TRANSIT CAPITAL VISION REPORT

Bellevue Transit Master Plan

CITY OF BELLEVUE

March 2014

Transportation Department

Draft

March 26, 2013

prepared for the
March 27, 2014 meeting of the
Transportation Commission

PHOTO BY WSDOT

Title VI Notice to Public

It is the City of Bellevue's policy to assure that no person shall, on the grounds of race, color, national origin or sex, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with the Title VI Coordinator. For Title VI complaint forms and advice, please contact the Title VI Coordinator at 425-452-4496.

CONTENTS

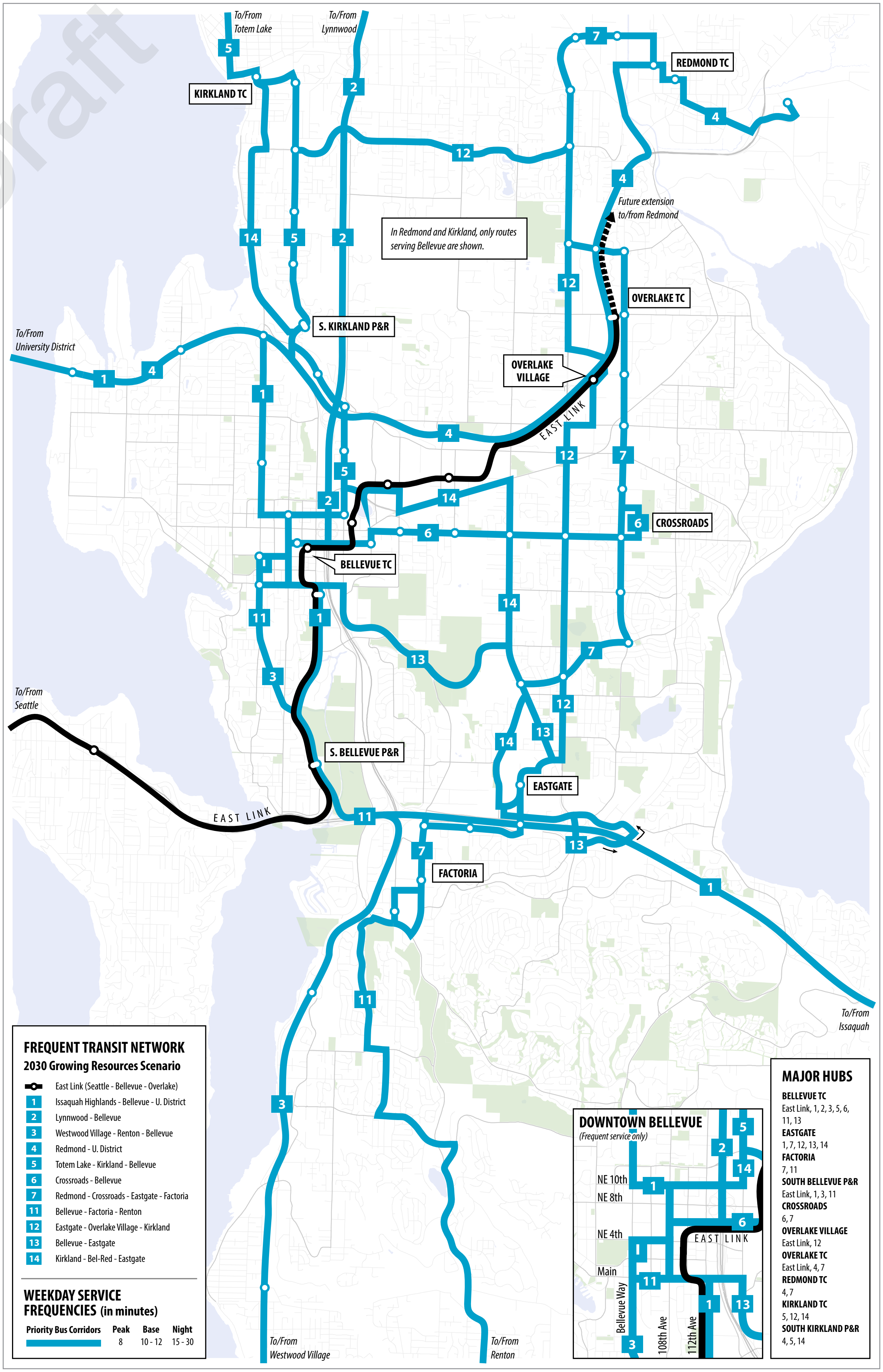


Figure 1 2030 Frequent Transit Network (FTN).

EXECUTIVE SUMMARY

INTRODUCTION

The Bellevue Transit Master Plan (TMP) will establish short- and long-term policies and projects that help foster a high-quality transit system that is more effective at connecting residents, employees, and visitors in Bellevue with the places they want to go. The *Transit Service Vision Report*, published in October 2013, identified where and how frequently service will operate according to three funding scenarios (Growing, Stable, and Reduced) at three time horizons (2015, 2022, and 2030). This *Transit Capital Vision Report* considers the various types of infrastructure that support productive, accessible, efficient transit services in Bellevue and recommends investments that would help the City realize its proposed 2030 Frequent Transit Network (FTN).

This document is a compilation of several draft reports previously published over the course of the Capital Element planning process, as well as additional, previously unpublished content. The Transit Capital Vision Report thus represents the culmination of that planning effort.

Purpose

The Transit Capital Vision is the result of an approximately eight month-long process undertaken by the Transportation Department following completion of the Transit Service Vision. The Capital Vision seeks to address the variety of means through which the City can positively affect the operation and user experience of transit within Bellevue. While the City of Bellevue does not operate its own bus system, it must play a critical role in ensuring that high quality transit is available to keep Bellevue moving. Specifically, the City's authority is to:

- Manage street rights-of-way on which transit operates. By investing in state-of-the-art adaptive traffic signal systems with transit signal priority, Bellevue reduces transit vehicle delay, travel time, and the number of stops on city streets.
- Develop and manage sidewalks and bicycle facilities. By creating accessible communities that seamlessly integrate the pedestrian, bicycle, and transit networks Bellevue increases the market demand for public transportation.
- Set land use policies. By creating vibrant concentrations of retail, office, service, residential, and recreational activity, Bellevue ensures that the greatest possible number of residents and employees have access to high quality transit.
- Use transit as a tool to support the Bellevue Comprehensive Plan. By adopting transit supportive policies, Bellevue has clarified its commitment to public transportation as part of a balanced strategy to improve mobility and meet sustainability and economic development goals.
- Advocate for Bellevue residents and businesses in regional forums. By working with residents and businesses to identify the City's transit needs, Bellevue has been successful in identifying and attracting new transit investments.

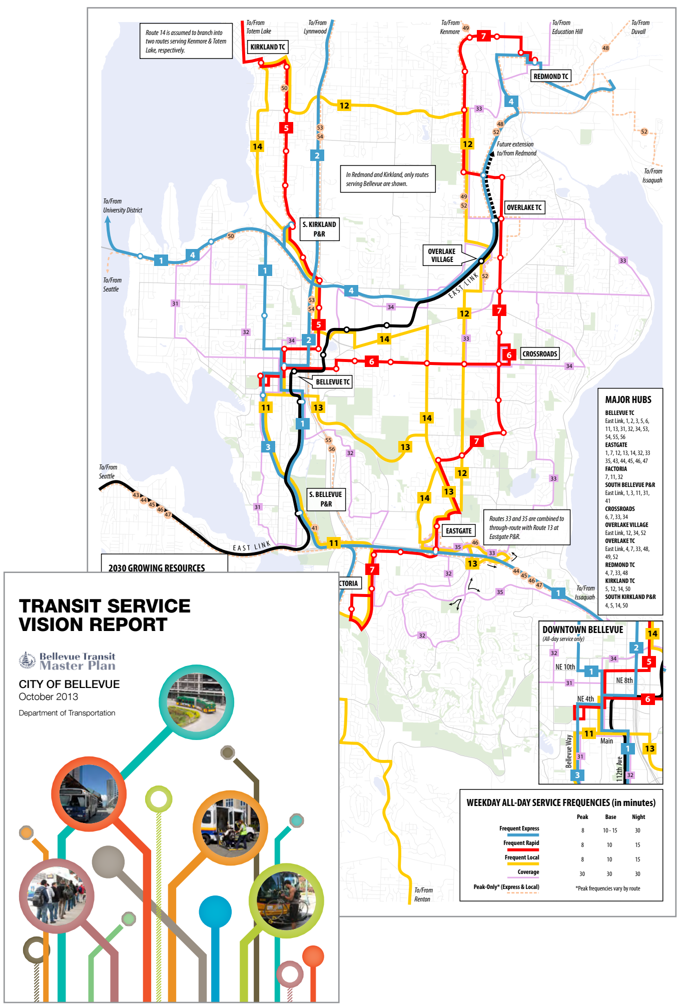


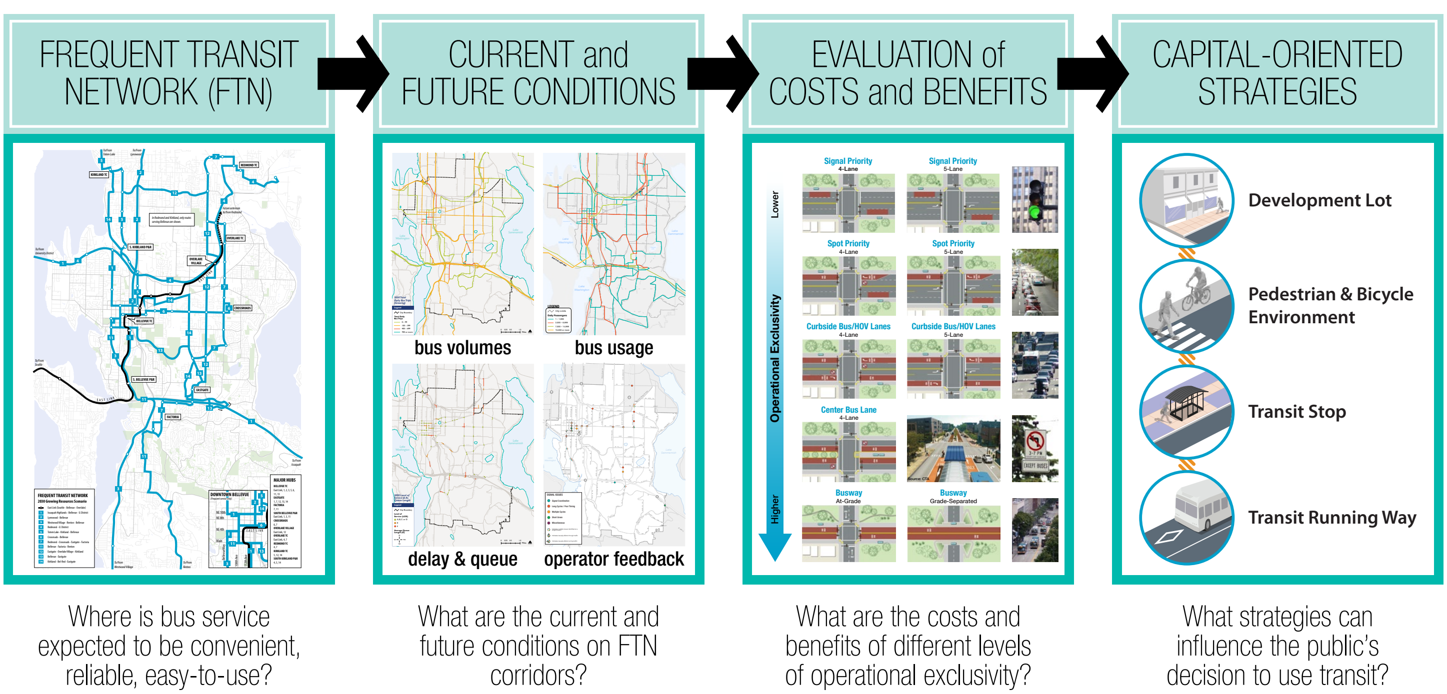
Figure 2 The *Transit Service Vision Report* presents route-level recommendations for transit in Bellevue that are responsive to three financial scenarios and attune to three time horizons. The 2030 Growing Resources Network (pictured above) is the most optimistic of the networks presented.

Policy Background

The Bellevue City Council approved the Transit Master Plan Project Principles on July 9, 2012, which represent the Council's priorities for directing development of the Transit Master Plan (see Figure 5 on page 5). The City Council envisions a fully integrated and user-friendly network of transit services for Bellevue that supports the city's growth, economic vitality, and livability.

Bellevue's Comprehensive Plan also acknowledges that responding to anticipated growth in travel necessitates a multi-modal transportation solution that offers the public real choices about how they travel within, to, and through Bellevue. Comprehensive Plan Policy TR-50 directs the Transportation Department to "work with transit providers to implement the Bellevue Transit Plan as an attractive travel option for local residents, employees, students, visitors, businesses and other users of regional facilities." This policy, along with others in the City's Comprehensive Plan, highlights Bellevue's recognition that enabling people to substitute single occupancy vehicle trips for transit

Figure 3 The Transit Master Plan process arrives at capital-oriented strategies based on a detailed review of where bus service is needed to support Bellevue's growing population and an appraisal of what investments can influence the public's decision to use transit.



trips has the potential to convey multiple public benefits such as: increased transportation options; reduced growth of traffic congestion; decreased air, water, and noise pollution; support for climate change emission reduction goals; and stimulation of the local economy.

Encouraging long-term ridership growth involves building capacity to meet future demand for transit service by: (i) providing service where there is anticipated to be high ridership, typically where there is some mix of: higher residential or commercial density; major activity centers; and, measures that discourage driving, such as limited parking; (ii) building and supporting park-and-ride facilities that help people access the transit system; (iii) improving the way people make transit connections so they can reach more destinations in less time; and, (iv) investing in speed and reliability enhancements such as transit priority measures and bus rapid transit (BRT).

Consistent with guidance from City Council, the Transportation Commission, existing policies, and the framework established by the TMP Service Element, the Capital Element has adopted four Capital-Oriented Strategies that will help to achieve the "Abundant Access" vision (Figure 4).

Figure 4 Four capital-oriented strategies have been defined to help realize the "Abundant Access" vision established by the TMP Service Element.

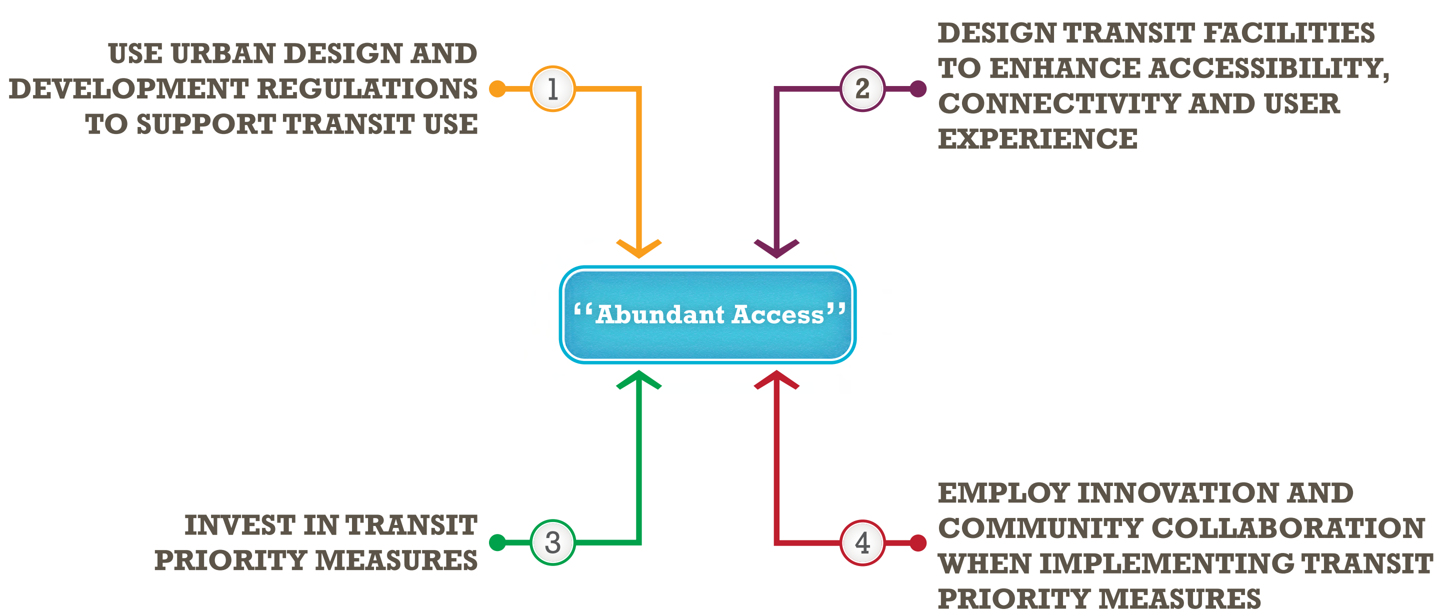


Figure 5 Transit Master Plan Project Principles, approved by the Bellevue City Council, July 9, 2012.

The City Council envisions a fully integrated and user-friendly network of transit services for Bellevue that supports the city's growth, economic vitality, and enhanced livability, and has developed the following set of project principles to direct development of the Transit Master Plan.

1. Support planned growth and development in Bellevue with a bold transit vision that encourages long-term ridership growth.	The dynamic nature of Bellevue's economic expansion requires a bold transit vision supported by practical, achievable strategies in the near term that set a solid foundation for longer term improvements through 2030. The Transit Master Plan should identify, evaluate, and prioritize transit investments that are responsive to a range of financial scenarios (cuts/status-quo/aspirational) and attune to different time horizons (near/mid/long term).
2. Engage community stakeholders in setting the priorities for transit delivery.	A comprehensive public engagement strategy should result in meaningful input on transit services and facilities from a range of stakeholders including residents, businesses, major institutions, neighboring cities, transportation agencies, and others (e.g., community associations, Network on Aging, Bellevue School District, Bellevue College, Chamber of Commerce, Bellevue Downtown Association). Special attention will be required to enlist the participation of "under-represented" communities such as immigrants, low-income and non-native English speakers.
3. Determine where and how transit investments can deliver the greatest degree of mobility and access possible for all populations.	The Transit Master Plan should look to the future and be compatible with Bellevue's land use and transportation plans and the challenges and opportunities of changing demographics, land use characteristics, and travel patterns. Following consultations with the community, demand forecasting, and a review of industry best practices and emerging technologies, this initiative will identify the steps required to create a public transportation system that is easy to use by all people in Bellevue for trips within Bellevue and to regional destinations.
4. Incorporate other transit-related efforts (both bus and light rail) underway in Bellevue and within the region.	The Transit Master Plan should incorporate local and regional transportation projects and plans that have been approved and/or implemented since the Bellevue Transit Plan was adopted in 2003. Transportation system changes include East Link, SR 520 expansion and tolling, and improvements to I-90 and I-405. Planning changes include the updated Bel-Red Subarea Plan, the Wilburton Subarea Plan and the Eastgate/I-90 Land Use and Transportation Project. Through coordination with local and regional transportation plans, the Transit Master Plan should outline a strategy to leverage the investment in public transportation projects to the benefit of Bellevue residents and businesses.
5. Identify partnership opportunities to further extend transit service and infrastructure.	While transit infrastructure is typically funded through large capital funding programs, other less traditional funding mechanisms can be utilized to pay for improvements vital to support transit communities and/or achieve higher transit ridership. The Transit Master Plan should undertake an analysis of partnership opportunities that the City might want to consider with other government organizations (e.g., Bellevue School District, Bellevue College, Metro, Sound Transit), human service agencies, and private corporations, to improve transit service delivery in Bellevue. This analysis will explore alternatives to traditional transit service delivery.
6. Develop measures of effectiveness to evaluate transit investments and to track plan progress.	The Bellevue Comprehensive Plan presently includes the following metrics/benchmarks related to transit: (i) mode split targets within each of the City's Mobility Management Areas [Table TR.1 – Area Mobility Targets]; (2) transit service frequency improvement targets between Downtown, Overlake, Crossroads, Eastgate, and Factoria [TR.8 – 10 Year Transit Vision]; and, (3) guidance found in 44 transit-supportive policies. The Transit Master Plan will revisit these metrics, and where necessary, propose modifications to better reflect present and future conditions.

This report is divided into four sections based on the areas over which the City of Bellevue has influence on the attractiveness and performance of transit services locally. These sections are organized in terms of both increasing specificity to transit operations and in the same order that they are experienced by transit users:

1. **The Development Lot** is where all transit trips begin. This section addresses the relationship between land use and transit services.
2. **The Pedestrian and Bicycle Environment** serves as the primary link between transit users' points of origin and transit services. More direct connections and hospitable facilities encourage greater use of transit.
3. **The Transit Stop** is the first point of contact between the passenger and the transit service. This is where pedestrians, bicyclists, and park-and-ride users transition from their mode of access to transit users.
4. **The Transit Running Way** encompasses the street rights-of-way on which transit services operate. While transit service providers define routes and schedules and operate the vehicles, the city builds and maintains roadway and traffic signal infrastructure, which significantly impact the speed and reliability of transit services.

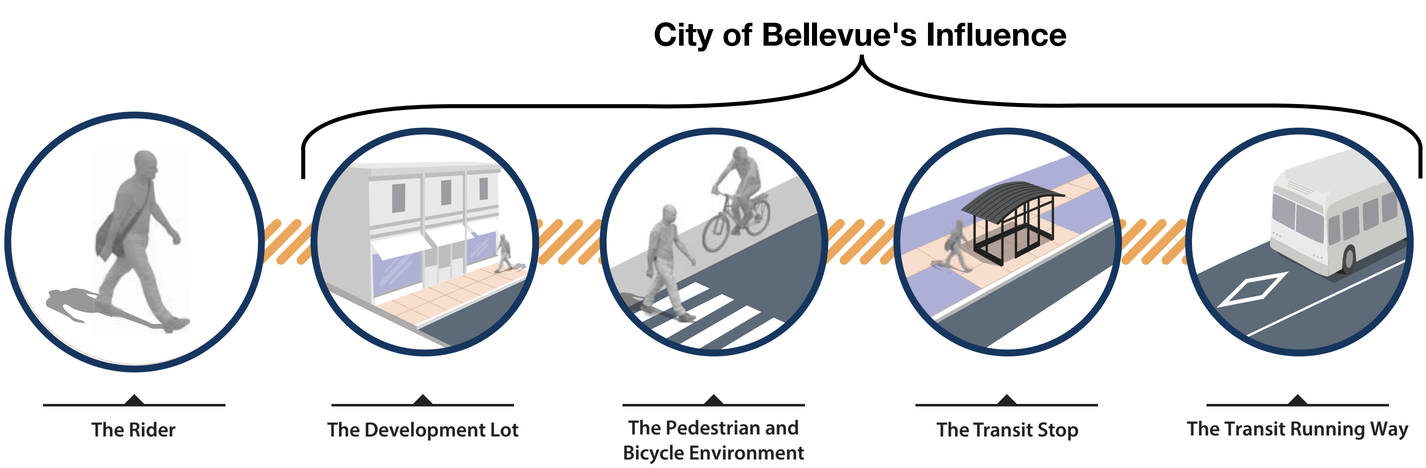


Figure 6 Although the City does not operate its own transit service, it has an influence over several important aspects of how well transit services perform locally. This includes influencing demand for transit by co-locating appropriate land uses to transit services, connecting pedestrians and bicycles to the transit network, providing convenient, safe, and comfortable transit stops, and maintaining roadways, traffic signals, and other infrastructure that supports efficient and reliable operations.

THE DEVELOPMENT LOT

Text summarizing the coordination of transit service and land use is forthcoming. In the meantime, please refer to the full section on The Development Lot, beginning on page 21.

THE TRANSIT STOP

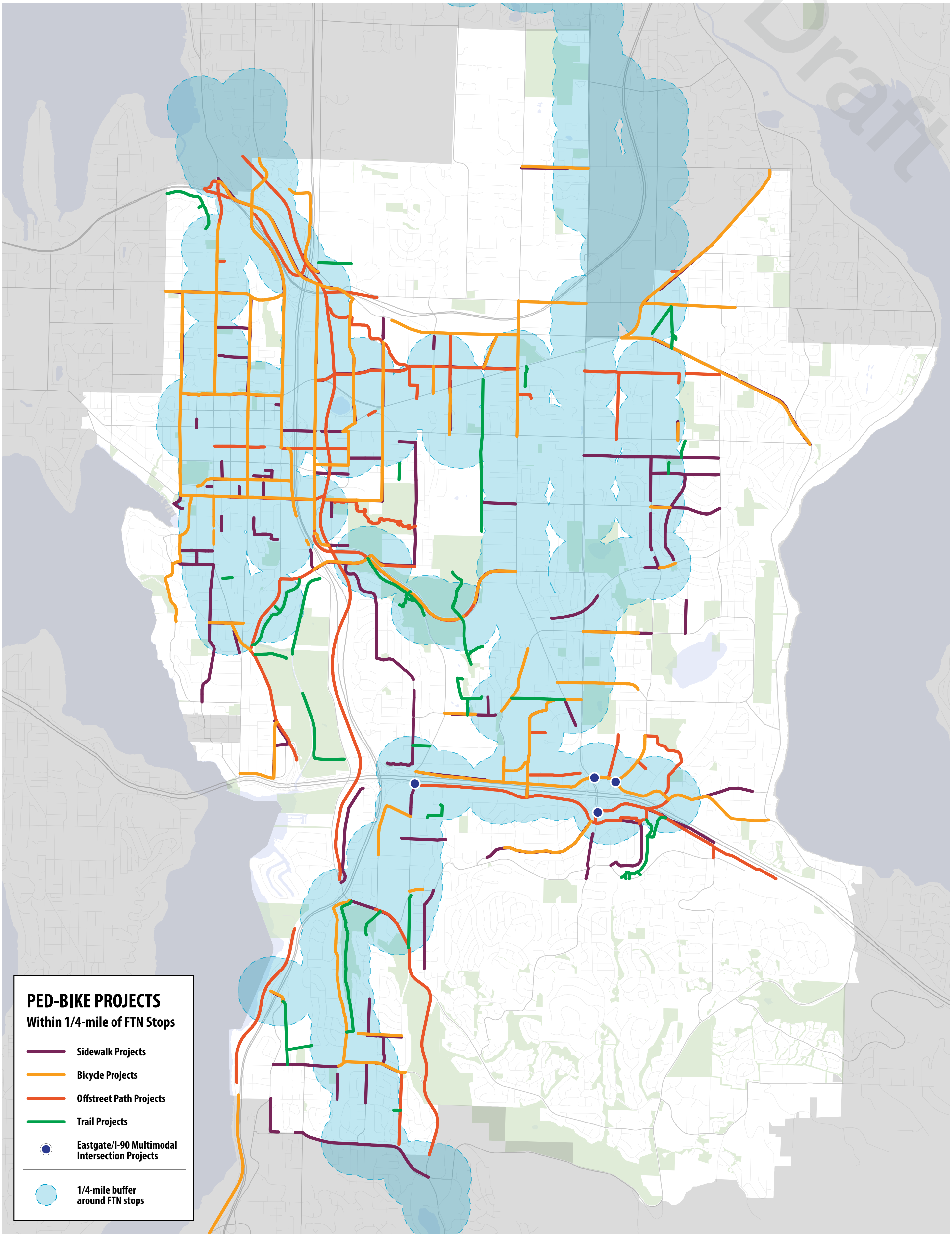
Text summarizing the bus shelter needs assessment, commuter parking analysis, and bus layover analysis is forthcoming. In the meantime, please refer to the full section on The Transit Stop, beginning on page 53.

This page temporarily left blank.

THE PEDESTRIAN AND BICYCLE ENVIRONMENT

Text summarizing the pedestrian and bicycle access to transit analysis and the projects identified as a priority from the perspective of transit is forthcoming. In the meantime, please refer to Figure 7 at right for a map of the transit priority projects, and to the full section on The Pedestrian and Bicycle Environment, beginning on page 29.

Figure 7 Preliminary transit priority pedestrian and bicycle projects.



THE TRANSIT RUNNING WAY

Figure 8 Bellevue Transit Center.

Figure 9 Eastgate Park-and-Ride.

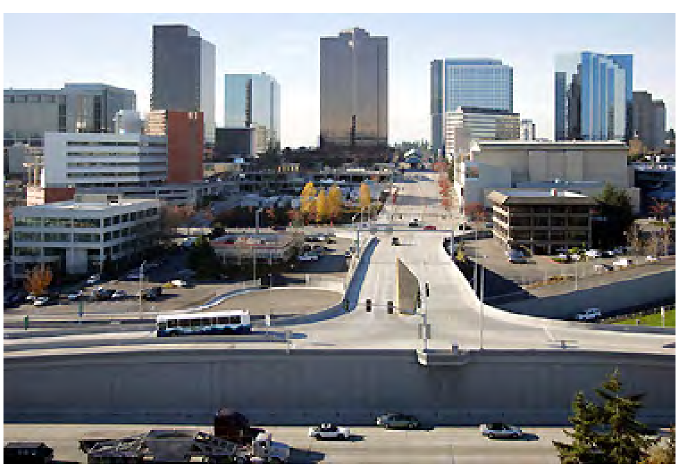


Figure 10 Downtown Bellevue HOV Access.

