitol Hill

Metropolitan Centers
Downtown Bellevue
Downtown Tacoma
Downtown Bremerton

Key Urban Centers
Downtown Everett
Northgate
U District
Downtown Redmond
Redmond/Overlake
Downtown Renton

- Urban Growth Boundary
- Urban Center
- Interstate
- Metropolitan Transportation System





Bellevue's Regional Employment Centers

- The Comprehensive Plan recognizes the larger Bel-Red/520 corridor as a major employment center
- The plan supports examining older commercial areas periodically to ensure they continue to be vital and productive

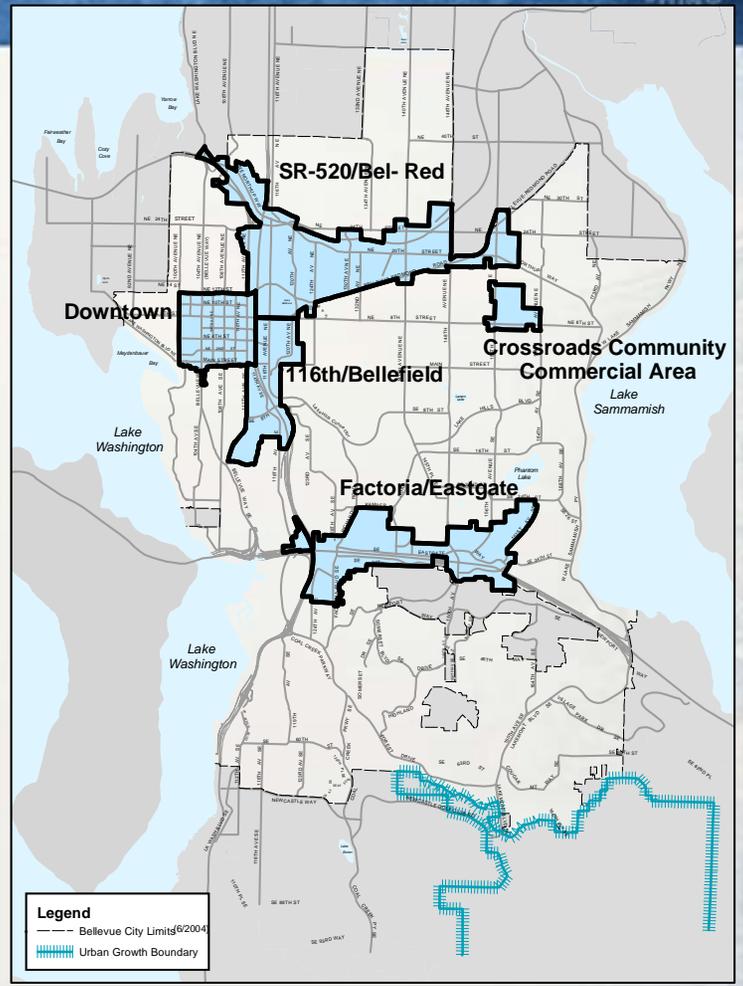


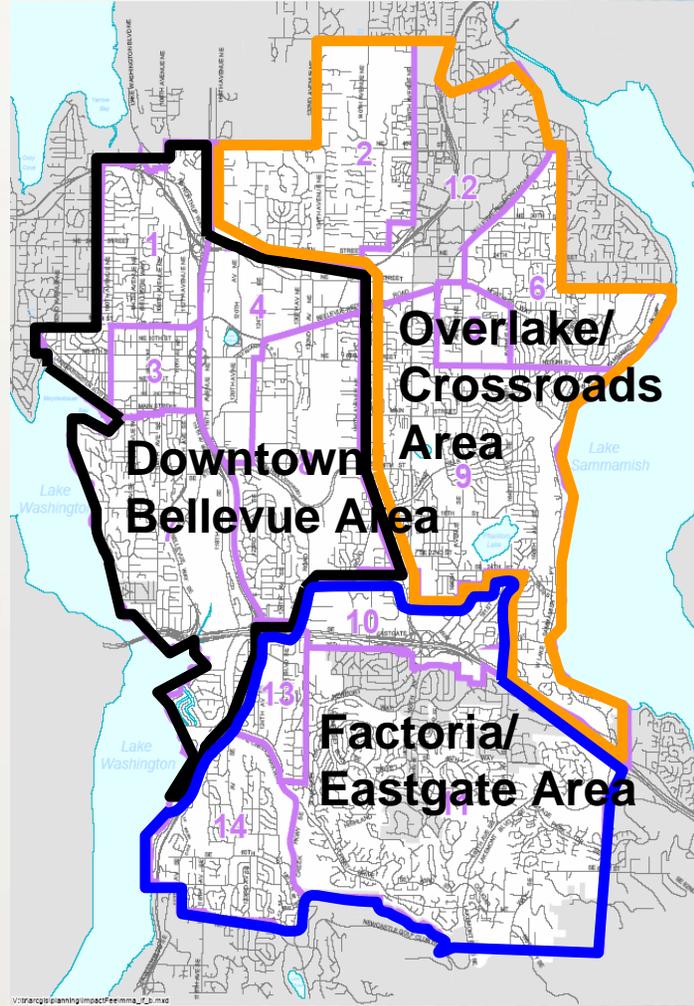
FIGURE LU.1
Major Employment Centers





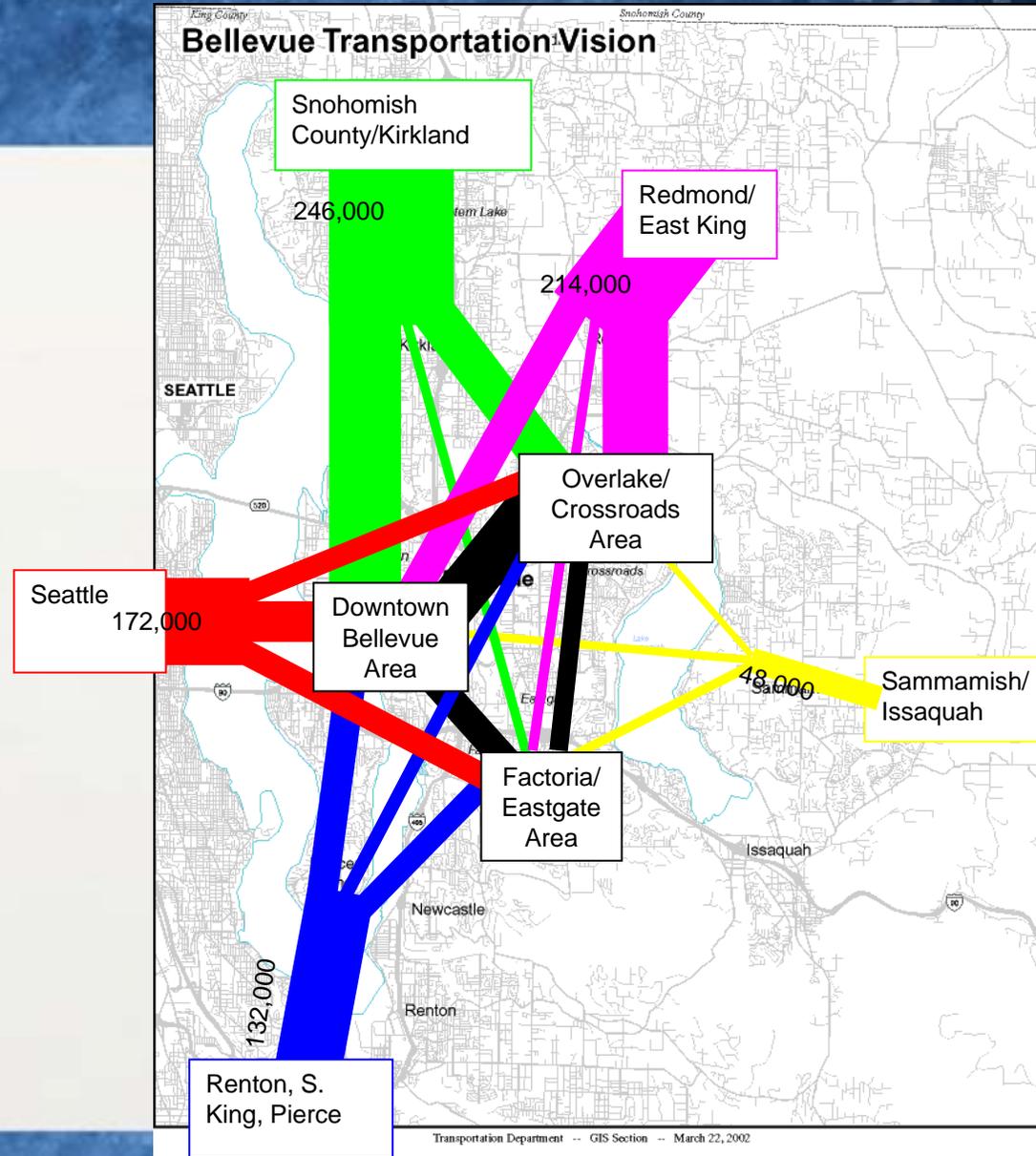
Travel Demand To and From Bellevue

- **Trips to and from Bellevue areas only**
- **Downtown area:**
 - Downtown, Bel-Red, Wilburton/Richards Valley, North Bel-Red, South Bellevue
- **Overlake/Crossroads area:**
 - Overlake, Crossroads, East Bellevue, Bridle Trails, Northeast Bellevue, East Bellevue
- **Factoria/Eastgate area:**
 - Factoria, Eastgate, Newport Hills, Newcastle
- **Assumptions/constraints:**
- **Growth:** Adopted City/Regional employment and pop.
- **SR 520:** 6-lane (2 general purpose, 1 HOV) with toll
- **I-405:** Add one lane each direction north of I-90, two lanes each direction south of I-90, BRT entire corridor
- **I-90:** Add HOV lane each direction
- **HCT:** Seattle-Bellevue-Overlake via I-90
- **Numerous other local and regional projects**
 - CIP/TFP, Nickel and TPA funded projects



