

**Bellevue-Redmond-Overlake Transportation Study (BROTS)
Transportation Mitigation Strategies for East Bellevue**

Findings and Initial Report

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EXECUTIVE SUMMARY

This report summarizes the results of the Bellevue-Redmond-Overlake Transportation Study (BROTS) East Bellevue Transportation Mitigation Study. The purpose of the study was to evaluate and recommend a range of strategies that could be implemented to benefit East Bellevue communities potentially impacted by traffic concerns.

Long-term trends with regard to increased development activity in Bellevue's Bel-Red corridor and Redmond's Overlake area are anticipated to increase vehicular travel within those areas, with potentially significant impacts on nearby East Bellevue neighborhoods. Through this BROTS transportation mitigation study, the City of Bellevue is seeking to identify measures to respond to the impacts of expected increases in vehicular traffic in East Bellevue for the long-term, 2030 planning horizon.

Overall, traffic conditions are expected to significantly worsen on the north-south arterials in the East Bellevue area over the next 25-30 years. Not surprisingly, as peak hour traffic levels on the area's major arterial, 148th Avenue, increase over time, congestion will likely spill-over onto parallel arterials. As described in the contents of this report, a significant and growing portion of travel in East Bellevue is due to regional trips that have neither their origin nor destination in Bellevue.

This report describes a list of candidate transportation and other urban livability strategies that were considered in this study. These potential strategies are intended to respond to the traffic pressures facing East Bellevue by improving the attractiveness and/or availability of alternatives to the single-occupant vehicle. Consistent with direction from the City, potential projects that primarily enhance general-purpose mobility and throughput capacity are excluded from this list. These potential strategies cover a wide range of modes, including transit improvements, demand management proposals, pedestrian and bicycle enhancements, urban livability/neighborhood amenities, channelization and operational changes, and regional initiatives.

An initial screening process was conducted on the potential strategies to balance – at a conceptual level – the relative costs and impacts of the strategies as compared to their potential benefits. As a result of the initial screening, seven strategies were removed from consideration.

Following the initial screening, the remaining 30 strategies were qualitatively evaluated and rated against a set of criteria that included the ability of the strategy to shift peak period travel to non-peak hours of the day and/or non-SOV modes, reduce or eliminate trips, avoid or minimize right-of-way acquisition and impacts to private property, enhance neighborhood aesthetics, landscaping, and/or parks and playgrounds, etc. The evaluation also considered each strategy's consistency with the BROTS Transportation Framework Agreement, the Bellevue Comprehensive Plan, the Bel-Red Corridor Steering Committee recommended vision, and applicable subarea plans.

Based on the evaluation results, a package of complementary strategies is recommended that could produce benefits for East Bellevue and that is consistent with the goals of the BROTS East Bellevue Transportation Mitigation Study. Order-of-magnitude cost estimates are also provided for the recommended strategies.

1. INTRODUCTION

This report summarizes the outcomes of the Bellevue-Redmond-Overlake Transportation Study (BROTS) East Bellevue Transportation Mitigation Study. This report provides an evaluation and recommendation of a range of strategies that could be implemented to benefit East Bellevue communities that may be impacted by traffic concerns.

Section 2 of this report provides a brief summary of the traffic conditions on East Bellevue arterials experienced today and projected into the future. Following the transportation model data review, a preliminary list of transportation strategies is described in Section 3 that would be likely to help mitigate long-term traffic impacts in the East Bellevue area. These potential strategies cover a wide range of modes and strategies, including transit improvements, transportation demand management proposals, pedestrian and bicycle improvements, channelization/operational changes, urban livability/neighborhood amenities, and regional initiatives.

Section 4 summarizes the results of a first phase of screening of the mitigation strategies. This initial screening was used to eliminate project ideas that are unlikely to produce a high level of benefit compared to their anticipated costs and/or impacts. A second, more detailed evaluation with strategy recommendations are described in Section 5. Order-of-magnitude cost estimates are provided in Section 6 for the recommended strategies.

1.1 Purpose of this Study

Long-term trends with regard to increased development activity in Bellevue's Bel-Red corridor and Redmond's Overlake area are anticipated to increase vehicular travel within those areas, with potentially significant impacts on nearby East Bellevue neighborhoods. Through this BROTS transportation mitigation study, the City of Bellevue is seeking to identify ways to respond to the impacts of the increased vehicular traffic that is expected to occur in the long-term (2030 planning horizon) in East Bellevue. Based on the assessment of future traffic demands and impacts, transportation strategies identified as part of this project should focus on the following:

- Minimizing PM peak period single-occupant vehicle (SOV) trips on collector arterials serving the East Bellevue area (especially 140th Avenue/145th Place, 156th Avenue, and 164th Avenue) and maximize use of other travel modes;
- Directing regional trips to the regional transportation system;
- Ensuring north-south arterials are able to function; and
- Protecting neighborhoods from through traffic.

1.2 Study Area

The East Bellevue study area is generally bounded on the north by NE Bel-Red Road/NE 20th Street/Northup Way NE, on the west by 140th Avenue, on the east by Lake Sammamish, and on the south by I-90. This area was outside the study areas covered by

the Bel-Red Corridor Study and Redmond’s Overlake Neighborhood Plan and also outside of the area covered in the existing BROTS agreement. See Figure 1 for a map of the study area.

As indicated above, the focus of this study is on the functionality of the north-south arterials in East Bellevue. Table 1 identifies the functional classification for each of these arterials, as shown in the City of Bellevue Comprehensive Plan.

Table 1: Functional Classification

Corridor	Limits	Functional Classification
140th Avenue	North study area limits to NE 8th Street	Minor Arterial
140th Avenue/145th Place	NE 8th Street to 148th Avenue SE	Collector Arterial
148th Avenue	North study area limits to Eastgate Way	Major Arterial
156th Avenue	North study area limits to NE 8th Street	Minor Arterial
156th Avenue	NE 8th Street to Eastgate Way	Collector Arterial
164th Avenue	North study area limits to SE 16th Street	Collector Arterial
West Lake Sammamish Pkwy	North study area limits to I-90	Minor Arterial

2. REVIEW TRANSPORTATION MODEL DATA

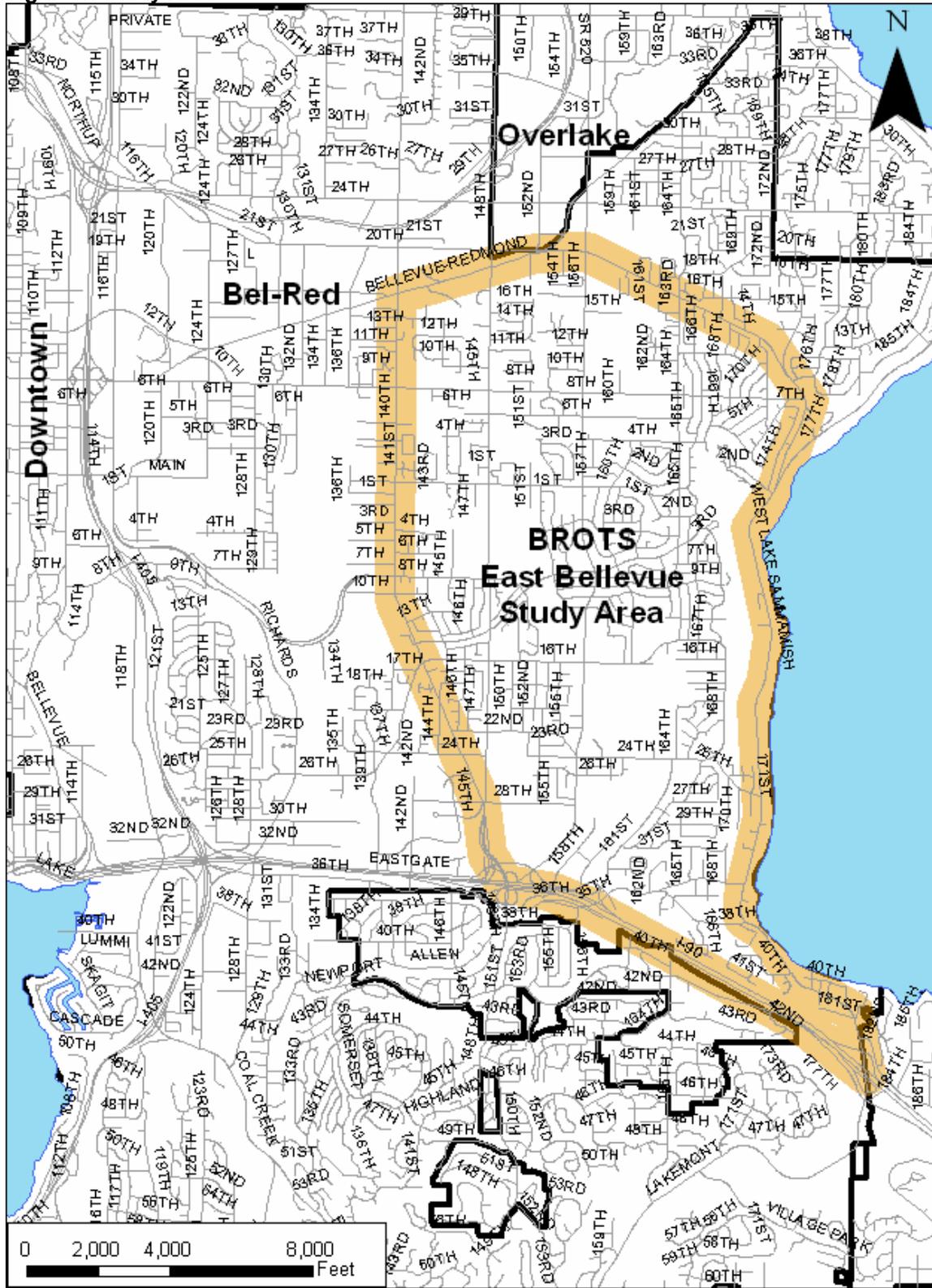
This report provides a brief summary of the traffic conditions on East Bellevue arterials experienced today and projected into the future. This analysis is based on the existing conditions (using 2004 data) and future 2030 Baseline¹ and 2030 Alternative 4B² transportation model output generated by the City of Bellevue. Except as noted below, the 2030 Baseline and 2030 Alternative 4B models assume land use growth occurring throughout the Eastside and greater region consistent with Puget Sound Regional Council (PSRC) forecasts. The issues covered in this section provide a basis for the development of transportation mitigation strategies for the north-south arterials in East Bellevue.

Overall, traffic conditions (in terms of congestion levels and travel times) are expected to significantly worsen on the north-south arterials in the East Bellevue area over the next 25-30 years. Not surprisingly, as peak hour traffic levels on the area’s major arterial, 148th Avenue, increase over time, congestion will spill-over onto parallel arterials. As described below, a significant and growing portion of travel in East Bellevue is due to regional trips that have neither their origin nor destination in Bellevue. In 2030, an estimated 1,300 regional trips that originate in Overlake will travel through East Bellevue, and end outside Bellevue.

¹ The 2030 Baseline output provided a snapshot of background conditions forecast for 2030 *without* the preferred alternatives of the Bel-Red Corridor Study and the Redmond Overlake Neighborhood Plan; however, some growth was expected to occur by 2030 in the Bel-Red and, in particular, Overlake area.

² The 2030 Alternative 4B scenario was developed to capture the combined impact of future growth in the Bel-Red and Overlake areas. Therefore, the 2030 development levels assumed for Alternative 4B for the Bel-Red and Overlake districts are consistent with the Bel-Red Corridor Study Steering Committee recommendations and the Overlake Neighborhood Plan, respectively.

Figure 1: Study Area



2.1 Select Zone Analysis

The select zone analysis of the Redmond Overlake Area for the PM peak hour indicates that regional trips through East Bellevue will increase dramatically over the next 20-25 years:

- Slightly over 13,000 PM peak hour trips originated in the Overlake area in 2004. This number is forecast to grow by 49% and 76% for the 2030 Baseline and Alternative 4B scenarios, respectively. Other locations in Redmond will remain the primary destination for PM peak hour trips starting in Overlake. Besides internal trips within the Overlake area, other major destinations are in the Kirkland/Bothell/Point Cities area, Snohomish County, and East King County/Issaquah/Sammamish.
- PM peak hour trips originating in the Overlake area and traveling to destinations in East Bellevue and locations to the southeast are expected to increase from slightly less than 3,000 trips to over 4,000 trips under the 2030 Baseline scenario, a 42% increase. The 2030 Alternative 4B scenario generates an additional 700 trips above the Baseline, for a total increase of 65% over 2004 levels. This is a significant increase from existing PM peak hour trip levels along the north-south arterials in East Bellevue.

2.2 Select Link Analysis

The following observations are based on the select link analysis conducted south of NE 8th St on the East Bellevue north-south arterials (140th, 148th, 156th, and 164th Avenues and West Lake Sammamish Pkwy) for the PM Peak Hour. One should note that under the 2030 Alternative 4B scenario, approximately 1,300 PM peak hour trips forecast to use the East Bellevue north-south arterials are regional trips that start in Overlake and are destined for locations outside Bellevue.

- Volumes on the selected north-south arterials will increase by over 500 trips in the 2030 Baseline as compared to 2004. The 2030 Alternative 4B scenario estimates an increase of 1,500 trips as compared to 2004. Of the trips on the East Bellevue north-south arterials under all 3 scenarios, approximately 50-52% originated in the East Bellevue/Eastgate and Overlake areas, combined.
- Among the 5 corridor links selected, the trips increased between 2004 and 2030 (Alternative 4B) by approximately 380 on 140th Avenue, 400 on 148th Avenue, 240 on 156th Avenue, 330 on 164th Avenue, and 130 on West Lake Sammamish Parkway. The arterial with the highest growth rate from 2004 volumes is 164th Avenue with 31% higher volumes, followed by 140th Avenue with a 20% increase, and 156th Avenue with a 16% increase.
- Under the 2030 Alternative 4B scenario, each of the north-south arterials in East Bellevue carries a significant number of regional trips, which have neither their origin nor destination in Bellevue. Over 1,000 (77%) of the PM peak hour trips using West Lake Sammamish Parkway are regional trips.