Completed Projects

Since the adoption of the 2003 *Bellevue Transit Plan*, hundreds of millions of dollars in HOV access ramps, transit centers, park-and-ride lots, and speed and reliability projects were completed in Bellevue in support of transit operations. Transit capital projects completed since 2003 include:

Bellevue Transit Center – In 2003, Sound Transit expanded the Bellevue Transit Center to include ten bus bays, shelter improvements, and rider amenities. Additional bus stops and roadway improvements on 108th Ave NE, 106th Ave NE and east of the transit center on NE 6th St have improved transit and traffic flow in Downtown Bellevue and enable more than 100 buses during peak periods to move efficiently through the transit center. *Total funding: $16 million.*

Eastgate Park-and-Ride Expansion – In 2004, King County expanded the Eastgate Park-and-Ride from a 696-stall facility to a structured complex that can accommodate 1,646 vehicles. In spite of the large number of parking spaces, the Eastgate Park-and-Ride is already at capacity with a utilization ratio of 97 percent (Q2 2012). *Total funding: $27 million.*

Downtown Bellevue HOV Access – Completed in 2005, the Bellevue HOV Access project makes it easier to travel in an out of Downtown Bellevue from the freeway. The project provides a new interchange on I-405 at NE 6th St for buses and carpools, giving buses direct access to the expanded Bellevue Transit Center. It improves freeway interchanges at NE 4th St, NE 8th St, and SE 8th St, including improvements to nearby city street intersections. *Total funding: $144 million.*

Eastgate Direct Access Ramp – WSDOT and Sound Transit partnered in 2006 to complete the Eastgate Transit Access project to connect the existing 142nd Pl SE bridge to I-90 HOV lanes. The addition of two ramps (one each on the east and west sides of I-90) allows a direct connection for bus and HOV users to 142nd Pl SE and the Eastgate Park-and-Ride without having to cross the general lanes to exit the highway. *Total funding: $19 million.*

I-90 Two-Way Transit & HOV Operations – WSDOT and Sound Transit are working together to improve on-time reliability and access for transit and HOVs on I-90. The project will provide full-time HOV lanes for eastbound and westbound traffic on the outer I-90 roadways and will retain the existing reversible lane operations in the center roadway until East Link light rail construction is ready to begin. HOV direct access on- and off-ramps will enable buses and carpools to access the HOV lanes without crossing other lanes of traffic. The project is being implemented in three stages: stages 1 and 2 were completed in 2009 and 2012, respectively; the third and final stage is in design with construction expected to be complete in September 2016. *Total funding: $188 million.*

RapidRide B Line – King County Metro's RapidRide B Line started running between the Downtown Bellevue and Redmond Transit Centers via Crossroads and Overlake in 2011. Customers enjoy enhanced frequencies (service at least every 10 minutes during the busiest morning and evening travel hours and 15 minute service during off-peak periods), real-time bus arrival signs, well-lit shelters, and speed and reliability enhancements offered by transit signal priority (TSP). *Total funding for roadway improvements, communication network, stations and stops and associated amenities: $10 million.*

Figure 11 Eastgate Direct Access Ramp.

Figure 12 I-90 Two-Way Transit & HOV Operations.

Figure 13 RapidRide B Line inauguration ceremony.

Table 1 Summary of speed and reliability projects by type.

Project Type	No. of Projects
Running Way Improvements	19
HOV Lanes	8
BAT Lanes	6
Roadway Construction	5
Spot Improvements	39
Queue Jump Lanes	16
Intersection and Roadway Improvements	13
Signalization Improvements	10
TSP Projects (Near-term)	44
Tracking & Additional Study	5
Total	107

Table 2 Summary of speed and reliability projects by cost.

Estimated Project Cost	No. of Projects
No Cost (NC) These projects primarily require staff time to track, review, or revise using existing City resources and staff time.	6
Tens of Thousands ($) These projects primarily include low-cost changes like striping or signal equipment additions or modifications. These projects do not involve any physical changes.	66
Hundreds of Thousands ($$) These projects include more significant striping or signal modification, which could include some small physical modifications to an intersection or signal. More significant projects include lane construction at intersection approaches assuming minimal land acquisition, environmental mitigation, and slope stabilization.	16
Millions ($$$) These projects include construction of new lanes through multiple intersections and/or construction of new lanes along intersections where constraints exist.	18
Not Applicable (N/A) This project highlights a need for improvement but does not recommend a specific solution. Further study of the situation will only require staff time to complete (i.e., no cost), and the cost of subsequent actions can only be estimated after the chosen solution is identified.	1
Total	107

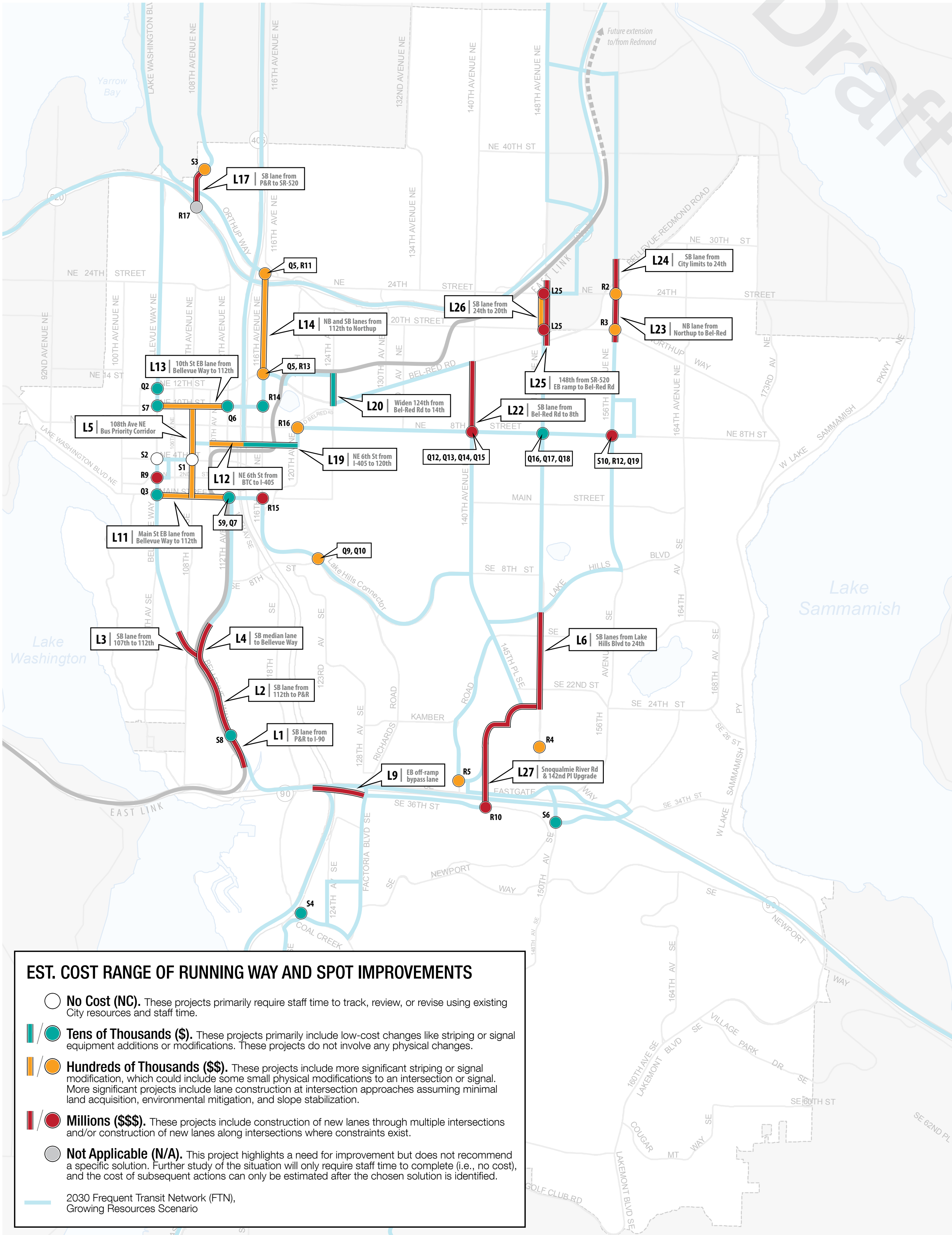
Proposed Transit Speed and Reliability Projects

Similar to the projects implemented in the ten years since adoption of the 2003 Transit Plan, the Capital Vision identifies a total of 107 capital projects that would benefit transit speed and reliability. As shown in Table 1, these include 19 running way improvement projects, 39 spot improvement projects, 5 tracking and additional study projects, and 44 near-term transit signal priority (TSP) projects.

These include some existing projects already adopted in the Transportation Facility Plan (TFP) and/or Transportation Improvement Program (TIP), previously proposed projects from past planning efforts (e.g. Eastgate/I-90 Land Use and Transportation Project, Downtown Transportation Plan Update), and numerous new projects conceived during the TMP Capital Element planning process. New projects were advanced through a multi-stage process that began with the development of a transit priority toolbox, was followed by a geographic information system- (GIS-) based issue identification analysis, and ultimately proceeded through several iterations of project feasibility screening. Travel demand modeling was used to provide some inputs into the issue identification analysis, and travel demand and micro-simulation models were used to help assess the potential degree of benefit provided by certain subsets of the total project list.

General cost estimates were identified for each project, as summarized in Table 2. Figure 14 maps the location and estimated costs of all running way and spot improvement projects, as well as two location-specific tracking projects. Citywide tracking projects and TSP projects are not included in the map, the latter because they are too numerous to include in a single map together with the others. Refer to Figure 127 on page 160 for a map of the near-term TSP projects being proposed.

Figure 14 Transit running way and spot improvement projects by estimated cost range.



Staff Project Prioritization Criteria

Base Priority Identification:

1.) Long-Term Corridor Composite Score(s)

- **High:** 19–24
- **Medium:** 16–18
- **Low:** N/A–15

Priority Refinement:

2.) Current TFP/CIP Projects

3.) Projects specifically required to implement future FTN route structure

- E.g. Project L5: 108th Ave NE Bus Priority Corridor (High) from the Downtown Transportation Plan

4.) Projects for which the Transportation Commission has provided specific guidance

- E.g. Project 27: Bellevue College Connection (High), Project L13: NE 10th St HOV Lane (Low)

Project Implementation Horizon:

5.) Project Cost Estimate

- **Short-Term (2014–2018):** No Cost, N/A, and Tens of Thousands ($)
- **Mid-Term (2018–2022):** Hundreds of Thousands ($$)
- **Long-Term (2023–2030):** Millions ($$$)

Project Prioritization

At the request of the Transportation Commission, Transportation Department staff reviewed the running way and spot improvement projects included in this report and assigned priorities and potential implementation horizons to each. The results of this preliminary priorization are summarized in Table 3 and mapped in Figure 15. It must be emphasized that the priorities identified here are preliminary and will be refined through further discussion with the Transportation Commission. Final project prioritization advanced by the Transit Master Plan will be presented in the *Transit Master Plan Summary Report*, which is expected to be adopted by City Council in July 2014.

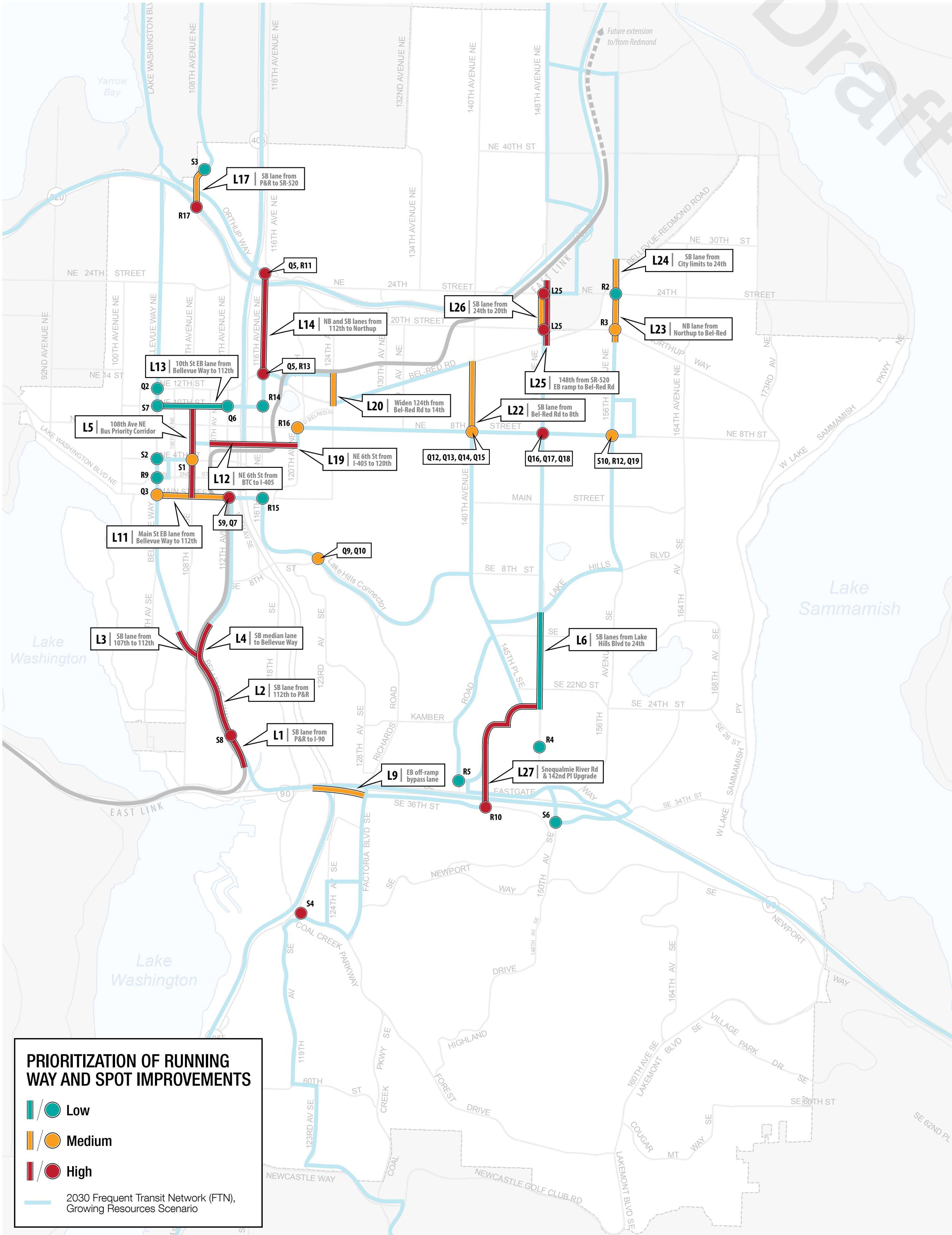
Composite scores serve as the primary means of identifying a project's priority. The ranges for High, Medium, and Low Priority (shown at left) are consistent with the categories shown on the long-term composite score map (see Figure 113 on page 141). For projects that span multiple corridor analysis segments and are characterized by more than one long-term composite score, a simple average of the maximum and minimum scores was used to determine a project's base priority.

These initial priority assignments were then refined according to three separate considerations. First, if a proposed project has already been adopted by the Transportation Facilities Plan (TFP) or Capital Investment Program (CIP), that project's priority was increased by one category. Likewise, the same

Table 3 Summary of preliminary staff project prioritization.

Preliminary Staff Project Prioritization	Total Projects	Project Type / Potential Implementation Horizon					
		Running Way			Spot Improvement		
		Short-Term	Mid-Term	Long-Term	Short-Term	Mid-Term	Long-Term
High	19	2	2	6	8	1	1
Medium	22	1	2	5	5	5	3
Low	19	0	1	1	10	5	2
Total	**60**	**3**	**5**	**12**	**23**	**11**	**6**

Figure 15 Preliminary Transportation Department staff prioritization of the proposed transit running way and spot improvement projects.



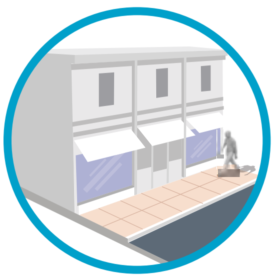
action was taken if a project is specifically required to implement the future Frequent Transit Network (FTN) route structure. The latter consideration applied to two projects, the NE 6th St Extension (Project L19) and the Bellevue College Connection (Project L27), both of which also have associated TFP projects. Therefore, while these projects both ranked as Low Priority based on their composite scores, they have been elevated to High Priority. It is worth noting that these are new road construction and road upgrade projects, respectively, both of which will have transit as the facilities' dominant user. General purpose traffic congestion (and its associated impacts on intersection LOS, delay, and queues) would therefore be minimal, hence their low composite scores. However, both facilities will provide considerable travel time savings by simplifying route structures and avoiding more congested intersections through which routes would otherwise have to travel.

The final priority refinement consideration relates to input previously received from the Transportation Commission during earlier stages of the Capital Element planning process. Unlike the other two refinement categories, this consideration could increase or decrease a project's base priority, depending on the direction provided by Commission. For example, the Commission has expressed particular interest in pursuing the Bellevue College Connection (Project L27) for a variety of reasons, such as its ability to significantly improve travel time and route directness while maintaining service to Bellevue College, its inclusion of non-motorized facility improvements, including improved connection between the college and the Mountains to Sound Greenway Trail, and the potential for this project to compete for funding as part of the Sound Transit 3 (ST3) system expansion program. Thus, if the Bellevue College Connection project had not already been elevated to High Priority by the previous refinement considerations, it would have been so elevated by this one. Conversely, following an in-depth micro-simulation analysis, Projects L11 and L13 (HOV lanes on Main St and NE 10th St, respectively) were considered to provide a relatively small benefit despite similar costs to some other HOV/BAT lane projects. Therefore, although these projects were initially identified as having High and Medium Priority, respectively, on the basis of their composite scores, both were reduced one level (to Medium and Low Priority, respectively).

After the preliminary staff project prioritzation was completed, project costs were used to identify the likely implementation period of each project. Costs were not considered as a factor in the prioritization of projects because it is believed that this should be determined based solely on the projects' merits and projected benefits, rather than on whether they might be convenient to fund. That is, an expensive project is not inherently less worthy of pursuit, nor is an inexpensive project more worthy. However, cost considerations may significantly impact how imminently a project can reasonably be pursued.

Implementation periods were generally identified according to the scheme shown on page 16 unless the timing of a particular project relates directly to other on-going projects (e.g. coordinating Projects L1–L4 with East Link light rail implementation) or specific nearer-term needs (e.g. implementation of the Bellevue College Connection is a central component of the Mid-Term network route structure in Eastgate). The time horizons identified should be thought of as the ideal or earliest likely implementation period; they are not intended to reflect any assessment of whether the City might have adequate funding available to pursue the projects, as there are many other capital projects that will compete for scarce resources.

This page intentionally left blank.



SECTION 1:
THE DEVELOPMENT LOT

Figure 16 Population growth in Bellevue, 2010–2030.

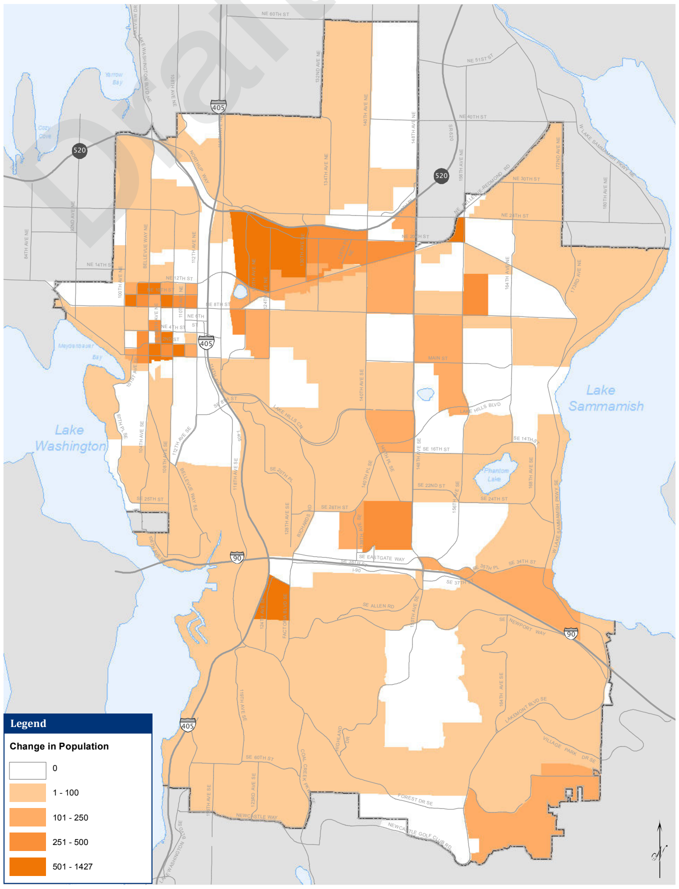
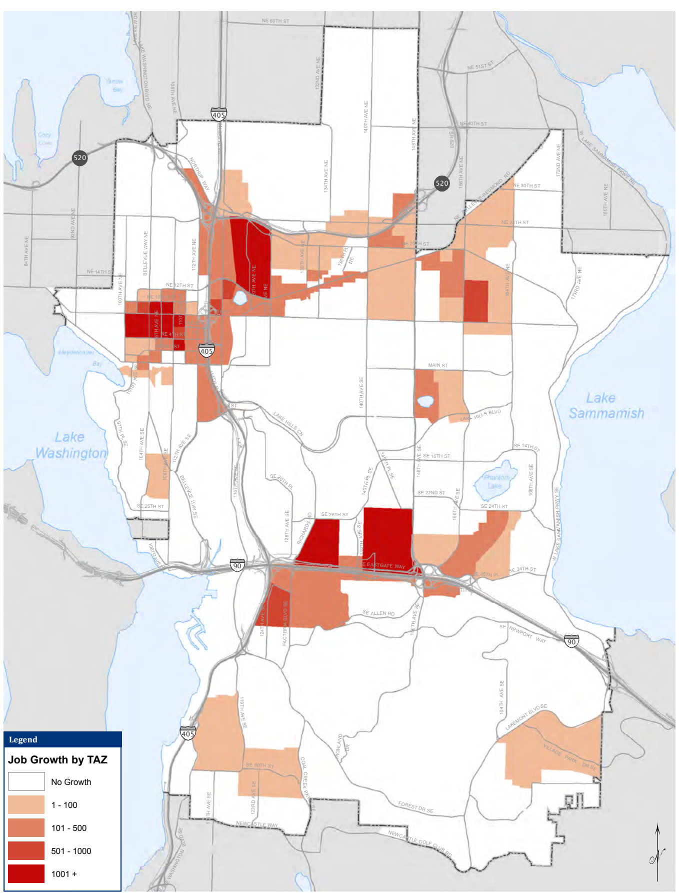


Figure 17 Employment growth in Bellevue, 2010–2030.



COORDINATING TRANSIT AND LAND USE

The "development lot" represents both the origin and destination of the transit trip (see Figure 18–20 for a sampling of development types in Bellevue). Factors that differentiate development types include urban structure (the spatial layout of a city), density (in terms of residential and employment), and design (site configuration and the dimensions and design of elements in the public realm). All of these factors affect the performance of transit in a community.

Looking to the future, between 2010 and 2030 the City of Bellevue as a whole is expected to increase in population by over 28,000. Downtown Bellevue is expected to double in size reaching 19,000 by 2030 comprising about 45 percent of the city's projected population growth over the next twenty years (see Figure 16). Bel-Red is expected to accommodate about 7,500 in population, almost another third of projected growth, and other mixed use areas about 16 percent. The remaining 7 percent of Bellevue's projected population growth is expected to be spread throughout residential areas in the city as development occurs on remaining vacant and underdeveloped land.

The number of jobs within the city of Bellevue is expected to increase by over 54,000 between 2010 and 2030 (see Figure 17). Downtown Bellevue is projected to capture over half of these jobs and Bel-Red about 18 percent. Eastgate would capture almost 14 percent and SR-520 nearly 5 percent. Other commercial and industrial lands in the city would capture the remaining 12 percent of projected job growth. Focusing growth and development around these major transit stops allows more people to live near transit services, and makes more destinations accessible by transit.

To support this growth it will be critical to integrate the provision of enhanced transit supply with a

Figure 18 Single-family suburban residential neighborhood.

Figure 19 Auto-oriented retail center and office campuses.

Figure 20 Local retail center and multi-family residential developments.

Figure 21 Downtown core with mixed-use office, regional retail, and high-rise residential developments.

supportive land use mix together with enhanced transit passenger and walking amenities, as well as transit supportive infrastructure. There are a number of promising trends that suggest the continued improvement of transit as a viable mobility option for Bellevue residents (see Figure 22).

One of the objectives of Bellevue's growth strategy is to strategically allocate population and employment in locations that are or are intended to be rich in public amenities, including public transit. While many areas of Bellevue are expected to see some growth in the future, those growing the fastest are concentrated in select areas. The biggest clusters of growth are in Downtown Bellevue, along the proposed alignment of East Link through the

Figure 22 Transit reinforces the Downtown Bellevue 2030 Vision, Bel-Red Subarea Plan, South Kirkland Park-and-Ride Transit Oriented Development Project, and Eastgate/I-90 Transit Oriented Development concept.

Downtown Bellevue 2030 Vision

South Kirkland Park-and-Ride TOD Project

Bel-Red Subarea Plan

Eastgate Transit Oriented Development Concept

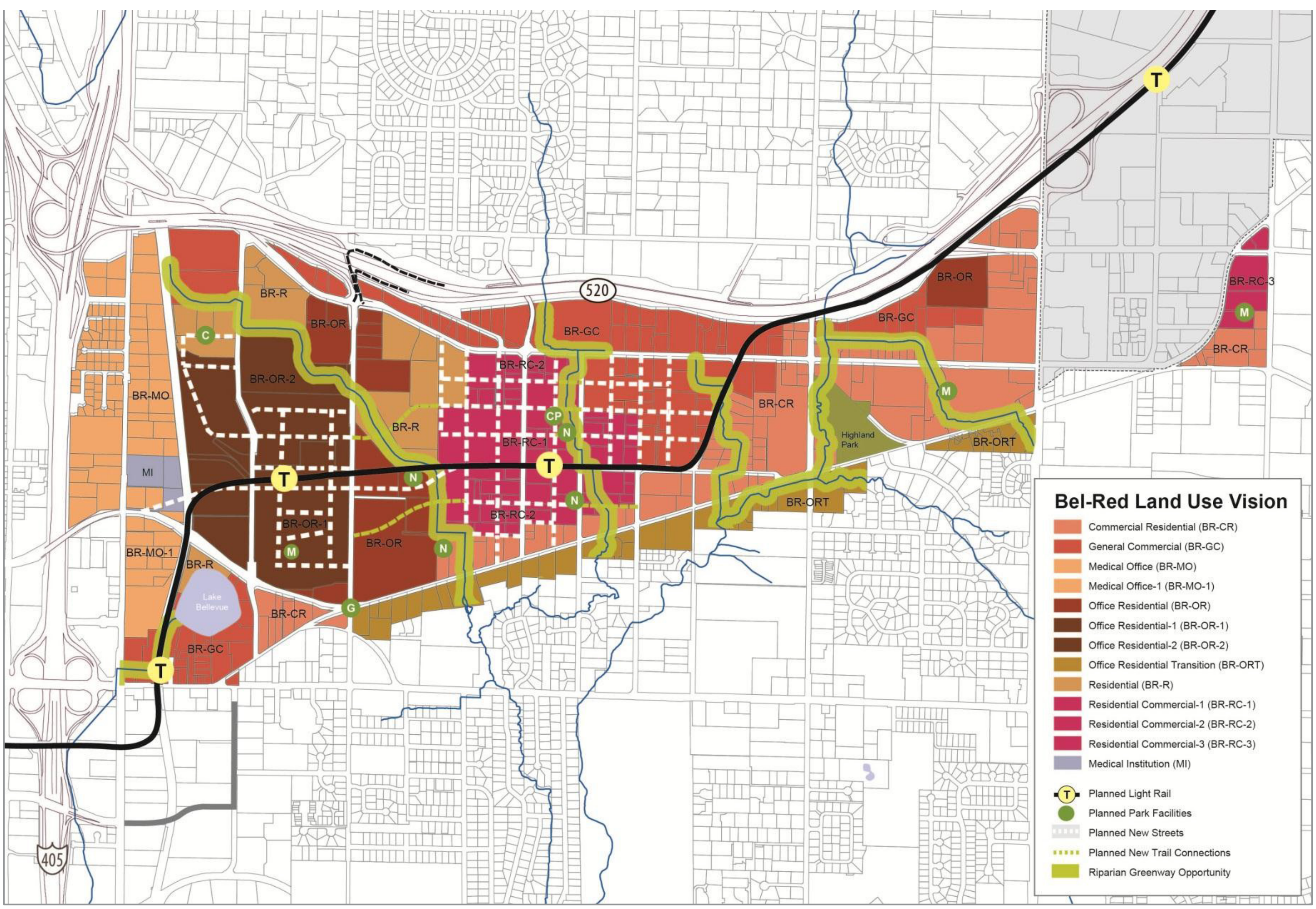
Bel-Red Corridor, in Factoria, and in the vicinity of Bellevue College. These are all areas where transit can effectively serve a large population. Future transit service increases, whether through new routes or frequency improvements, should be successful when concentrated in these areas.