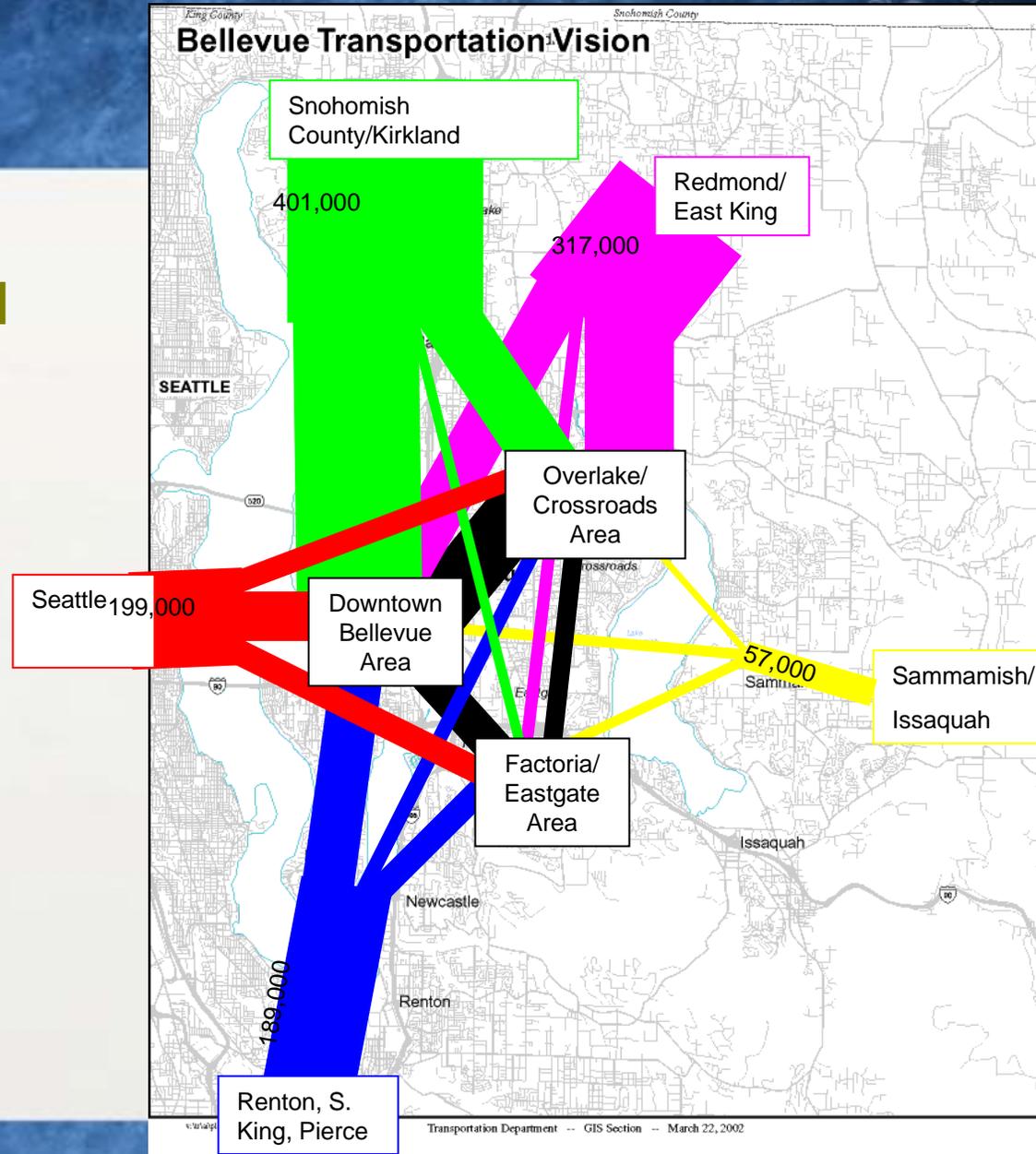
2004 Daily Travel Demand

- High volumes on regional system
- Demands reflect multiple employment centers



2030 Daily Travel Demand

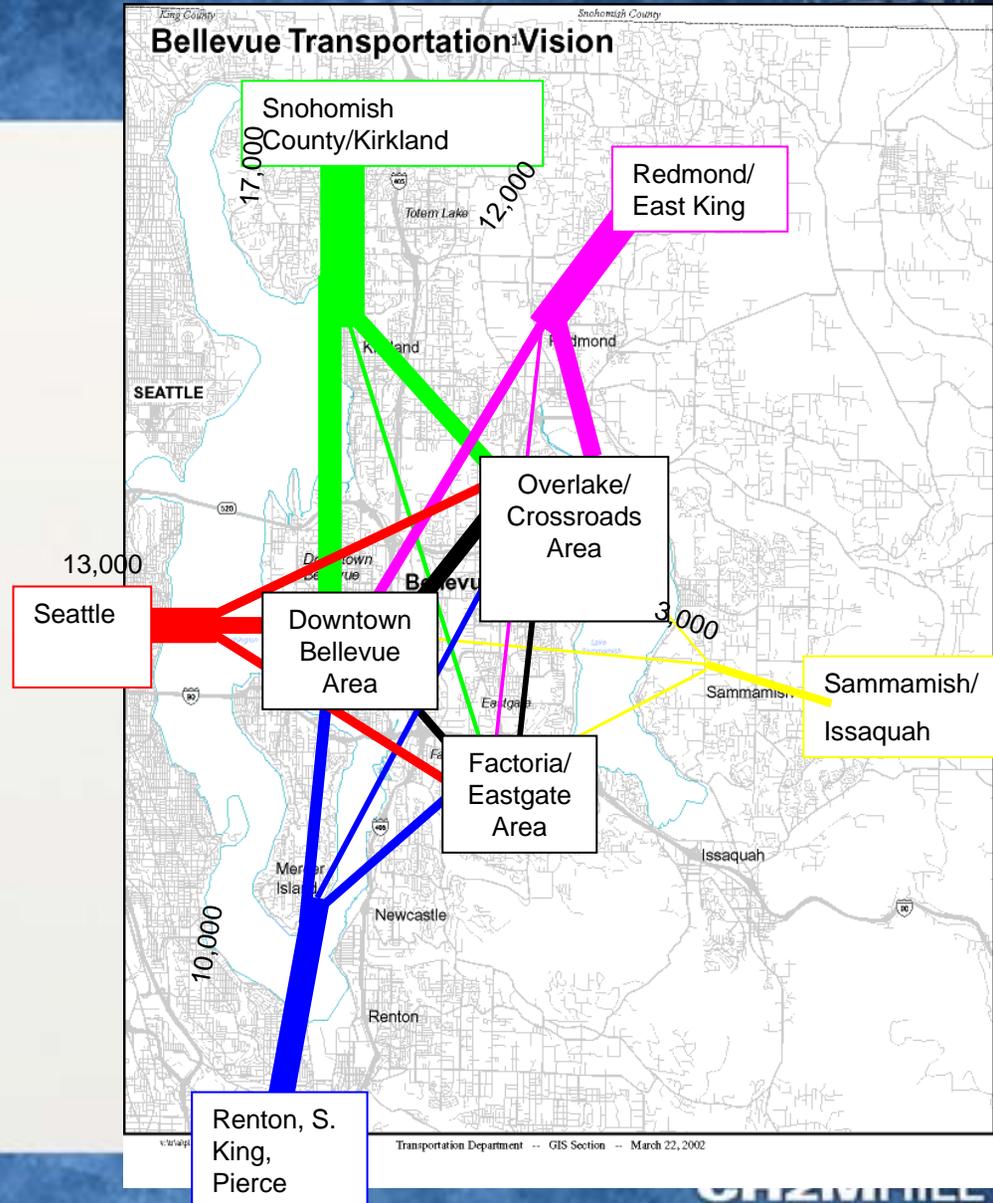
- Regional residential growth areas reflected on I-405 corridor and from Redmond/East King County
- Cross-Lake Washington trips constrained by assumed capacity constraints
- Increasing inner-Bellevue trips