Similarly, almost one-half of the PM peak hour trips along 148th Avenue are regional trips. One-third of the PM peak hour trips along 156th and 164th are regional trips, and regional PM peak hour traffic comprises one-quarter of the trips along 140th Avenue.

- Under the 2030 Alternative 4B scenario, approximately 26% of the PM peak hour trips along the East Bellevue north-south arterials originate in the Overlake area. Of those 2,700 trips, 52% begin in Overlake and end in Bellevue. The remaining 1,300 of those trips (48%) are regional trips that begin in Overlake, travel through East Bellevue, and end outside Bellevue.

2.3 Segment Volume/Capacity Analysis

The following observations are made from the volume/capacity (v/c) ratio plots for 2030 PM Peak network for Alternative 4B. [Note: v/c ratios of 1.0 indicate that roadway capacity is being fully used. Ratios greater than 1.0 indicate increased deterioration of traffic operations]:

- On 140th Avenue NE and SE, southbound v/c ratios are greater than 1.0 south of SR 520 extending on to 145th PI SE. The segment of 140th Avenue SE between NE 20th Street and NE Bel-Red Road is the only exception with a v/c ratio of 0.9.
- On 148th Avenue NE and SE, the v/c ratios are consistently greater than 1.0 in the southbound direction over the study area.
- The southbound segments on 156th Avenue NE and SE that exceed a v/c ratio of 1.0 include the segments between NE 20th Street and NE 15th Street and NE 8th Street and SE Lake Hills Boulevard.
- The traffic volumes on 164th Avenue NE and SE are likely to exceed capacity in the southbound direction between NE 8th Street and SE 2nd Street (approximately).
- The volume on West Lake Sammamish Parkway is likely to exceed capacity south of its intersection with Northup Way with the v/c ratio increasing to 1.66 as it approaches I-90.
- Except for NE Bel-Red/20th/Northup, NE 8th Street, Lake Hills Connector/Boulevard, and Eastgate Way, the v/c ratios for east-west streets in East Bellevue are less than 0.5.

2.4 Intersection Analysis

The following are some relevant highlights of the intersection analyses documented in the Bellevue Concurrency Update (City of Bellevue, September 2007), and the Bel-Red Corridor Study Final EIS Transportation Analysis (City of Bellevue, September 2007, Appendix A). Note: unlike 2030 Alternative 4B, the Bel-Red Corridor Study Final EIS analysis covered did not assume or consider enhanced growth in the Overlake area of Redmond.

- Of the 14 signalized intersections evaluated along the East Bellevue north-south arterials, five (5) intersections had a level of service of “D plus” or worse in 2004. All five of these intersections are along 148th Avenue. Under the 2030 Bel-Red Study Preliminary Preferred Alternative scenario, 13 of the 14 intersections will operate at LOS “D” or worse.
- The worst-performing intersection of this group, 148th Avenue NE at NE Bel-Red Road, had a LOS of “D minus” in 2004 and is forecast to worsen to LOS “F” under the 2030 Bel-Red Study Preliminary Preferred Alternative scenario.

3. CANDIDATE STRATEGIES

This section describes the list of candidate transportation and other urban livability strategies that were initially considered in this study. These potential strategies are intended to respond to the traffic pressures facing East Bellevue by improving the attractiveness and/or availability of alternatives to the single-occupant vehicle. Consistent with direction from the City, potential projects that add only general-purpose throughput capacity are excluded from this list. These potential strategies cover a wide range of modes, including transit improvements, demand management proposals, pedestrian and bicycle enhancements, urban livability/neighborhood amenities, channelization and operational changes, and regional initiatives. The preliminary list of strategies is shown in Table 2. The potential strategies are described in the following sections of the report.

Table 2: Candidate Transportation Strategies

NOTE: Project ideas are listed separately but are most effective when implemented in a coordinated manner.	
Number	PROJECT IDEA (not listed in any priority order)
Transit	
1	Grade-separated transit way (elevated busway, etc.) along 148th Avenue
2	At-grade BRT on 148th Avenue or 156th Avenue (range of treatment options)
3	Transit Signal Priority (paired with far-side bus stops)
4	Transit queue jumps at intersections (paired with near-side bus stops)
5	Additional local park-and-ride lots in church parking lots
6	Additional parking at Eastgate Park-and-Ride
7	Expanded transit serving urban centers, activity centers, park-and-ride lots on the Eastside
Transportation Demand Management (TDM)	
8	HOV/transit goals in each City
9	Parking ratios/costs
10	Parking cash-out programs
11	Encourage tele-commute, tele-work centers
Non-Motorized	
12	Bike facilities on all key north-south streets per 2007 Pedestrian and Bicycle Transportation Plan
13	Bike lanes on 156th Ave NE north of NE 8th St
14	Bike lanes on Northup Way from NE 20th to WLSP
15	Solution for bike system at Eastgate Way/Eastgate Park-and-Ride
16	Channelize 161st/Eastgate Way/I-90 WB on-ramps intersection to add ped/bike connection to the I-90 trail
17	Alternative bicycle treatments
18	Signalized pedestrian crossings of arterials
19	Complete missing sidewalks on key residential streets per 2007 Pedestrian and Bicycle Transportation Plan
20	Complete multi-use trail segments per 2007 Pedestrian and Bicycle Transportation Plan
Urban Livability/Neighborhood Amenities/Traffic Calming	
21	Implement additional traffic calming measures within neighborhoods
22	Emphasize protection of neighborhood character as priority
22	Streetscape and landscaping improvements to protect and enhance neighborhood character
23	Play equipment and other improvements for neighborhood parks
Channelization/Operations	
24	Prohibit southbound through movement at NE 8th Street/156th Avenue NE
25	Create cul-de-sac on 156th Avenue NE at SE 28th Street
26	Prohibit southbound through movement at NE 8th Street/164th Avenue NE
27	Improve westbound I-90 freeway signage to 148th Avenue SE
28	Peak-hour HOV and/or transit lanes in both directions
29	Peak-hour HOV and/or transit lane in peak direction
30	Peak-hour reversible HOV lane
31	Peak-hour reversible general purpose lane
32	Optimization improvements for 148th Avenue
33	Exempt 148th Avenue from concurrency standards
34	Add southbound right-turn pocket on 156th Avenue SE at SE 16th Street/SE 22nd Place
Joint Regional Advocacy	
35	SR 520 lane capacity east of I-405 (auxiliary lanes)
36	HOV-to-HOV connections at SR 520/I-405 and I-90/I-405
37	Expanded high capacity transit (HCT) options on the Eastside, including East Link

3.1 Transit Strategies

This section provides descriptions of potential transit elements or strategies. The following are some key assumptions used in developing and evaluating the potential transit strategies:

- Include both service and capital improvements, where applicable
- Bus rapid transit (BRT) elements are consistent with the proposed Bellevue-Redmond RapidRide route
- If implemented as part of a package, transit investments would be particularly complementary with transportation demand management (TDM) measures.

Major Transit Markets in East Bellevue

A primary goal of this study is to identify strategies that have the potential to reduce traffic volumes on north-south arterials in East Bellevue. If improved transit options were provided to people who currently drive through East Bellevue, traffic volumes on East Bellevue arterials could be reduced as some people take transit instead of driving. Based on the review of the travel demand forecasts (as summarized in Section 2), a major contributor to East Bellevue traffic congestion is the large number of employees on their way to and from jobs in the Overlake area.

Therefore, a primary market for transit improvements -- as part of this study -- includes Overlake-bound commuters. The commuter market is particularly sensitive to travel time and service reliability. With limited stops and associated transit priority improvements, the Eastgate-Overlake bus rapid transit (BRT) service proposed in this report, for example, could provide frequent and reliable service for this market. Accordingly, transit strategies proposed for East Bellevue include a new BRT line operating between Eastgate Park-and-Ride and Overlake Transit Center.

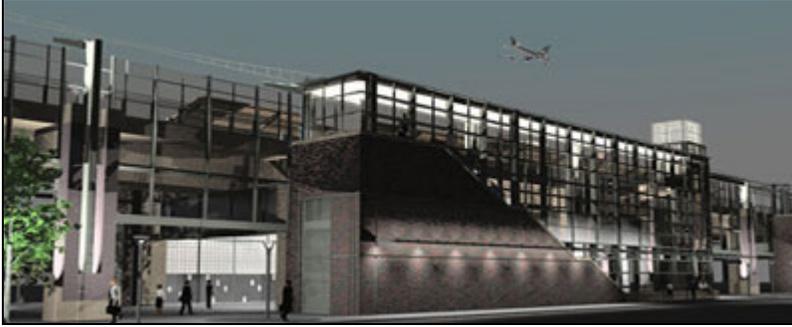
Riders of the BRT service will likely come from several areas on the Eastside and possibly beyond³. With stops serving major cross streets in East Bellevue, the Eastgate-Overlake BRT service will attract East Bellevue residents traveling to and from jobs in the Overlake area. The BRT service will also address other transit markets on the Eastside through connections at Eastgate Park-and-Ride and Overlake Transit Center. There are routes at Eastgate Park-and-Ride that serve several communities in the City of Bellevue; for example, Route 921 operating in Somerset. With a transfer at Eastgate from the BRT line, connections can be made to Issaquah (including Issaquah Highlands), Sammamish, and other communities along the I-90 East corridor. Parking at Eastgate (especially if expanded) provides another option for Eastside residents to access the BRT route. Capturing these Overlake-bound commuters closer to their origin and providing them with an appealing transit option will help reduce traffic volumes in East Bellevue.

Strategy 1

Elevated transitway on 148th Avenue

This strategy would provide elevated high capacity transit (HCT) in the 148th Avenue corridor in exclusive right-of-way. Transit technologies that could be considered include both rail and bus modes. Elevated HCT along the 148th Avenue would serve the regional transit market by connecting Eastgate Park-and-Ride and Overlake Transit Center with frequent, high speed service. Connections at Overlake Transit Center would allow for transfers to future East Link light rail service to the west and possibly east. In addition, connections could be made with bus routes at Eastgate Park-and-Ride, Overlake Transit Center, and points in between.

³ No ridership modeling has been completed for this proposed BRT service.



Central Link McClellan Station (simulation)
Source: Sound Transit

Provision of elevated HCT in this corridor would require extensive environmental documentation, analysis of alternatives, and a comprehensive public and agency involvement process. Implementation of HCT in the 148th Avenue corridor by Sound Transit would require an amendment to the agency's Long-Range Plan, which does not include HCT in this corridor.

Example(s): Sound Transit, the regional transit service provider, is constructing Central Link light rail in Seattle and South King County and is in the process of completing the Draft EIS for East Link.

Strategy 2

At-grade BRT along 148th and/or 156th Avenues

Given the importance of the 148th Avenue and 156th Avenue corridors for East Bellevue, development of at-grade Bus Rapid Transit (BRT) can be considered. To provide a higher level of transit service vs. more conventional bus transit, the BRT system should include several key elements which are further described below. Speed and reliability improvements, such as transit signal priority, queue jumps and bus access/transit (BAT) lanes, which could be combined with the bus service improvements, are covered later in this section. A range of treatment options are provided.

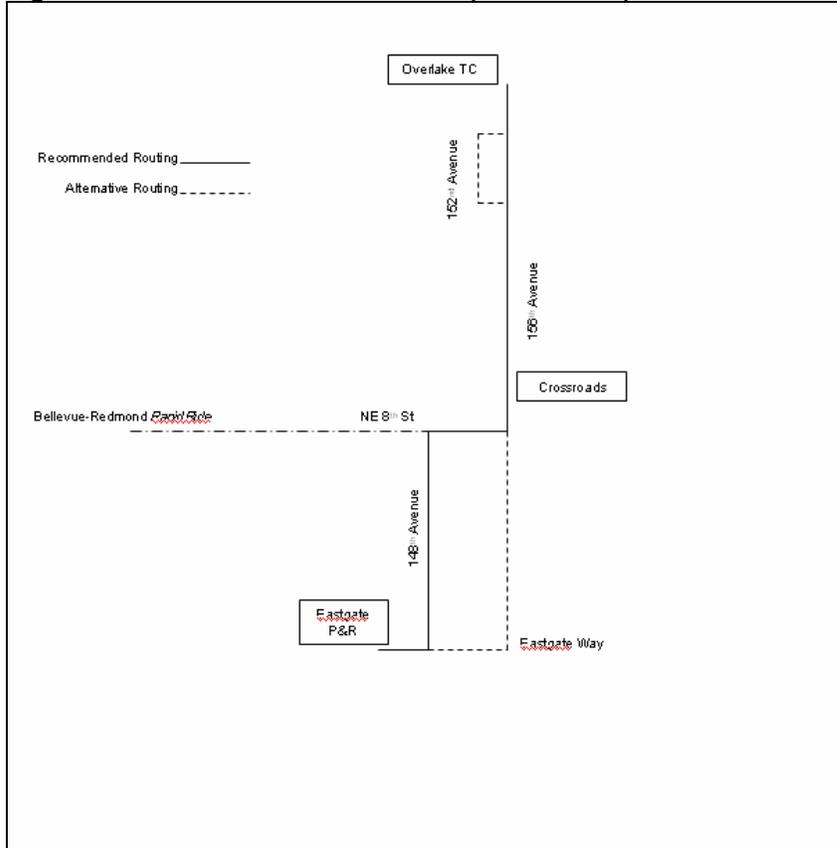
Recommended Alignment for At-Grade BRT

As shown in Figure 2, the general BRT alignment would have segments along 148th Avenue, NE 8th Street, and 156th Avenue NE, with a potential option to serve the former Overlake Hospital campus along 152nd Avenue NE. **Note: South of NE 8th Street, 148th Avenue is the recommended corridor because it provides direct access to more potential destinations (e.g., BCC campus) than 156th Avenue. However, an alternative option would use 156th Avenue along the entire route.** The recommended routing is as follows:

- Between Eastgate and NE 8th Street, provide BRT along 148th Avenue to provide direct access to Eastgate Park-and-Ride lot and the BCC campus. The alignment of a surface BRT route will reinforce potential City of Bellevue improvements to 148th Avenue, including pedestrian and transit-supportive facilities.
- Between 148th Avenue NE and 156th Avenue NE, operate on NE 8th Street; provides direct access to the Crossroads area. Route and stops are consistent with proposed Bellevue-Redmond RapidRide route.