Bellevue's Comprehensive Plan acknowledges that responding to anticipated growth in travel necessitates a multi-modal transportation solution that offers the public real choices about how they travel within, to, and through Bellevue. The Bellevue City Council views transit solutions as an increasingly important part of the local and regional transportation system—as reflected in the City's overall goal for the Transportation Element of its Comprehensive Plan:

"Transit needs to be made easier and faster so that people would make decisions to ride based off of the convenience…. I favor setting up high-ridership corridors for transit that serve high density areas."

- Dallas Evans, *Parks and Community Services Board, TMP Forum*

Figure 23 Bel-Red Land Use Vision with the future local street system grid.



To maintain and enhance mobility for residents and businesses through the creation and maintenance of a balanced system of transportation alternatives that:

- *Provides a wide range of travel choices;*
- *Supports the land use vision of the city;*
- *Protects our neighborhoods from adverse transportation impacts;*
- *Reflects the regional role of the city in transportation issues; and*
- *Reduces the overall dependency on automobiles throughout the city*

The Bellevue Transit Master Plan aims to support the City's growth strategy with a Frequent Transit Network by: (i) directing service where there is anticipated to be high ridership, typically where there is some mix of higher residential or commercial density, major activity centers, and measures that discourage driving; (ii) building and supporting park and ride facilities that help people access the transit system; (iii) improving the way people make transit connections so they can reach more destinations in less time; and, (iv) investing in speed and reliability enhancements such as transit priority measures and bus rapid transit.

"Rezoning a corridor to encourage mixed-use development, creating a comprehensive plan for the area, actively reaching out to investors, marketing the program, offering financial incentives — these elements of a strong official involvement directly predicted TOD success."

- Eric Jaffe, *The Surprising Key to Making Transit-Oriented Development Work* (2013)

This page intentionally left blank.

SECTION 2:
THE PEDESTRIAN AND BICYCLE ENVIRONMENT

WHY ACCESS MATTERS:

Increased ridership and revenue. Safe, effective and convenient access to transit stops maximizes ridership and revenue. Barriers that prevent, or conditions that discourage, a potential customer from accessing a transit stop depress transit ridership.

More efficient fixed-route transit service. Access deficiencies may cause bus routes to deviate or to take an indirect path to serve hard-to-access destinations like office complexes surrounded by surface parking, or medical complexes with multiple entrances. The more direct a transit route is, the less running time and potentially cost is required to provide a given level of service. Also, more direct service can be more competitive with the auto and attract more customers and revenue.

Increased opportunity for pedestrian travel for any trip. All transit customers are pedestrians for some part of the trip. This includes the walk from one's origin to the stop, transfers between an auto and transit vehicle and transferring between two transit vehicles. Improved access to transit leads to improved conditions for other walking trips.

More balanced transportation modes. Application of the standards presented in this Recommended Practice will have benefits for pedestrian trips of all kinds, not just those to access transit. Access solutions such as off-street paths may benefit cycling trips as well as walking and access to transit. Even auto trips may benefit if increased connectivity results in more direct trips. In many communities, auto access may trump access by other modes. As communities prepare for environmental, resource and economic challenges of the future, a more balanced transportation system my help them adapt.

Source: APTA, *Design of On-street Transit Stops and Access from Surrounding Areas* (2012: iii)

BACKGROUND

The terms 'access' and 'accessibility' can be defined in several different ways, depending on context. For example, in the context of the Americans with Disability Act of 1990 (ADA), accessible facilities are those that meet certain design requirements to ensure that individuals with mobility, vision, and hearing impairments are able to fully enjoy public accommodations. For the purposes of this report, access is considered more broadly as simply the ability to reach one's desired destination, wherein the desired destinations being considered are transit stops in the 2030 Frequent Transit Network (FTN), and the means of travel to these stops are on foot and by bicycle.

All transit users are pedestrians for some part of their trip. For this reason, the provision of an accessible pedestrian network is an essential component of a useful transit system. If potential transit users are unable to reach a bus stop easily, quickly, and reasonably directly, they are more likely to consider alternative travel modes if any are available to them.

The purpose of this analysis is to determine which existing pedestrian and bicycle projects proposed by other planning efforts would specifically improve non-motorized access to transit. Unlike the 'Transit Running Way' section of this report, this section does not propose any new projects, nor does the basic assessment presented here assign any priority ranking (e.g. high/medium/low) to a project for which this has not already been done. This represents only a first-level of screening for identifying pedestrian and bicycle projects that should be considered a priority from the perspective of transit. A more rigorous analysis, briefly previewed at the end of this section, will leverage more complex accessibility metrics to propose a means of prioritizing non-motorized projects based on the degree to which they improve one's ability to access transit.

Community Input

The characterization of pedestrian and bicycle access to transit as an important consideration for transit planning is supported by some of the results obtained by the Bellevue Transit Improvement Survey conducted in early 2012. When asked how the City should invest municipal resources to improve transit, 5 percent of current transit users supported installation of additional bicycle facilities to better connect neighborhoods to bus services, and 2 percent supported improvements to sidewalk connectivity at and around bus stops. Although this is not current transit users' highest priority, at a combined 7 percent, access network improvements remain a notable concern (see Figure 24).

Perhaps even more tellingly, when those who have never used transit in Bellevue were asked what

> **"The ability for patrons of transit agencies to get to and from, or access, transit stops is critical for providing a safe, pleasant and convenient trip from beginning to end. Improvements to the ways in which patrons access stops can yield higher ridership and greater patron satisfaction."**
>
> - APTA, *Design of On-street Transit Stops and Access from Surrounding Areas* (2012: iii)

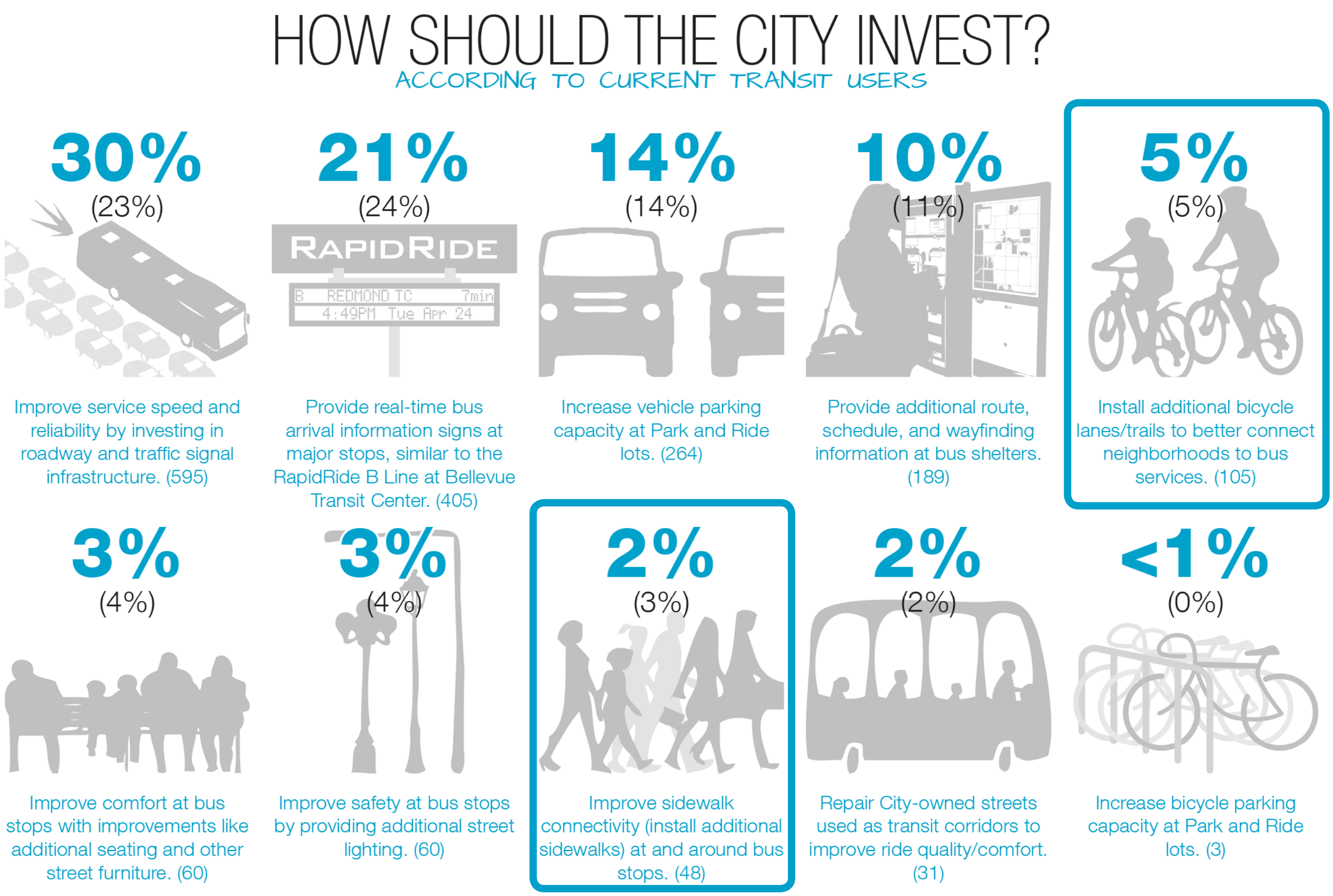


Figure 24 Priorities for municipal investment in transit among those who currently use transit services in Bellevue.

"Failure to provide adequate access means that some people will be denied opportunities for leisure, employment, trading, healthcare, education – even for taking part in the electoral process. Accessibility is not just about being 'nice' to people with difficulties, it is about ensuring that the benefits and responsibilities of living in society are truly available to, and are shared between, the vast majority of its members."

- Nick Tyler, *Accessibility and the Bus System: From Concepts to Practice* (2002: 2)

improvements would make them consider riding the bus, 46 percent selected the proximity of stops to their home and/or destinations, and 8 percent selected improved pedestrian connections to bus stops. The *Transit Service Vision Report* has already defined its intentions for Bellevue's future transit networks through 2030—even though, as noted in the Transit Stop section of this report, stop-level recommendations are not being proposed, though some assumptions are made for analytical purposes (see page 54)—so the absolute proximity of stops to properties around Bellevue has already generally been established. However, the perceived distance between properties and bus stops can be significantly affected by the pedestrian and bicycle facilities that are available to connect those properties to their nearest bus stop. Many situations exist citywide where a well-located non-motorized facility could dramatically reduce the walking or bicycling distance from a given property to its nearest transit stop.

WHAT IMPROVEMENTS WOULD GET YOU TO CONSIDER RIDING THE BUS?

ACCORDING TO THOSE WHO HAVE NEVER USED TRANSIT IN BELLEVUE

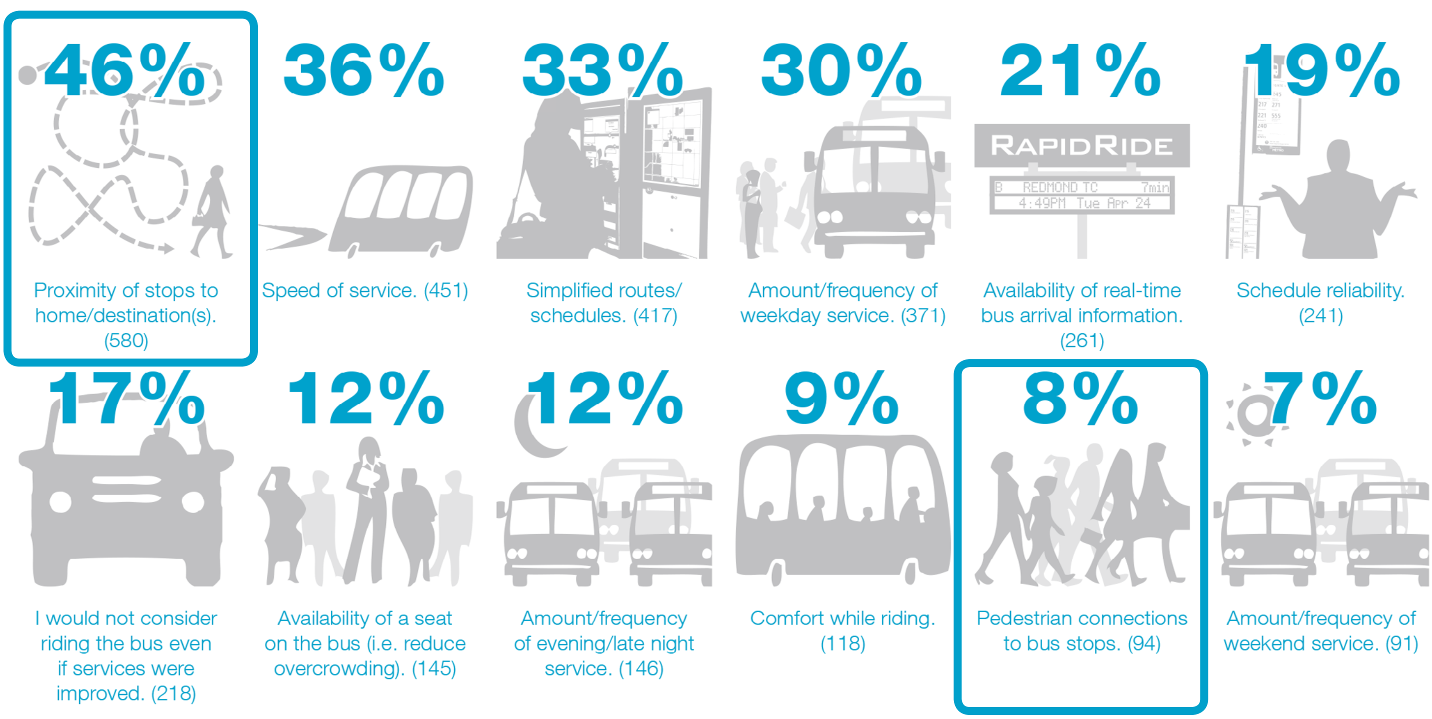


Figure 25 Priorities for municipal investment in transit among those who have never used transit services in Bellevue.

Comprehensive Plan Policies

Given these stated preferences from members of the community, it is clear that facilitating non-motorized access should be of interest to the City, and indeed there are several policies in the Comprehensive Plan that directly address this issue. The policies listed at right is not a comprehensive list of all policies with some relation to non-motorized access to transit; rather, it is a representative sample of some of the most directly relevant policies.

Abundant Access Vision

The Transit Master Plan has also defined strategies that relate specifically to the subject of access to transit. When the “Abundant Access” vision was established during the Service Element planning process, one of the six Service-Oriented Strategies specifically addressed this issue, as does one of the four Capital-Oriented Strategies. Both the service and capital components of the "Abundant Access" vision are presented on the following pages, with excerpts of the relevant text providing additional context for the language used to define the strategy.

TR-77: Consider pedestrians and bicycles along with other travel modes in all aspects of developing the transportation system.

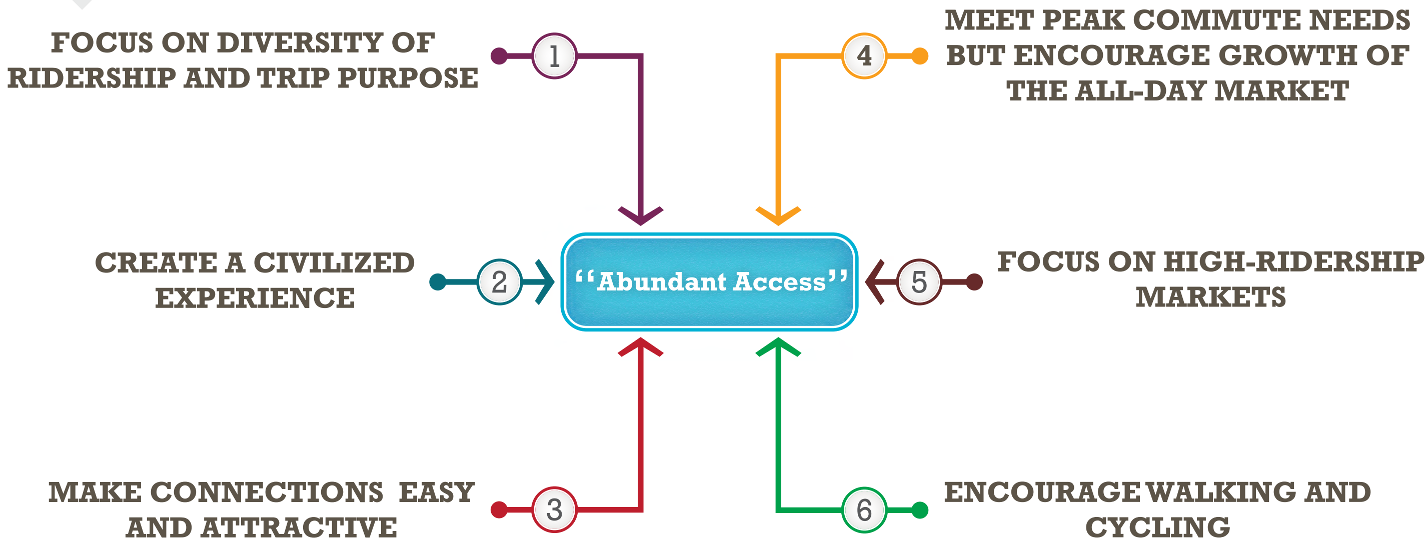
TR-79: Assign high priority to pedestrian and bicycle projects that… [p]rovide accessible linkages to the transit and school bus systems.

TR-56: Develop partnerships with transit providers to implement projects providing neighborhood–to–transit links that improve pedestrian and bicycle access to transit service and facilities.

TR-80: Encourage transit use by improving pedestrian and bicycle linkages to existing and future transit and school bus systems, and by improving the security and utility of park-and-ride lots and bus stops.

UD-49: Design and coordinate the proximity of bike racks, wheelchair access, pedestrian amenities, and other modes of transportation with transit facilities.

Figure 26 Six Service-Oriented Strategies comprise the "Abundant Access" vision.

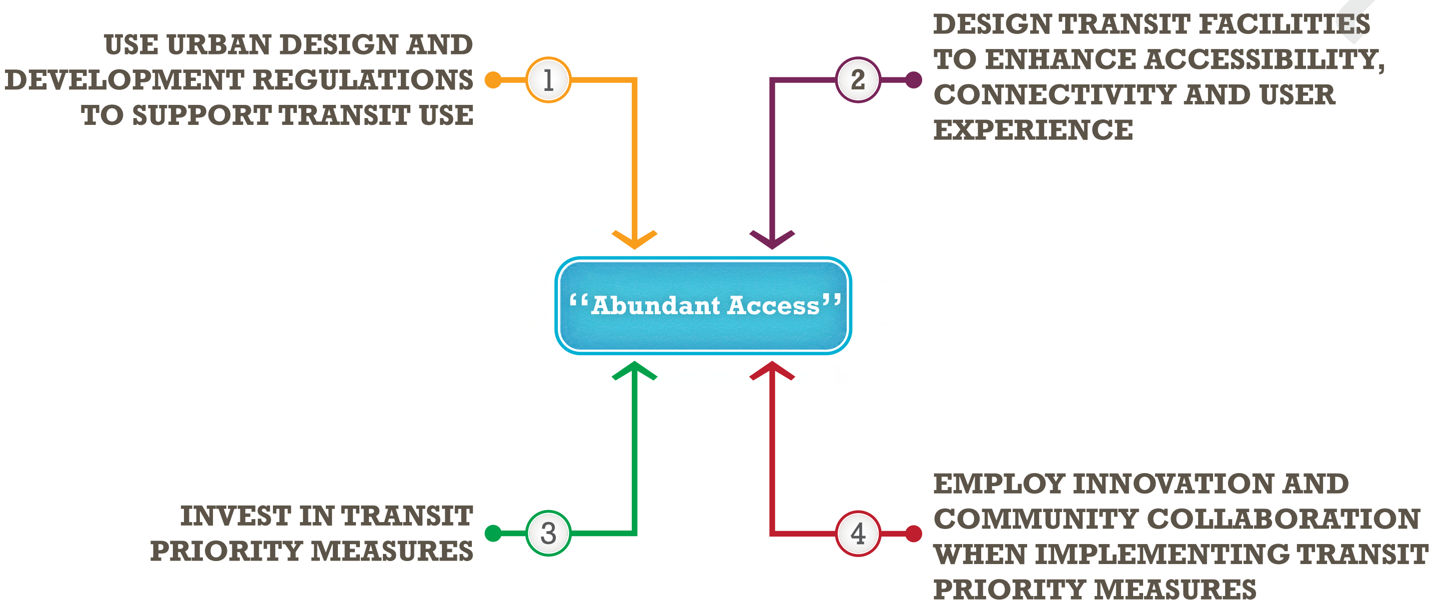


6 Service-Oriented Strategy
ENCOURAGE WALKING AND CYCLING

As the transit network moves towards attracting more patrons who take transit by choice, it will be increasingly important to factor in the pedestrian and bicycle experience as part of a more holistic ridership strategy so that transit can run more efficiently.

The efficiency of the transit network is compromised when bus routes try to get too close to everyone's home — no matter how winding the road network or dispersed the land use patterns. Integrating pedestrian and bicycle use with transit service is an effective means of attracting new riders by increasing the catchment areas of stations and stops without expensive investments in route expansion or new routes. Since transit cannot provide universal door-to-door access, ensuring that stops are easily accessible to a large percentage of the public is important to enhancing ridership. Walking and cycling are already the predominant methods by which people access transit; today only 16 percent of transit customers access public transportation at Park-and-Ride facilities in Bellevue. Transit's role is not to compete with walking or cycling, but rather to compete with cars, so it must focus on faster services that are worth walking or cycling to.

Figure 27 Four Capital-Oriented Strategies comprise the "Abundant Access" vision.



Capital-Oriented Strategy

2 DESIGN TRANSIT FACILITIES TO ENHANCE ACCESSIBILITY, CONNECTIVITY, AND USER EXPERIENCE

The location and design of transit stops, centers, and park & ride facilities is an important factor in determining how far pedestrians, cyclists, and drivers must travel to reach transit services and the quality of the wait once they get there. These facilities are the most consistently visible image of a city's transit system.

When stops, transit centers, and park & ride facilities are poorly designed, difficult to reach, or uncomfortable for users, it can negatively affect the image of a transit system and reduce opportunities for capturing choice ridership. When local governments partner with transit agencies—as is the case with work underway at the South Kirkland Park & Ride, a transit oriented development project that integrates housing within a transit hub—the transit facility environment will enhance connectivity between different modes of transportation and contribute to a positive community identity.

PEDESTRIAN AND BICYCLE ACCESS IMPROVEMENT PROJECTS

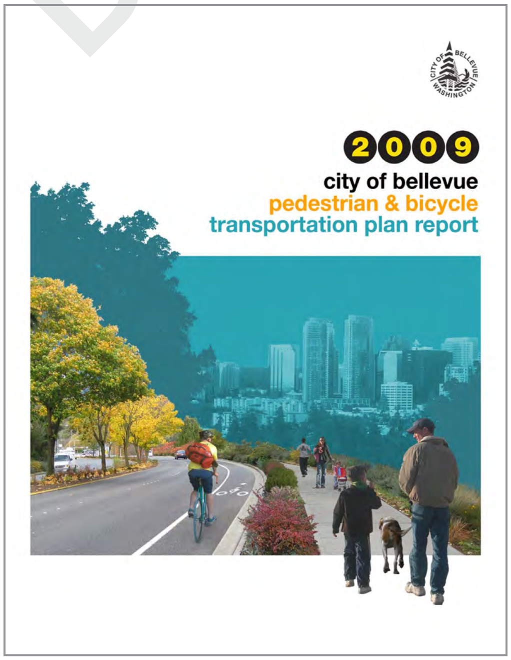


Figure 28 The *2009 Pedestrian and Bicycle Transportation Plan Report* is the principle reference for planning, designing, constructing, and maintaining pedestrian and bicycle facilities in Bellevue.

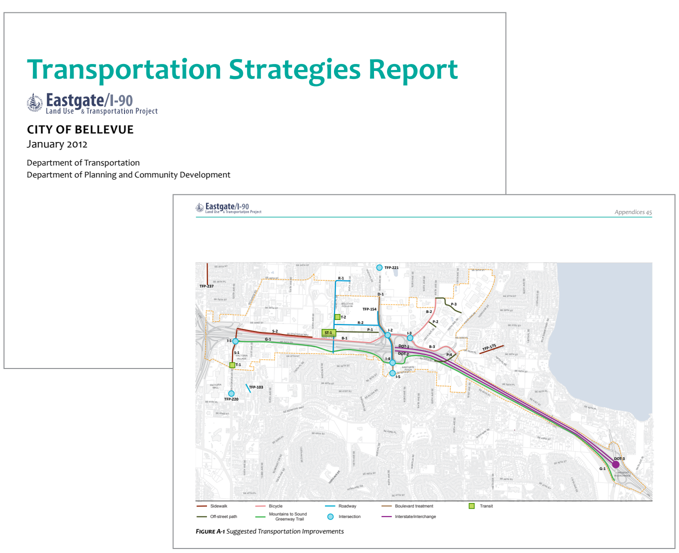


Figure 29 Additional projects considered include those included in the *Eastgate/I-90 Transportation Strategies Report*, adopted by City Council in April 2012.

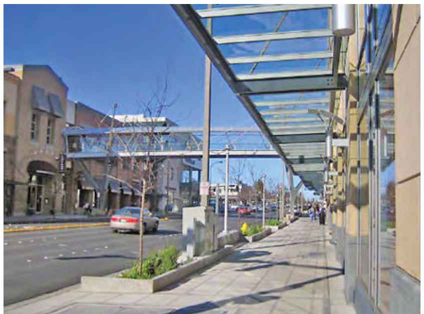
The projects included in this analysis are all derived from two existing plans: the *2009 Pedestrian and Bicycle Transportation Plan Report* (hereafter referred to as the 2009 Ped-Bike Plan), and the *Eastgate/I-90 Transportation Strategies Report*. Nearly all of the projects included in the final list come from the former, with the latter plan adding only a few projects. The 2009 Ped-Bike Plan includes a total of 504 projects, of which 237 are sidewalk projects, 167 are bicycle projects, 46 are offstreet path projects, 53 are trail projects, and 1 (not included in this analysis) is an education program. Figure 30 depicts the categories of projects included in the 2009 Ped-Bike Plan.

Of the 17 projects in the Eastgate/I-90 Plan that include non-motorized improvements, seven are not already reflected by projects in the 2009 Ped-Bike Plan. These include one each of sidewalk, offstreet path, and trail projects, and four multimodal intersection improvement projects. Figure 32 on page 40 provides a map of all 511 of these projects.

Although, as noted, the Capital Vision does not propose any new pedestrian or bicycle projects, one of the running way improvement projects (L27: Bellevue College Connection) is a multimodal corridor that includes non-motorized components. The 2009 Ped-Bike Plan already includes two projects along the same rights-of-way, so the descriptions of those two projects are revised to reflect the proposal being advanced by the Transit Master Plan, as described in on page A175.

Figure 30 Existing non-motorized transportation facility types, as identified by the *2009 Pedestrian and Bicycle Transportation Plan Report.*

SIDEWALKS


12 ft. walk and 4 ft. planter


8 ft. walk and 4 ft. planter


6 ft. walk and 4 ft. planter


5 ft. walk without planter

BICYCLE & OFFSTREET PATHS

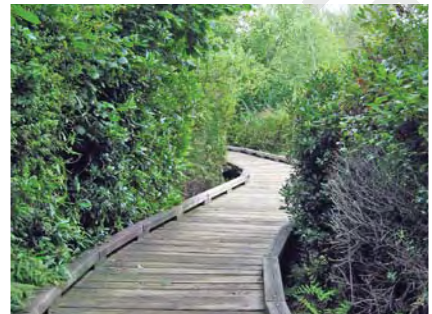

Off-Street Path


Bike Lane

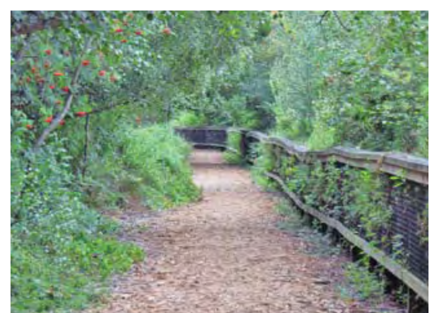

Bike Shoulder


Wide Outside Lane

TRAILS


Boardwalk


Multi-Use Gravel Trail


Walking Trail


Primitive Hiking Trail

“[B]us systems—as with any public transport system—involve the superimposition of two networks: the access network used by people to reach the system and the bus network provided by bus operators as a response to their perception of users’ needs. The connecting points between these two networks are formed by bus stops...”