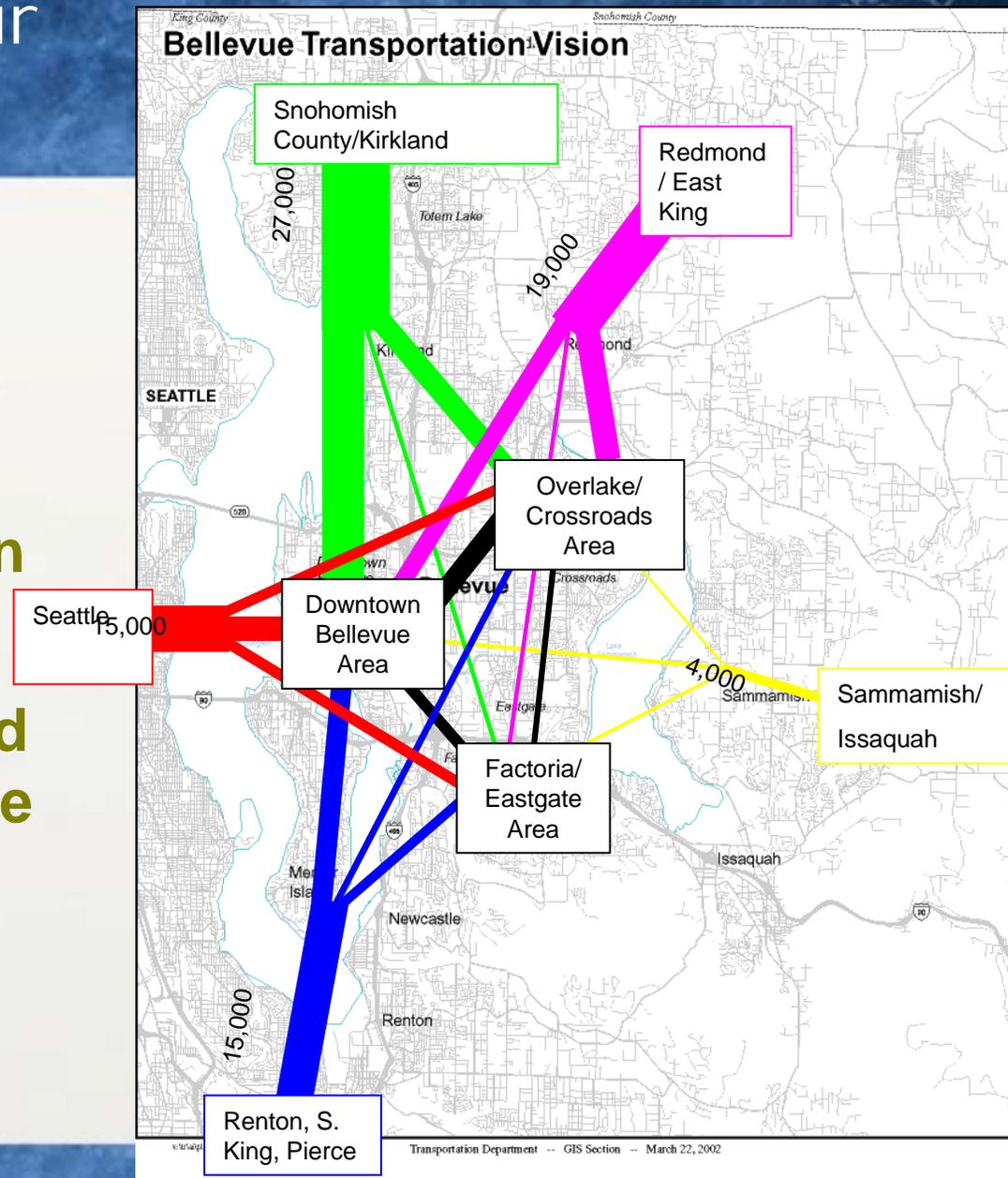
2004 AM Peak Hour Travel Demand

- **Commuter volumes mirror daily trips**
- **Downtown Bellevue and Overlake/Crossroads are the major draws**



2030 AM Peak Hour Travel Demand

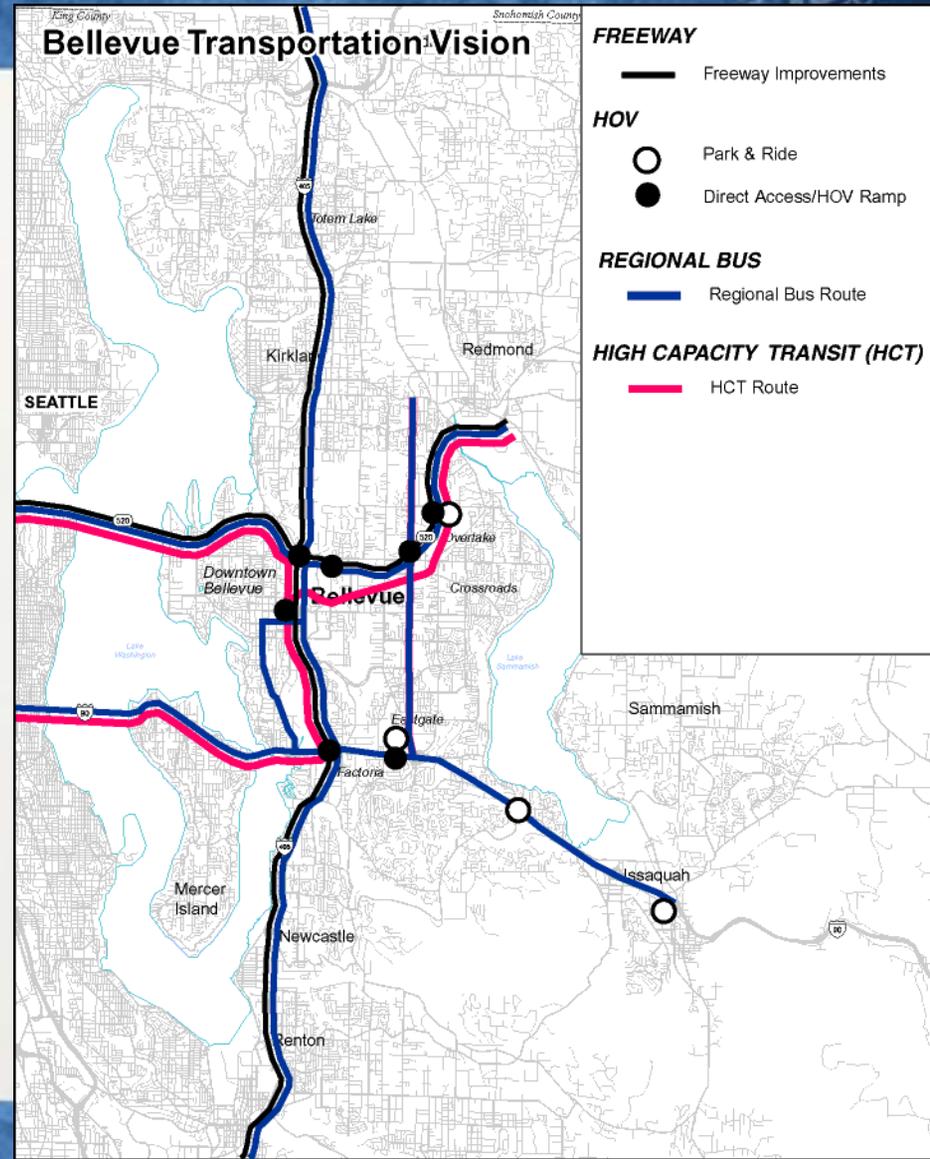
- Intense commuter trip growth from outlying areas – a reflection of residential growth
- Cross-Lake Washington volumes constrained
- Downtown Bellevue and Overlake/Crossroads are the major draws





Bellevue City Council Policy Direction

- **Regional Transportation Vision and Regional Mobility Interest Statement seeks investment in all modes**
 - **Freeways**
 - **High Capacity Transit**
 - **Regional Bus**
 - **High Occupancy Vehicles**
- **Vision provides guidance for planning and investments**





Key Regional Transportation Plans

■ SR 520

- EIS underway considering options between I-405 and I-5:
 - 4 lane = two general purpose lanes each direction
 - 6 lane = two general purpose lanes and one HOV lane each direction
 - *8 lane = three general purpose lanes and one HOV lane each direction: also under consideration, but not in EIS – may require additional system improvements*
- Preferred alternative expected in Spring 2006

■ I-405

- Master Plan adds up to two general purpose lanes each direction and bus rapid transit
- Implementation Plan focuses on bottlenecks and access

■ I-90

- Addition of one HOV lane each direction underway, Bellevue Way to I-5
- Corridor planning beginning East of I-405