- Between NE 8th Street and Overlake Transit Center, operate on 156th Avenue; provides direct access to central part of Microsoft campus and Overlake TC. Route and stops are consistent with proposed Bellevue-Redmond RapidRide route. A potential alignment option would serve the former Overlake Hospital campus along 152nd Avenue NE.
- Service schedules can be coordinated with existing L-shaped routes operating between Downtown Seattle and Overlake and with the proposed Bellevue-Redmond RapidRide route.

Figure 2: Recommended BRT Route (not to scale)



BRT Treatment Options

As described below, a range of treatment options are presented for surface treatment BRT. Investments in BRT could be increased over time, starting initially with the improved service levels and adding passenger amenities, transit signal priority and/or (business access and transit) BAT lanes over time as funds allow. These options include:

1. Core BRT elements that focus on reduced travel time/frequency improvements;
2. Passenger enhancements that complement the premium travel times and reliability of the BRT service
3. Facility and vehicle improvements that provide a high profile image for the BRT system.
4. BAT lane in each direction along the majority of the alignment to provide for shorter and more reliable bus travel times between Eastgate Park-and-Ride and

Overlake Transit Center. BAT lanes are reserved for the exclusive use by buses and by any vehicle that is making a right turn at an upcoming intersection or driveway.

BRT Option 1 - Core Elements: Less Travel Time/Higher Service Frequencies

BRT Option 1 elements would provide BRT service that has fewer stops and greater frequencies as compared to traditional local bus service. Potential service-related treatments include:

- Limited stop service between Eastgate and the Overlake Transit Center in order to reduce bus travel times. The station spacing should be roughly ½ mile vs. the more typical closer spacing for local bus service. Likely locations for BRT stations include:
 - Eastgate Park-and-Ride
 - 148th and SE 28th (BCC)
 - 148th and Lake Hills Boulevard
 - 148th and Main Street
 - 148th and NE 8th Street
 - 156th and NE 10th Street (Crossroads)
 - 156th and NE 16th Place
 - 156th and NE 24th Street (alternative stop along routing 152nd Avenue would be at Overlake Park-and-Ride)
 - 156th Street and NE 31st Street (Microsoft)
 - Overlake Transit Center at NE 40th Street
- Buses will operate every 10 minutes during weekday peak periods and every 15 minutes during non-peak periods, evenings and weekends.

BRT Option 2 – Option 1 plus Passenger Enhancements

Under BRT Option 2, all elements under Option 1 will be implemented and upgraded capital amenities will be provided at stations. These features include (but are not limited to):

- Real-time service information that will provide updates on expected bus arrival times.
- Integrated information on fares and service availability by time-of-day and day-of-week.
- Larger shelters and canopies for riders.
- Wall maps showing BRT line, station locations, and other passenger information similar to that normally provided at rail stations.

BRT Option 3 – Option 2 plus High Profile Characteristics

Option 3 represents an extensive program of service and facility elements for a potential at-grade BRT system in East Bellevue. This option will include all elements under Option 2 plus facility and vehicle features that will provide a high profile for BRT. These features include (but are not limited to):

- Station and brand signs that provide visibility to riders and non-riders (Photo shows Kansas City MAX).



- Buses with branding, color schemes, and other features that provide a higher profile for the BRT system.



Typical BRT Vehicle
Source: Los Angeles County Metropolitan Transportation Authority

The selection of features that provide a higher profile for the BRT service will need to be coordinated with Metro’s RapidRide program.

BRT Option 4 – Option 3 plus BAT Lanes on 148th Avenue and 156th Avenue NE
Option 4 provides a BAT lane in each direction on 148th Avenue between Eastgate Way and NE 8th Street and on 156th Avenue NE between NE 8th Street and the Overlake Transit Center. The lanes will be located in the outside portion (i.e. adjacent to the curb) of the affected streets.

The BAT lanes will complement the potential BRT service operating between Eastgate Park-and-Ride and Overlake Transit Center. The BAT lanes on 156th Avenue NE will also support the planned RapidRide route under KC Metro’s *Transit Now* program. This new route will connect the downtown Bellevue Transit Center with the Overlake Transit Center via NE 8th Street and 156th Avenue NE.

Example(s): In this region, WSDOT has implemented BAT lanes on Pacific Highway South in South King County, and the City of Shoreline is in the process of implementing BAT lanes on Aurora Avenue North.



Business Access and Transit (BAT) Lanes (simulation)
Aurora Avenue North (SR 99), Shoreline, WA
Source: City of Shoreline

Strategy 3

Transit signal priority (TSP)

The City of Bellevue's 148th Avenue Mobility Improvement Package identified several potential speed and reliability improvements along the major north-south corridor in East Bellevue. The package included transit signal priority treatments (TSP) along 148th Avenue NE. TSP is typically provided with far-side bus stops. An initial list of potential TSP treatments included the locations listed below on 148th Avenue SE, but TSP could be implemented along any major transit corridor to improve transit speed and reliability.

- SE 24th Street (unless a Transit Queue Jump is provided at this location)
- SE 22nd Street
- Lake Hills Boulevard
- NE 8th Street

Example(s): Transit signal priority technology is used in the City of Seattle along Aurora Avenue North (SR 99) to provide buses that are running behind schedule with extra green-time at signals.

Strategy 4 **Transit queue jumps**

The City of Bellevue's 148th Avenue Mobility Improvement Package identified a transit queue jump in East Bellevue. The project involves a southbound transit lane along 148th Avenue SE from approximately 300 feet north of SE 22nd Street to SE 24th Street and a queue jump at SE 24th Street. Signal modifications will be required at SE 22nd and SE 24th Streets. Transit queue jumps could be implemented along any major transit corridor to improve transit speed and reliability. Transit queue jumps are typically provided with near-side bus stops.

Example(s): A transit queue jump is used in the City of Seattle at Olive Way/6th Avenue to allow curb-lane buses to cross several lanes of traffic to get to the I-5 northbound on-ramp.

Strategy 5 **Additional park-and-ride stalls at leased lots**

In addition to publicly owned lots, King County Metro currently provides park-and-ride stalls at several leased lots in King County, including Bellevue. The capacity of leased lots makes up about 11 percent of total park-and-ride capacity in King County.

Additional park-and-ride stalls at leased lots in East Bellevue could be provided through new lots or expanding available spaces at existing facilities. To be effective, stalls should be located where they are served by frequent transit service. Under current City of Bellevue code, leased park-and-ride lots within the City are limited to 50 stalls. To encourage greater use of park-and-ride and associated transit services, this policy could be re-visited. One potential approach is to identify potentially higher capacity (i.e., over 50) limits along only those corridors that are targeted for enhanced transit services and where passengers are in need of expanded park-and-ride supply. Alternatively, new leased lots could be opened along transit corridors in East Bellevue, such as 148th and

156th Avenues. If four new lots with a maximum capacity of 50 stalls per lot were opened, up to 200 additional stalls could be provided for transit passengers.

Example(s): In East Bellevue, leased park-and-ride lots are located at the following locations: St Luke’s Lutheran Church (3030 140th Avenue NE), Bellevue Christian Reformed Church (1221 148th NE), and St. Andrew’s Lutheran Church (2650 148th Avenue SE).



Leased Park-and-Ride Lot
St. Andrew’s Lutheran Church, Bellevue, WA

Strategy 6 **Additional parking at Eastgate Park-and-Ride**

With its location near the intersection of I-90 and 148th Avenue SE, Eastgate Park-and-Ride serves as a major parking facility and transfer point for passengers traveling to major destinations such as downtown Seattle, downtown Bellevue, and the Overlake area. During a field count in September 2007, 94 percent of the approximately 1,600 spaces were occupied. The high occupancy rate in 2007 compares to 65 percent occupancy only one year earlier, and may be partially due to spillover from the temporary construction-related closures of Mercer Island and Issaquah Transit Center parking facilities.



Eastgate Park-and-Ride, Bellevue, WA

Given constraints on available land, the existing Eastgate facility may need to be explored for potential expansion. Most of the spaces at Eastgate Park-and-Ride are located in a 1300-stall parking garage. An additional 325 stalls are in surface lots to the west and east of this garage. By constructing a five-level garage (similar in height to the existing Eastgate Park-and-Ride structure) on land currently occupied by the surface parking lot on the western side, approximately 625 stalls can be provided, for a net addition of 500 stalls.

Strategy 7

Expanded service connecting urban centers, activity centers, and park-and-ride lots on the Eastside

In addition to the surface BRT service identified in Section 2.1, other transit enhancements should be considered that connect East Bellevue employment areas with other areas of the Eastside. Currently KC Metro provides several routes operating between Seattle and the Overlake area; some routes provide peak period/peak direction while others provide all day-two-way service. However, direct bus service is not available between Overlake/East Bellevue and the growing I-90 corridor and the Sammamish Plateau area.

A proposed new route could be in addition to or coordinated with potential 148th/156th Avenue BRT service. To provide a quick connection to Overlake, the service will have limited stops similar to a BRT service.

The Sammamish Plateau/East Bellevue route would have the following service characteristics:

- Service days – weekdays
- Service span – 6:00 AM to 7:00 PM (during evening periods one-transfer service could still be provided with existing KC Metro/Sound Transit routes)
- Headways during peak periods, between 10 and 15 minutes
- Headways during midday period, 30 minute service

3.2 TDM Strategies

This section describes potential transportation demand management (TDM) elements or strategies. The following are some key assumptions used in developing and evaluating these strategies:

- Candidate projects will support reduced daily and/or peak hour travel through East Bellevue
- Strategies will potentially address all modes including general purpose, transit, and bicycle/pedestrian
- All strategies described in this report complement TDM measures, and - in fact – the expansion of alternative transportation modes (e.g., enhanced transit) may be critical to provide reasonable commute options for employees who are subject to TDM programs.

Strategy 8

Establish non-SOV mode-share goals in each City

This strategy would establish mode-share goals for non-single occupant vehicle (non-SOV) travel for major employers in each City. Consistent with the Commute Trip Reduction (CTR) Act, the standard minimum threshold for major employer size would be 100 employees who work full-time at the worksite during typical weekday work hours⁴. The non-SOV mode share is the percent of employees using a commute option other than driving alone to work, typically determined by a one-week survey of commute habits.

Under state law, the cities of Bellevue and Redmond are each required to prepare a CTR plan. Each respective City (i.e., Bellevue or Redmond) would establish the non-SOV mode share specific to each sub-area or neighborhood, taking into consideration various characteristics such as existing mode share, existing and anticipated employment and population levels, density and mix of uses, existing and planned transit services, pedestrian and bicycle networks, etc.

As with Bellevue's strategy for its downtown, Redmond could develop and apply non-SOV mode share goals to the Overlake area under the Growth and Transportation Efficiency Centers (GTEC) program, which is yet to be finalized. This program is an optional element established by the CTR Efficiency Act and provides opportunities for local jurisdictions to link transportation and land use in areas with a concentration of employment and/or residential development, subject to approval by the Puget Sound Regional Council (PSRC).

The Bellevue Comprehensive Plan identifies a 2005 non-SOV mode-share target of 25 percent for the Bel-Red/Northup employment center, and a survey in late 2005 showed that this target was achieved that year. As indicated in the Comprehensive Plan, an employer size threshold of less than 100 could be used (in coordination with other Eastside cities) to affect more employers and, consequently, more employees.

City business licenses, code enforcement, taxation, and land use and building permit processes are potential local enforcement mechanisms if mandatory non-SOV goals are adopted. Incentive-based strategies such as building height bonuses could be used if the non-SOV goals are voluntary (or mandatory). A transportation management association (TMA) for the Bel-Red corridor, similar to TMAs in other areas of the Eastside, could be established to provide marketing and program assistance to employers in that district.

Strategy 9

Parking costs/maximum ratios

Establish costs and/or maximum ratios for privately provided parking in Bellevue's Bel-Red and Redmond's Overlake districts. These parking management strategies would reduce the amount of free parking available to employees (and potentially customers) to encourage the use of alternative modes. Parking cost and availability have been found to be two of the primary indicators of transit use.

⁴ "A major employer" means a private or public employer, including state agencies, that employs one hundred or more full-time employees at a single worksite who begin their regular work day between 6:00 a.m. and 9:00 a.m. on weekdays for at least twelve continuous months during the year. *RCW 70.94.524*.

Parking costs would be established in the form of a City-imposed tax on parking stalls, to be paid by the owners of the parking stalls. The tax would likely be passed directly through to the users of the parking stalls in the form of parking charges. The tax could also be passed through to the users indirectly in the form of higher building rents, higher prices for goods and services, etc.