-Nick Tyler, *Accessibility and the Bus System: From Concepts to Practice* (2002: 2)

Ped-Bike Project Prioritization

The 2009 Ped-Bike Plan assigned one of three priority designations—high, medium, or low—to each project included in that plan, with ranks assigned according to the criteria reproduced in Figure 4 below. It should be noted that quarter-mile proximity to and stop-level ridership at a bus stop is among the corridor conditions contributing to a project's priority ranking. However, transit considerations were only one part of the overall prioritization scheme used in the 2009 Ped-Bike Plan, as the emphasis of that plan was not on transit. For the purposes of this preliminary screening of transit priority pedestrian and bicycle projects, these priority rankings are considered and reported, but the more rigorous access analysis will assign new, transit-centric priority rankings according to other metrics. The Eastgate/I-90 Plan did not assign priority rankings to any of the projects proposed therein.

Table 4 2009 Pedestrian-Bicycle Transportation Plan GIS-Based Project Prioritization Framework.

Category		Total Transit Priority Projects
Corridor Conditions	System linkage (connectivity to other sidewalk/bikeway facilities)	20
	Severity of problem (how many collisions have occurred)	10
	Roadway arterial classification	10
	Bus stop-level ridership (1/4 mile proximity)	10
Social Justice	Vehicle ownership (%)	5
	Below poverty level (%)	5
	Under 18 or 65 and over (%)	5
Destination Network	Park proximity (%)	5
	School proximity (%)	5
	Community center/social service/library proximity (%)	5
	Retail proximity (%)	5
	Major employment center (Comprehensive Plan)	5
	Housing density (Comprehensive Land Use Plan)	10

Transit Priority Ped-Bike Projects

As noted on the opposite page, the bus stop is the point of connection between the two networks that comprise the bus system—the access and transit networks. As such, when assessing which pedestrian and bicycle projects should be prioritized from the perspective of transit, the projects of interest are those that are proximate to bus stops. For the purposes of this preliminary screening, any project that has some portion within one quarter-mile of an FTN bus stop was selected and identified as being a priority to transit. Figure 31 depicts the Frequent Transit Network, its major stations, the stops assumed to be served for the purposes of this analysis, and the consolidated quarter-mile radial area around those stops.

Figure 33 on page 41 depicts the 342 non-motorized projects that have some portion within one-quarter mile of an FTN stop. That map retains the consolidated quarter-mile radial area for reference but removes FTN route lines so that lines corresponding to non-motorized projects can be identified more easily. Table 5 below summarizes the number of projects of each type and priority ranking (if applicable) identified as a transit priority pedestrian-bicycle project. The full list of identified projects is documented by project type in Appendix B1, Appendix Tables 1 through 5.

Figure 31 Freqeunt Transit Network (FTN) with quarter-mile radial areas around stops.

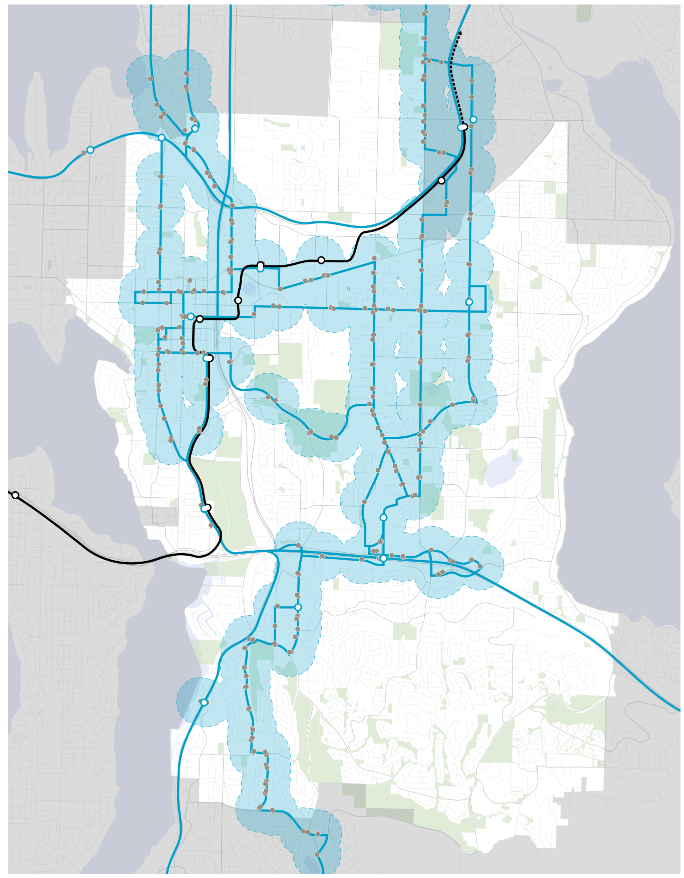


Table 5 Preliminary transit priority pedestrian and bicycle projects.

Project Type	2009 Pedestrian-Bicycle Plan Project Priority			Eastgate/I-90	Total Transit Priority Projects
	Low	Medium	High	N/A*	
Sidewalk Projects	14	50	89	1	**154**
Bicycle Projects	31	39	48	0	**118**
Offstreet Path Projects	12	13	11	1	**37**
Trail Projects	3	7	18	1	**29**
Multimodal Intersections	0	0	0	4	**4**
All Projects	**60**	**109**	**166**	**7**	**342**

*Projects from the Eastgate/I-90 Transportation Strategies Report were not prioritized, thus their priority is identified as 'N/A' or 'Not Applicable'.

Figure 32 Citywide pedestrian and bicycle projects identified by other plans.

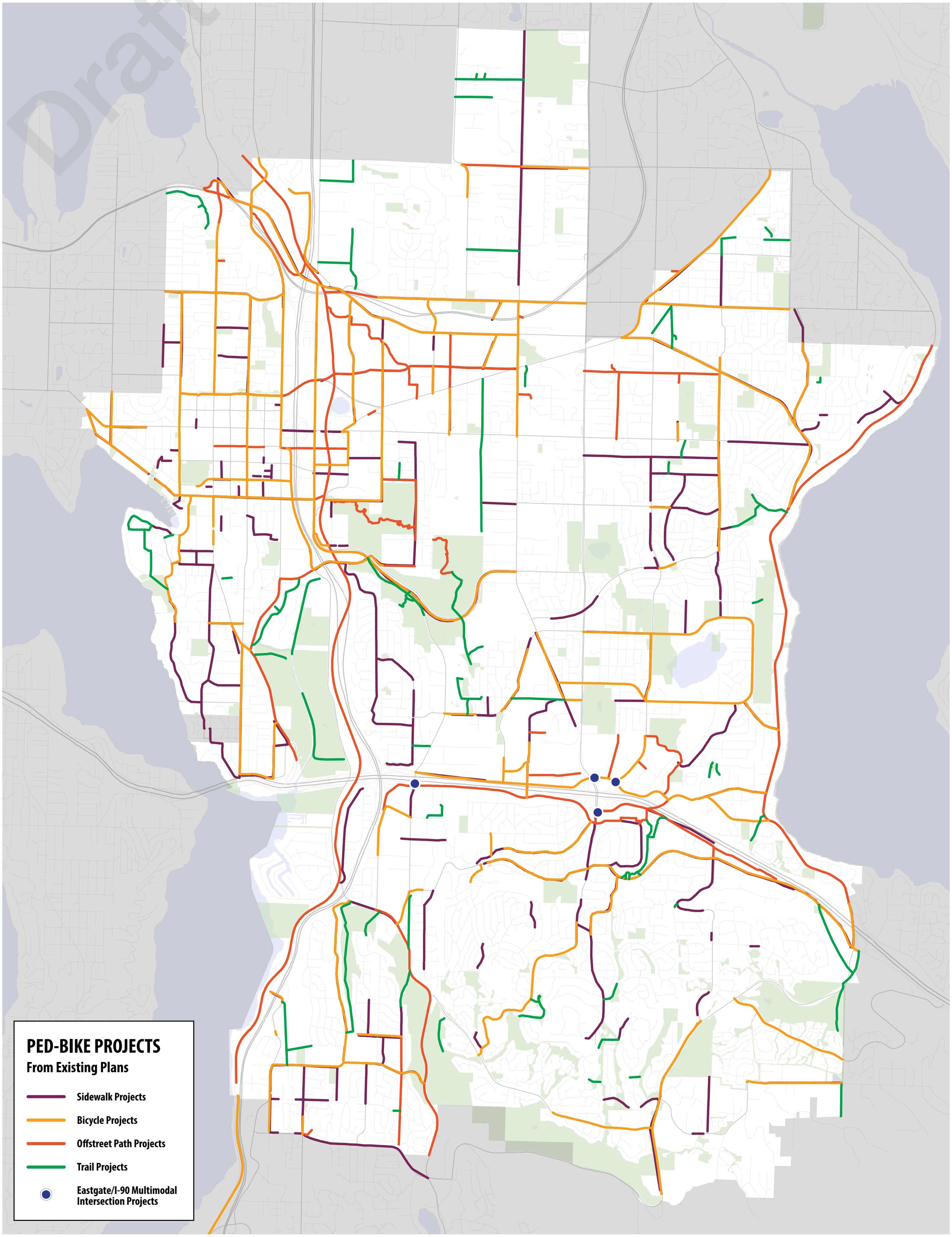
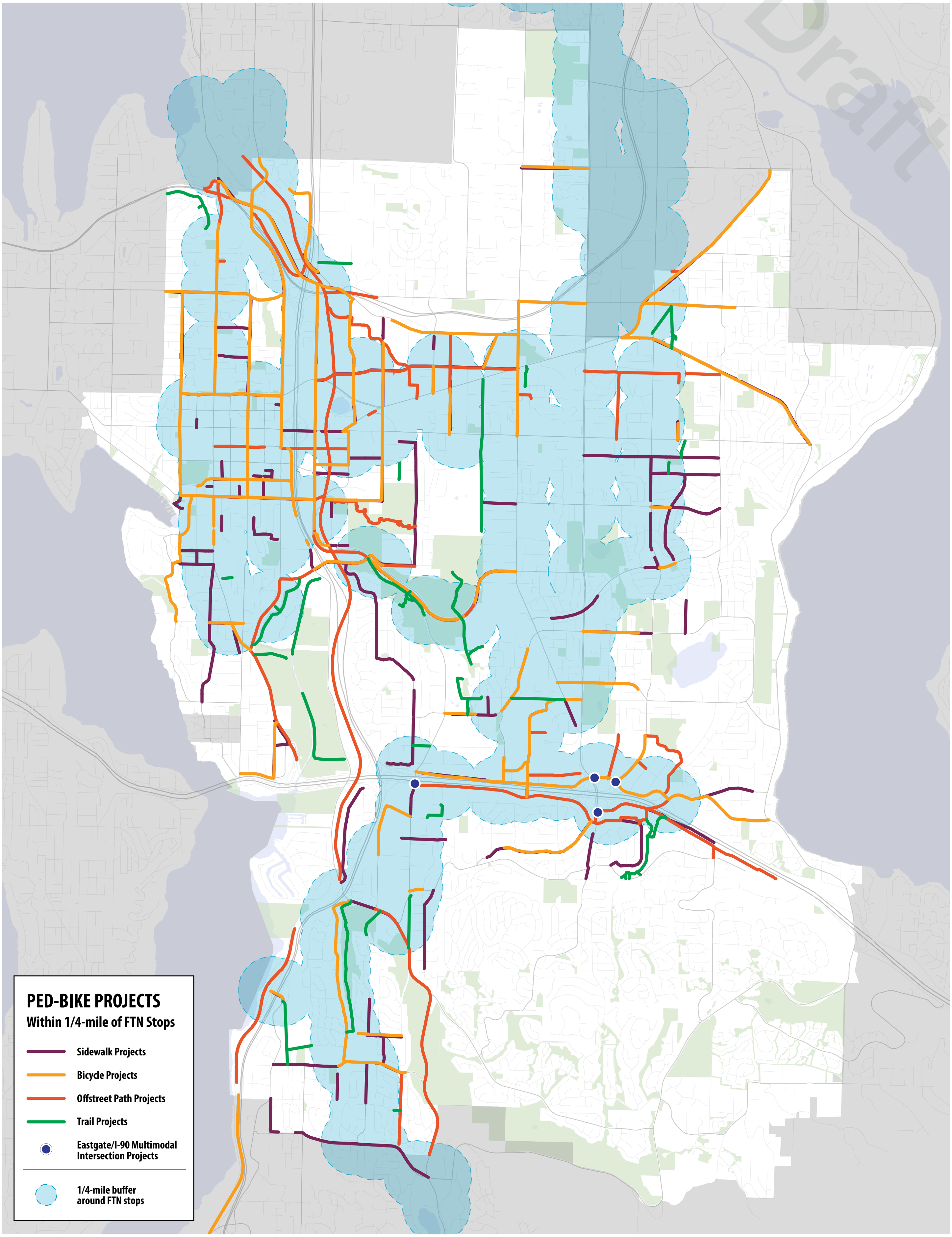


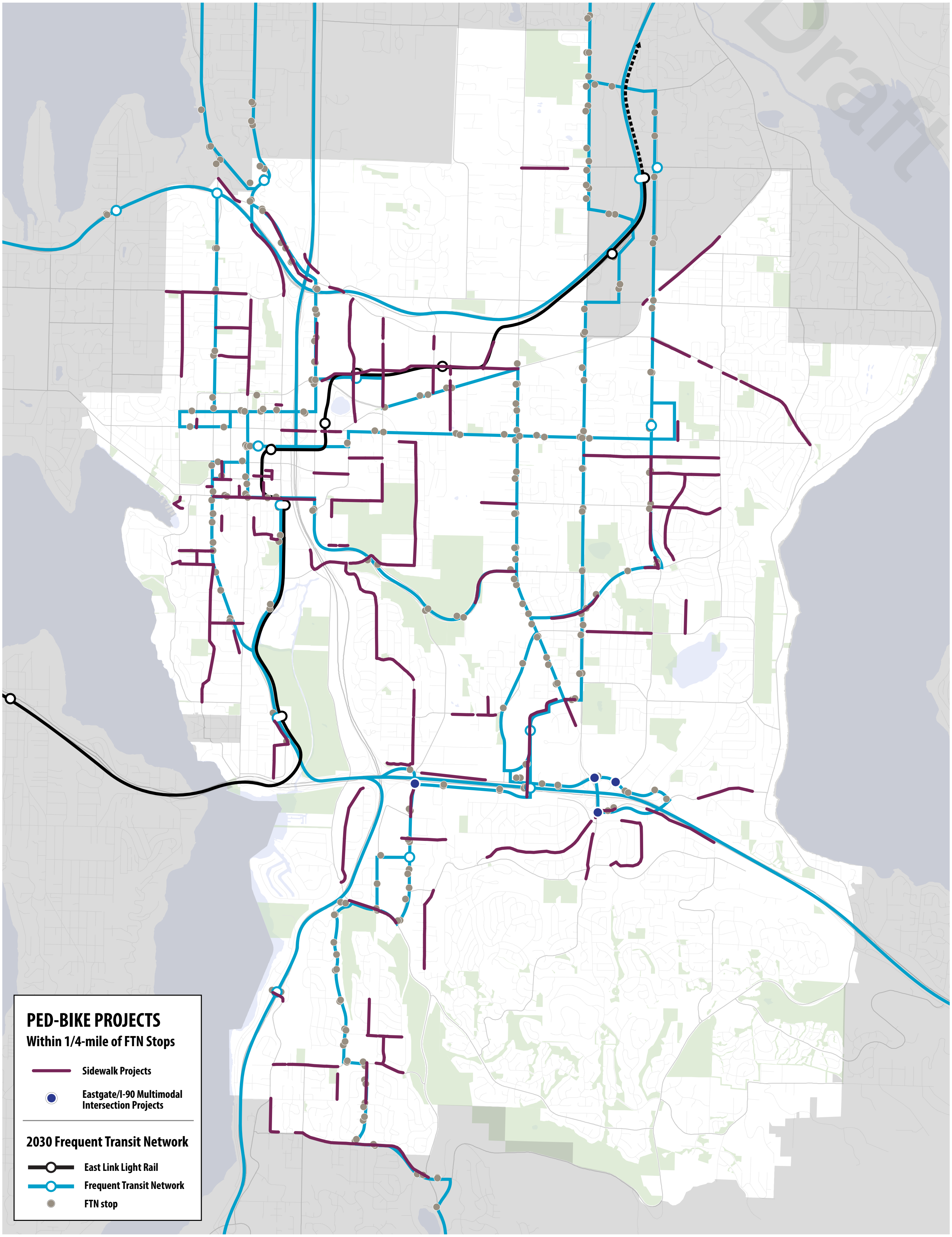
Figure 33 Preliminary transit priority pedestrian and bicycle projects.



Sidewalk Projects

A summary of the transit priority sidewalk projects is forthcoming.

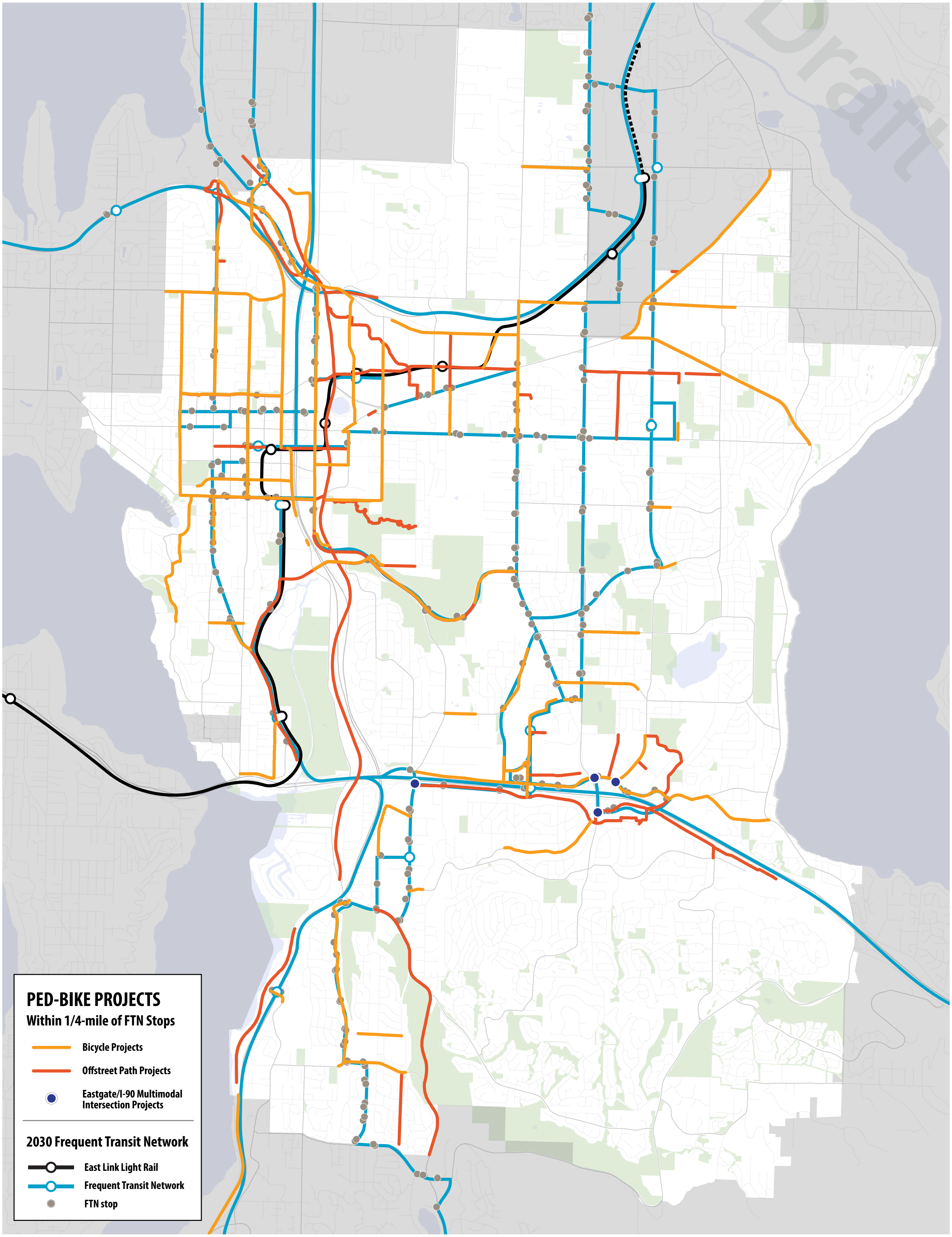
Figure 34 Preliminary transit priority sidewalk projects.



Bicycle and Offstreet Path Projects

A summary of the transit priority bicycle and offstreet path projects is forthcoming.

Figure 35 Preliminary transit priority bicycle and offstreet path projects.



Trail Projects

A summary of the transit priority trail projects is forthcoming.

Figure 36 Preliminary transit priority trail projects.

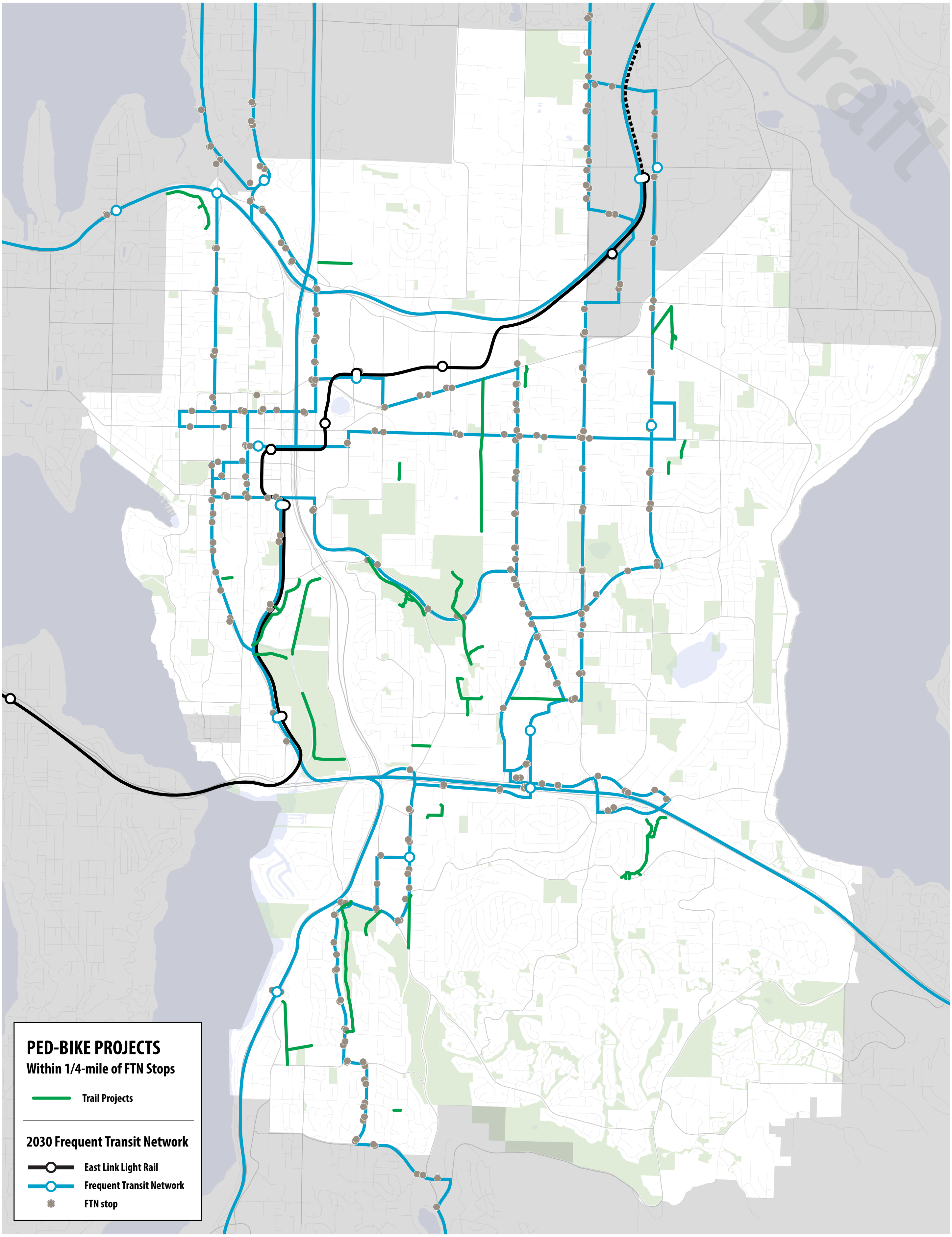


Table 6 Forecast (2030) populations in Bellevue with access to transit operating 15- and 30-minute frequencies.

Funding Scenario	2030 Employment Projection				Total Jobs
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	82.2%	93.3%	95.2%	98.6%	184,300
Stable	82.2%	89.8%	95.2%	97.2%	
Reduced	82.2%	82.2%	95.2%	95.2%	

Funding Scenario	2030 Households Projection				Total HH
	Quarter-Mile		Quarter-Mile		
	15-min	30-min	15-min	30-min	
Growing	58.1%	76.6%	75.4%	91.3%	70,300
Stable	57.7%	68.5%	75.3%	85.4%	
Reduced	57.8%	57.8%	75.3%	75.5%	

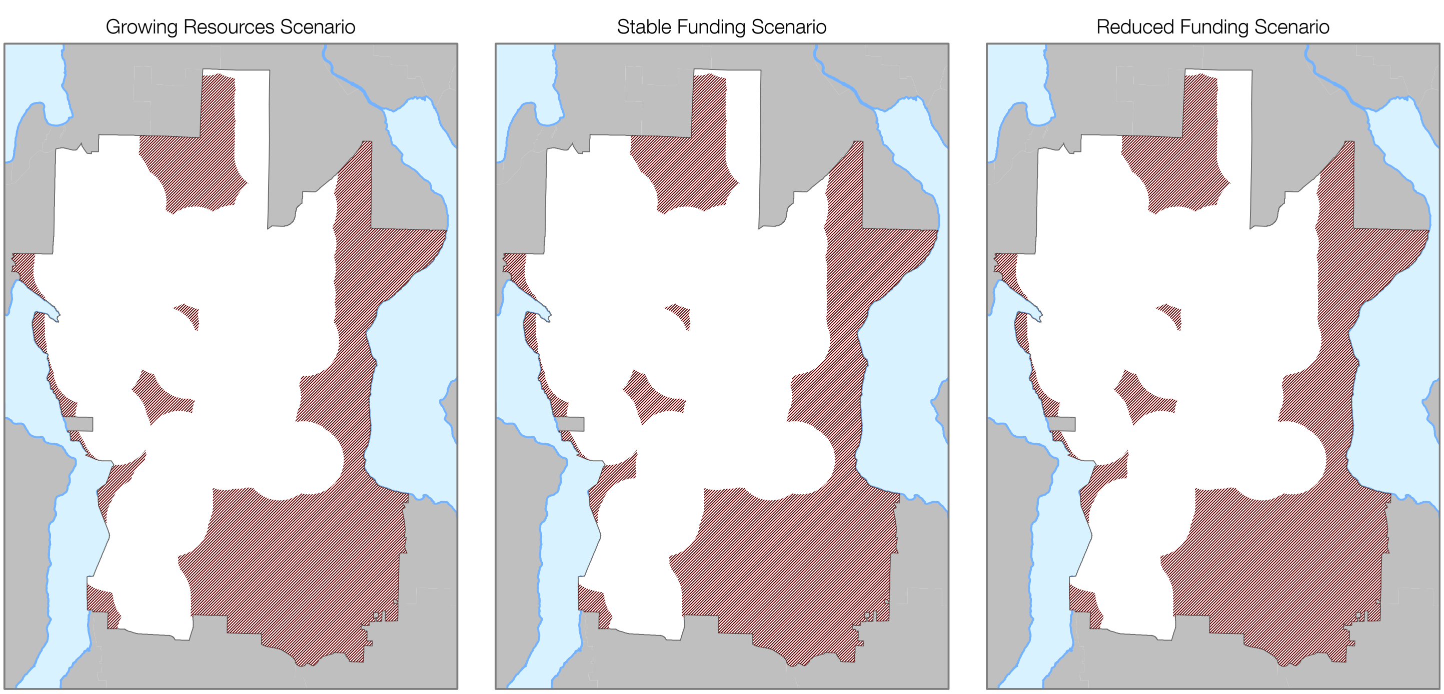
Funding Scenario	2030 Population Projection				Total Pop
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	51.2%	72.6%	69.9%	89.3%	157,400
Stable	50.9%	63.2%	69.8%	82.1%	
Reduced	50.9%	51.0%	69.8%	70.0%	

2030 FTN ACCESS

For the purposes of a preliminary assessment of transit network accessibility, areas with access reflect those highlighted in Figure 37 below (reproduced from page 74 of the *Transit Service Vision Report*). White areas in the map are within one radial quarter-mile of a bus stop served by one or more 2030 Frequent Transit Network (FTN) routes, which are those routes operating 15-minute headways or better all day. This network service area was also used to begin prioritizing pedestrian and bicycle projects from the perspective of transit, a process addressed later in this section.

Figure 38 on page 49 is expanded to also include quarter-mile radii around Coverage services (Routes 31-36), which are those routes that operate infrequently (every 30 minutes). The Service Vision Report also presented access maps for half-mile radii around FTN and Coverage service bus stops. Although further than many riders who choose to use transit may be willing to walk, a half-mile remains a reasonable service distance to provide for those who depend on transit for some or all of their personal mobility needs.