■ High Capacity Transit

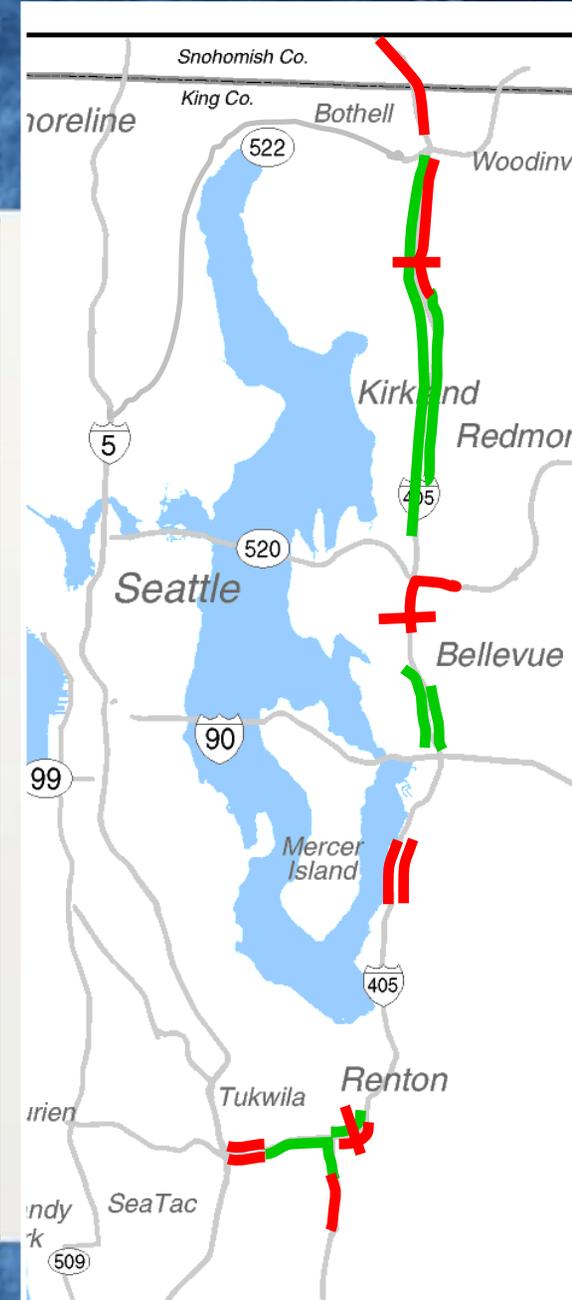
- Regional Transit Long Range Plan calls for I-90 and SR 520 HCT
- ST2 focusing on I-90 HCT, Seattle – Bellevue – Overlake – Redmond and I-405 Bus Rapid Transit system.

■ King County Metro/Bellevue Transit Plan

- Focus on connecting activity centers (downtown, Overlake, Factoria, etc.)

Funded I-405 Improvements (\$1.5b)

	<p>Nickel Improvements (\$485m funded)</p> <p>\$185m: Main to I-90 (+1GP each direction,HOV)</p> <p>\$164m: Kirkland (+1GP each direction)</p> <p>\$136m: Renton (SR167 area improvements)</p>
	<p>Transportation Partnership Act (\$922m):</p> <p><u>Bellevue</u></p> <p>\$67m: NE 10th Overcrossing (112th – 116th)</p> <p>\$250m: NE 8th to SR 520 to 124th Braid</p> <p>\$170m: SR 169 to I-90 (+2 GP NE 44th to 112th), subject to additional funding</p> <p><u>South</u></p> <p>\$30m: I-5 to SR 181 (+1GP both directions)</p> <p>\$110m: SR 515 half interchange (Talbot Road)</p> <p>\$20m: +1 NB GP (SR 167-SR 169)</p> <p>\$50m: SR 167 +1 SB GP (I-405 to SE 180th)</p> <p><u>North</u></p> <p>\$230m: NB GP lane (124th to SR 522) & 132nd interchange</p> <p>\$45m: +1 NB GP – 195th to SR 527</p>



Other Key TPA Funded Projects

I-90 Two Way Transit/HOV: \$30m

- Phase 1 moving to construction (Bell way to MI)
- Phase 2 & 3 likely (MI to Seattle and Seattle MI)

\$95m (+/-) funded, \$128m total cost

SR 520 Bridge Replacement & HOV: \$500m

\$552m funded, \$2.6-2.9b total cost (6-lane), tolls estimated to generate \$700m

Alaska Way Viaduct: \$2.0b

\$2.4b funded, \$3.7 - 4.1b total cost (tunnel)

SR 522 Business and Transit Lanes: \$17m

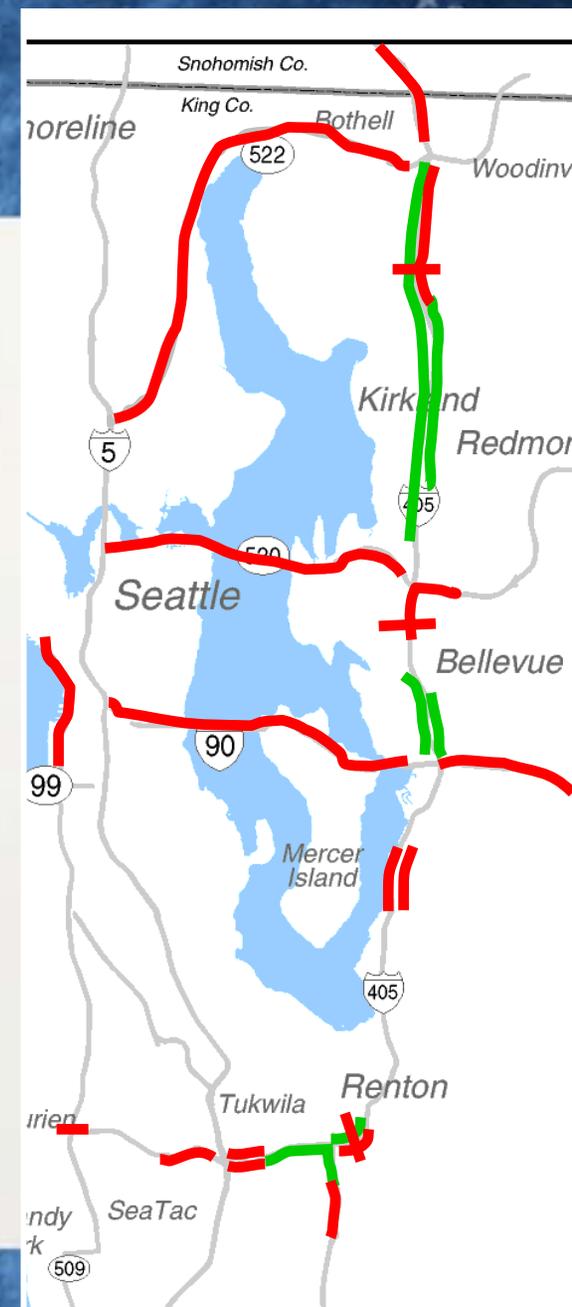
Approaching full funding - \$35m total cost

SR 518: \$26m

- +1 EB GP lane, Airport to I-5
- SR 518/SR 509 interchange improvements

I-90 Route Development Plan: \$2m

- Analyze needs from I-405 to North Bend to identify near and long term improvements



Bellevue RTID/ST2 Priorities

Highway Improvements ———

I-405

- \$470 Downtown Bellevue capacity (I-90 to SR 520) and NE 4th to SE 8th (2nd St. Interchange)
- \$210 SR 520 to NE 10th St. braids and ramps
- \$830 SR 169 to I-90: add two lanes each direction

SR 520

- \$1,500 – 1,800 6 lane bridge & approaches (tolled)