Maximum parking ratios would reduce the amount of parking supplied when a land use action occurs, such as construction, remodeling, expansion of a building, and/or a change of use. Similar to minimum parking ratios that are in common use, the maximum parking ratio would be tied to the square footage, number of employees, or other indicator of building size or intensity of use.

The respective City (i.e., Bellevue or Redmond) would establish the parking tax and/or maximum parking ratio specific to each zoning (or overlay) classification within the districts, taking into consideration various characteristics such as existing parking availability, mode share, existing and anticipated employment and population levels, density and mix of uses, proximity to existing and planned transit services, pedestrian and bicycle networks, etc. The City of Bellevue would also likely need to consider comparable strategies for Downtown Bellevue to maintain equitable treatment of competing commercial/office districts within the City (Bellevue already uses parking maximums in its Downtown).

Strategy 10

Parking cash-out programs

Establish parking cash-out programs for privately provided employee parking in Bellevue's Bel-Red and Redmond's Overlake districts. These parking management strategies would reduce the amount of free parking available to employees to encourage the use of alternative modes. Parking cost and availability have been found to be two of the primary indicators of transit use.

Under a parking cash-out program, employers would provide up to \$185 in taxable cash per month to each employee in lieu of a free or subsidized parking space at work. The employee can choose how to use the money: for parking or for a tax-free transit or vanpool voucher or pass, with the balance provided as taxable cash income. Having a choice may prompt more consideration of alternatives to driving alone and parking.

Parking cash-out programs are an incentive-based option and are seen as a positive way to promote travel options. A transportation management association (TMA) for the Bel-Red corridor, similar to TMAs in other areas of the Eastside, could be established to provide marketing and program assistance to employers in that district.

Strategy 11

Encourage tele-commuting and provide tele-work centers

Encourage tele-commuting and provide tele-work centers for employees who work in Bellevue's Bel-Red and Redmond's Overlake districts. These strategies would reduce trips to those districts.

Tele-commuting is already in common use as a travel alternative on an occasional basis, but this strategy is still under-utilized by many employers. Employers may need to provide and/or expand secure remote access to company servers to make this a more feasible option for some employees. A transportation management association (TMA) for the Bel-Red corridor, similar to TMAs in other areas of the Eastside, could be established to provide marketing and program assistance to employers in that district.

Tele-work centers could be established at satellite locations near clusters of employee residences. Individual employers or groups of employers could provide or lease off-site work spaces, secure communications equipment and other amenities for occasional use by their employees. Employers may need to provide and/or expand secure remote access to company servers to make this a more feasible option for some employees. For example, Microsoft could provide for and actively encourage appropriate Redmond-based employees to use office space at the Issaquah Highlands location on an occasional basis if they live in nearby communities.

3.3 Non-motorized Improvements

This section describes potential non-motorized elements or strategies. The following are some key assumptions used in developing and evaluating these strategies:

- Non-motorized candidate projects focus on improving safety for pedestrians and bicyclists through improved facilities and/or separation from automobile traffic.
- Non-motorized strategies are complementary to other measures described in this report, but might preclude other improvements that would compete for limited right-of-way.

Strategy 12

Bicycle facilities on all key north-south arterials in East Bellevue per Pedestrian and Bicycle Transportation Plan Update

Provide bicycle facilities on all key north-south arterials in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update. The Plan identifies different design treatments for bicycle facilities, depending on traffic volumes and speeds, available right-of-way, roadway shoulders, etc.

Provide off-street paths (Type “A” facilities) as follows:

- West Lake Sammamish Parkway between northern City limits and I-90 (west side of street), consistent with adopted plan

Provide bicycle lanes (Type “B” facilities) as follows:

- 140th Avenue north of NE 8th Street
- 140th Avenue/145th Place south of SE 8th Street
- 156th Avenue between NE 8th Street and Lake Hills Blvd



Bicycle Lanes
140th Avenue SE south of Main Street, Bellevue, WA

Provide bicycle shoulder with fog line (Type “C” facilities) as follows:

- 156th Avenue between SE Eastgate Way and SE 24th Street
- West Lake Sammamish Parkway between northern City limits and I-90 (northbound only, east side of street), consistent with adopted plan

Provide shared shoulder with fog line (Type “C” facilities) as follows:

- 164th Avenue between NE 8th Street and SE 16th Street

Strategy 13

Bicycle lanes on 156th Avenue north of NE 8th Street

Provide bicycle lanes (Type “B” facilities) on 156th Avenue north of NE 8th Street. This segment may be a challenging area to install bicycle lanes, which is why they were not identified in the draft Pedestrian and Bicycle Transportation Plan Update. However, this segment is a key missing segment along this direct route between Eastgate and the Overlake area.

Strategy 14

Bicycle lanes on Northup Way NE between NE 20th Street and West Lake Sammamish Parkway

Provide bicycle lanes (Type “B” facilities) on Northup Way between NE 20th Street and West Lake Sammamish Parkway. This segment is included in the draft Pedestrian and Bicycle Transportation Plan Update, and it would connect the bicycle facilities on West Lake Sammamish Parkway with facilities on 156th and 164th Avenues.

Strategy 15

Solution for bicycle system at SE Eastgate Way/Eastgate Park-and-Ride

Widen SE Eastgate Way to provide continuous bicycle lanes (Type “B” facilities) from Richards Road to SE 35th Place. Channelize intersections to place bicycle lanes on the inside of dedicated right-turn lanes.

Strategy 16

Extend I-90/Mountains to Sound Trail to SE 35th Place and channelize SE Eastgate Way/SE 35th Place intersection

Extend I-90 (Mountains to Sound Greenway) Trail along the south side of SE Eastgate Way from its current trail head terminus (just east of SE 35th Place) to the SE quadrant of the SE Eastgate Way/SE 35th Place intersection. Channelize SE Eastgate Way/SE 35th Place intersection to connect bicycle lanes on the west leg to the new trail extension in the SE quadrant.



I-90/Mountains-to-Sound Greenway Trail
I-90 at SE Eastgate Way, Bellevue, WA

Strategy 17

Alternative bicycle treatments

As an example of alternative bicycle treatments, green pavement coloring could be used to define the conflict area between bicyclists and motorists along the SE Eastgate Way bicycle lanes. This strategy would provide colored bicycle lanes where they cross dedicated right-turn lanes along SE Eastgate Way between Richards Road and the I-90 trail head (east of SE 35th Place).

Example(s): Colored bicycle lanes have been used at strategic locations in the City of Portland for several years. Blue pavement coloring, which was previously used in Portland (see photo), is associated with disabled parking and was subject to fading over time, so Portland will use the color green for future treatments. In 2008, the City of Seattle will begin using green pavement coloring to highlight selected conflict points.



Portland Blue Bike Lanes
NE Broadway at Williams (I-5 NB On-Ramp)
Source: City of Portland, Oregon

Strategy 18 **Signalized pedestrian crossings of arterials**

Provide signalized pedestrian crossings of arterials at key locations, such as transit stops, schools, parks, trails, community centers, shopping centers, etc. Corridors that could be considered for this treatment include 140th, 148th, 156th, 164th Avenues and West Lake Sammamish Parkway.



Signalized Pedestrian Crossing
148th Avenue SE at Lake-to-Lake Trail, Bellevue, WA

Strategy 19 **Complete missing sidewalks on key residential streets in East Bellevue per 2007 Pedestrian and Bicycle Transportation Plan**

Complete missing sidewalks on key residential streets in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update.



Sidewalks with Street Trees
140th Avenue SE south of Main Street, Bellevue, WA

Strategy 20

Complete trail segments in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update

Complete missing trail segments in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update.



Lake-to-Lake Trail Marker
140th Avenue SE, Bellevue, WA

3.4 Neighborhood Livability Strategies

This section describes potential neighborhood livability elements or strategies. The following are some key assumptions used in developing and evaluating these strategies:

- Strategies will potentially address all modes including general purpose, transit, and bicycle/pedestrian as well as non-transportation amenities. However, strategies that would significantly expand pavement – even if they provide benefits for transit – may be inconsistent with neighborhood livability goals.
- Traffic calming candidate projects attempt to slow down automobile traffic to improve safety and comfort for pedestrians and bicyclists.
- The City’s Neighborhood Traffic Calming Program has historically focused on low-volume residential streets, but is beginning research to identify and evaluate

potential strategies that could be applied to streets with higher daily traffic volumes.

Strategy 21

Implement additional traffic calming measures within neighborhoods

Implement additional traffic calming measures within neighborhoods, consistent with the City’s Neighborhood Traffic Calming Program. The City’s program involves a two-phase process in coordination with the affected neighborhood to determine the most appropriate treatment for each location. Potential treatments may include both physical and non-physical strategies such as neighborhood speed watch, enhanced police enforcement, medians, speed humps, traffic circles, etc.

Example(s): The City’s Neighborhood Traffic Calming Program recently recommended implementation of a Radar Dolly, a Neighborhood Speed Watch Program, and a Neighborhood Speed Reduction Program along 165th Avenue SE near Main Street.



Traffic Circle
152nd Avenue SE at SE 18th Street, Bellevue, WA

Strategy 22

Streetscape and landscaping improvements to protect and enhance neighborhood character

Provide improved streetscapes and landscaping along collector arterials and residential streets in East Bellevue to enhance neighborhood character. Improvements might include any or all of the following types of treatments: street lighting, signage, public art, benches, trash cans, curbs, gutters and sidewalks, storm water detention and landscaping. Street lighting should be downcast and consistent with the “Dark Skies” concept to avoid light dispersion. Gateway treatments may be provided at neighborhood entry points to improve aesthetics and to remind drivers that they are entering a residential neighborhood.

Example(s): Bellevue’s Neighborhood Enhancement Program (NEP) and the Neighborhood Investment Strategy (NIS) in Lake Hills have generated many requests for these types of improvements, many of which have been implemented.



Streetscape and Landscape Improvements
Main Street west of 148th Avenue, Bellevue, WA

Strategy 23

Play equipment and other improvements to neighborhood parks

Provide new and/or improved play equipment and other amenities to neighborhood parks and playgrounds to enhance neighborhood character. Sports field improvements, restrooms, lighting, signage, public art, benches, trash cans, paved trails and pathways, storm water detention and landscaping are examples of the types of amenities that could be provided to enhance neighborhood parks in East Bellevue.

Example(s): Bellevue’s Neighborhood Enhancement Program (NEP) and the Neighborhood Investment Strategy (NIS) in Lake Hills have generated many requests for these types of improvements, many of which have been implemented.



Play Equipment
Robinswood Park, Bellevue, WA

3.5 Channlization/Operations Strategies

This section describes potential channelization/operations elements or strategies. The following are some key assumptions used in developing and evaluating these strategies:

- Candidate projects will generally focus on consolidating and organizing traffic flows rather than expanding or enhancing overall traffic carrying capacity.
- Methods to constrain capacity along specific sections of roadway may be pursued to encourage diversion to “preferred” routes.
- Strategies will potentially address all modes including general purpose, transit, and bike/pedestrian.
- Channelization/operations strategies complement the other measures described in this report, but could potentially preclude other improvements that would compete for limited right-of-way.

Strategy 24

Prohibit southbound through movement at NE 8th Street/156th Avenue NE

Reduce traffic volumes on 156th Avenue by prohibiting (except buses) southbound (SB) through movements at NE 8th Street/156th Avenue NE (but continue to allow WB left turns and EB right turns). This treatment could be applied to both 156th and 164th Avenues concurrently.

Example(s): This treatment is currently used at 108th Avenue/Main Street in Downtown Bellevue.



Southbound Through Movements Prohibited (except buses and bicycles)
108th Avenue at Main Street, Bellevue, WA

Strategy 25:

Create cul-de-sac on 156th Avenue NE at SE 28th Street

Discourage regional NB traffic (except buses) from using 156th Avenue SE by creating a cul-de-sac on 156th Avenue SE at approximately SE 28th Street. Use collapsible bollards across the dead-end to allow for emergency vehicles, pedestrians and bicyclists.

Strategy 26

Prohibit southbound through movement at NE 8th Street/164th Avenue NE

Reduce traffic volumes on 164th Avenue by prohibiting (except buses) SB through movements at NE 8th Street/164th Avenue NE (but continue to allow WB left turns and

EB right turns). This treatment could be applied to both 156th and 164th Avenues concurrently.

Example(s): This treatment is currently used at 108th Avenue/Main Street in Downtown Bellevue.

Strategy 27

Improve westbound I-90 freeway signage to 148th Avenue SE

Improve freeway signage revisions to off-ramp by adding more advanced (prior to the 164th Avenue SE off-ramp) signage to 148th Avenue SE.



Freeway Ramp Signage (located adjacent to off-ramp)
I-90 at 164th Avenue SE exit, Bellevue, WA

Strategy 28

Peak-hour HOV and/or transit lanes in both directions

Consider peak-hour only HOV and/or transit travel lanes in both directions 140th, 156th, 164th Avenues (all south of NE 8th Street) in the peak direction during the peak period; off-peak parking allowed in the non-peak direction during the peak period.

Strategy 29

Peak-hour HOV and/or transit lane in peak direction

Consider restricting parking to one side of street (e.g., 156th and 164th south of NE 8th Street) and re-stripe to add HOV and/or transit travel lanes (and potentially bicycle and/or shared bicycle/transit lanes) in the peak direction during the peak period; off-peak parking allowed in the non-peak direction during the peak period.

Example(s): A peak-period transit lane is currently operated on Aurora Avenue North (SR 99) in the City of Seattle between NE 38th Street and NE 50th Street. On-street parking is prohibited in this lane during the a.m. peak period.