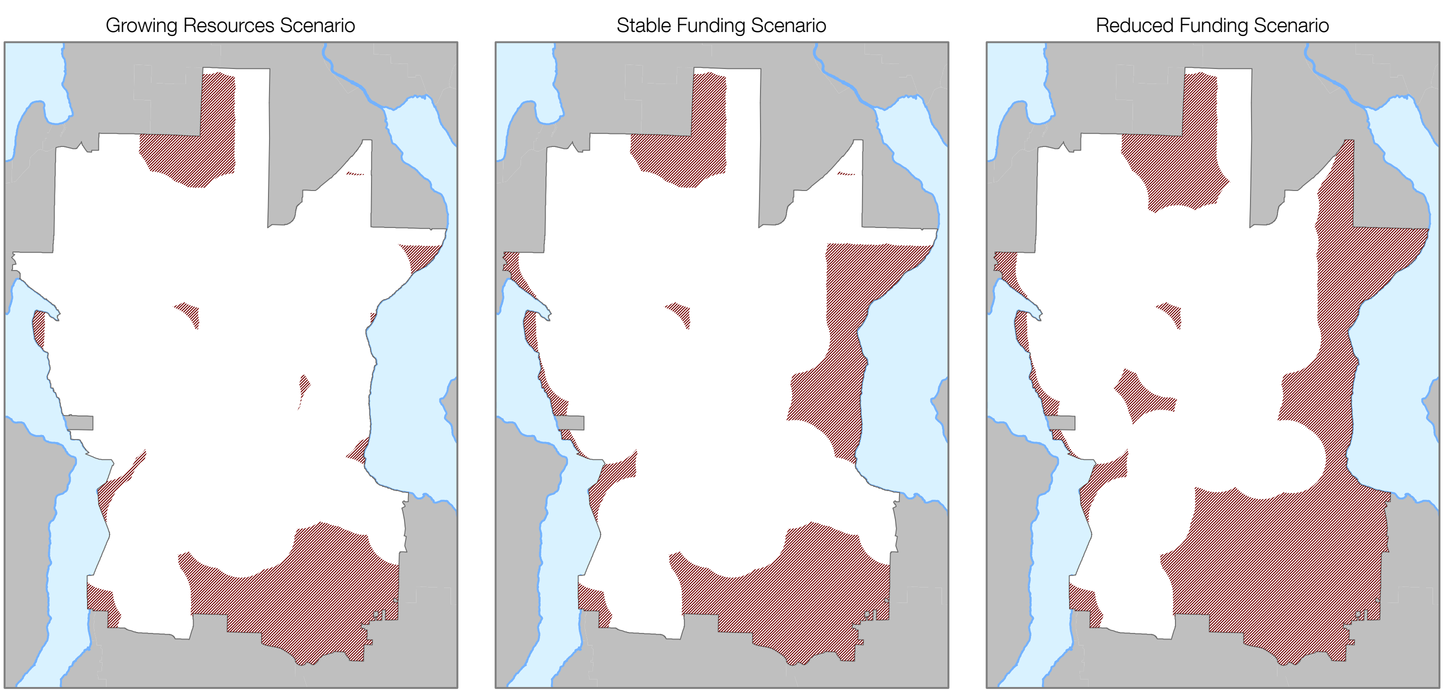
Figure 37 Access to transit in Bellevue within one-half mile of 15-minute or better service on weekdays (proposed 2030).



Accessibility Analysis Method and Data Notes:

Model output from the Puget Sound Regional Council's (PSRC) UrbanSim model for employment, households, and household population in 2030 was obtained and reviewed by Bellevue's Planning and Community Development department. Employment and household figures were adjusted upward for the forecast zone containing the Eastgate subarea by a factor of approximately 1.106 and 1.158, respectively, to better reflect policies in the Eastgate Subarea Plan. Household population figures in the forecast zone containing Downtown Bellevue were adjusted down by a factor of approximately 0.921 to account for the smaller household size that is typical within Downtown.

Figure 38 Access to transit in Bellevue within one-half mile of 30-minute or better service on weekdays (proposed 2030).

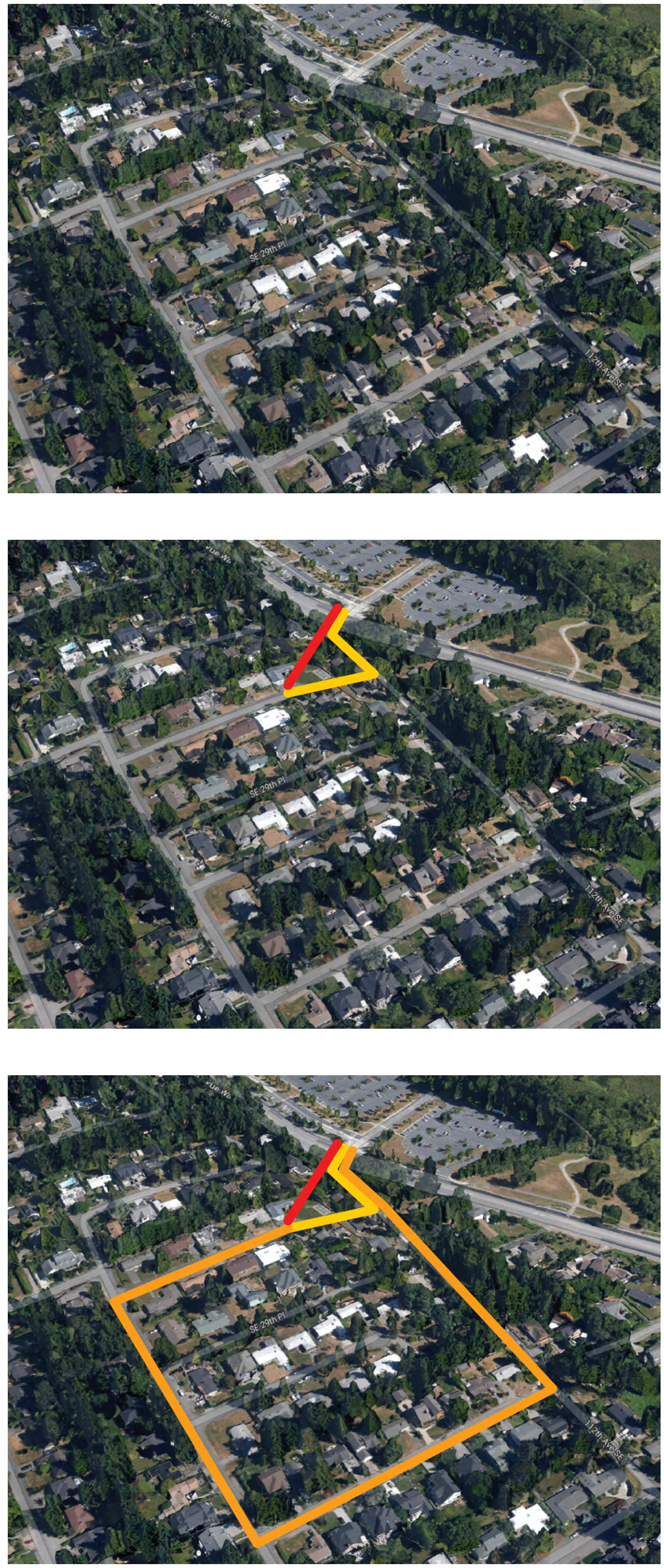


NETWORK ANALYSIS

Description of this analysis is forthcoming.

Figure 39 The SE 28th Pl stairs to 112th Ave NE . Imagery from Google Maps.

Figure 40 The SE 28th Pl stairs to 112th Ave NE dramatically reduce the distance for portions of the Enatai neighborhood. Imagery from Google Maps.



This page intentionally left blank.

SECTION 3:
THE TRANSIT STOP

BACKGROUND

"The bus stop is the first point of contact between the passenger and the bus service. The spacing, location, design, and operation of bus stops significantly influence transit system performance and customer satisfaction."

- Transportation Research Board, *Guidelines for the Location and Design of Bus Stops* (1996: 1)

As noted in the previous section, bus systems are comprised of access and transit service networks, and the transit stop serves as the connecting points between these two. The efficient placement of bus stops near major destinations with well-connected pedestrian and bicycle facilities helps to provide communities with viable transportation choices by making the entire transit trip shorter and more pleasant. Also important to the ability of transit to attract ridership is the quality and comfort of the transit stop and its environment.

The Transit Master Plan (TMP) will not make specific recommendations about bus stop locations for the route networks defined in the *Transit Service Vision Report*. That document provides general stop spacing guidelines based on the various service types defined, and for the purposes of conducting stop-related analyses, some preliminary assumptions have been made about which stops may be served by those networks. However, the elimination of existing stops and siting of new stops requires specific consideration of a variety of factors including existing boarding and alighting patterns at a given stop and others nearby, right-of-way availability, impacts to other traffic, and implications to accessibility. Such analyses will be conducted in the future as implementation planning for the proposed route structures begins.

Instead, this section focuses on three other subjects related to the transit stop:

1. Bus stop amenities
2. Commuter parking
3. Bus layover

The first two of these subjects relate primarily to how transit users experience their first point of contact with the transit system. As shown in Figure 41, these are issues of particular interest to current transit users in Bellevue. Individually, the provision of real-time bus arrival and schedule and wayfinding information ranked as the second- and fourth-highest priorities for municipal investment in transit, respectively, but together, these investments in improving the information provided at bus stops rank as respondents' most-cited priority. Increasing the capacity of vehicle parking at park-and-ride lots was the third most commonly-cited priority for municipal investment, and while the City does not build or maintain its own parking facilities for transit users, it can help to facilitate partnerships with other local organizations that have a surplus of underutilized parking to permit use of those facilities for park-and-ride purposes.

While the first two subjects addressed in this section are user-centric, the third subject—bus layover—deals with operational considerations. The layover, or amount of time between the end of one trip and the start of the next trip, requires that space be provided at transit facilities or designated along nearby streets or parking lots for transit vehicles to park while not in service. Inefficiencies result when vehicles must travel from their route terminal to reach the layover location. Understanding how much layover space will be required and where that space can most efficiently be accommodated can help to ensure that the scarce regional transit resources allocated to Bellevue are used to provide service to passengers, not lost to operational inefficiencies.

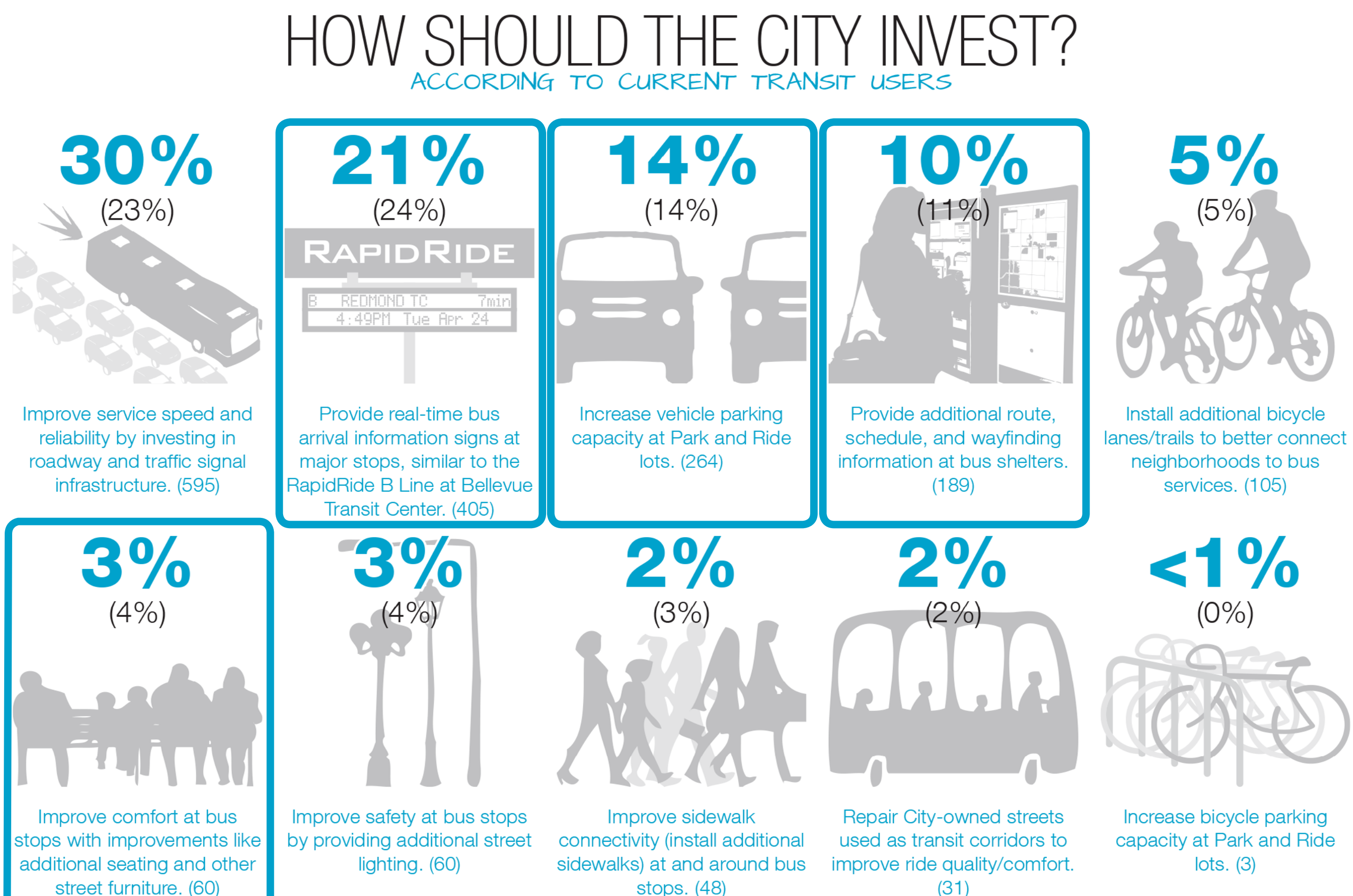


Figure 41 Priorities for municipal investment in transit among those who currently use transit services in Bellevue.

BUS STOP AMENITIES

Waiting area amenities increase the convenience, comfort, safety, and usefulness of bus stops and influence the overall attractiveness of public transportation. Stop locations that are designed with paved waiting pads, shelters, benches, lighting, windbreaks, route information, trash bins, bicycle racks, and, in some cases, off-board pay stations and real-time arrival information make bus stops more hospitable places to be. While frequent services help to reduce the amount of time transit users will typically have to wait at a bus stop, waiting area amenities can make for a more pleasant experience, regardless of how long or short the wait.

Although a form of public space that few would consider a destination unto itself, thousands of people spend time standing or sitting at bus stops every day. So to the extent possible, stops should be designed with the same care and attention to user experience as other more esteemed aspects of the public realm. However, unlike other public amenities like parks and plazas, bus stops are more numerous, scattered throughout much of the city, and despite being sited in widely varying urban and suburban contexts (e.g. along major urban arterials and in quiet residential neighborhoods), stops must remain similar enough to one another to be easily recognized as part of a coherent network. However, given scarce resources and investments in improving waiting areas should be targeted to locations that demonstrate a particular need.

Figure 42 Stop-level daily boardings and alightings (ons/offs) in Spring 2013.

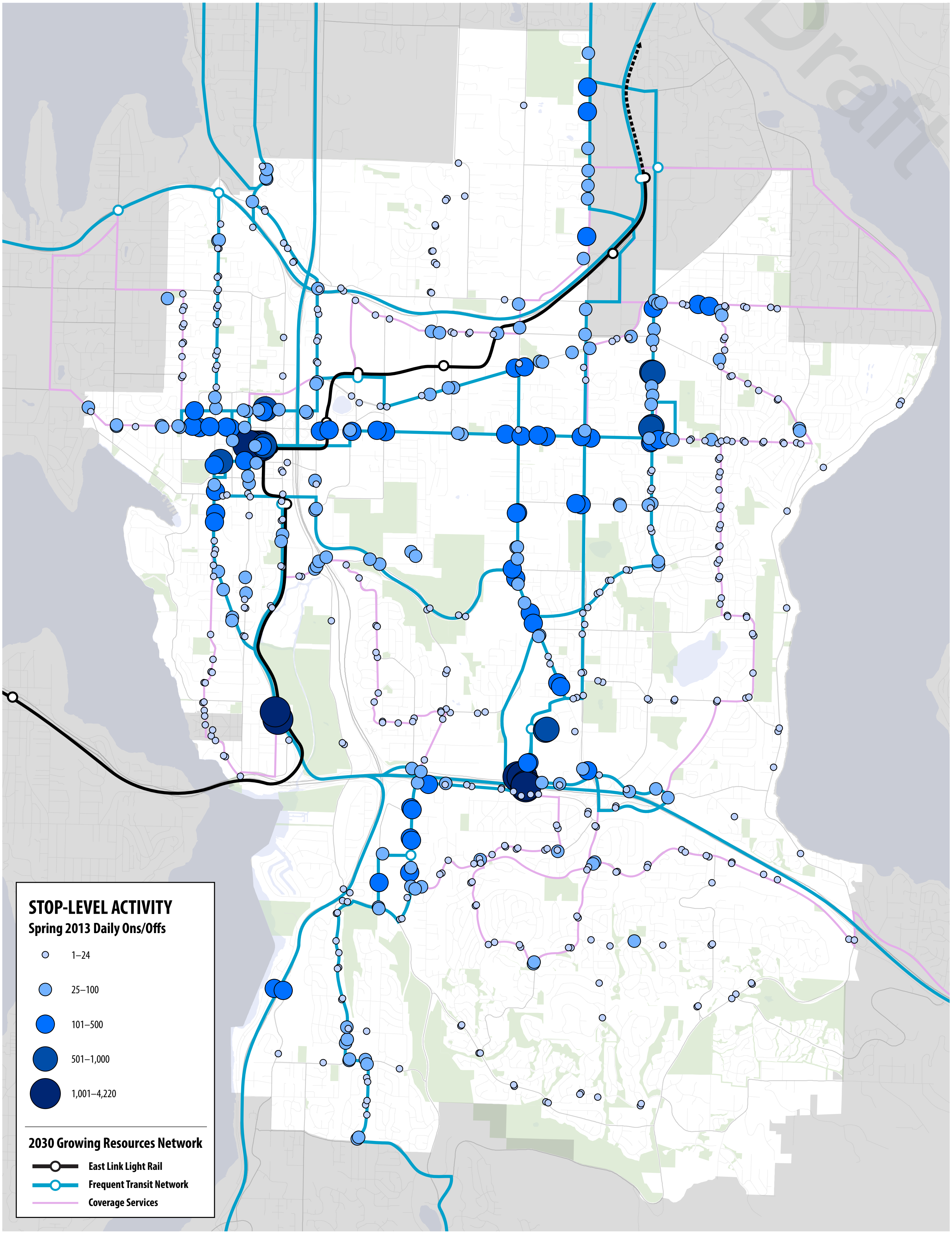


Figure 43 Most bus shelters in Bellevue are similar to these, which may include benches and murals reflective of the surrounding neighborhood.

Figure 44 Stops served by RapidRide lines throughout the King County Metro system are distinguished from other services by the style, materials, color of and amenities at stations and stops.

Figure 45 This stop on 108th Ave NE—Bay 1 of the Bellevue Transit Center—provides an example of a building awning providing shelter for pedestrians and waiting transit users alike.

Bus Shelters

The most fundamental of the various bus stop amenities is the bus shelter, which provides protection from the elements and seating. In areas where building frontages are adjacent to the sidewalk—most common in Downtown (see Figure 45) and other neighborhoods with mixed-use development—awnings can be designed to serve as waiting areas for transit users with built-in cover from the elements. In most other parts of the city, where the only overhead protection from the elements is likely to be the tree canopy, if any at all, free-standing bus shelters like those pictured in Figure 43 are typically used. Benches are often provided in these shelters, and the Metro Bus Shelter Mural Program offers communities an opportunity to paint shelter panels to reflect local character. All stations and stops in Metro's RapidRide network use a consistent shelter typology (see Figure 44) to clearly identify this enhanced service type from those that serve standard bus stops.

Several factors influence the determination of need for various stop amenities. For stop shelters, the primary consideration is stop-level passenger activity. King County Metro's bus shelter warrant standard requires shelters to be installed at stops with 25 or more average daily boardings. Figure 42 depicts the number of stop-level daily boardings and alightings (ons/offs) at all bus stops served in Bellevue in Spring 2013. The 2030 Growing Resources network is shown in the background for reference, as investments in shelters should be targeted to stops that will continue to be served as the network evolves in the coming years. However, while passenger activity is the primary consideration, other factors may also warrant installation of a bus shelter in the absense of high ridership. For example, stops with nearby healthcare facilities or services oriented toward older adults, rapidly growing areas, or areas that are particularly vulnerable to the elements, such as

Figure 46 Bus stops warranting shelters based on Spring 2013 stop-level boardings and alightings (ons/offs).

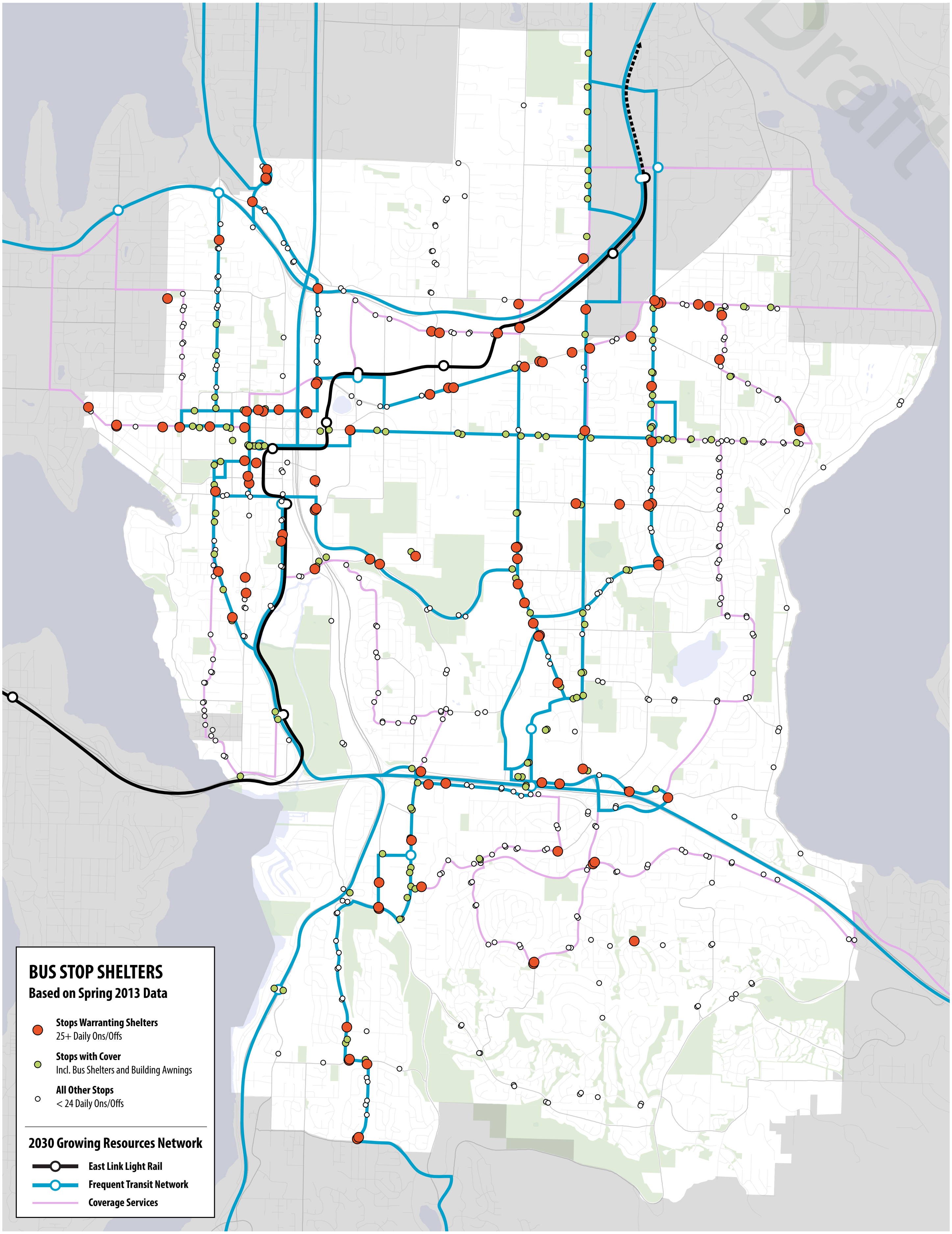


Figure 49 Major stops like the Eastgate Freeway Station provide riders with more information than standard bus stops, including more comprehensive schedule information and route maps.

Figure 47 Real-time arrival information signboard installed by King County Metro at the Bellevue Transit Center for RapidRide B Line service.

Figure 48 A digital signboard in Downtown Seattle, funded and installed by the Seattle DOT, displaying real-time arrival information from OneBusAway.

highway overpasses (e.g. 142nd Pl SE) may indicate a need for targeted investment to improve passenger comfort and encourage additional transit use.

In general, all new bus stops should be constructed with sufficient space to accommodate a standard bus shelter and bench, even if these are not installed when service to the stop begins. However, some existing bus stop locations may not have been established with this standard in mind. It is therefore possible that some stops that serve a sufficient number of daily boardings to warrant a shelter cannot have one installed due to limited available right-of-way.

Schedule Information

Although shelters are the amenity with the most readily apparent impact on the transit user's experience while waiting at the bus stop, other features that improve comfort, convenience, and information can also contribute to passengers' decision to use transit instead of traveling by some other mode. According to current transit users who completed the Transit Improvement Survey in early 2012, the most highly-valued of these other amenities relate to the provision of schedule information. When asked how the City should invest municipal resources to improve transit in Bellevue, 21 percent indicated that real-time bus arrival information should be provided at major stops, similar to that available for the RapidRide B Line at the Bellevue Transit Center (see Figure 47) and other stations along that route. Although King County Metro currently has no plans to implement this feature more broadly at standard bus stops throughout its service network, precedent exists in the region for municipalities to pursue such investments on their own.

Thanks to technological advances and the increased availability of data in recent years, software like OneBusAway allows users to track upcoming bus arrivals in real-time from any internet-connected home computer or mobile device. For transit users on the go with compatible cell phones or tablets, this free software helps to reduce the actual and perceived amount of time spent waiting at a bus stop and the perception of transit service reliability. However, those without such devices must continue to rely on posted schedules at all non-RapidRide stops in Bellevue. In Seattle, the Department of Transportation has installed digital monitors in downtown storefront windows adjacent to several high passenger activity bus stops that display real-time arrival data for all routes serving those stops (see Figure 48).

At this time, the City of Bellevue has not yet adopted plans or allocated capital improvement funds to embark on a similar program. However, given sufficient community interest, available resources, and willing business property owners, the opportunity exists for the City to pursue such investments at costs many times less than most other transit infrastructure improvements.

COMMUTER PARKING

BACKGROUND

Commuter parking facilities play an important role in concentrating transit rider demand, often in lower-density areas that would otherwise be unable to support frequent services. These facilities provide convenient access to transit via automobile or bicycle for people who do not live within convenient walking distance of a standard bus stop. Park-and-ride facilities also serve as a meeting place for carpool and vanpool partners.

As the regional inventory of housing and employment grows, the demand for roadway capacity increases. Because roadway capacity and the ability to expand roadways is limited, park-and-ride lots provide an important amenity that supports the use of alternatives to the single-occupant vehicle, thereby requiring less overall roadway capacity. Further, by concentrating transit boardings at a single point, a more frequent level of service can be supported. This section reviews commuter parking demand assessments for the I-405 and I-90 corridors and considers this demand in light of existing parking facilities. This analysis predicts that if a transit network were established that is consistent with the Growing Resources Scenario depicted in Bellevue's *Transit Service Vision Report*, then there would be an undersupply of parking stalls available along the two study corridors serving Bellevue, I-405 and I-90. If an unlimited supply of parking were available along each of the corridors, the I-90 corridor would be short by approximately 6,300 park-and-ride stalls, and the I-405 corridor would be short by approximately 4,600 stalls.