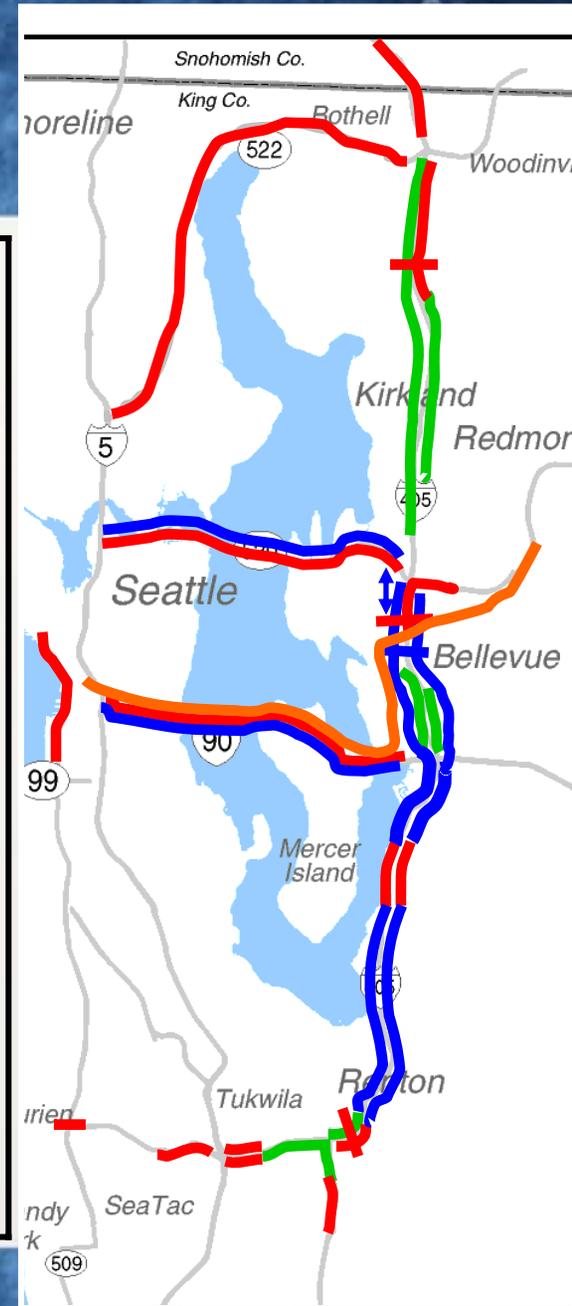
I-90

- \$35 Complete addition of HOV lane each direction

High Capacity Transit ———

- \$1,950 – 3,100 Seattle-Bellevue-Overlake HCT (approximate, to be clarified in future months)

Total: \$6+ Billion



Implementation Phasing

2006/07-2008/09

I-405:

- 112th Ave SE to SE 8th St. (Bellevue)
 - Northbound: adds one general purpose lane (112th Ave SE to SE 8th)
 - Southbound: adds one general purpose lane and one HOV lane (SE 8th to I-90)
- NE 10th St. Overcrossing (downtown Bellevue)
 - Connect 112th Ave NE to 116th Ave NE
- NE 85th- NE124th (Kirkland)
 - Adds one general purpose lane northbound and southbound
- Renton improvements
 - Add general purpose capacity Northbound and Southbound, I-405 and SR 167

I-90:

- Bellevue Way to 80th Ave SE Westbound HOV and direct access ramp

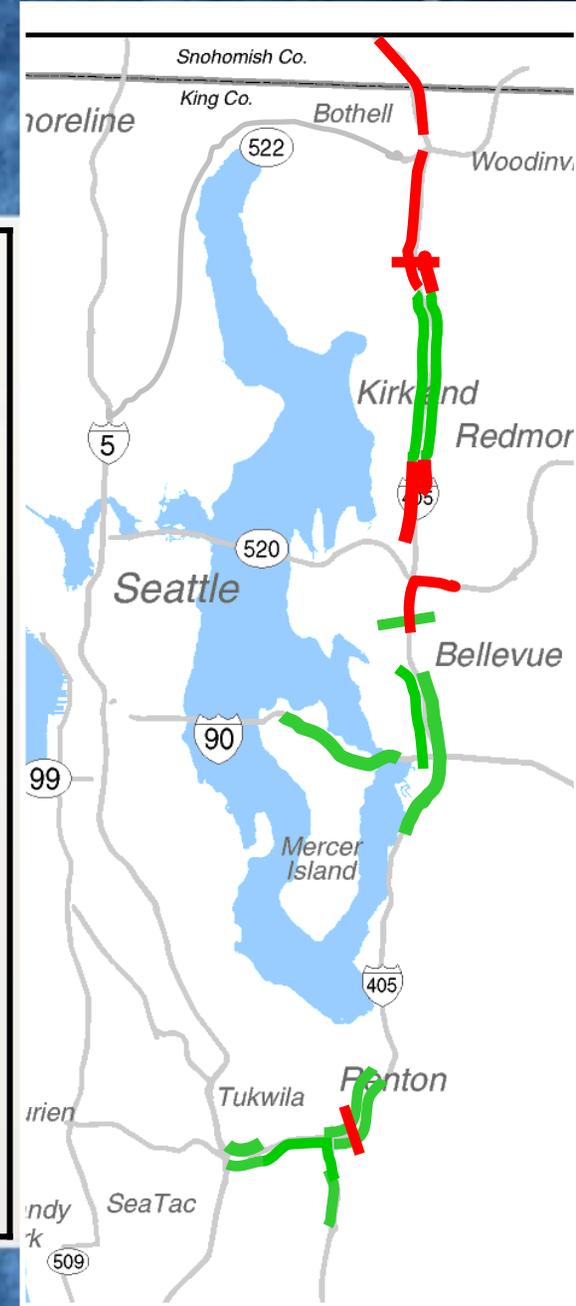


Implementation Phasing

2008/09-2010/11 █

I-405:

- I-405-SR 520 Northbound braid, NE 12th Street reconstruction (downtown Bellevue)
 - Reconfigure ramps from Northbound I-405 to SR 520, requires widening of NE 12th St. Overcrossing
- NE 124th-SR 522, SR 520 to NE 85th (Kirkland)
 - Northbound: adds one general purpose lane from NE 70th St. to NE 85th St.
 - Southbound: adds one general purpose lane from SR 522 to NE 124th St. and from NE 85th St. to SR 520
- Renton Improvements
 - New half diamond interchange at Talbot Road



Implementation Phasing

Future Phases (subject to additional funding) —

I-405:

- Renton to Bellevue – add two lanes each direction
- Downtown Bellevue capacity – add one lane each direction
- SR 520 to I-405 Southbound Braid and NE 10th St. Ramps
- SR 167/I-405 Interchange improvements

SR 520:

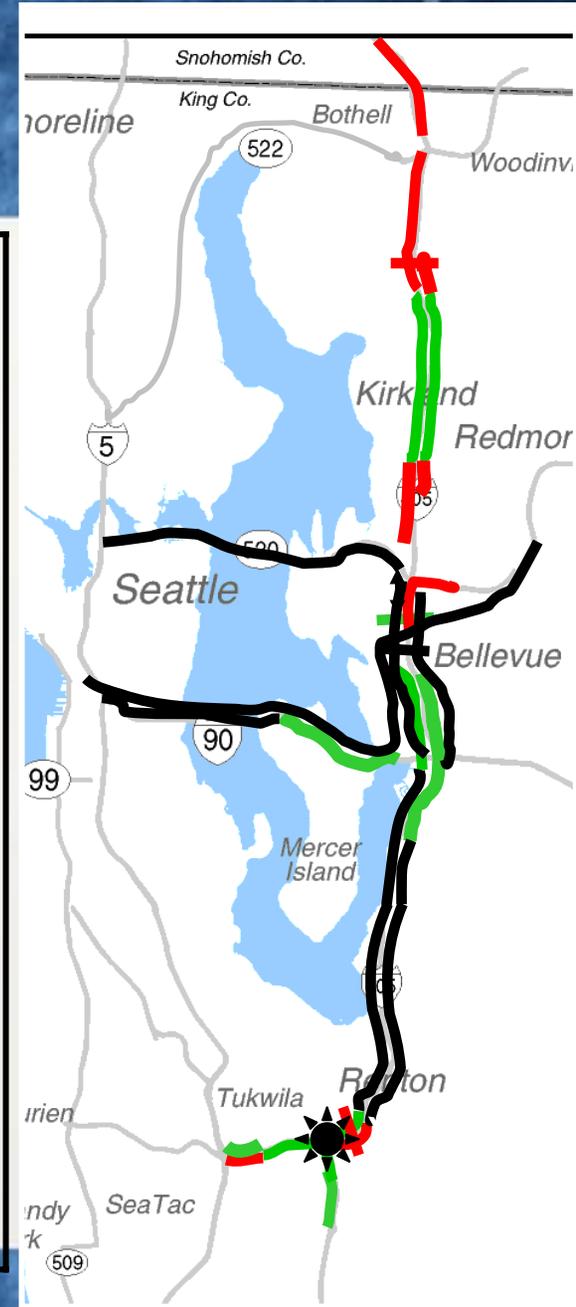
- Bridge Replacement and HOV Project – add HOV lane each direction, 108th Ave NE direct access

I-90:

- HOV Lane completion (Westbound and Eastbound)

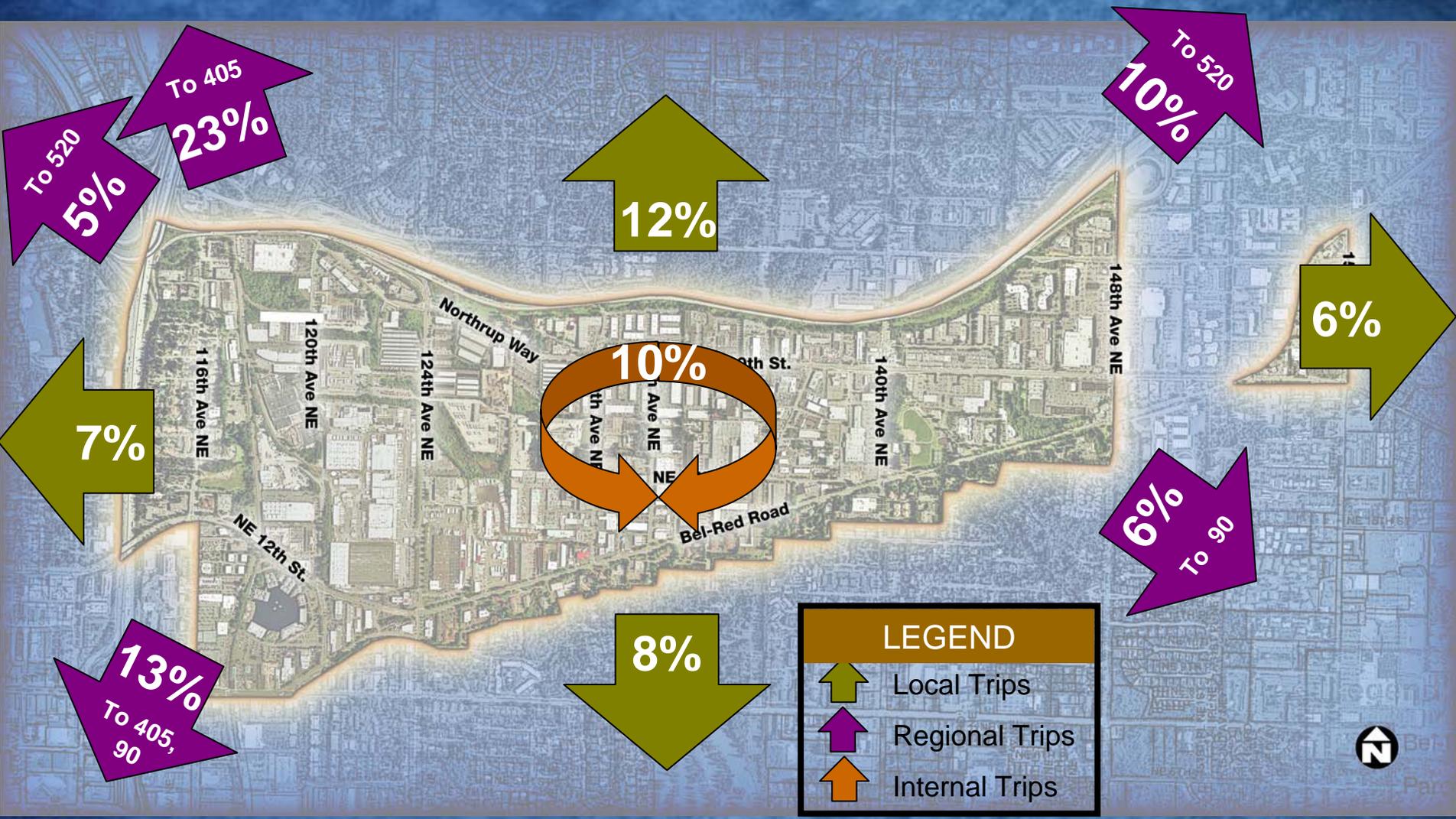
HCT:

- Seattle-Bellevue-Overlake (+Redmond?) via I-90



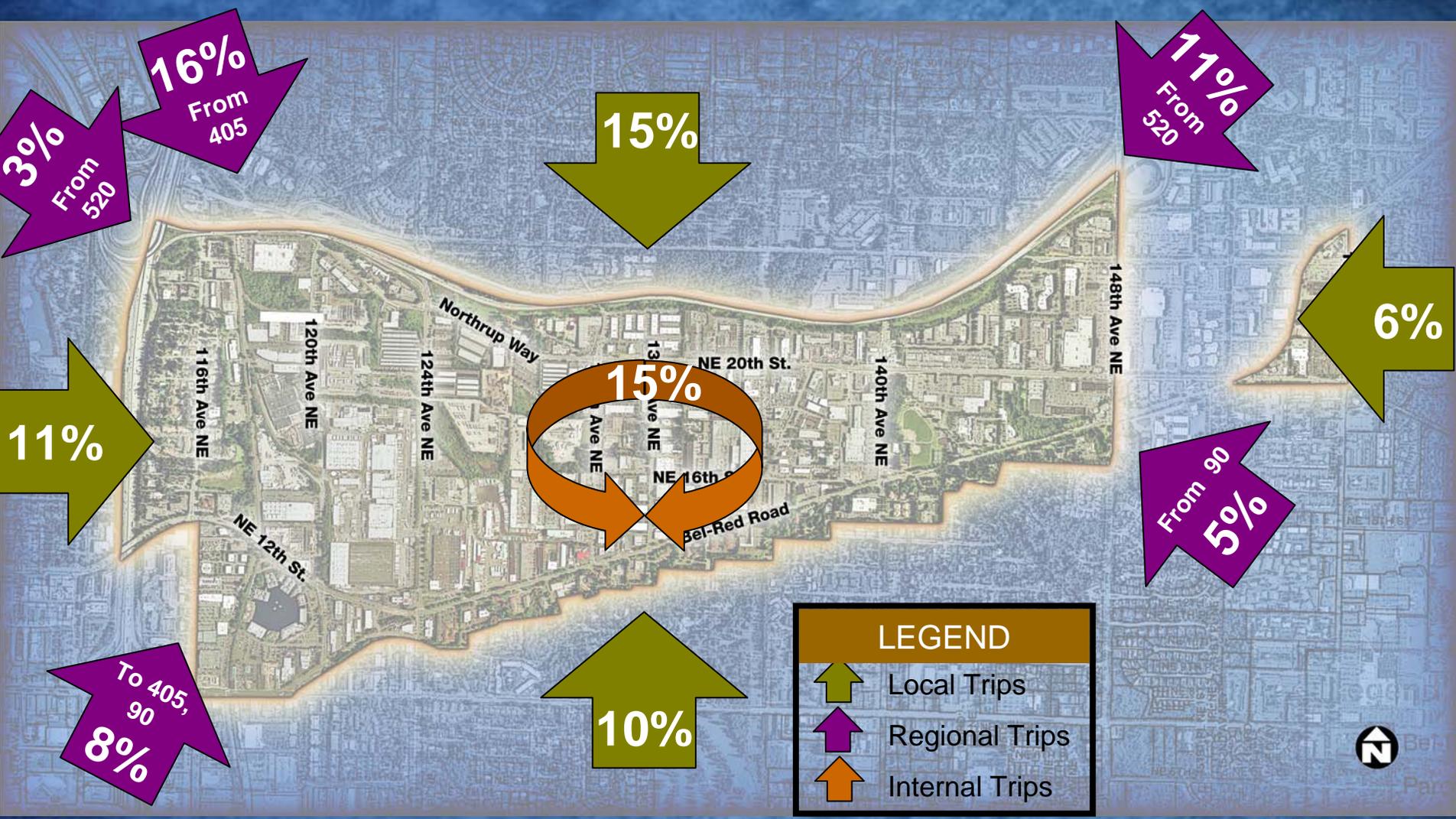


Traffic Demand Leaving Bel Red Corridor



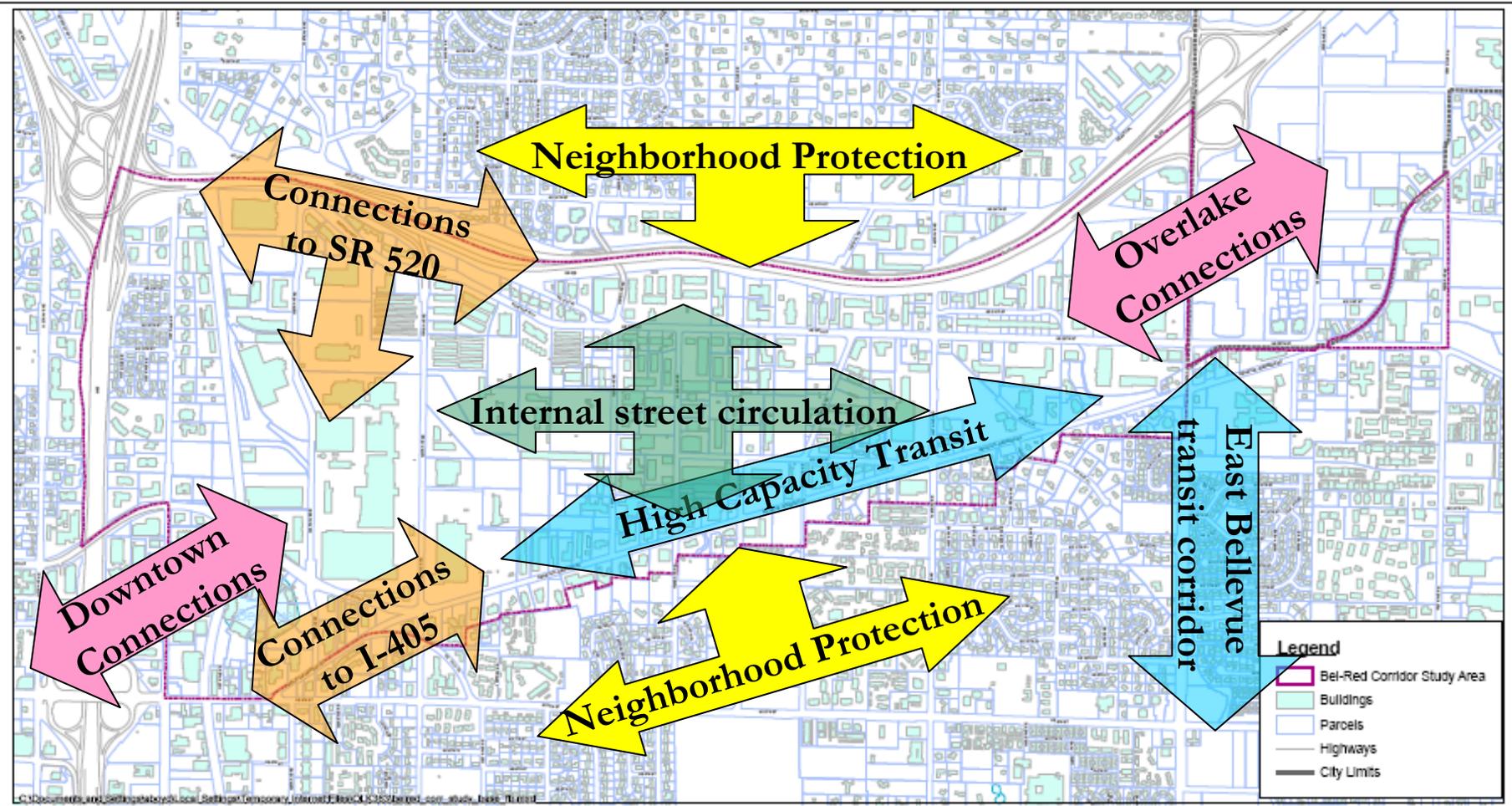


Traffic Demand Entering Bel Red Corridor





Transportation System Ideas





Open Discussion/Questions



High Capacity Transit

- **Council Policy: Connect Bellevue across the lake and east to downtown Redmond through Bel-Red**
- **HCT could enable land use change that's otherwise impossible due to transportation capacity constraints**
- **Study Driver: Establish Bellevue's HCT direction as input to ST2 process**