Strategy 30

Peak-hour reversible HOV lane

Consider peak-hour reversible HOV lane with left turns restricted in the median of 148th Avenue, 156th Avenue north of NE 8th Street.

Example(s): Peak-period/peak-direction HOV lanes are currently operated on the I-90 center roadway east of Mercer Island.

Strategy 31

Peak-hour reversible general purpose lane

Consider peak-hour reversible general purpose lane with left turns restricted in the median of 148th Avenue, 156th Avenue north of NE 8th Street.

Example(s): Peak-period/peak-direction general purpose traffic to/from Mercer Island is allowed to use the I-90 center roadway west of Mercer Island.

Strategy 32

Optimization improvements for 148th Avenue

Consider a variety of optimization improvements, such as additional or lengthened turn lanes, traffic signal revisions, etc., to improve traffic flow on 148th Avenue, with the goal of minimizing traffic spillover into neighborhoods.

Example(s): The 148th Avenue Mobility Improvement Package identified a variety of improvements for 148th Avenue, some of which have been implemented.

Strategy 33

Exempt 148th Avenue from concurrency standards

Exempt 148th Avenue from concurrency standards. Intersections on 148th Avenue would not be included in concurrency calculations.

Example(s): Under state law, highways of statewide significance are exempt from local concurrency regulations.

Strategy 34

Add southbound right-turn pocket on 156th Avenue SE at SE 16th Street/SE 22nd Place

Add SB right turn lane pocket to facilitate more efficient traffic flow and connect to 148th Ave SE. This project idea was proposed for the 2002 Neighborhood Enhancement Program but was not funded.

3.6 Joint Regional Advocacy Initiatives

This section describes potential joint regional advocacy elements or strategies. The following are some key assumptions used in developing and evaluating these strategies:

- Candidate projects will support reduced daily and/or peak hour travel through East Bellevue but are located outside East Bellevue

- Projects would allow for more “regional” trips to use the regional (freeway) system, as opposed to city streets
- Strategies address SOV, HOV and transit modes
- Joint regional advocacy initiatives are complementary to other measures described in this report but would be most beneficial for transit and carpool vehicles that could use the HOV-to-HOV connectors.

Strategy 35

SR 520 lane capacity east of I-405 (auxiliary lanes)

Support WSDOT implementation of auxiliary lanes on SR 520 east of I-405 to improve traffic flow on the highway, thereby encouraging drivers to use the regional freeway system instead of cutting through East Bellevue neighborhoods.

Strategy 36

HOV-to-HOV connections on I-405 at SR 520 and I-90 interchanges

Support WSDOT implementation of HOV-to-HOV connections on I-405 at SR 520 and I-90 interchanges to improve travel speed and reliability for HOVs (including transit) to and within the Eastside. These improvements would help make HOV and transit more attractive options for travel to and within the Eastside.



HOV-to-HOV Connector (simulated)
 I-5 at SR 16 (Nalley Valley), Tacoma, WA
 Source: WSDOT

Strategy 37

Expanded high capacity transit (HCT) options on the Eastside, including East Link

Support expansion of HCT options on the Eastside. The Metropolitan Transportation Plan (*Destination 2030*) calls for significant improvements in HCT in the region and on the Eastside. In addition, the Sound Transit Long-Range Plan (updated in 2005) includes several HCT improvements on the Eastside, including light rail or rail-convertible LRT between Seattle, Mercer Island, Bellevue and Redmond via I-90 (East Link). Potential rail extensions to the north, south and east of Bellevue are also included as well as HCT service across the SR 520 bridge. Bus Rapid Transit (BRT) is proposed for the I-405

corridor between Lynnwood and Tukwila and the I-90 corridor to Issaquah. King County Metro has identified a RapidRide corridor linking Downtown Bellevue and Downtown Redmond via Crossroads and Overlake.

These improvements will provide high quality transit alternatives that are competitive with the automobile, potentially helping to reduce the future growth in automobile travel to and within the Eastside.



East Link on I-90 Bridge (simulated)
Source: Sound Transit

4. FIRST-LEVEL SCREENING

While all of the strategies shown in Table 2 and described in the previous section may be technically feasible, the list includes some concepts that may not provide sufficient benefits in relation to their costs and/or may be challenging to implement due to their impacts on neighborhoods, the environment, etc. This section of the report describes the initial screening process that was conducted to balance – at a conceptual level – the relative costs and impacts of the strategies as compared to their potential benefits.

4.1 *Screening Criteria*

A potential strategy was likely to be screened out during this phase if the project met one or more of the following criteria (not in any order):

- Project inconsistent with BROTS Transportation Mitigation Project goals and Framework Principles adopted by Bellevue and Redmond City Councils
- Project previously rejected by neighborhood group(s), East Bellevue Community Council and/or City Council (and likely to be rejected again if proposed)
- Project inconsistent with subarea, Bel-Red Corridor, or Overlake land use plans
- Project inconsistent with other City of Bellevue priorities
- Project likely to have significant adverse impact on parks and/or residential land uses
- Project has high cost (e.g., exceeds approximately \$25M/mile)

- Project precludes public access to public streets (note: limiting some movements may be acceptable)
- Project increases potential traffic safety concerns

4.2 Results of First-Level Screening

Based on the screening criteria listed above, the following seven project ideas have been screened out and are not recommended for further review. The rationale for this recommendation is described following each project. The 30 strategies that are recommended for further consideration and evaluation are listed in Table 2.

Strategy 1

Elevated transitway on 148th Avenue

Recommendation: Remove from further consideration

- Project has potentially very high cost (example: very rough estimate of \$150-200 million/mile capital cost for elevated light rail transit)
- Regional high capacity transit (HCT) is intended to connect urban centers (PSRC *Vision 2020, Destination 2030*), and the City of Bellevue priority for HCT is to serve Downtown Bellevue (*Future High Capacity Transit Interest Statement*)
- Potential ridership in the corridor (based on origin-destination volumes) unlikely justify the high cost of exclusive right-of-way transit technology.
- Note: Grade-separated transit in the 148th Avenue corridor may be justified at a later stage, due to potential demand in the very long-term

Strategy 24

Prohibit southbound through movement at NE 8th Street/156th Avenue NE

Recommendation: Remove from further consideration

- Project is inconsistent with city policies.

Strategy 25

Create cul-de-sac on 156th Avenue NE at SE 28th Street

Recommendation: Remove from further consideration

- Project precludes public access to 156th Avenue SE to and from the south.

Strategy 26

Prohibit southbound through movement at NE 8th Street/164th Avenue NE

Recommendation: Remove from further consideration

- Project is inconsistent with city policies.

Strategy 30

Peak-hour reversible HOV lane

Recommendation: Remove from further consideration

- Reversible lanes are typically avoided on arterial streets (e.g., routes that are not limited-access facilities) due to traffic control challenges. Left turns would need to be restricted along the entire corridor, including driveway access. With left turns and U-turns prohibited, access to/from destinations on the left side of the street would involve long out-of-direction travel due to the long spacing of cross-streets along the East Bellevue north-south arterials, such as 148th Avenue.
- Additional signage, driver unfamiliarity, varying left-turn restrictions, high speeds, etc., could create potential traffic control risks

Strategy 31

Peak-hour reversible general purpose lane

Recommendation: Remove from further consideration

- Reversible lanes are typically avoided on arterial streets (e.g., routes that are not limited-access facilities) due to traffic control challenges. Left turns would need to be restricted along the entire corridor, including driveway access. With left turns and U-turns prohibited, access to/from destinations on the left side of the street would involve long out-of-direction travel due to the long spacing of cross-streets along the East Bellevue north-south arterials, such as 148th Avenue.
- Additional signage, driver unfamiliarity, varying left-turn restrictions, high speeds, etc., could create potential traffic control concerns.

Strategy 33

Exempt 148th Avenue from concurrency standards

Recommendation: Remove from further consideration

- Project is inconsistent with city policies.

As described above, the first-level screening process resulted in recommendations to not conduct further review on seven of the preliminary strategies. The 30 strategies that are recommended for further consideration and evaluation are listed in Table 3.

Table 3: Potential Transportation Strategies Following First-Level Screening

NOTE: Project ideas are listed separately but are most effective when implemented in a coordinated manner.	
Number	PROJECT IDEA (not listed in any priority order)
Transit	
1	Grade-separated transit way (elevated busway, etc.) along 148th Avenue
2	At-grade BRT on 148th Avenue or 156th Avenue (range of treatment options)
3	Transit Signal Priority
4	Transit queue jumps at intersections
5	Additional local park-and-ride lots in church parking lots
6	Additional parking at Eastgate Park-and-Ride
7	Expanded transit serving urban centers, activity centers, park-and-ride lots on the Eastside
Transportation Demand Management (TDM)	
8	HOV/transit goals in each City
9	Parking ratios/costs
10	Parking cash-out programs
11	Encourage tele-commute, tele-work centers
Non-Motorized	
12	Bike facilities on all key north-south streets per 2007 Pedestrian and Bicycle Transportation Plan
13	Bike lanes on 156th Ave NE north of NE 8th St
14	Bike lanes on Northup Way from NE 20th to WLSP
15	Solution for bike system at Eastgate Way/Eastgate Park-and-Ride
16	Channelize 161st/Eastgate Way/I-90 WB on-ramps intersection to add ped/bike connection to the I-90 trail
17	Alternative bicycle treatments
18	Signalized pedestrian crossings of arterials
19	Complete missing sidewalks on key residential streets per 2007 Pedestrian and Bicycle Transportation Plan
20	Complete multi-use trail segments per 2007 Pedestrian and Bicycle Transportation Plan
Urban Livability/Neighborhood Amenities/Traffic Calming	
21	Implement additional traffic calming measures within neighborhoods
22	Emphasize protection of neighborhood character as priority
22	Streetscape and landscaping improvements to protect and enhance neighborhood character
23	Play equipment and other improvements for neighborhood parks
Channelization/Operations	
24	Prohibit southbound through movement at NE 8th Street/156th Avenue NE
25	Create cul-de-sac on 156th Avenue NE at SE 28th Street
26	Prohibit southbound through movement at NE 8th Street/164th Avenue NE
27	Improve westbound I-90 freeway signage to 148th Avenue SE
28	Peak-hour HOV and/or transit lanes in both directions
29	Peak-hour HOV and/or transit lane in peak direction
30	Peak-hour reversible HOV lane
31	Peak-hour reversible general purpose lane
32	Optimization improvements for 148th Avenue
33	Exempt 148th Avenue from concurrency standards
34	Add southbound right-turn pocket on 156th Avenue SE at SE 16th Street/SE 22nd Place
Joint Regional Advocacy	
35	SR 520 lane capacity east of I-405 (auxiliary lanes)
36	HOV-to-HOV connections at SR 520/I-405 and I-90/I-405
37	Expanded high capacity transit (HCT) options on the Eastside, including East Link

5. STRATEGY EVALUATION

This section of the report describes the evaluation (second-level screening) process that was conducted to qualitatively evaluate and rate the potential strategies that were not screened out during the first-level screening process.

5.1 Evaluation Criteria

The following measures were used collectively to evaluate the candidate projects and strategies during this phase. They are not listed in any particular order and are weighted equally.

A project generally received a higher rating if it was likely to:

1. Shift peak period travel to non-peak hours of the day and/or non-SOV modes
2. Reduce or eliminate trips (such as flex schedules or telecommuting);
3. Reduce peak period congestion along north-south arterials in East Bellevue
4. Improve/enhance transit service (e.g., coverage, frequency and span of service, speed & reliability) to and between major employers, activity centers, transit centers, park-and-ride facilities, etc., that generate travel through East Bellevue
5. Improve/enhance the non-motorized environment in East Bellevue (through facilities and/or various treatments such as traffic calming, bike lanes, sidewalks, etc.)
6. Enhance neighborhood aesthetics, landscaping, and/or parks and playgrounds
7. Avoid or minimize impacts to landscaped street corridors and/or mature trees (e.g., median trees along 148th)
8. Avoid or minimize right-of-way acquisition and impacts to private property
9. Leverage proposed regional and/or county transportation investments near or within the East Bellevue area (such as the KC Metro RapidRide bus route between Downtown Bellevue and Downtown Redmond)
10. Demonstrate consistency with the BROTS Transportation Framework Agreement, the Bellevue Comprehensive Plan, the Bel-Red Corridor Steering Committee recommended vision, and applicable subarea plans

5.2 Evaluation Results

The results of the strategy evaluation are presented in Table 4. The detailed evaluation rating sheets are included in the Appendix.

Table 4: Strategy Evaluation Results

NOTE: Project Ideas are listed separately but are most effective when implemented in a coordinated manner. Strategies are not listed in any priority order.