An assessment of commuter parking facility needs is long overdue. Although King County Metro publishes *quarterly reports* detailing the utilization

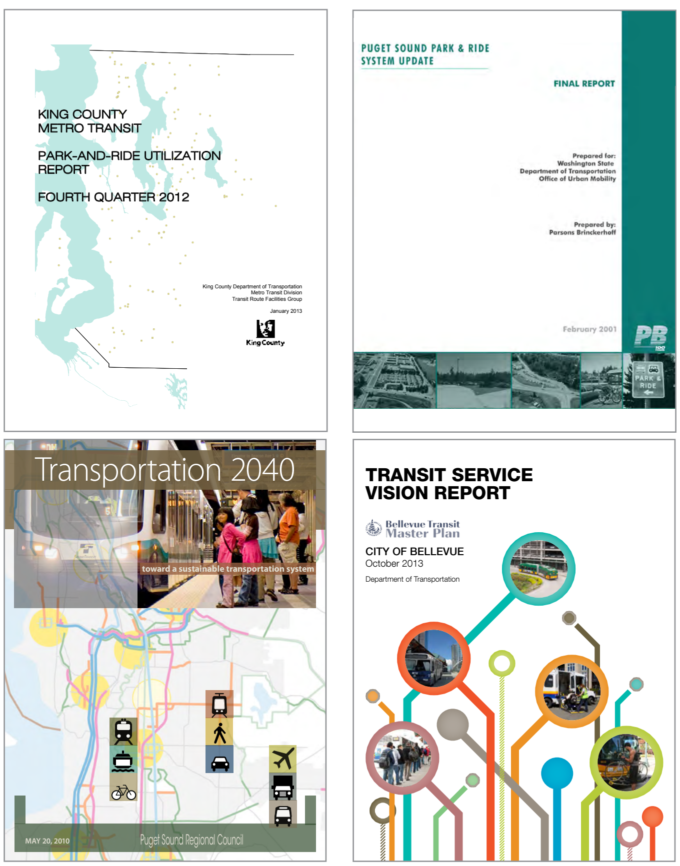


Figure 50 King County Metro publishes *Park-and-Ride Utilization Reports* (top left) quarterly, while the *Puget Sound Park & Ride System Update* (top right) by WSDOT is the last study reporting on the regional demand for park-and-ride capacity. PSRC's *Transportation 2040* (bottom left) and the TMP's *Transit Service Vision Report* (bottom right) also provide context for this report's assessment of park-and-ride capacity in Bellevue.

of all 131 park-and-ride facilities operating in the Metro service area, regional needs were last studied in 2001 when the Washington State Department of Transportation (WSDOT) conducted a study of park-and-ride lots in King, Pierce, Snohomish, and Kitsap Counties (Parsons Brinckerhoff 2001). This *Puget Sound Park & Ride System Update* recommended that commuter parking needs should be reassessed every five to ten years to maintain their usefulness as a planning tool. The Puget Sound Regional Council (PSRC) also stated in *Transportation 2040* that transit agencies, WSDOT, and PSRC all recognize the need to re-examine the region's commuter parking strategy.

This section analyzes capacity, use, and projected demand data for park-and-ride lots along two corridors: I-405 and I-90, as defined by the 2001 WSDOT study. Consistent with the *Bellevue Transit Master Plan*, the planning horizon for this study is through 2030, and projected demand is based on the transit network proposed by the 2030 Growing Resources scenario in Bellevue's Transit Service Vision Report. This assumes an increase in transit service of about 47 percent from Spring 2012 to accommodate the projected near tripling of transit demand by 2030.

"For those of us who commute into Downtown Seattle, it isn't very realistic to catch the bus from our neighborhoods and transfer. So we depend upon the Park and Rides. It is therefore crucial that adequate parking spaces be provided at the Park and Rides in order for Bellevue residents to use transit for commuting."

-Sarah, Work and Special Event Transit User Resident of Bellevue[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

CONTEXT

Comprehensive Plan Policies

In recognition of the important role of commuter parking facilities in providing local and regional access to transit, consolidating demand for service, and reducing vehicle trips and traffic congestion, the City of Bellevue *Comprehensive Plan* includes several policies related to commuter parking facilities. The City is dedicated to providing effective commuter parking options and to working in partnership with transit providers and the State to increase capacity as needed by expanding existing facilities, developing additional facilities, and pursuing lot lease agreements with other local entities.

POLICY TR-53. Work with transit providers to maintain and improve public transportation services to meet employer and employee needs. Develop and implement attractive transit commuter options, such as park and ride facilities and local shuttle systems with sufficient frequencies to increase use of transit for commuting and reduce reliance on private automobiles.

POLICY TR-62. Work to ensure that the regional transit system includes park and ride lots to serve activity centers in the region and on the Eastside to:

1. Intercept trips by single occupant vehicles closer to the trip origins;
2. Reduce traffic congestion; and
3. Reduce total vehicle miles traveled

POLICY TR-64. Encourage transit providers and the state to provide new and expanded park and ride lots to adequately serve city residents and to develop additional capacity outside Bellevue at other strategic Eastside locations to serve outlying residents.

Figure 51 With more than 1,600 stalls, Eastgate Park-and-Ride concentrates ridership, thereby facilitating service by multiple transit routes that provide more frequent service than would otherwise be possible in the surrounding area.

POLICY TR-65. Work with transit providers and local property owners to develop new leased park and ride lots.

POLICY TR-75.27. Provide reliable access to the system for Bellevue residents in cooperation with local and regional transit providers, by ensuring that adequate existing and new park and ride lot capacity, neighborhood bus connections and local and regional express bus services are available.

POLICY TR-75.30. Evaluate proposed new park and ride facilities and expansion of existing park and ride facilities to serve light rail transit, for their effectiveness to serve the community and the light rail system, and for their potential environmental and community impacts. New or expanded park and ride facilities should be consistent with the Comprehensive Plan vision for each specific location.

Community Input

The Bellevue Transit Master Plan provides insight into the value of commuter parking facilities in relation to other components of the transit system. In particular, the Bellevue *Transit Improvement Survey*, completed in October 2012, and the *Existing and Future Conditions Report*, completed in August 2013, provide context about the issue of commuter parking in Bellevue in terms of their use and perceived value.

According to the Bellevue Transit Improvement Survey, investment in park-and-ride facilities is the third highest ranked priority among ten alternative municipal investment options. (see Figure 52). However, investment in speed and reliability infrastructure and the provision of real-time information are ranked as higher priorities.

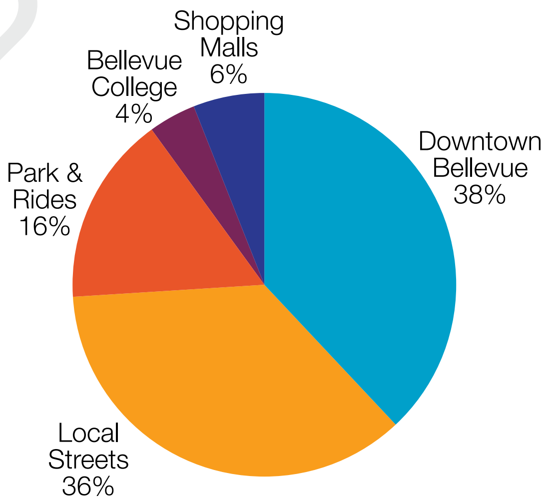
"...[M]ore parking needs to be made available at Park-and-Ride lots to enable more users to ride the buses. I would utilize bus service more if there was a safe place and convenient place for me to park my car!"

-Michelle, Non-Rider

Resident of Snohomish[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

Figure 53 Transit use patterns in Bellevue based on Fall 2011 boarding and alighting (on/off) data.



While park-and-ride lots are clearly an important amenity supporting transit use in Bellevue, the *Existing and Future Conditions Report* indicates that the majority of people riding transit in Bellevue access bus service at other types of facilities (Figure 51). In Fall 2011, about 38 percent (15,408/27,889) of daily ons/offs took place in Downtown Bellevue, including at the transit center; about 36 percent (14,523/27,889) occurred on local streets outside of Downtown Bellevue; and park-and-ride facilities, including Eastgate (2,166), South Bellevue (1,588), Newport Hills (281), Wilburton (51), and the Eastgate Direct Access Ramp (2,270), collectively accounted for about 16 percent of daily boardings and alightings.

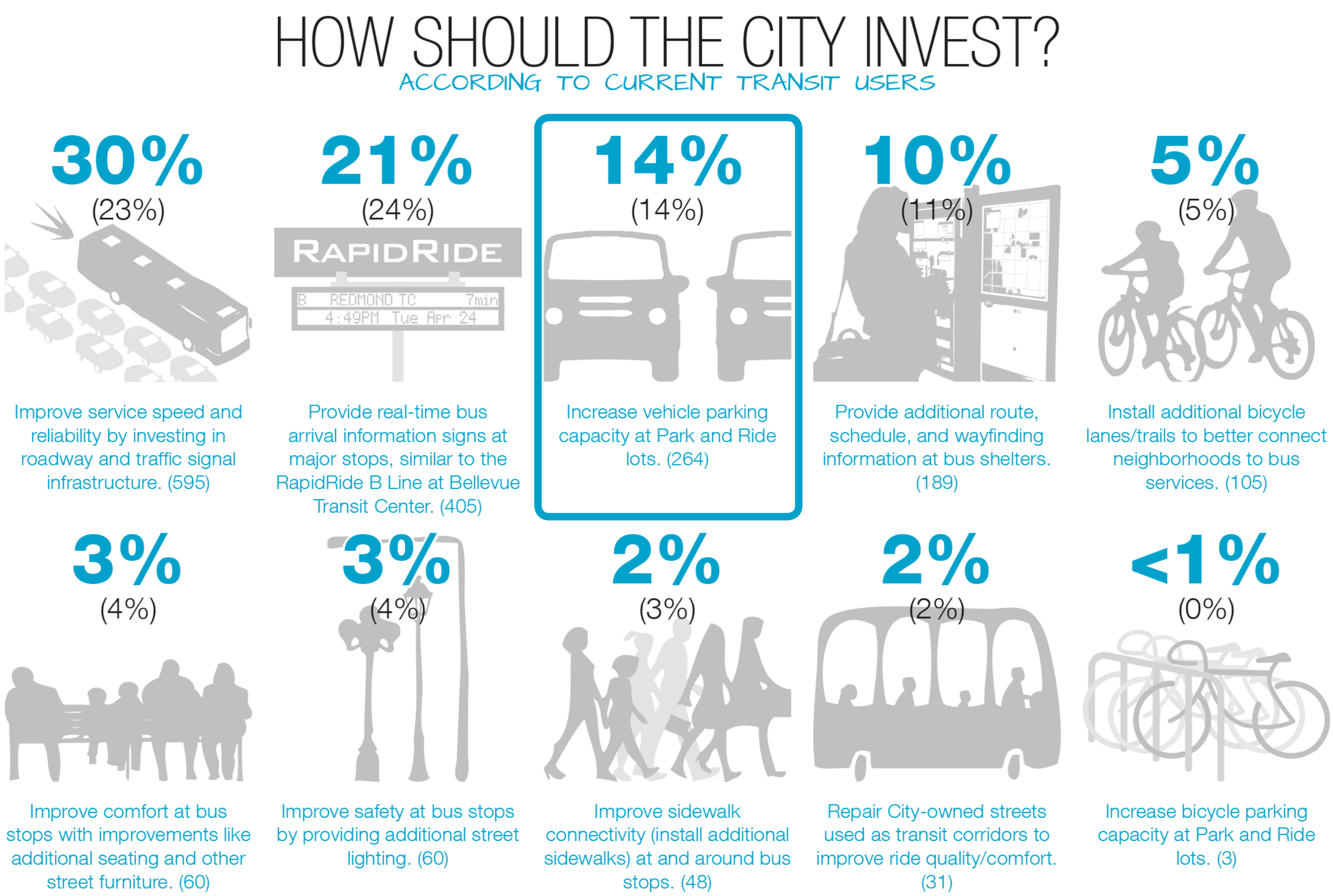


Figure 52 According to the Bellevue Transit Improvement Survey, transit users requested park-and-ride improvements as the third most common response. This illustration shows the percent of all survey respondents who select each potential improvement (large blue numbers), the percent of Bellevue only respondents who select the improvement (black numbers below in parentheses), and the total number of respondents (in parentheses following each blue description).

PARK-AND-RIDE USE

For the purpose of this report, park-and-ride usage is measured by corridor, which were first established by WSDOT's 2001 *Puget Sound Park & Ride System Update* (Parsons Brinkerhoff, 2001). Corridors provide organizational structure to the existing park-and-ride lots. Capacity needs for park-and-ride lots are considered in general—not in a lot-specific sense—allowing for more flexibility in analyzing the findings and in developing solutions.

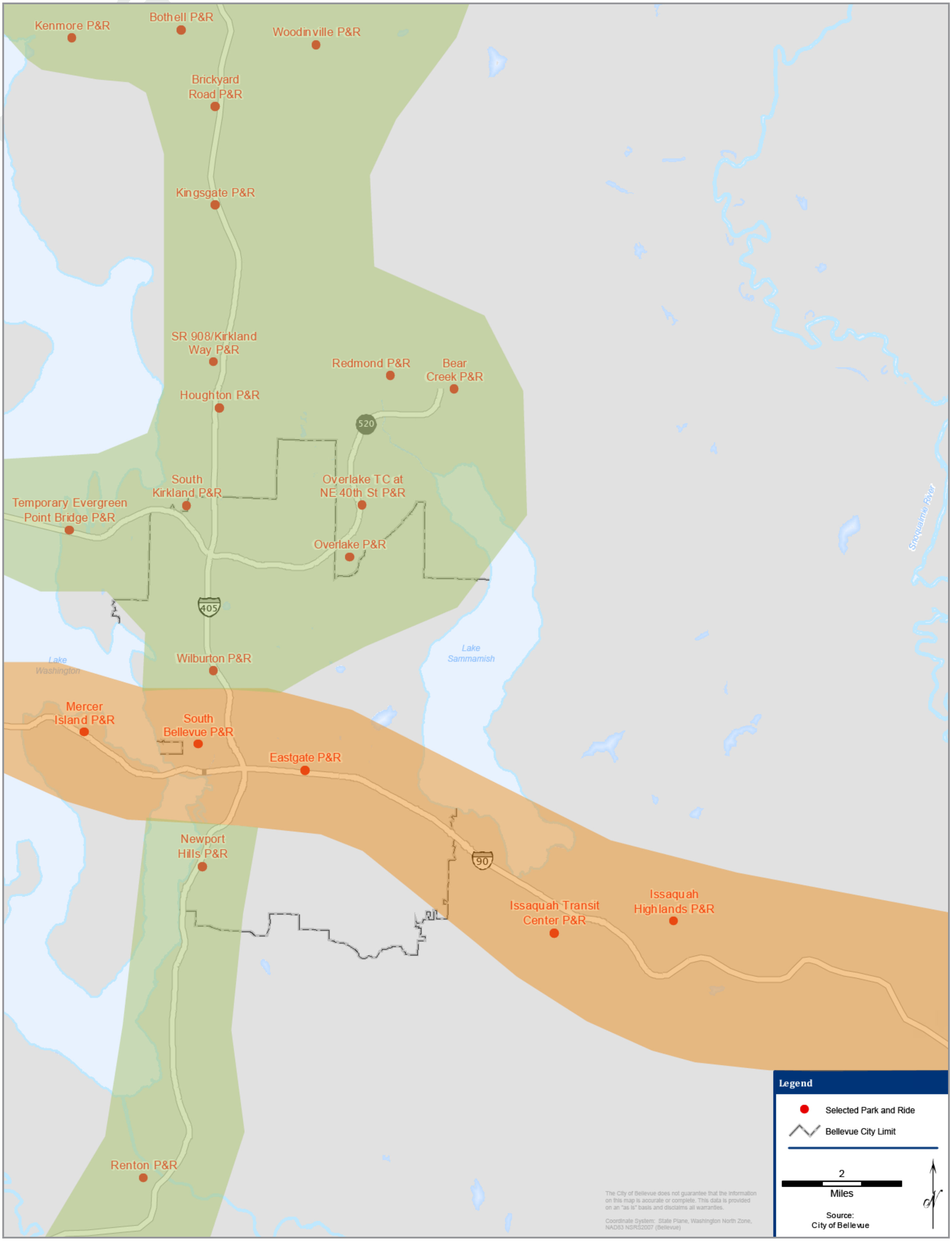
Corridor-level analysis allows for the capture of both local park-and-ride demand and demand that may be shifting between facilities within the corridor. Shifts between facilities, called "lot substitutions," are caused when a transit rider travels further, or in some conditions a short distance in the direction opposite of their destination, to reach a lot with more favorable conditions. These favorable conditions often include higher frequency services, a wider range of destinations, or more parking lot capacity. Lot substitution is observed in Bellevue where transit riders pass park-and-ride lots closer to their homes in favor of parking at the South Bellevue Park-and-Ride, where faster and more frequent service is available. The map in Figure 54 on page 68 depict lots representing the corridor broadly defined by I-405 in green and those within the I-90 corridor are shown in orange. This map shows Bellevue and its surroundings with selected park-and-ride lots located within the identified corridors.

A review of park-and-ride usage in the Puget Sound Region over the past ten years reveals two trends. First, there is an uneven regional distribution of park-and-ride use. Several lots east of Bellevue and/or an inconvenient distance from the Frequent Transit Network (FTN) are under-capacity, while several lots in western Bellevue such as the South Bellevue Park-and-Ride are over-capacity, as shown by the images in Figure 55. This imbalance of lot usage indicates that

"Park and Rides are full in Bothell and Lynnwood very early - doesn't align with school schedules"
-Elesa, Non-Rider
Resident of Bothell[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

Figure 54 Park-and-ride lots in the I-405 (green) and I-90 (orange) corridors.



lot location in relationship to the FTN is an important factor to consider when siting new facilities.

Figure 56 on page 70 presents a trend of increasing utilization of park-and-ride lots. Overall usage of park-and-ride lots in both corridors increased from 5,375 to 8,779 stalls used daily between 2000 and 2013, a 63 percent increase. An analysis by corridor reveals that park-and-ride usage rose by 128 percent (2,497 vehicles) for the I-90 corridor from 2000 to 2013, and usage in the I-405 corridor rose by 26 percent (907 vehicles) over the same period. Refer to Appendix 1 on page A192 for the complete associated data. Contributing to this increased use is the construction of the new 1,600-stall Eastgate Park-and-Ride facility in 2005. The 2013 opening of a 525-stall parking garage at the South Kirkland Park-and-Ride facility is further increasing usage. As shown in Table 24 on page 168, there are a total of 3,377 park-and-ride stalls and 351 leased lot stalls within Bellevue city limits as of December 2013. Occupancy rates for leased lots vary considerably among Metro's quarterly utilization reports.

Park-and-ride usage in Bellevue varies by the size and location of the lot. Two of the most popular lots are profiled in the appendices of this report: South Bellevue Park-and-Ride and Eastgate Park-and-Ride. The South Bellevue Park-and-Ride is a surface parking lot with a 519-stall capacity. It is heavily utilized, especially by users originating a great distance from the lot. 44% of all users commute from a distance of greater than five miles from the lot.

The Eastgate Park-and-Ride is a five story parking structure with a capacity of 1,614 vehicles. The composition of the users of the Eastgate Park-and-Ride differ from those of the South Bellevue Park-and-Ride lot in that 52% of the users commuted between one and three miles to reach the lot. Additional information on the South Bellevue Park-and-Ride lot and the Eastgate Park-and-Ride lot may be found in Appendix 7 and Figure 113.

Figure 55 The South Bellevue Park-and-Ride is often over capacity, with vehicles parked along the shoulders of the driveway

2030 PARK-AND-RIDE USE

To quantify corridor-level park-and-ride demand under constrained and unconstrained conditions, forecasts for 2030 were developed based on the "Growing Resources Scenario" depicted in Bellevue's Transit Service Vision Report. Demand projections used the Bellevue-Kirkland-Redmond (BKR) Travel Demand Model (MP0r12), The demand for park-and-ride use in the I-90 and I-405 corridors is estimated using all standard assumptions in the model, except that the unconstrained demand estimates remove capacity as a constraint for all park-and-ride lots.

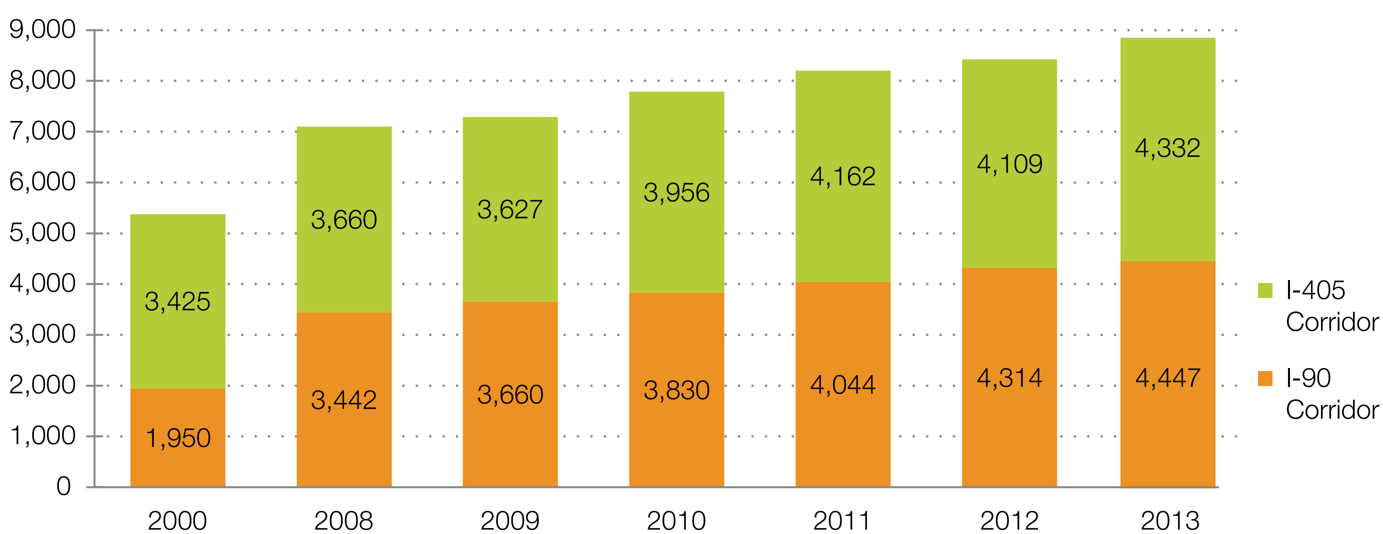
The following are standard assumptions and sources from the BKR Travel Demand Model:

- Baseline data is derived primarily from a regional survey conducted by the Puget Sound Regional Council (PSRC). This data is validated by census data and data from the PSRC regional household travel survey.
- The base-year model platform is updated annually to reflect changes in the land use and roadway network.
- The model is then validated with observed traffic counts and transit ridership on an annual basis.

Table 7 2013 park-and-ride and leased lot capacity and usage.

Park-and-Ride Facility	Lot Capacity	% Occupancy
Park-and-Ride Lots:		
Eastgate	1,614	99%
Newport Hills	275	84%
South Kirkland (Bellevue and Kirkland)	783	75%
South Bellevue	519	107%
Wilburton	186	87%
Total	**3,377**	
Leased Lots:		
Bellevue Christian Reformed Church	20	38%
Bellevue Foursquare Church	35	20%
Eastgate Congregational Church	20	100%
Grace Lutheran Church	50	100%
Newport Covenant Church	75	24%
Newport Hills Community Church	37	64%
St. Luke's Lutheran Church	30	18%
St. Andrew's Lutheran Church	20	63%
Total	**351**	

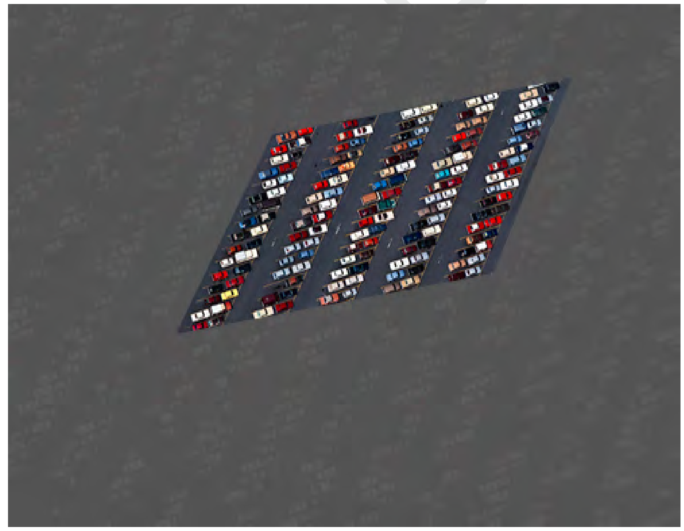
Figure 56 Historic fourth quarter utilization of park-and-ride facilities in the I-405 and I-90 corridors (King County Metro 2008 to 2013, Parsons Brinkerhoff 2001).



- As travel survey data becomes available, enhancements are made to the BKR base model to more accurately project travel demand.
- Trip assignments constrain transit capacity, and park-and-ride capacity typically constrains the mode split process.
- The same park-and-ride attractiveness factors are carried forward from the constrained demand projection to the unconstrained demand projection.
- Attractiveness factors include size and ratio of lot size to average lot size in the system, and these are represented by a proxy figure in the model. Characteristics of transit service quality, such as frequency of service at a given park-and-ride facility, are not specifically considered by the model.

Both constrained and unconstrained scenarios use the same set of assumptions but differ only in that the constrained scenario limits the parking capacity to the expected size of each lot and the unconstrained scenario places no limit to the number of available parking stalls. This concept is graphically illustrated by Figure 57.

Constrained



Unconstrained

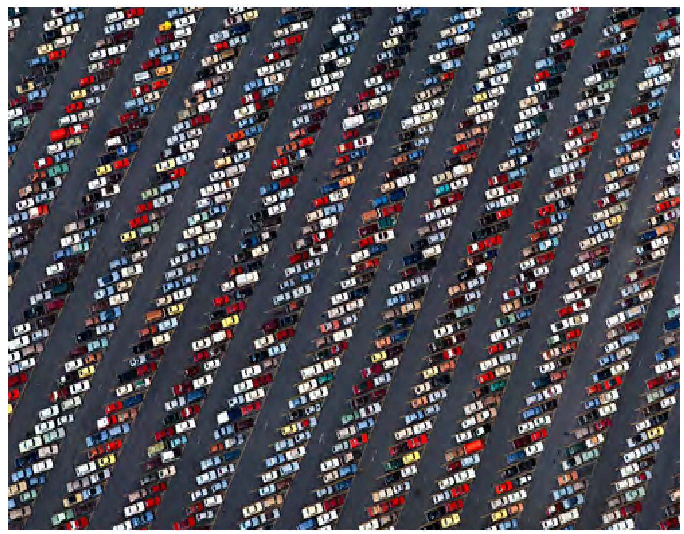


Figure 57 The parked cars in these images represent the difference between constrained (above) versus unconstrained (below) in the 2030 travel demand forecast.

Figure 58 Constrained and unconstrained demand for park-and-ride lots along the I-90 corridor.

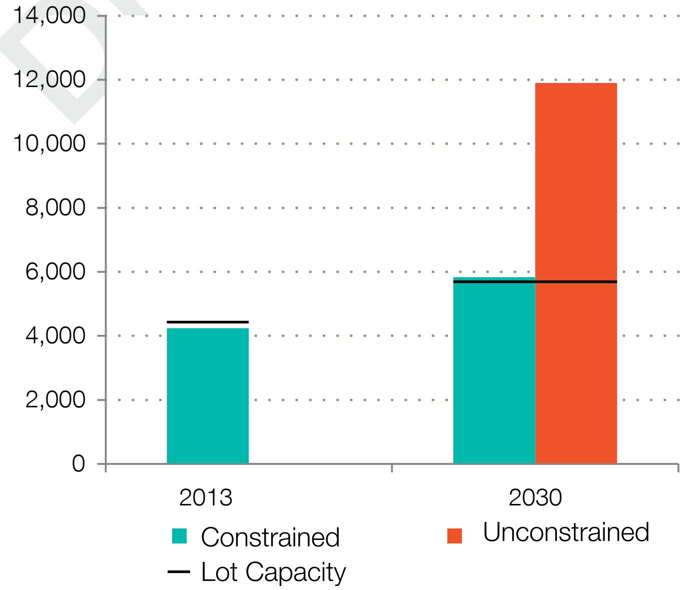
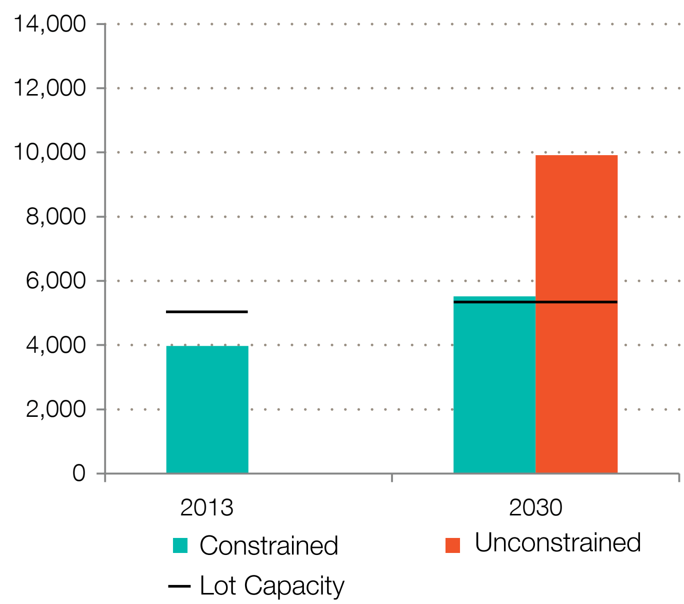


Figure 59 Constrained and unconstrained demand for park-and-ride lots along the I-405 corridor.



