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

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

Map 3 Mobility Management Areas (MMA) of Bellevue
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
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
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.

**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/Northup 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)
Non-Motorized – Types of Facilities

- **Pedestrian**
  - Sidewalk
  - Walkway
  - Shoulders
  - Recreational trails

- **Bicycle**
  - Bicycle Lanes
  - Signed shared roadway
  - Shared Roadway

- **Facility enhancements**
  - Landscaping, aesthetics, wayfinding, lighting, crossings, bike parking, street furniture, public art, etc.
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
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/Capital Hill

**Metropolitan Centers**
- Downtown Bellevue
- Downtown Tacoma
- Downtown Bremerton

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

Existing system insufficient to serve anticipated growth.
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.
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

- **King County Metro/Bellevue Transit Plan**
  - Focus on connecting activity centers (downtown, Overlake, Factoria, etc.)
### Funded I-405 Improvements ($1.5b)

<table>
<thead>
<tr>
<th>Project</th>
<th>Funding</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Nickel Improvements</strong></td>
<td>$485m</td>
<td>- $185m: Main to I-90 (+1GP each direction, HOV)</td>
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<tr>
<td></td>
<td></td>
<td>- $164m: Kirkland (+1GP each direction)</td>
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<tr>
<td></td>
<td></td>
<td>- $136m: Renton (SR167 area improvements)</td>
</tr>
<tr>
<td><strong>Transportation Partnership Act</strong></td>
<td>$922m</td>
<td>- Bellevue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $67m: NE 10&lt;sup&gt;th&lt;/sup&gt; Overcrossing (112&lt;sup&gt;th&lt;/sup&gt; – 116&lt;sup&gt;th&lt;/sup&gt;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $250m: NE 8&lt;sup&gt;th&lt;/sup&gt; to SR 520 to 124&lt;sup&gt;th&lt;/sup&gt; Braid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $170m: SR 169 to I-90 (+2 GP NE 44&lt;sup&gt;th&lt;/sup&gt; to 112&lt;sup&gt;th&lt;/sup&gt;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>subject to additional funding</td>
</tr>
<tr>
<td><strong>South</strong></td>
<td></td>
<td>- $30m: I-5 to SR 181 (+1GP both directions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $110m: SR 515 half interchange (Talbot Road)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $20m: +1 NB GP (SR 167-SR 169)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $50m: SR 167 +1 SB GP (I-405 to SE 180&lt;sup&gt;th&lt;/sup&gt;)</td>
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<tr>
<td><strong>North</strong></td>
<td></td>
<td>- $230m: NB GP lane (124&lt;sup&gt;th&lt;/sup&gt; to SR 522) &amp; 132&lt;sup&gt;nd&lt;/sup&gt; interchange</td>
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<tr>
<td></td>
<td></td>
<td>- $45m: +1 NB GP – 195&lt;sup&gt;th&lt;/sup&gt; to SR 527</td>
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Other Key TPA Funded Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Funding Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-90 Two Way Transit/HOV: $30m</td>
<td></td>
<td>Phase 1 moving to construction (Bell way to MI)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 2 &amp; 3 likely (MI to Seattle and Seattle MI)</td>
</tr>
<tr>
<td></td>
<td>$95m (±)</td>
<td>$128m total cost</td>
</tr>
<tr>
<td>SR 520 Bridge Replacement &amp; HOV: $500m</td>
<td>$552m</td>
<td>$2.6-2.9b total cost (6-lane), tolls estimated to generate $700m</td>
</tr>
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<td></td>
<td>$2.6-2.9b total cost (6-lane), tolls estimated to generate $700m</td>
</tr>
<tr>
<td>Alaska Way Viaduct: $2.0b</td>
<td></td>
<td>$2.4b funded, $3.7 - 4.1b total cost (tunnel)</td>
</tr>
<tr>
<td>SR 522 Business and Transit Lanes: $17m</td>
<td></td>
<td>Approaching full funding - $35m total cost</td>
</tr>
<tr>
<td>SR 518: $26m</td>
<td></td>
<td>+1 EB GP lane, Airport to I-5</td>
</tr>
<tr>
<td>SR 518: $26m</td>
<td></td>
<td>SR 518/SR 509 interchange improvements</td>
</tr>
<tr>
<td>I-90 Route Development Plan: $2m</td>
<td></td>
<td>Analyze needs from I-405 to North Bend to identify near and long term improvements</td>
</tr>
</tbody>
</table>
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
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 Entering Bel Red Corridor

- 3% From 520
- 16% From 405
- 11% From 520
- 15% From 90
- 11% To 405
- 10% To 90
- 8% From 405
- 6%
- 15%
- 5%

LEGEND
- Local Trips
- Regional Trips
- Internal Trips
Transportation System Ideas

- Connections to SR 520
- Internal street circulation
- High-Capacity Transit
- Downtown Connections
- Connections to I-405
- Neighborhood Protection
- Overlake Connections
- East Bellevue transit corridor

Legend:
- Be-Red Corridor Study Area
- Buildings
- Parcels
- Highways
- City Limits
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