Number	Strategy	Potential Benefits (+) or Issues/Concerns (-)	Total Points (max. 50)
Transit Strategies			
2.1	148th/156th Ave BRT: Option 1 - high frequency service/reduced travel time	<ul style="list-style-type: none"> • Provides high level transit service between two major transit focal points in East Bellevue and Overlake (+) • Service improvement can occur without major capital expenditures (assumes no ROW expansion) (+) • Service improvements will occur without the benefit of speed and reliability improvements to affected streets (-) 	31
2.2	148th/156th Ave BRT: Option 2 - Option 1 plus passenger enhancements	<ul style="list-style-type: none"> • Provides high level transit service between two major transit focal points in East Bellevue and Overlake (+) • Enhanced passenger facilities will help attract higher ridership to BRT service (+) 	31
2.3	148th/156th Ave BRT: Option 3 - Option 2 plus high profile characteristics	<ul style="list-style-type: none"> • Provides high level transit service between two major transit focal points in East Bellevue and Overlake (+) • Enhanced passenger facilities and higher profile stations/buses will help attract higher ridership to BRT service (+) • Higher costs for high profile buses and facility features (-) 	31
2.4	148th/156th Ave BRT: Option 4 - Option 3 plus BAT lanes on 148th Ave./156th Ave NE	<ul style="list-style-type: none"> • Provides high level transit service between two major transit focal points in East Bellevue and Overlake (+) • Will enhance speed and reliability for potential new BRT route operating between Eastgate and Overlake; along 156th Avenue NE portion (+) • Will enhance speed and reliability of future RapidRide route between downtown Bellevue and Overlake (+) • BAT Lanes provides a high profile to future RapidRide and new Eastgate/Overlake BRT routes (+) • Enhanced passenger facilities and higher profile stations/buses will help attract higher ridership to BRT services (+) • Higher costs for high profile buses and facility features (-) • Enforcement needs relating to restricting the use of BAT lanes to buses and to general traffic making right turns only (-) • Need for added right-of-way to construct BAT lanes (-) 	38
3	Transit signal priority (TSP)	<ul style="list-style-type: none"> • These TSP treatments will support existing service such as KC Metro Route 222 as well as a future BRT route along 148th Avenue SE (+) • If TSP is provided through increased green time for north-south movements, there will be potential delays/degradation of operations for traffic using east-west streets intersecting with 148th Avenue (-) 	24
4	Transit queue jumps at intersections	<ul style="list-style-type: none"> • Supports existing service such as KC Metro Route 222 as well as a future BRT route along 148th Avenue SE (+) • Improves operations of southbound general purpose lanes on 148th Avenue SE by providing a separate lane for buses/right turn traffic at SE 22nd and SE 24th Streets (+) • No added right-of-way would be required (+) • New southbound lane will decrease buffer between traffic and residences (-) • Three trees will be removed at the SW corner of 148th Avenue SE and SE 22nd Street (-) • Possible loss of additional trees; may be need for retaining wall to protect significant trees (-) 	23
5	Added park-and-ride capacity at leased lots	<ul style="list-style-type: none"> • Provides added park-and-ride capacity along major transit corridors without incurring new construction costs (+) • Expanded facilities beyond 50 spaces per facility will not be allowed by existing City of Bellevue codes (-) 	20
6	Added park-and-ride capacity at Eastgate	<ul style="list-style-type: none"> • Provides added park-and-ride capacity at a facility where demand is approaching maximum capacity (+) • Will support potential future BRT service operating between Eastgate and Overlake (+) • Added stalls will be in a structure thereby incurring significant construction costs (-) • Temporary parking to replace existing surface spaces will have to be provided (-) 	26
7	Expanded bus service connecting urban centers, activity centers, and park-and-ride lots on the Eastside	<ul style="list-style-type: none"> • Provides direct, one-seat transit link between growing Issaquah Highlands area and Overlake/other East Bellevue employment areas (+) • Will help cut traffic using West Lake Sammamish Parkway as a short cut to Overlake (+) • Can use recently constructed Issaquah Highlands park-and-ride garage located at the south end of the Sammamish Plateau (+) • Will be served by local transit access (KC Metro 269) which serves the 228th Avenue Corridor (this corridor has been identified by Metro's Transit Now program for upgraded service) (+) • Makes use of existing infrastructure supporting transit speed and reliability; e.g. transit/HOV lanes on I-90 and transit/HOV queue jump at I-90 and 9th Avenue (+) • By coordinating schedules with existing Seattle/Overlake service, new route will provide very frequent service along the 148th Avenue/156th Avenue corridors between Eastgate and Overlake (+) • Route is not in current program of improvements included in KC Metro's TransitNow (-) 	28

Number	Strategy	Potential Benefits (+) or Issues/Concerns (-)	Total Points (max. 50)
Transportation Demand Management (TDM) Strategies			
8	Establish non-SOV mode-share goals in each City	<ul style="list-style-type: none"> • Reduce through traffic volumes especially during peak periods (+) • Eliminate trips, reducing daily traffic volumes (+) • Employer support may be difficult to obtain (-) • Enforcement of non-SOV goals could be time-consuming and/or difficult (-) 	32
9	Parking costs/maximum ratios	<ul style="list-style-type: none"> • Reduce through traffic volumes especially during peak periods (+) • Eliminate trips, reducing daily traffic volumes (+) • Parking costs generate revenue for City and/or transportation uses (+) • Employer/property owner support may be difficult to obtain (-) • Need to consider potential change of use, building vacancies, etc., in determining appropriate parking maximum ratios and/or costs (-) 	32
10	Parking cash-out programs	<ul style="list-style-type: none"> • Reduce through traffic volumes especially during peak periods (+) • Eliminate trips, reducing daily traffic volumes (+) • Provides choices for employees (+) • Employer support may be somewhat difficult to obtain due to increased administrative responsibilities (-) 	27
11	Encourage tele-commuting and provide tele-work centers	<ul style="list-style-type: none"> • Reduce through traffic volumes especially during peak periods (+) • Eliminate trips, reducing daily traffic volumes (+) • Provides choices for employees (+) • Employers would need to provide additional work sites (-) • Employer/management support may be difficult to obtain (-) 	27
Non-Motorized Strategies			
12	Bicycle facilities on all key north-south arterials in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update	<ul style="list-style-type: none"> • May reduce through traffic volumes especially during peak periods due to mode shift (+) • Provides enhanced transportation choices (+) • Improves safety and convenience of bicycling to and within neighborhoods, parks, schools, shopping, etc. (+) 	24
13	Bicycle lanes on 156th Avenue north of NE 8th Street	<ul style="list-style-type: none"> • May reduce through traffic volumes especially during peak periods due to mode shift (+) • Provides enhanced transportation choices (+) • Improves safety and convenience for bicyclists traveling to and within neighborhoods, parks, schools, shopping, etc. (+) • NOTE: This is a very difficult stretch to put in bike lanes due to high traffic volumes, lots of driveways, etc. 	22
14	Bicycle lanes on Northup Way NE between NE 20th Street and West Lake Sammamish Parkway	<ul style="list-style-type: none"> • May reduce through traffic volumes especially during peak periods due to mode shift (+) • Provides enhanced transportation choices (+) • Improves safety and convenience for bicyclists traveling to and within neighborhoods, parks, schools, shopping, etc. (+) 	23
15	Solution for bicycle system at SE Eastgate Way/Eastgate Park-and-Ride	<ul style="list-style-type: none"> • May reduce through traffic volumes especially during peak periods due to mode shift (+) • Provides enhanced transportation choices (+) • Improves safety and convenience for bicyclists traveling to and within neighborhoods, parks, schools, shopping, etc. (+) 	24
16	Extend I-90/Mountains to Sound Trail to SE 35th Place and channelize SE Eastgate Way/SE 35th Place intersection	<ul style="list-style-type: none"> • May reduce through traffic volumes especially during peak periods due to mode shift (+) • Provides enhanced transportation choices (+) • Improves safety and convenience for pedestrians and bicyclists traveling to and within neighborhoods, parks, schools, shopping, etc. (+) • Provides a regional east-west connection to an enhanced north-south network between I-90 and Overlake 	28
17	Alternative bicycle treatments	<ul style="list-style-type: none"> • Improves safety and convenience for bicyclists traveling to and within neighborhoods, parks, schools, shopping, etc. (+) 	27
18	Signalized pedestrian crossings of arterials	<ul style="list-style-type: none"> • Improves safety and convenience for pedestrians traveling to and within neighborhoods, parks, schools, shopping, transit stops, etc. (+) • Provides enhanced transportation choices (+) • May reduce vehicular traffic capacity (-) 	31
19	Complete missing sidewalks on key residential streets in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update	<ul style="list-style-type: none"> • Improves safety and convenience for pedestrians traveling to and within neighborhoods, parks, schools, shopping, transit stops, etc. (+) • Provides enhanced transportation choices (+) 	27
20	Complete trail segments in East Bellevue per draft Pedestrian and Bicycle Transportation Plan Update	<ul style="list-style-type: none"> • Improves safety and convenience for pedestrians and bicyclists traveling to and within neighborhoods, parks, trails, schools, shopping, transit stops, etc. (+) • Provides enhanced transportation choices (+) 	26

Number	Strategy	Potential Benefits (+) or Issues/Concerns (-)	Total Points (max. 50)
Neighborhood Livability Strategies			
21	Implement additional traffic calming measures within neighborhoods	<ul style="list-style-type: none"> Improves safety and convenience for pedestrians and bicyclists traveling to and within neighborhoods, parks, trails, schools, shopping, transit stops, etc. (+) May shift traffic to other neighborhood streets (-) 	21
22	Streetscape and landscaping improvements to protect and enhance neighborhood character	<ul style="list-style-type: none"> Improve neighborhood aesthetics (+) Provides little or no congestion relief (-) 	26
23	Play equipment and other improvements to neighborhood parks	<ul style="list-style-type: none"> Improve neighborhood aesthetics (+) Provides no congestion relief (-) 	25
Channelization/Operations Strategies			
27	Improve westbound I-90 freeway signage to 148th Avenue SE	<ul style="list-style-type: none"> Signage changes may potentially reduce use of 164th by those unfamiliar with the area (+). More traffic diverted/added to already heavily congested corridors such as 148th Ave or 156th Ave (-). Potential for rerouting back to 164th Ave using E-W connectors such as SE 24th Street (from 156th Ave) (-). 	17
28	Peak-hour HOV and/or transit lanes in both directions	<ul style="list-style-type: none"> Adds traffic capacity for peak direction - NB in the AM and SB in the PM (+) Opportunity to implement arterial HOV and/or transit only lane (+) Provides consistent parking supply on both sides of street during non-peak hour periods (+) Maintains separation between traffic lanes and peds/bikes during off-peak hours (+) Would likely require some right-of-way acquisition and roadway widening along some segments to accommodate full-width lanes in both directions (-) Community may be opposed to adding capacity even if for HOV and/or transit uses (-) Community may be opposed to parking restrictions in peak direction (-) May preclude future bike lanes if ROW is limited to roadway widening for transit/HOV modes (-) 	27
29	Peak-hour HOV and/or transit lane in peak direction	<ul style="list-style-type: none"> Potentially adds capacity for one peak direction, NB in the AM or SB in the PM (+) Opportunity to implement arterial HOV and/or transit only lane for at least one direction (+) Maintains separation between traffic lanes and peds/bikes for at least one direction (+) May be limited to only one direction for transit lane (-) May still require widening to accommodate full-width peak period travel lane (-) Community may be opposed to adding capacity in only one direction if this is all that can be provided within the existing pavement width (-) Community may be opposed to adding capacity in any direction (-) Parking restrictions during peak period may not be supported (-) May preclude future bike lanes if ROW is limited to roadway widening for transit/HOV modes (-) 	24
32	Optimization improvements for 148th Avenue	<ul style="list-style-type: none"> Reduce diversion of regional traffic to parallel collector arterials especially during peak periods (+) 	21
34	Add southbound right-turn pocket on 156th Avenue SE at SE 16th Street/SE 22nd Place	<ul style="list-style-type: none"> Adds capacity for right turning traffic and reduces queuing in SB direction at both intersections (+) Potentially reduces traffic continuing through (SB) on 156th Ave SE by providing a better connections to 148th Ave SE (+) Potential reduces vehicular/non-motorized conflicts along 156th Ave SE if traffic can be effectively redirected to 148th Ave SE via SE 16th Street or SE 22nd Place (+) Short segments of roadway widening may be needed to accommodate right turn lanes and additional striping may be required if bikes lanes are provided along 156th Ave SE (-) Residents along/near SE 16th Street and/or SE 22nd Place may be opposed to these right turn lanes if significant capacity is added (i.e. long turn lanes > 300 feet) due to potential added E-W traffic loads on these arterials. 	18
Joint Regional Advocacy Initiatives			
35	SR 520 lane capacity east of I-405 (auxiliary lanes)	<ul style="list-style-type: none"> Reduces through traffic volumes especially during peak periods (+) Requires external agency (WSDOT) funding and/or implementation (-) 	15
36	HOV-to-HOV connections on I-405 at SR 520 and I-90 interchanges	<ul style="list-style-type: none"> Improves travel speed and reliability for HOVs and transit (+) Reduces through traffic volumes especially during peak periods (+) Requires external agency (WSDOT) funding and/or implementation (-) 	22
37	Expanded high capacity transit (HCT) options on the Eastside, including East Link	<ul style="list-style-type: none"> Improves transit frequency, coverage and span of service (+) Improves transit travel speed and reliability (+) Reduces through traffic volumes especially during peak periods (+) Requires external agency (Sound Transit, King County Metro and/or WSDOT) funding and/or implementation (-) 	29

5.3 Recommended Package of Strategies

Each of the strategies presented in Table 4 shows some promise for responding to anticipated traffic concerns in East Bellevue, and therefore, each strategy in the table is recommended for further consideration and analysis by the City. However, as noted on the table, the maximum effectiveness of the strategies is most likely to be realized if they are implemented in a *coordinated* manner, rather than individually.

The following is a recommendation for a package of complementary strategies that could produce benefits for East Bellevue and that consistent with the goals of the BROTS East Bellevue Transportation Mitigation Study. The strategies below are not listed in any priority order:

- All Transit Strategies, including strategy 2.4 (includes BAT lanes) as the option for the BRT service. The BRT service would use the recommended route: 148th Avenue/NE 8th Street/156th Avenue.
- All TDM Strategies
- All Non-motorized Strategies
- All Neighborhood Livability Strategies
- Channelization/Optimization Strategy 27: Improve westbound I-90 freeway signage to 148th Avenue SE
- Channelization/Optimization Strategy 32: Optimization improvements for 148th Avenue
- Channelization/Optimization Strategy 34: Add southbound right-turn pocket on 156th Avenue SE at SE 16th Street/SE 22nd Place
- All Joint Regional Advocacy Initiatives

If the BRT service route follows the optional alignment segment along 156th Avenue between NE 8th Street and SE Eastgate Way and does not include BAT lanes along that segment of 156th Avenue, one of the following additional strategies could be employed along that segment of 156th Avenue by prohibiting on-street parking during peak hours (all other strategies in the list above are still recommended):

- Channelization/Optimization Strategy 28: Peak-hour HOV and/or transit lanes in both directions (may require additional right-of-way and some roadway widening); or
- Channelization/Optimization Strategy 29: Peak-hour HOV and/or transit lanes in one directions (may require additional right-of-way and some roadway widening).