Modeling Results

Anticipated demand for park-and-ride lots in 2030 is shown for the I-90 and I-405 corridors in and on page A227, based on the modeling methodology outlined in the previous section. Refer to to on page A245 for the complete associated data. These charts show that for the year 2030, both constrained and unconstrained demand for each of the two corridors exceeds projected lot capacity for each corridor. If an unlimited supply of parking were available at all park-and-ride lots in both corridors, the model predicts that an additional 6,300 stalls would be required in the I-90 corridor and an additional 4,600 stalls would be required for the I-405 corridor to meet anticipated commuter parking demand in these corridors.

Model results show that unconstrained demand is approximately 200% greater than constrained demand, suggesting that new riders will likely begin using the system given increased parking availability.

RECOMMENDATIONS

There are many ways to address the projected regional shortage of park-and-ride spaces. This section presents both supply and demand side solutions. From the supply side, It is recommended that new lots be constructed or existing lots be expanded using the guidance from this section regarding sizing and siting strategies. From the demand perspective, it is recommended that service be fast, reliable, and accessible. It is also recommended that service be provided in residential areas through the use of leased lots. While traditional Park-and-Ride lots are located near highways and arterials, leased lots could provide access to the frequent transit network for low density residential areas and their locations would blend in well the character of these neighborhoods. Finally, this section discusses several already underway regional strategies to improve the capacity of park-and-ride lots.

Siting / Sizing Strategies

A strategic response to the unmet commuter parking needs in the I-90 and I-405 corridors warrants consideration of guidance found in "Characteristics of a Successful Rapid Transit-Focused Park-and-Ride Lot", within *TCRP Report 153: Guidelines for Providing Access to Public Transportation (see Table 25)*. This report identifies the following characteristics of successful park-and-ride lots:

- ***Locate in advance of congestion.*** Park-and-ride lots in combination with rapid transit lines generate the greatest use (and transit ridership) in travel corridors that experience the most intense traffic congestion (i.e., peak-hour peak direction freeway speeds of less than 30-35 miles per hour. Park-and-ride facilities should intercept motorists in advance of congestion and before points of major route convergence.

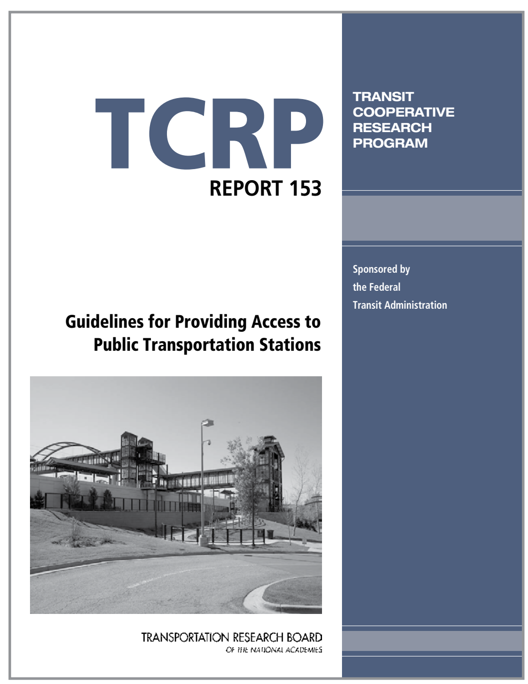


Figure 60 Transit Cooperative Research Program (TCRP) Report 153: Guidelines for Providing Access to Public Transportation Stations identifies qualities of successful park-and-ride lots.

Sites near junctions of radial transit lines and beltways or major arterial roads can tap a wide catchment area. Access to the lot should be upstream of major congestion points.

- ***Locate sufficiently far away from the city center.*** Park-and-ride facilities should be located as far from the downtown area as practical to remove the maximum number of travelers (and vehicle miles traveled (VMT) from roadways during peak periods. They generally should be located at least 5 to 8 miles from the city center. They should be far enough away to compensate for the time spent changing travel modes. Increasing parking spaces on the fringes of the downtown area is not desirable, as it could divert existing passengers from feeder transit services and non-motorized access modes.
- ***Locate in safe areas.*** Park-and-ride facilities should be placed in areas that are perceived as safe by patrons. They should not be located in high-crime areas, or in settings that are considered unattractive to users.
- ***Complement and reinforce land development.*** Park-and-ride facilities should be compatible with the surrounding environments. Large facilities—especially open-lot parking—should be limited or avoided in town centers, areas of high population and development density, and locations where transit-supportive uses are planned or encouraged around stations. Where garages are built, they should be carefully integrated with their surroundings.
- ***Provide good roadway access.*** Facilities should be accessible and visible from nearby freeways and arterial roadways.
- ***Serve multiple markets.*** Most rapid transit-focused park-and-ride lots serve downtown travelers. However, there is a growing tendency

to also serve other large activity centers along the rapid transit lines. The lots should be located between their catchment areas and major activity centers. Motorists will use facilities that can be easily accessed en-route, but are less likely to backtrack.

- ***Provide fast and frequent rapid transit service.*** Rapid transit should operate at frequencies of 10 to 12 minutes or less during peak periods, while frequencies up to 20 minutes are acceptable during midday hours. Headways of 20 to 30 minutes are acceptable for commuter rail and commuter bus service during commute hours.
- ***Serve low-density residential areas.*** In general, population densities in park-and-ride catchment areas should be less than 4,000 to 6,000 persons per square mile, or about 4 to 6 dwelling units per net acre.

Leased Lots

Leased lots, shared use park-and-ride lots, often blend in well with the character of residential neighborhoods and are a good tool to use to better serve low-density residential areas. Other cities along the I-90 and I-405 corridors regard lease lots as an allowable use. However, the City of Bellevue currently requires applicants to undergo an administrative conditional use permit application process with approval by the Planning Director. An administrative conditional use permit requires the following: a $4,490 submittal fee (2014), mailed notice to property owners within 500 feet of the site, minimum public comment period of 14 days, and permit application and fees for all signs posted. Processing an administrative conditional use permit can take up to 120 days. This procedure is regulated by the Bellevue City Code 20.20.200, which may be found in Appendix Figure 20 on page A271 of this report.

"If the bus route came closer to where I live I wouldn't need to drive to the Park and Ride. So either the city should have a lot more Park and Ride spaces or have more bus routes in unserved parts of Bellevue."

-Pat, Shopping and Social Transit User
Resident of Bellevue[1]

"I sometimes have to pass two Park-&-Ride lots on my route before finding a parking space. By that time, I've driven half-way to work."

-Don, All-Around Transit User
Resident of Kirkland[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

Table 8 Potential leased lots relative to FTN routes.

Potential Lease Lot Facility	Address	Distance to Transit (feet)	Lot Capacity
FTN Route 1 (Issaquah Highlands - Bellevue - U District)			
First Presbyterian Church	1717 Bellevue Way NE	440	365
First Congregational Church*	752 108th Ave NE	580	15
Church in Bellevue	1835 Bellevue Way NE	620	66
Bellewood Presbyterian Church	10936 NE 24th St	1,870	70
First United Methodist Church	1934 108th Ave NE	2,210	168
Church of Jesus Christ of LDS	10675 NE 20th St	2,320	160
FTN Route 2 (Lynnwood - Bellevue)			
First Congregational Church*	752 108th Ave NE	580	15
FTN Route 3 (Westwood Village - Renton - Bellevue)			
First Baptist Church - Bellevue*	10431 SE 11th St	180	84
Bellevue Church of Christ*	1212 104th Ave SE	200	90
Pilgrim Lutheran Church*	1030 Bellevue Way SE	200	55
FTN Route 6 (Crossroads - Bellevue)			
Lake Sammamish Foursquare*	14434 NE 8th St	700	240
Eastside Baha'i Center	16007 NE 8th St #100	1,700	6
FTN Route 7 (Redmond - Crossroads - Eastgate - Factoria)			
Overlake Park Presbyterian	1836 156th Ave NE	10	135
Church of the Resurrection	15220 Main St	1,060	100
Cross of Christ Lutheran Church	411 156th Ave NE	1,300	230
Temple B'Nai Torah	15727 NE 4th St	1,800	50
New Hope Ministries	15760 NE 4th St	2,150	52
FTN Route 11 (Bellevue - Factoria - Renton) (In Addition to the Churches in the FTN Route 3 Corridor)			
St Margaret's Episcopal Church	4228 Factoria Blvd SE	250	160
Holy Cross Lutheran Church	12835 SE Newport Way	500	40
Korean Pilgrim Presbyterian	6016 120th Ave SE	500	56
East Shore Unitarian Church	12700 SE 32nd St	1,390	60
Bellevue Korean Church	3105 125Th Ave SE	2,400	34
St Madeleine Sophie Catholic	4400 130th Pl SE	2,400	300
FTN Route 12 (Eastgate - Overlake Village - Kirkland)			
Lake Sammamish Foursquare*	14434 NE 8th St	700	240
All Saints Lutheran Church	5501 148th Ave NE	100	84
Islamic Center of Eastside	14700 Main St	400	14
Highland Covenant Church	15022 Bel Red Rd	650	80
Coal Creek Chapel	14615 SE 22nd St	720	100
FTN Route 13 (Bellevue - Eastgate)			
Eastgate Bible Fellowship	15005 SE 38th St	1,200	100
Crossroads Bible Church	15815 SE 37th St	2,000	580
Eastside Christian Comm. Church	3615 164th Pl SE	2,300	90
Gathering Place (Foursquare)	2015 Richards Rd	2,300	110
FTN 14 (Kirkland - Bel-Red - Eastgate)			
Westminster Chapel	13646 NE 24th St	2,500	630
Neighborhood Church	625 140th Ave NE	150	230
Seventh-Day Adventist Church	15 140th Ave NE	600	65
Blue Sky Church	1720 130th Ave NE #100	700	60
Bellevue Kingdom Hall	2211 140th Pl SE	1,000	35
Church of Christ Lake Hills	14213 Lake Hills Blvd	150	10

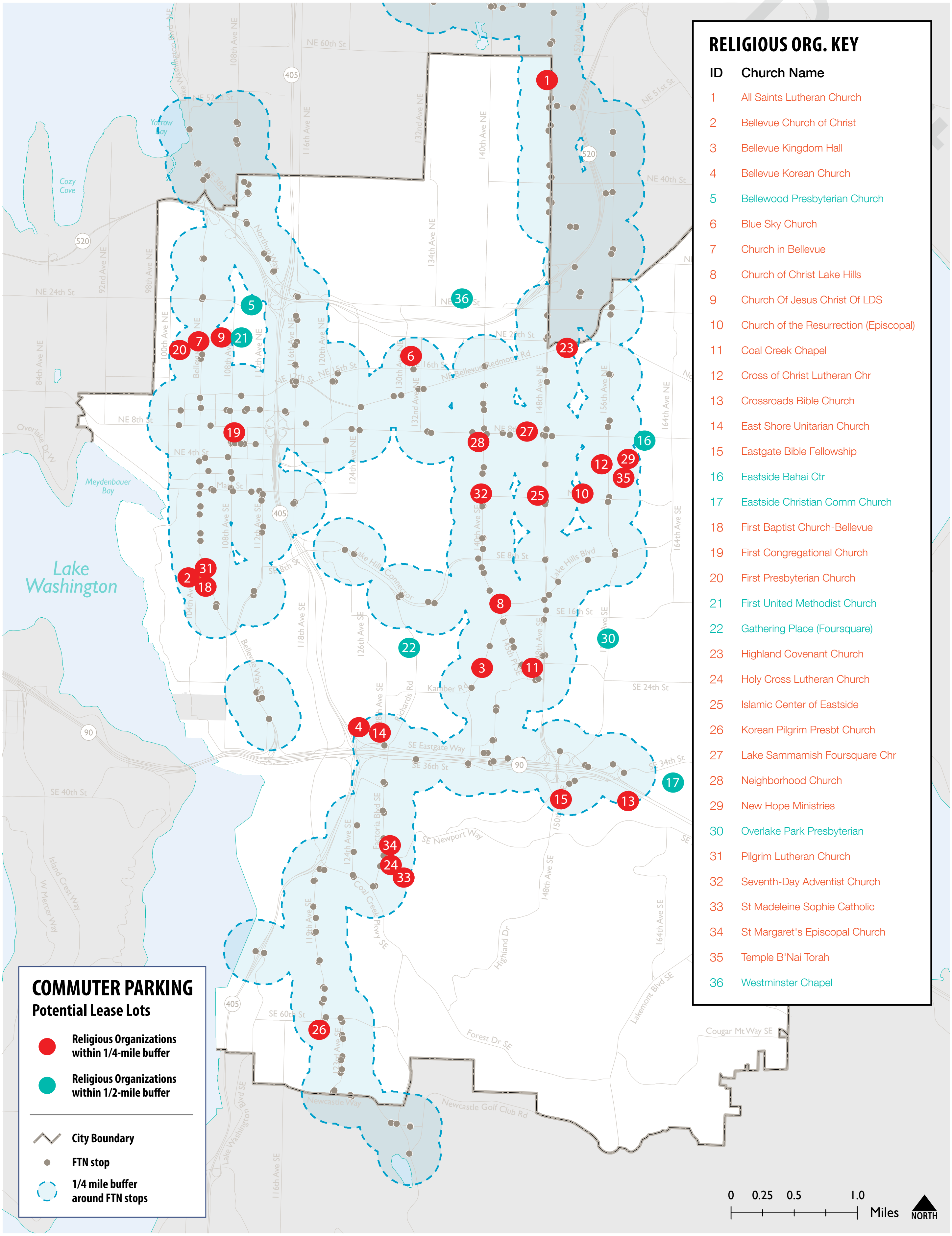
* Nearest transit stop is served by multiple FTN routes.

By overlaying the anticipated 2030 Frequent Transit Network with the location of existing faith communities (i.e., churches), it is apparent that there is a potential for lease lots (established at church lots) to relieve future commuter parking demand. If all churches within a half-mile walking distance of the frequent transit network were to share their parking, over 4,700 stalls would become available. Six churches within this group have large parking lots, with over 200 stalls each. For example, the Neighborhood Church, with 230 stalls, has direct access to FTN 14. These churches are not evenly distributed among the Frequent Transit Network, with greater access to Routes 1, 11, and 14.

This study identifies faith communities based on a 2013 InfoUSA database. Of the 105 churches listed in this database, 50 have their own dedicated parking lots. Of these 50 locations, 35 churches are located within a half mile walking distance of stops along the 2030 FTN. Table 8 lists the churches relative to each FTN route. It lists the approximate number of parking stalls at each location based on stall counts from aerial photos. The table also provides the distance in feet between the church lot and the nearest FTN-served transit stop.

Figure 61 provides a reference map showing the 25 church locations that fall within a quarter-mile radius of FTN stops. Also shown are an additional seven churches that are within a half mile walking distance to FTN stops.

Figure 61 Potential Lease Lots



Regional Efforts Underway

Regional efforts are underway to address park-and-ride needs. King County Metro and The Puget Sound Regional Council initiated an "Access to Transit Work Plan", which will define the role of park-and-rides and other community infrastructure related to access to transit. PSRC's Transportation 2040 recommends that the region study park-and-rides in more depth, including potentially charging for parking at these facilities. Also, Sound Transit is conducting Parking Management Pilot studies (Fall 2013 - Early 2015)offering limited permit parking for frequent riders at the Issaquah Transit Center, Mukilteo Station, Sumner Station, and Tukwila International Blvd Station. This study also provides real-time customer information about parking availability at select locations, and collaborates with rideshare programs. Finally, the King County Metro Right Size Parking Project is considering the paid use of parking in multi-family apartment buildings during the day to facilitate access to transit.

CONCLUSIONS

This assessment suggests that there is a significant shortage of commuter parking along the I-90 and I-405 corridors. As the park-and-ride usage trends indicate, commuter parking expansions have occurred in high-utility areas due to their locations in proximity to I-405 and I-90 and their central to western location within the City of Bellevue. Indeed, past experience shows that lots are quickly filled shortly after new park-and-ride facilities are built.

The constrained travel demand model indicates that there are approximately 200 stalls for each corridor that are required beyond those provided. When an unlimited supply of stalls is provided in the model— the unconstrained scenario—there is a shortage of approximately 6,300 stalls along the I-90 corridor and a shortage of approximately 4,600 stalls along the I-405 corridor. Thus, each corridor would need to have twice the number of stalls to keep up with the projected unconstrained demand.

BUS LAYOVER

Layover/Recovery Time: The scheduled time spent at a route's terminal between consecutive trips by a single bus.

Deadhead Time: The scheduled time spent driving to and from the base or between trips on different routes.

In addition to serving as the first point of access to transit, the location and environment surrounding bus stops can also have significant implications on transit operating efficiency. Behind the steering wheel of every bus is an operator, and operators are contractually required a certain amount of break time to rest in between individual trips of their route, known as layover or recovery time. An essential aspect of bus scheduling, this time also helps to ensure that a late-running bus still begins its next trip on time. Locations must be identified near route terminals for operators—and their buses—to park while not operating revenue service.

This need for parking space can be accommodated in a variety of ways depending on local conditions. Transit facilities like the Eastgate Park-and-Ride are often designed to provide some layover space on-site (see Figure 62), which is the most operationally efficient solution to implement when possible. Other facilities like the Bellevue Transit Center have the capacity to accommodate current layover needs for some routes at lesser-used bus bays, but as the amount of service operated increases in the future, the available bays may need to all be used by in-service buses, meaning that layover space will need to be identified elsewhere. In such cases, and in cases where a route's terminal is not at a transit facility, bus layover space is commonly designated in the curbside lane of a nearby street. When the use of such space in the street right-of-way is necessary, it is critical that these spaces be designated as close as possible to the route's terminal, as any additional distance that buses need to deadhead from terminal to layover location represents a reduction in operating efficiency. While bus layover may not require the use of the land on a development lot per se, it may require the use of some portion of a block's street frontage. A relationship therefore exists between the transit network and the land use and urban design of the public realm in the areas surrounding bus route terminals.

This report does not attempt to identify specific locations at transit facilities or along street right-of-ways to be used by transit vehicles for layover. Instead, it provides an estimate of the range of total linear feet of layover space that will be required to operate the 2030 Growing Resources Network defined in the *Transit Service Vision Report*. Because layover space is intrinsically a place-based demand—as noted, it should be as close as possible to the route terminal—the total need is then divided among Bellevue's Mobility Management Areas as an indication of where such space will need to be identified in the future. This provides an actionable basis for further consideration and analysis without being prescriptive about specific details related to siting at this time.

Figure 62 The Eastgate Park-and-Ride has layover space available on-site across from the parking garage and bus bays.

PHOTO BY John Tiscornia

Frequency: The number of transit vehicles of the same route passing a point in one direction during one hour, often expressed in terms of the number of minutes between consecutive trips, known as headway.

Span: The time of day during which a particular route operates, expressed as the number of hours between the first and last trips scheduled in each direction.

Cycle Time: For a given route, the sum of the inbound and outbound travel times and layover time.

METHODOLOGY

The process used here to estimate bus layover needs consists of the following five steps:

1. Identify terminals of all 2030 Growing Resources Network services in the greater Bellevue area.
2. Using service frequency, span, and cycle time, estimate layover time for each route at each terminal.
3. Estimate the total number of vehicles that may be laying over at any given time per route.
4. Multiply the number of vehicles laying over at any given time per route by the length (in feet) required to accommodate each vehicle. Different bus length assumptions were used for FTN, coverage, and peak-only routes.
5. Sum all identified layover length requirements by terminal.

In addition to estimating the total linear feet of layover space required, this analysis also estimated the operational cost of not having layover space immediately proximate to the terminal where each route ends. These costs were estimated using thresholds of 2- and 5-minute travel times to the hypothetical layover facility following the four steps:

1. Add twice the threshold travel time (4 or 10 minutes) to the cycle time for each route.
2. Estimate the annual service cost of the additional cycle time.
3. Compare the new service costs to the original annual costs.
4. Sum the difference in service costs for each terminal.

Note that these estimates assumes that *all* trips must travel to a remote layover location; in practice, layover locations can vary throughout the day depending on the demand for available space. These costs are only meant to be illustrative.

The range of layover space required is based on varying transit vehicle ingress and egress lengths and assumed schedule efficiencies. The low estimate used the following assumptions: curbside lengths of 60 feet for FTN and peak-only service and 40 feet for coverage routes, and estimated layover times that are 20 percent of a route's cycle time or 10 minutes, whichever is greater. The high estimate assumed the following: 140 feet for FTN and peak-only services and 120 feet for coverage services, and estimated layover times were 30 percent of cycle time or 10 minutes, whichever is greater.

Note that these assumed lengths reflect variations in two factors. First, the differentiation between FTN and peak-only services and coverage routes relates to the size of the vehicles operated by each service type. The former are assumed to be 60-foot articulated coaches, while the latter are assumed to be standard 40-foot coaches. The second factor, which differentiates the low and high estimates from one another, is the amount of additional space assumed to be required to accommodate a bus in layover. The low estimate assumes the vehicle's length alone is required, while the high estimate doubles the vehicle's length to accommodate acceleration and deceleration and adds 20 feet more for ingress/egress space, which would permit queued buses to pull out and pass one another.

The range of assumed layover time reflect a more general estimation. The low estimate (20%) reflects the schedule efficiency typically used by King County Metro service planners to generate estimated costs for new routes. The high estimate (30%) adds a premium of 10 percent to reflect conditions with reduced schedule efficiency.

Figure 63 The RapidRide B Line in layover at the Bellevue Transit Center. FTN and peak-only services are assumed to operate 60-foot articulated coaches with space requirements similar to this one.

PHOTO BY John Tiscornia

Figure 64 Coverage services are assumed to operate standard 40-foot coaches similar those used by existing Route 241.

PHOTO BY John Tiscornia

SPACE REQUIREMENTS

Applying this methodology results in maximum layover requirements—that is, the amount needed during the time of day when the most buses are in operation—ranging from 3,560 to 8,480 feet (see Table 9). For each of the variables in this analysis, the assumed conditions are appropriate and applicable in some cases but either too conservative or excessive in others, depending on site- and service-specific needs. These estimates should therefore be interpreted as the extreme lower and upper bounds of what may be necessary, with the actual amount of layover space required falling somewhere in between. Clearly, these assumptions result in a very large range—the high estimate is more than double the other.

Although, as noted, this analysis does not attempt to identify specific layover locations, it is useful to consider how these projected layover needs relate to the existing supply, both in terms of amount and location. And because the routes defined by the 2030 Growing Resource Network include terminals in other jurisdictions, it is instructive to consider the layover space implications on those cities as well, even if only the Bellevue Transit Master Plan is only specifically planning for Bellevue.

It is estimated that approximately 7,000 feet of layover space currently exist in the study area that includes Bellevue and portions of Redmond, Kirkland, and Issaquah. While this total might be sufficient to accommodate the projected needs in aggregate, consideration of the location of this supply (see Figures 20 and 21) suggests that adjustments will be necessary. For example, layover sites currently exist in the North Bellevue, Bel-Red/Northup, Richards Valley, and Bridle Trails MMAs; however, no routes proposed by the 2030 Growing Resources Network have terminals in these areas. Conversely, the Crossroads MMA is projected to need to accommodate between

320–800 feet of layover space in 2030, but no layover locations currently exist there. Because retention of the existing layover locations would incur inefficiencies as buses travel from their terminals to layover, it is clear that additional analysis will be required in the coming years to determine where these needs can be optimally accommodated.

Table 9 Minimum layover space required by route terminal location.

Route Terminals	Low Estimate (feet)							High Estimate (feet)						
	AAM	AM	MD	PM	EVE	NITE	Maximum	AAM	AM	MD	PM	EVE	NITE	Maximum
Within Bellevue														
Downtown Bellevue	580	1,000	580	1,000	580	460	1,000	1,220	2,460	1,800	2,460	1,660	1,240	2,460
Bellevue Transit Center	*400*	*700*	*400*	*700*	*460*	*340*	*700*	*880*	*1,700*	*1,240*	*1,700*	*1,240*	*960*	*1,700*
Bellevue Square	*120*	*180*	*120*	*180*	*60*	*60*	*180*	*200*	*480*	*420*	*480*	*280*	*140*	*480*
Old Bellevue	*60*	*120*	*60*	*120*	*60*	*60*	*120*	*140*	*280*	*140*	*280*	*140*	*140*	*280*
Crossroads	100	160	100	160	100	100	160	260	400	260	400	260	260	400
Eastgate P&R	300	600	420	600	300	300	600	920	1,580	1,180	1,580	1,320	920	1,580
Factoria	60	120	120	120	60	60	120	280	420	280	280	280	140	420
S. Bellevue P&R	40	80	40	80	40	40	80	120	240	120	240	120	120	240
Sub-Total	***1,080***	***1,960***	***1,260***	***1,960***	***1,080***	***960***	***1,960***	***2,800***	***5,100***	***3,640***	***4,960***	***3,640***	***2,680***	***5,100***
Outside of Bellevue														
Issaquah	100	340	220	340	160	100	340	260	720	460	720	460	260	720
220th Ave SE/SE 56th St	*0*	*60*	*0*	*60*	*0*	*0*	*60*	*0*	*60*	*0*	*60*	*0*	*0*	*60*
Issaquah Highlands	*60*	*180*	*120*	*180*	*60*	*60*	*180*	*140*	*480*	*280*	*480*	*280*	*140*	*480*
Issaquah Transit Center	*40*	*100*	*100*	*100*	*100*	*40*	*100*	*120*	*180*	*180*	*180*	*180*	*120*	*180*
Kirkland Transit Center	120	240	240	240	120	120	240	420	700	560	700	560	420	700
Mercer Island P&R	60	360	0	360	0	0	360	60	360	0	360	0	0	360
Redmond	160	400	220	400	220	100	400	460	900	580	640	640	260	900
Bear Creek P&R	*0*	*60*	*0*	*60*	*0*	*0*	*60*	*0*	*60*	*0*	*60*	*0*	*0*	*60*
Education Hill	*40*	*40*	*40*	*40*	*40*	*40*	*40*	*120*	*240*	*240*	*120*	*240*	*120*	*240*
Overlake P&R	*0*	*60*	*60*	*60*	*60*	*0*	*60*	*0*	*60*	*60*	*60*	*60*	*0*	*60*
Overlake Transit Center	*60*	*120*	*0*	*120*	*60*	*0*	*120*	*60*	*120*	*0*	*120*	*60*	*0*	*120*
Redmond Transit Center	*60*	*120*	*120*	*120*	*60*	*60*	*120*	*280*	*420*	*280*	*280*	*280*	*140*	*420*
Totem Lake	60	180	60	180	120	60	180	140	340	280	340	280	140	340
Yarrow Point Fwy Stn	80	80	80	80	80	80	80	240	240	240	360	240	240	360
Total	**1,660**	**3,560**	**2,080**	**3,560**	**1,780**	**1,420**	**3,560**	**4,380**	**8,360**	**5,760**	**8,080**	**5,820**	**4,000**	**8,480**

Figure 65 Bus layover needs in linear feet by Mobility Management Area (MMA): Conservative (low) estimate.

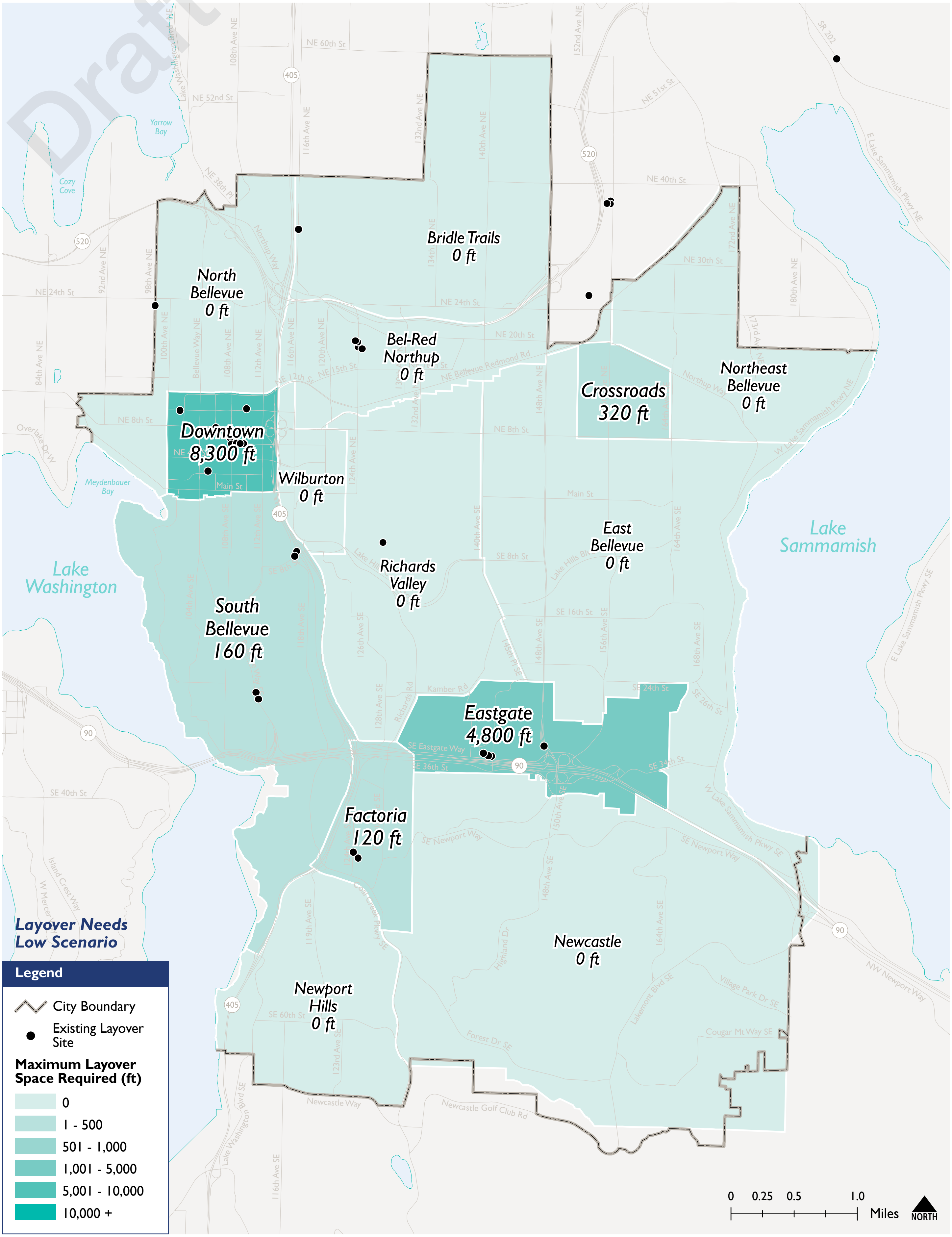


Figure 66 Bus layover needs in linear feet by Mobility Management Area (MMA): High estimate.