Combined, these strategies provide a comprehensive and reasonable effort to address traffic concerns in East Bellevue while avoiding general purpose capacity expansion.

Figures 3 - 5 show the recommended transit, bicycle and joint advocacy strategies, respectively. Note that not all recommended strategies can be mapped.

Figure 3: Recommended Transit Strategies

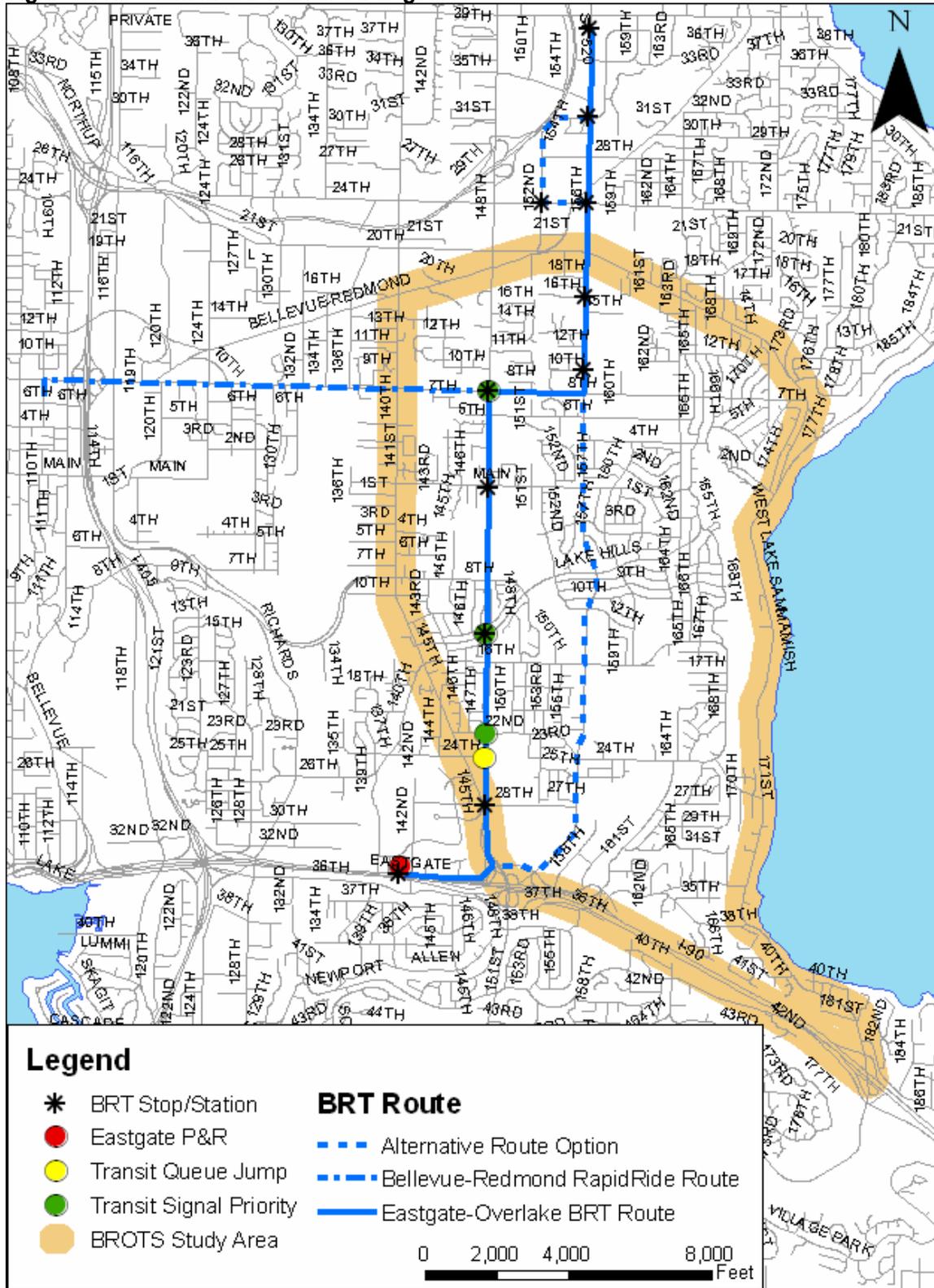


Figure 4: Recommended Bicycle Strategies

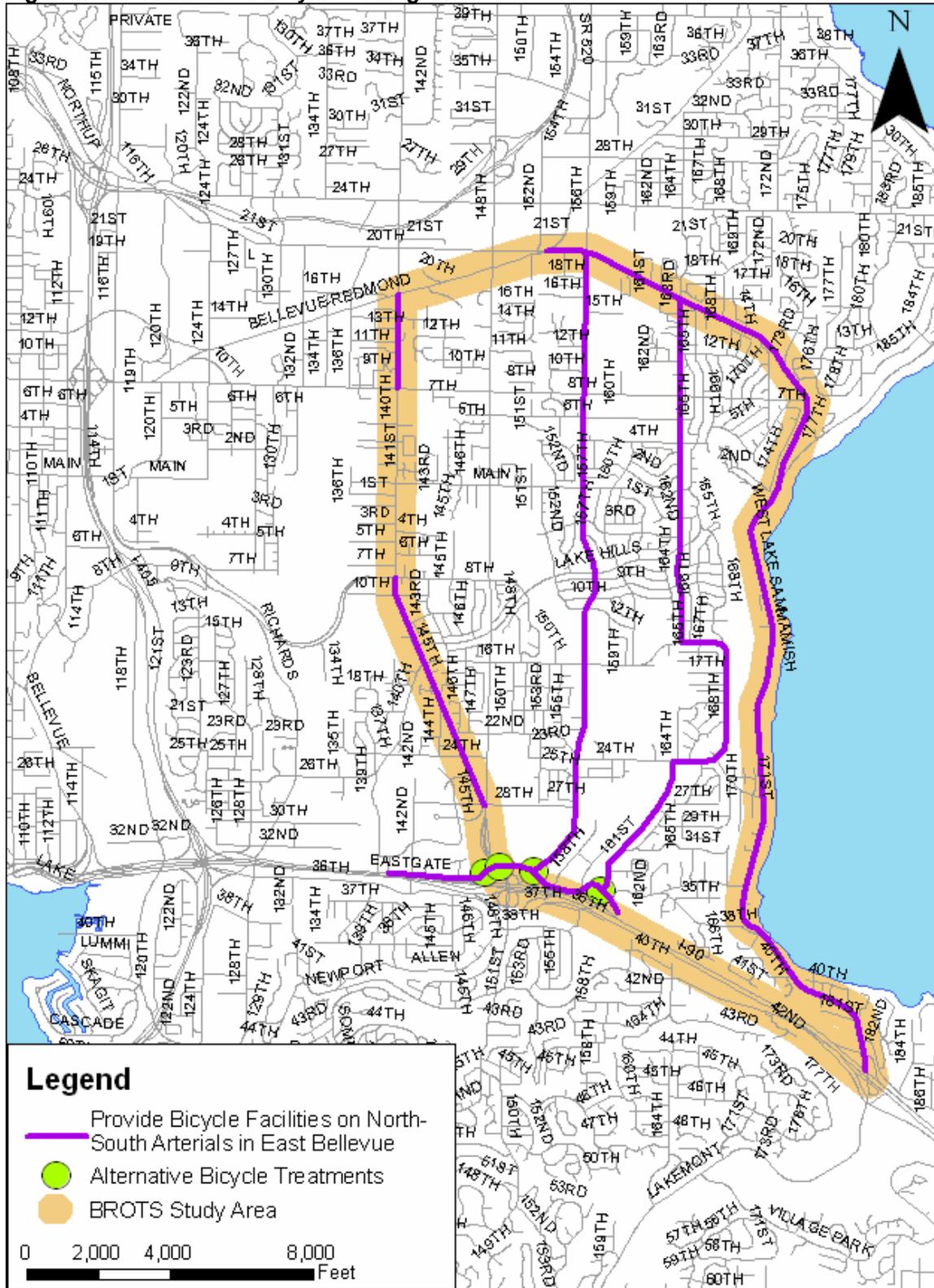
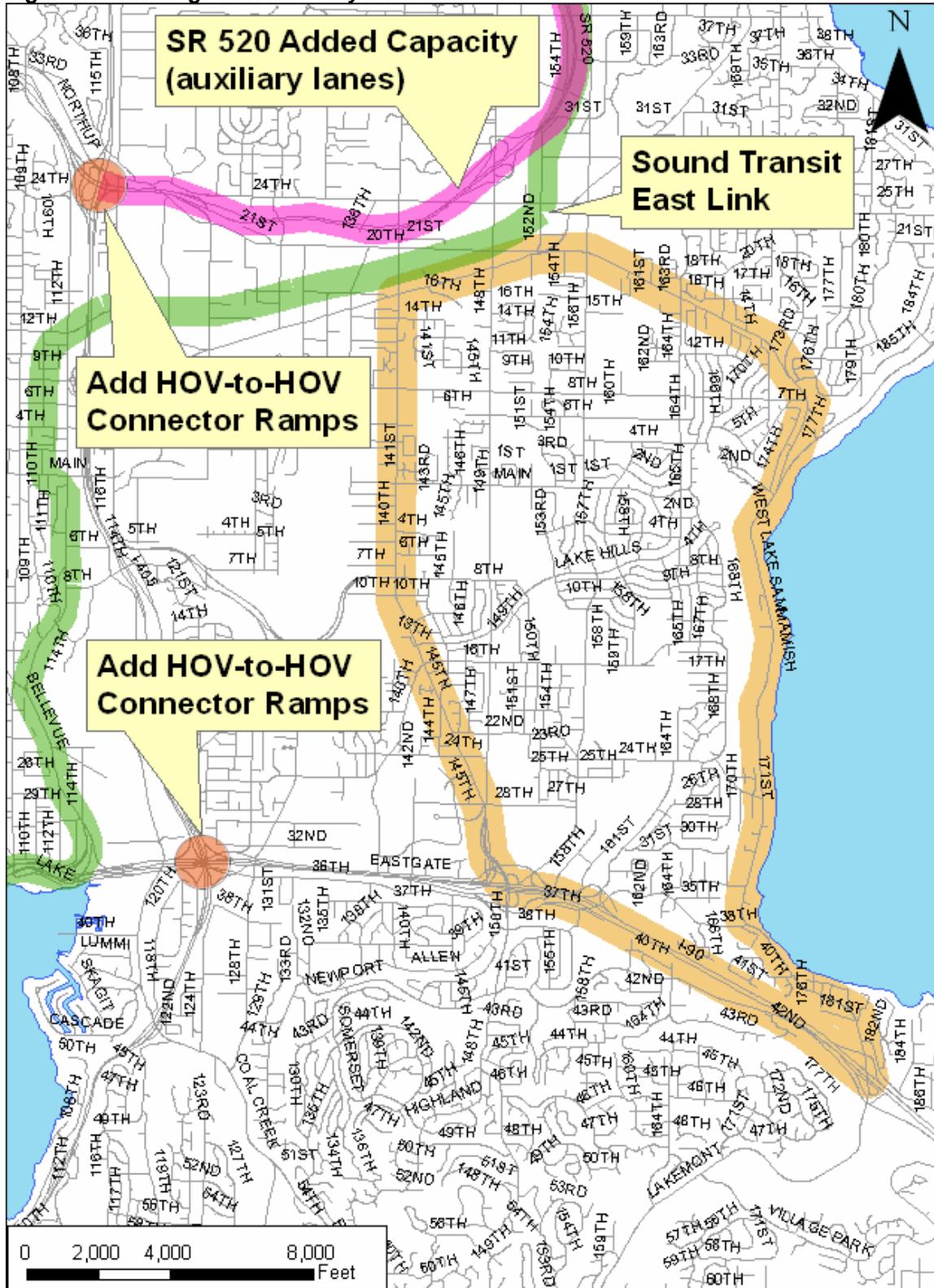


Figure 5: Joint Regional Advocacy Initiatives



6. COST ESTIMATES

This section provides order-of-magnitude cost estimates (or unit costs, where appropriate) for the recommended strategies shown in Table 4, with several exceptions. Cost estimates are not provided for TDM strategies – which are typically funded by employers – or for the Joint Regional Advocacy Initiatives – which are complex, large-scale, regionally funded projects. In addition, because the specific location, scale, and design of many of the strategies, such as completing sidewalk segments in neighborhoods, traffic calming improvements, etc., would be determined in part through neighborhood priority-setting, cost estimates are not included for those as yet un-defined projects. However, a rough “program budget” could be identified for those items, with incremental improvements completed as funds allow.

The following order-of-magnitude cost estimates are provided for informational purposes only. The study that is the subject of this report included no field work, design or engineering. Further project scoping, definition and analysis of the recommended strategies is needed to produce definitive cost estimates.

Transit Strategies

For cost estimating purposes, an estimated transit travel time between Issaquah Highlands was identified. Based on the existing (Winter 2007/2008) schedule for KC Metro Route 218, the scheduled travel time between Issaquah Highlands Park-and-Ride and Eastgate Park-and-Ride is approximately 15 minutes. Between Eastgate Park-and-Ride and the Overlake Transit Center KC Metro Route 222 requires about 32 minutes. However, Route 222 provides local stops along 148th Avenue and continues north to NE 51st Street before accessing the Overlake Transit Center at NE 40th Street. Thus, transit travel time will likely be less for a BRT route providing limited stop service.

Using the information above, the estimated one-way travel time between Issaquah Highlands Park-and-Ride and the Overlake Transit Center is 45 minutes. To allow time for layover and maneuvering at Eastgate Park-and-Ride, the estimated total operating time (e.g., platform time) for the new route between Issaquah Highlands and Overlake Transit Center is 60 minutes.

Estimated capital costs and annual operating costs for the recommended transit strategies are provided in Table 5. Additional right-of-way may be needed but costs for acquisition are not estimated or included.

Table 5: Estimated Order-of-Magnitude Costs for Recommended Transit Strategies

Major Elements of Recommended Transit Strategies	2. BRT Bus Service between Eastgate and Overlake				3. Transit Signal Priority	4. Transit Queue Jump	5. Added Leased Park-and-Ride Spaces	6. Eastgate Park-and-Ride Expansion	7. New Issaquah/East Bellevue Bus Route
	2.1 - Core Elements	2.2 - Core + Passenger Enhancements	2.3 - Core + Passenger Enhancements + High Profile	2.4 - Core + Passenger Enhancements + High Profile + BAT Lanes					
Vehicles, Shelters, Lanes									
Vehicle Costs	\$4,560,000	\$4,560,000	(See <i>High Profile Vehicles</i>)						\$5,439,000
Real-Time Service Info		\$2,204,000	\$2,204,000	\$2,204,000					
Enhanced Passenger Shelters		\$1,668,000	(See <i>Enhanced High Profile Passenger Shelters</i> below)						
Vehicle Costs - High Profile Vehicles			\$5,820,000	\$5,820,000					
Enhanced High Profile Passenger Shelters			\$3,765,000	\$3,765,000					
BAT Lanes				\$168,368,000					
Bus Priority Treatments									
Transit Signal Priority	\$432,000	\$432,000	\$432,000	\$432,000	\$432,000				
Transit Queue Jumps*	\$1,612,000	\$1,612,000	\$1,612,000	\$144,000		\$1,612,000			
Park-and-Ride Expansion									
Added Capacity (Structure)								\$19,060,000	
Total Costs									
Capital Costs (2008\$)	\$4,560,000	\$8,432,000	\$11,789,000	\$180,157,000	\$432,000	\$1,612,000		\$19,060,000	\$5,439,000
Annual Operating Costs (2008\$)	\$3,588,000	\$3,588,000	\$3,588,000	\$3,588,000			\$14,400	\$432,000	\$2,514,000

TDM Strategies

Because TDM strategies are usually provided at employer expense and their scope varies widely, cost estimates are not provided for the TDM strategies evaluated in this report. However, the City of Bellevue may need to plan for and fund additional City staff for implementation, administration and monitoring of TDM programs.

Non-Motorized Strategies

Widening Bellevue roadways and modifying intersections to add bicycle lanes and alternative bicycle treatments will be highly dependent on existing roadway configuration and conditions, utilities, environmental issues, etc. Provided here are some very general, planning-level construction unit costs (excluding right-of-way acquisition, environmental mitigation, storm water facilities, unique site conditions, structures, etc.) published by the Vermont Agency of Transportation in 2006, which includes many caveats and assumptions not repeated here⁵.

Actual costs could vary significantly. Bicycle lanes with durable pavement markings and appropriate signage could cost \$9000/mile. Providing a paved 12-foot wide multi-use trail could cost roughly \$150 per route-foot. Constructing a curb and 5-foot wide sidewalk along one side of a roadway could cost approximately \$132 per route foot.

⁵ Vermont Agency of Transportation, *Report on Shared-use Path and Sidewalk Unit Costs*, February 2006.

Neighborhood Livability Strategies

The costs of providing neighborhood enhancements will vary widely, depending on the project and site conditions. Due to their highly variable nature, no estimates are provided in this report for these types of strategies.

Channelization/Operations Strategies

Recommended channelization and operations strategies cover a range of project types. Installation of a new shoulder-mounted 14 foot by 25 foot sign on I-90 westbound in advance of the exit leading to 148th Avenue SE could cost approximately \$60,000. More project definition and analysis is needed to estimate the costs for providing peak-hour HOV and/or transit lanes (in either one or both directions). Similarly, cost estimates cannot be provided without further analysis of potential optimization improvements for 148th Avenue. According to the 2002 Neighborhood Enhancement Program ballot for East Lake Hills, the cost estimate for providing a right turn lane/pocket on 156th Avenue SE at SE 22nd Street was \$35,000.

Joint Regional Advocacy Initiatives

Cost opinions are available from regional project sponsors for some of the joint regional advocacy initiatives. Further scoping, definition and analysis is needed to provide a cost estimate for adding lanes to SR 520 east of I-405. At a previous time, WSDOT estimated the cost of modifying the I-405 interchanges at SR 520 and I-90 and adding HOV-to-HOV connections (except the NE quadrant of I-405/SR 520) at \$2.5B - \$3.0B (2005\$). For structural and construction sequencing reasons, some portions of the general purpose connection ramps may need to be constructed prior to the HOV-to-HOV connections, so this cost estimate includes all ramp work. The current Sound Transit estimate for providing East Link light rail service from downtown Seattle to downtown Redmond is roughly \$3.4B (2007\$).

APPENDIX

BROTS Mitigation - Strategy Evaluation (Detailed Rating Sheets)

Page 1

Project Number	Potential Transit Strategies							Potential TDM Strategies					
	2.1	2.2	2.3	2.4	3	4	5	6	7	8	9	10	11
Criteria	148th/156th Ave BRT				Transit Signal Priority Treatments	Queue Jumps	Added Park-and-Ride Capacity at Leased Lots	Added Park-and-Ride Capacity at Eastgate	Expanded Bus Service Connecting Urban Centers, Activity Centers, and PNR Lots on Eastside	Establish non-SOV mode-share goals in each City	Parking costs/maximum ratios	Parking cash-out programs	Encourage tele-commuting and provide tele-work centers
	Option 1 - High Frequency Service/Reduced Travel Time	Option 2 - Option 1 plus Passenger Enhancements	Option 3 - Option 2 plus high Profile Characteristics	Option 4 - Option 3 plus BAT Lanes on 148th Ave./156th Ave NE									
1. Shift peak period travel to non-peak hours of the day and/or non-SOV modes	4	4	4	5	4	3	3	4	5	5	5	4	4
2. Reduce or eliminate trips (such as flex schedules or telecommuting)	0	0	0	0	0	0	0	0	0	5	5	3	5
3. Reduce peak period congestion along north-south arterials in East Bellevue	4	4	4	5	3	3	3	4	5	4	4	3	3
4. Improve/enhance transit service (e.g., coverage, frequency and span of service, speed & reliability) to and between major employers, activity centers, transit centers, park-and-ride facilities, etc	4	4	4	5	5	5	2	4	5	0	0	0	0
5. Improve/enhance the non-motorized environment in East Bellevue (through facilities and/or various treatments such as traffic calming, bike lanes, sidewalks, etc.)	0	0	0	3	0	2	0	0	0	0	0	0	0
6. Enhance neighborhood aesthetics, landscaping, and/or parks and playgrounds	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Avoid or minimize impacts to landscaped street corridors and/or mature trees (e.g., median trees along 148 th)	5	5	5	5	0	0	0	0	0	5	5	5	5
8. Avoid or minimize right-of-way acquisition	5	5	5	5	5	3	5	5	5	5	5	5	5
9. Leverage proposed regional and/or county transportation investments near or within the East Bellevue area (such as the RapidRide bus route between Downtown Bellevue and Downtown Redmond)	4	4	4	5	3	3	2	4	3	3	3	2	0
10. Demonstrate consistency with the BROTS Transportation Framework Agreement, the Bellevue Comprehensive Plan, the Bel-Red Corridor Steering Committee recommended vision, and applicable subarea plans	5	5	5	5	4	4	5	5	5	5	5	5	5
Total Points	31	31	31	38	24	23	20	26	28	32	32	27	27

BROTS Mitigation - Strategy Evaluation (Detailed Rating Sheets)

Page 2

Project Number	Potential Non-Motorized Strategies									Potential Neighborhood Livability Strategies		
	12	13	14	15	16	17	18	19	20	21	22	23
Criteria	Bicycle facilities on all key north-south arterials in East Bellevue per 2007 Pedestrian and Bicycle Transportation Plan	Bicycle lanes on 156th Avenue north of NE 8th Street	Bicycle lanes on Northup Way NE between NE 20th Street and West Lake Sammamish Parkway	Solution for bicycle system at SE Eastgate Way/Eastgate Park-and-Ride	Extend I-90/Mountains to Sound Trail to SE 35th Place and channelize SE Eastgate Way/SE 35th Place intersection	Alternative Bicycle Treatments	Signalized pedestrian crossings of arterials	Complete missing sidewalks on key residential streets in East Bellevue per 2007 Pedestrian and Bicycle Transportation Plan	Complete trail segments in East Bellevue per 2007 Pedestrian and Bicycle Transportation Plan	Implement additional traffic calming measures within neighborhoods	Streetscape and landscaping improvements to protect and enhance neighborhood character	Play equipment and other improvements to neighborhood parks
1. Shift peak period travel to non-peak hours of the day and/or non-SOV modes	3	2	2	2	2	2	3	3	3	0	0	0
2. Reduce or eliminate trips (such as flex schedules or telecommuting)	0	0	0	0	0	0	0	0	0	0	0	0
3. Reduce peak period congestion along north-south arterials in East Bellevue	3	2	2	2	2	2	3	3	3	0	0	0
4. Improve/enhance transit service (e.g., coverage, frequency and span of service, speed & reliability) to and between major employers, activity centers, transit centers, park-and-ride facilities, etc	1	1	1	1	1	1	2	2	2	1	1	0
5. Improve/enhance the non-motorized environment in East Bellevue (through facilities and/or various treatments such as traffic calming, bike lanes, sidewalks, etc.)	5	5	5	5	5	5	5	5	5	5	5	5
6. Enhance neighborhood aesthetics, landscaping, and/or parks and playgrounds	1	1	1	1	1	1	1	1	1	3	5	5
7. Avoid or minimize impacts to landscaped street corridors and/or mature trees (e.g., median trees along 148 th)	3	3	4	4	5	5	5	3	3	3	5	5
8. Avoid or minimize right-of-way acquisition	2	2	2	2	5	5	5	3	3	3	5	5
9. Leverage proposed regional and/or county transportation investments near or within the East Bellevue area (such as the RapidRide bus route between Downtown Bellevue and Downtown Redmond)	1	1	1	2	2	1	2	2	1	1	0	0
10. Demonstrate consistency with the BROTS Transportation Framework Agreement, the Bellevue Comprehensive Plan, the Bel-Red Corridor Steering Committee recommended vision, and applicable subarea plans	5	5	5	5	5	5	5	5	5	5	5	5
Total Points	24	22	23	24	28	27	31	27	26	21	26	25

BROTS Mitigation - Strategy Evaluation (Detailed Rating Sheets)

Page 3

Project Number	Potential Channelization/Operations Strategies					Potential Joint Regional Advocacy Initiatives		
	27	28	29	32	34	35	36	37
Criteria	Improve WB I-90 freeway signage to 148th Avenue SE	Peak hour-only travel lane; parking allowed off-peak - 140th, 156th, 164th (S of NE 8th St)	Peak hour-only travel lane in one dir; parking allowed off-peak - 140th, 156th, 164th (S of NE 8th St)	Optimization improvements for 148th Avenue	Add SB RT lane at 156th & SE 22nd Place	SR 520 lane capacity east of I-405 (auxiliary lanes)	HOV-to-HOV connections on I-405 at SR 520 and I-90 interchanges	Expanded high capacity transit (HCT) options on the Eastside, including East Link
1. Shift peak period travel to non-peak hours of the day and/or non-SOV modes	0	2	2	0	0	0	3	4
2. Reduce or eliminate trips (such as flex schedules or telecommuting)	0	1	1	0	1	0	0	0
3. Reduce peak period congestion along north-south arterials in East Bellevue	1	4	3	3	2	3	3	4
4. Improve/enhance transit service (e.g., coverage, frequency and span of service, speed & reliability) to and between major employers, activity centers, transit centers, park-and-ride facilities, etc	0	5	4	1	1	2	4	5
5. Improve/enhance the non-motorized environment in East Bellevue (through facilities and/or various treatments such as traffic calming, bike lanes, sidewalks, etc.)	1	3	2	2	1	0	0	3
6. Enhance neighborhood aesthetics, landscaping, and/or parks and playgrounds	0	0	0	0	0	0	0	1
7. Avoid or minimize impacts to landscaped street corridors and/or mature trees (e.g., median trees along 148 th)	5	3	3	5	4	2	2	2
8. Avoid or minimize right-of-way acquisition	5	1	2	4	3	0	0	0
9. Leverage proposed regional and/or county transportation investments near or within the East Bellevue area (such as the RapidRide bus route between Downtown Bellevue and Downtown Redmond)	0	3	2	1	1	3	5	5
10. Demonstrate consistency with the BROTS Transportation Framework Agreement, the Bellevue Comprehensive Plan, the Bel-Red Corridor Steering Committee recommended vision, and applicable subarea plans	5	5	5	5	5	5	5	5
Total Points	17	27	24	21	18	15	22	29