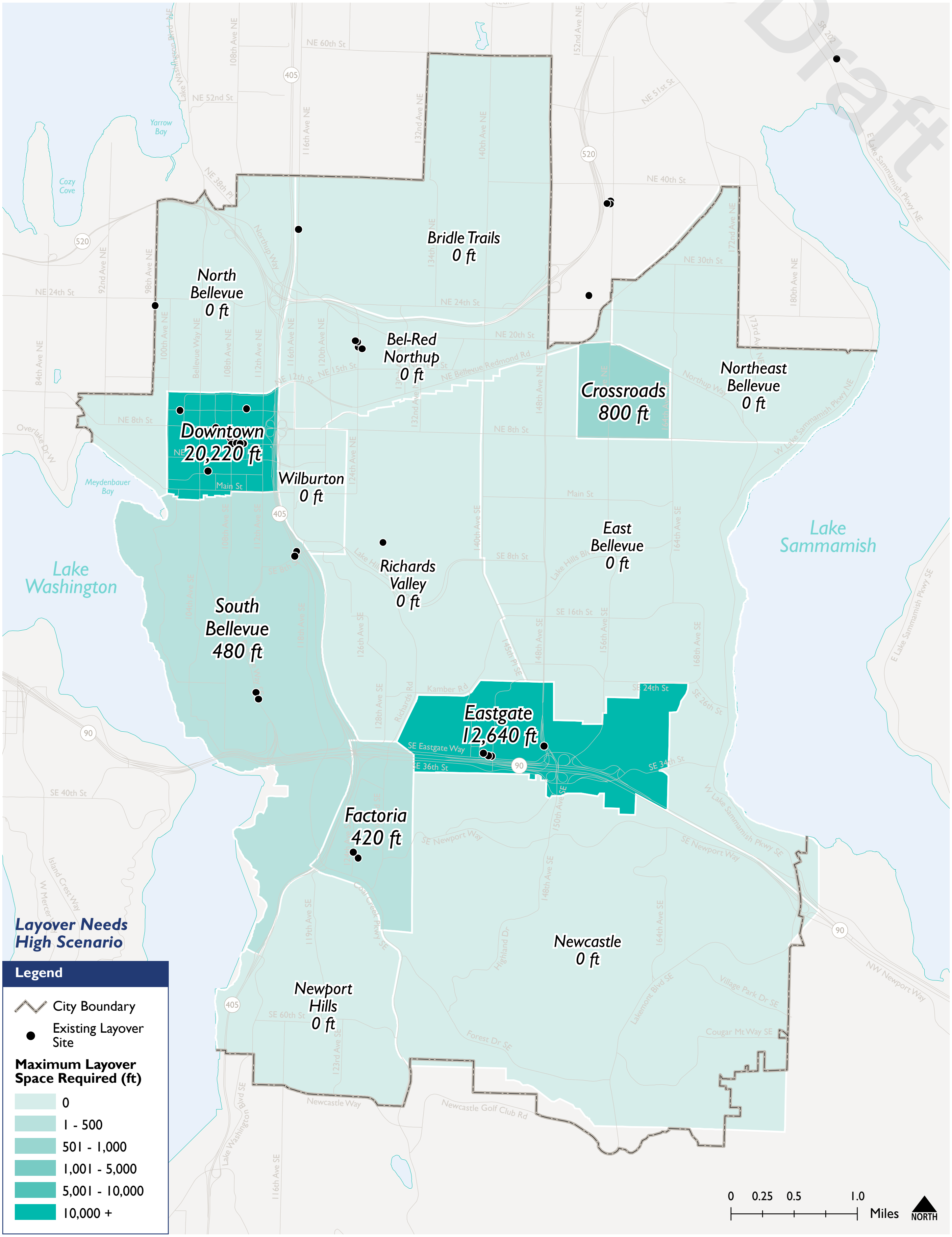


Table 10 Additional annual weekday platform hours incurred by traveling to layover locations for each route terminal in the 2030 Growing Resources Network.

Route Terminals	Total Annual Additional Weekday Platform Hours Given...	
	2-minute Terminal Access	5-minute Terminal Access
Within Bellevue		
Downtown Bellevue	15,221	36,679
Bellevue Transit Center	*9,518*	*25,098*
Bellevue Square	*2,899*	*5,716*
Old Bellevue	*2,805*	*5,865*
Crossroads	2,805	8,160
Eastgate P&R	9,648	20,804
Factoria	1,785	4,080
S. Bellevue P&R	765	957
Sub-Total	***30,224***	***70,680***
Outside of Bellevue		
Issaquah	2,856	7,523
220th Ave SE/SE 56th St	*51*	*128*
Issaquah Highlands	*1,777*	*5,971*
Issaquah Transit Center	*1,029*	*1,424*
Kirkland Transit Center	3,570	9,690
Mercer Island P&R	952	2,380
Redmond	4,786	8,479
Bear Creek P&R	*102*	*255*
Education Hill	*2,550*	*2,550*
Overlake P&R	*264*	*659*
Overlake Transit Center	*85*	*935*
Redmond Transit Center	*1,785*	*4,080*
Totem Lake	4,335	7,150
Yarrow Point Fwy Stn	1,530	2,295
Total	**48,252**	**108,196**

LOCATION IMPLICATIONS

Table 10 and Table 11 offer two different ways of considering the impacts of layover location decisions on operating efficiency. Table 10 follows the four-step methodology presented on page 82 to estimate the annual weekday cost in platform hours of locating a bus layover location 2 or 5 minutes away from the route terminal for each of the Eastside terminals served by the 2030 Growing Resources Network. That assessment indicates that between 48,000 to 108,000 annual additional weekday platform hours would be incurred, of which about 30,000 to 70,000 annual platform hours would be derived from layover locations within Bellevue.

Table 11 provides a hypothetical example that more generally illustrates the impacts of moving a layover location away from a route terminal, in this case for a route with a round trip running time of 90 minutes. Several scenarios of service frequencies and travel times to the layover location are included. The table illustrates the significance of layover location selection in a general sense to avoid complications that may arise in any given specific location. Assuming an average speed of 12 mph, the travel times shown range from 1 to 4 miles away. Figure 67 on page 91 provides a representative example of how this might be applied to routes with terminals at the Bellevue Transit Center, but it must be emphasized that the areas shown are based solely on radial distance and not meant to reflect actual travel times.

The calculations in Table 11 make several assumptions that should be noted. The additional hours shown are relative to if the route's layover location were at its terminus. Both the existing and new schedule are assumed to require 20 percent layover and recovery, which is consistent with the low estimate reflected in the terminal-based assessment. Finally, the calculations assume six hours of peak and ten hours of off-peak operation.

Any specific route would likely experience different results in a real world scenario than are shown below. However, this model provides a conceptual, planning-level illustration of the implications of layover site selection. Again, for purely illustrative purposes, we may consider the implications of the results in Table 11 on routes terminating at Bellevue Transit Center (BTC), as shown in Figure 67. If the hypothetical route terminates at BTC, it would incur no additional annual platform hours. If the route travels 5 minutes

Table 11 Example of service hours impact of layover relocation.

Existing Weekday Service Levels Annual Platform Hours (90 Minute Roundtrip)						
Service Levels	*Peak Frequency*	*5*	*10*	*15*	*20*	*30*
	Off-Peak Frequency	*10*	*20*	*30*	*40*	*60*
	Baseline Annual Hours	**61,710**	**32,130**	**22,440**	**16,830**	**11,220**

Additional Annual Weekday Platform Hours Due to Change in Layover Location By Service Level						
Service Levels	*Peak Frequency*	*5*	*10*	*15*	*20*	*30*
	Off-Peak Frequency	*10*	*20*	*30*	*40*	*60*
If new layover location is...	5 Minutes Away	5,610	1,530	—	—	—
	7 Minutes Away	9,690	5,610	4,080	4,080	4,080
	10 Minutes Away	15,300	7,140	4,080	4,080	4,080
	15 Minutes Away	20,910	11,220	5,610	5,610	4,080
	20 Minutes Away	28,050	12,750	9,690	5,610	5,610

Percent Impact of Layover Relocation on Platform Hours						
If new layover location is...	5 Minutes Away	9%	5%	0%	0%	0%
	7 Minutes Away	16%	17%	18%	24%	36%
	10 Minutes Away	25%	22%	18%	24%	36%
	15 Minutes Away	34%	35%	25%	33%	36%
	20 Minutes Away	45%	40%	43%	33%	50%

Span of Service	
Peak Hours	6
Off-Peak Hours	10

Assumes existing route currently takes layover at route terminus.

Assumes existing schedule at 20% layover and recovery, new schedule at 20% layover and recovery.

Assumes existing roundtrip running time of 90 minutes.

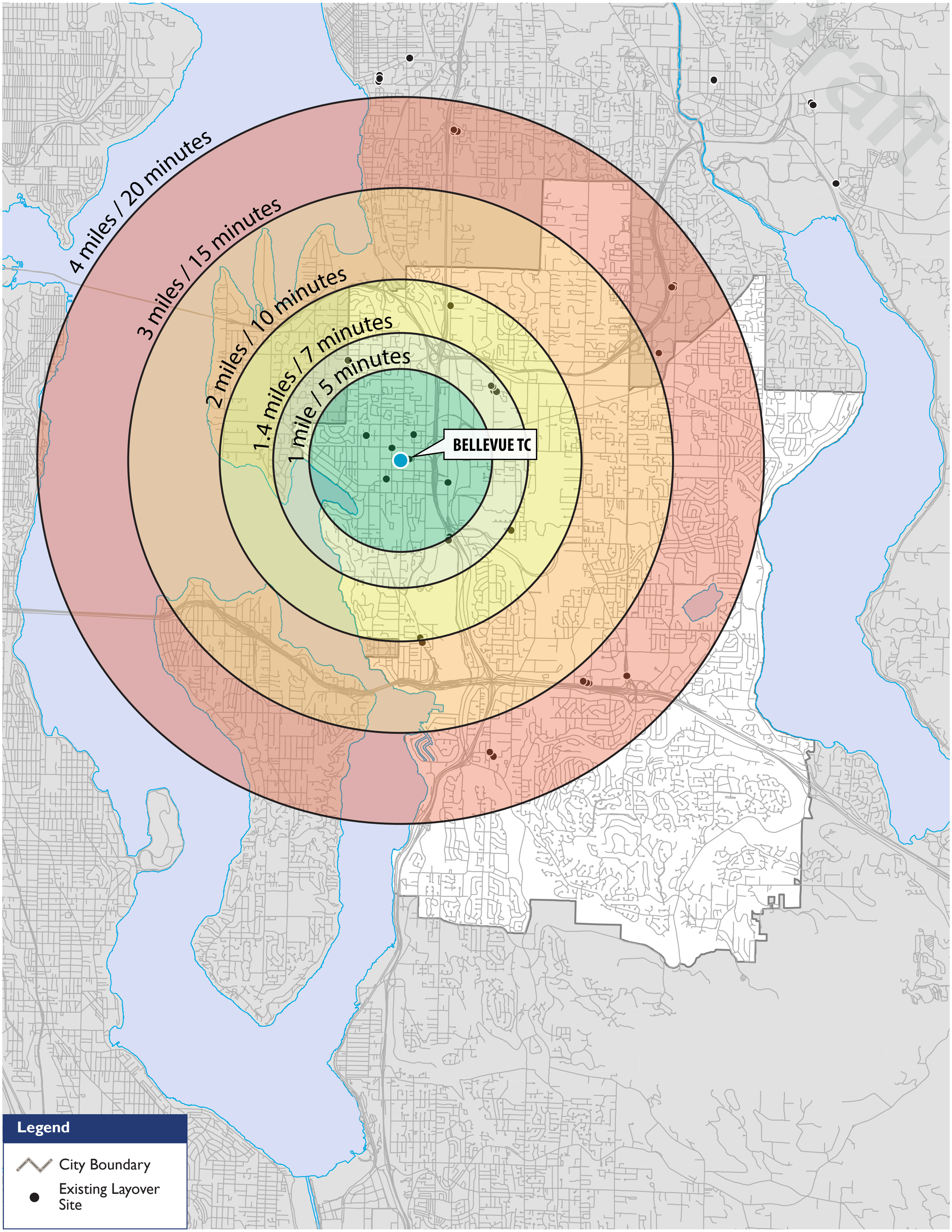
Assumes six hours of peak and ten hours of off-peak operation.

Putting Annual Platform Hours in Context		
Service hours needed to...	Fund a bus during the peak	1,530
	Fund a bus midday and evening	2,550
	Fund a bus all day	4,080

to a layover location within the inner green circle—an area generally including Downtown and its immediate vicinity—it would incur up to roughly 5,610 additional annual weekday platform hours. This means that the process of traveling from the route terminal to its layover location, which provides no service to transit users, adds the equivalent of up to 9 percent of the route's existing total annual weekday platform hours, reducing the route's operating efficiency and wasting scarce transit resources.

It follows that the further the route must travel to reach its layover location, the more significant the loss. A route traveling from BTC to the South Bellevue Park-and-Ride on the edge of the middle yellow circle (reflecting 2 miles, or 10 minutes) would incur about 15,300 additional annual weekday platform hours, or about 25 percent more than the route's baseline annual hours. This latter hypothetical is particularly noteworthy given that South Bellevue Station is being designed with considerable bus layover accommodations, yet the South Bellevue MMA ranks fourth of five Bellevue MMAs in terms of the amount of layover space it needs to accommodate based on the number of 2030 Growing Resources routes with terminals there.

Figure 67 Bus layover needs in linear feet by Mobility Management Area (MMA): Conservative (low) estimate.



This page intentionally left blank.

SECTION 4:
TRANSIT RUNNING WAY

BACKGROUND

According to respondents of Bellevue's Transit Improvement Survey, improving service speed and reliability by investing in roadway and traffic signal infrastructure is the highest priority for municipal investment in transit among current transit users in Bellevue (see Figure 68). Building from an extensive market analysis, review of future growth patterns, and evaluation of transit needs, the City of Bellevue's Transit Master Plan (TMP) will detail specific capital projects that will improve transit speed and reliability in high ridership bus corridors. This task, identified as the Capital Element in the TMP scope of work, has three primary objectives:

1. Stimulate discussion on congestion in Bellevue that compromises transit's efficiency.
2. Evaluate the trade-offs associated with different street design decisions.
3. Assess roadway, signal system, and other right-of-way improvements that could be made to support the 2030 Frequent Transit Network outlined in the Service Vision Report.

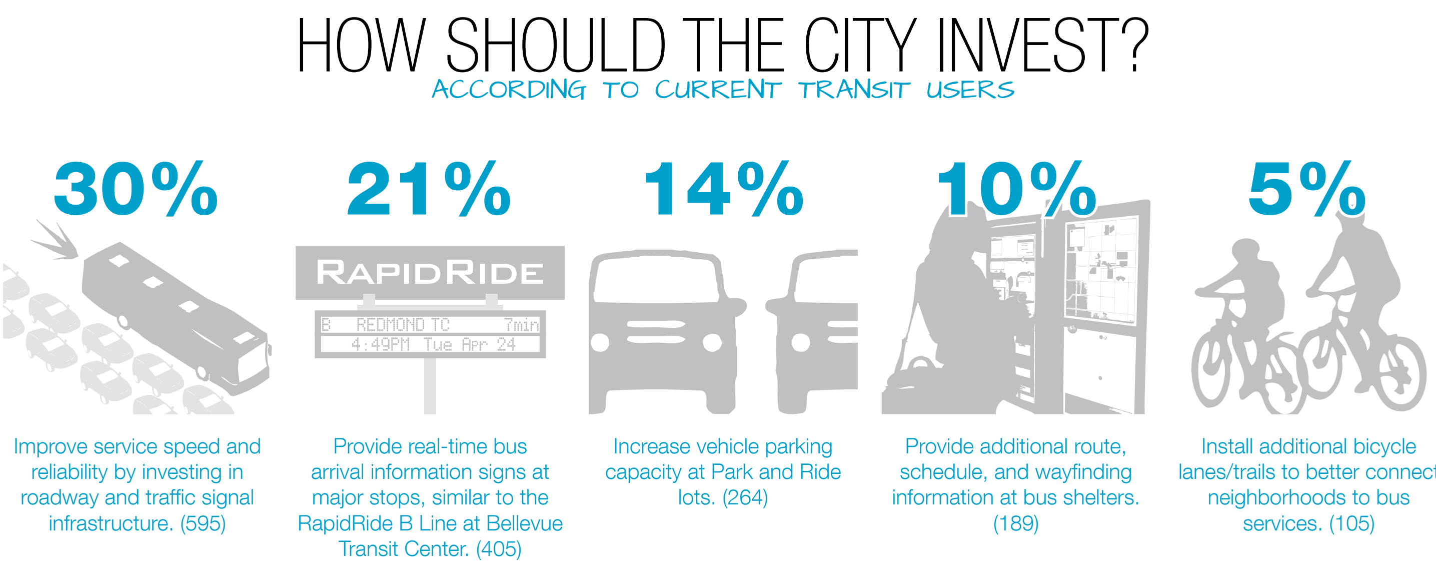


Figure 68 The most common way current transit users think the City should invest municipal resources to improve transit service in Bellevue is by "improving service speed and reliability by investing in roadway and traffic infrastructure" (30.3%; 595/1,962). The above are the five strategies most commonly selected by respondents to the 2012 Transit Improvement Survey. For full results, see the *Bellevue Transit Improvement Survey Report*.

For the purposes of assessing potential capital projects, the Capital Element references the 2030 Frequent Transit Network (FTN) as proposed in the *Transit Service Vision Report* (see Figure 2 on page 2 and Figure 1 on page iv). This network is comprised of all frequent services operating in the 2030 Growing Resources scenario, which increases service by approximately 47 percent from Spring 2012 levels to accommodate the projected near tripling of citywide transit demand by 2030. This is both the vision to which the City aspires and that with the greatest number of buses in operation—and hence that with the greatest need for capital investments to support fast and reliable service. The FTN supports Downtown growth, planned Bel-Red corridor redevelopment, and Bellevue's other activity centers with well-connected bus routes that seamlessly interface with East Link light rail. People traveling along FTN corridors can expect convenient, reliable, easy-to-use services that are so frequent, riders will not need to refer to a schedule when using these routes or connecting to East Link.

As part of the ongoing outreach supporting the TMP, the Transportation Department held the joint Board/Commission Capital and Policy Workshop on September 6, 2013. Workshop participants engaged in a discussion about the appropriate degree to which transit should be given priority over other modes—if at all—and in which situations. This was considered both in terms of the language used in City policies and in relation to transit priority treatments along Frequent Transit Network corridors. Refer to the *Capital & Policy Workshop Report* for additional information.

Although the Capital & Policy Workshop represented only an initial step in the capital planning process, the perspectives expressed and insights gleaned from it prompted numerous rounds of staff consultation, field assessment, and technical

Figure 69 Boards and Commission members provide their perspective on potential transit priority policy language and treatment options.

evaluation. On November 14, 2013 Bellevue staff published the *Draft Capital Element Background Report (Volume 1: Speed and Reliability)*, which addressed each of the following:

1. **Past Studies** – Summary of notable previous studies conducted since the adoption of the 2003 Bellevue Transit Plan. See pages 99 through 103 of this report.

2. **Toolbox of Corridor Treatments** – A review of best practices compiled into a toolbox of speed and reliability treatments to guide capital improvements along FTN corridors. See pages 105 through 119 of this report.

3. **Speed & Reliability Issue Identification** – Evaluation methodology used to determine where it might be appropriate for Bellevue to consider investing in capital projects along FTN corridors. See pages 120 through 141 of this report.

4. **Potential Improvements** – A preliminary list of potential speed and reliability improvements for each of the FTN corridors. See pages 53 through 77 of the Draft Report. (The current list of projects being proposed is presented on pages 143 through 163 of this report.)

5. **Projected Outcomes** – Assessment of potential speed and reliability improvements on transit and general purpose travel speeds. See pages 165 through 169 of this report.

Preliminary project descriptions and visualizations provided Transportation Commissioners and other interested stakeholders with an opportunity to review and comment on the potential improvements being considered. Over the course of several Commission meetings, staff responded to requests for additional information on many of the projects contained in the Draft Report. In some cases, these requests prompted detailed micro-simulation traffic model analysis (see Appendix 5 on page A234). During this evaluative stage, a number of suggested projects were eliminated from further consideration due to one or more 'fatal flaws' that were identified, but these projects are included for reference in this document in Appendix 7 (see page A268).

The current list of speed and reliability improvements is based on months of technical review and input from the Transportation Commission (see pages 143 through 163). Still, these projects remain conceptual, and the final details of design will be developed as the projects proceed further along in the implementation process.

This page intentionally left blank.

PAST STUDIES

The first task of the Capital Element was the documentation of previously identified transit and roadway improvements along the corridors served by the Frequent Transit Network (FTN). The following provides a brief summary of the reports referenced.

Downtown Transportation Plan Update (current) – This on-going project will be a focused update to the transportation portion of the Downtown Subarea Plan, which was adopted in 2004. The update will incorporate forecasted growth in population and employment through 2030 to ensure that the Downtown transportation system can function well and support this anticipated growth. A multimodal strategy is being pursued to accommodate both motorized and non-motorized transportation demand. The final report will include a revised list of system improvements to roadways, transit, pedestrian and bicycle facilities, and traffic signal operations. While still on-going, some early results of this effort relating to the Transit Master Plan include the establishment of future transit circulation patterns in Downtown, which are reflected in the networks proposed in the *Transit Service Vision Report*, and the consideration of projects such as the 108th Ave NE Bus Priority Corridor.

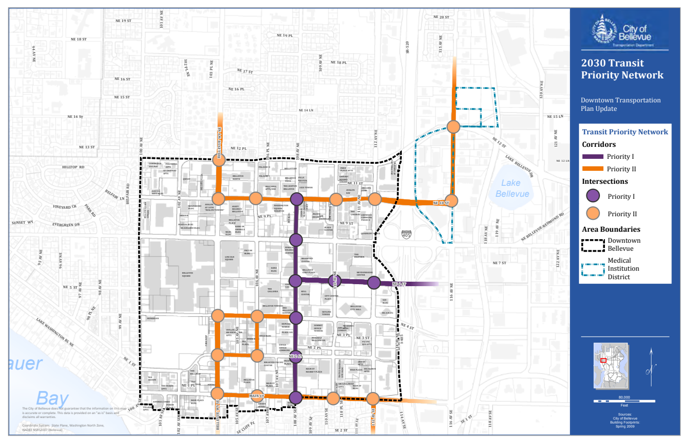


Figure 70 The 2030 Transit Priority Network from the *Downtown Transportation Plan Update*.

East Link Extension Cost Savings Work Plan Findings (2012) – Following the November 2011 execution of a Memorandum of Understanding (MOU) regarding funding and construction of East Link light rail, the City of Bellevue and Sound Transit analyzed cost savings concepts that have the potential to save at least $60 million in project costs while supporting the system's performance. This report summarizes the cost savings options advanced for further development, including alternative alignments for Bellevue Way and 112th Ave SE segments and several

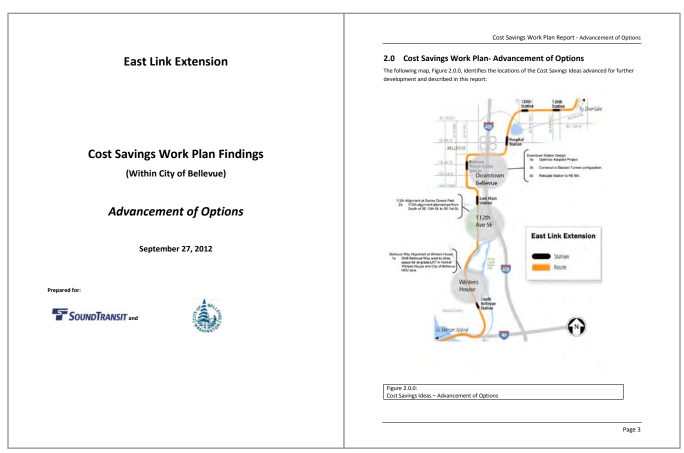
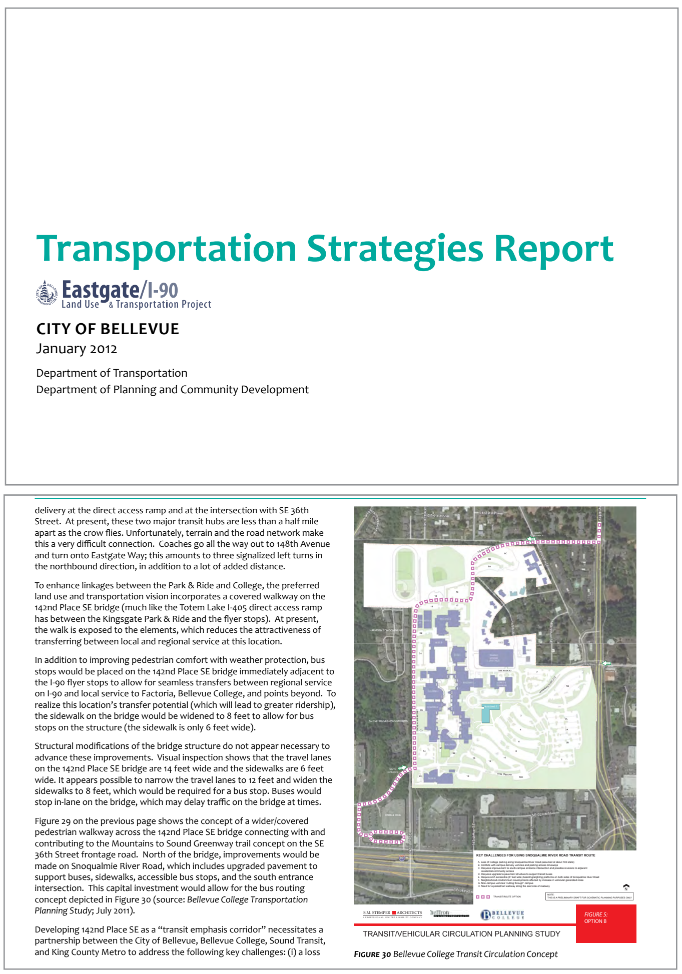


Figure 71 Map of the three areas with cost savings options advanced for further consideration, from the *East Link Extension Cost Savings Work Plan Findings.*

options for the Downtown Station design. The review of each of these includes anticipated cost savings, impacts to traffic, vehicle and pedestrian access, noise, visual appearance, and any impacts to adjacent properties, wetlands, and parks. Other projects are associated with these concepts, including a southbound HOV lane along Bellevue Way SE between 112th Ave SE and South Bellevue Park-and-Ride.

Eastgate/I-90 Land Use and Transportation Project (2012) – The *Transportation Strategy Report* outines a vision that will guide public and private actions, investments, and capital project priorities to improve mobility for all travel modes in the Eastgate/I-90 corridor. Potential improvements advanced by the plan are oriented toward finding the best transportation solutions for the area that are affordable, supported by the community, and can be implemented in a reasonable time frame. The list includes projects that would improve traffic flow at critical intersections, enhance the pedestrian/ bicycle environment, and increase the attractiveness of transit as a travel option. One of the transit improvements proposed is the development of 142nd Pl SE as a transit emphasis corridor, including upgrading Snoqualmie River Rd to support buses and accessible bus stops.



Transportation Strategies Report

Eastgate/I-90 Land Use & Transportation Project

CITY OF BELLEVUE
January 2012

Department of Transportation
Department of Planning and Community Development

delivery at the direct access ramp and at the intersection with SE 36th Street. At present, these two major transit hubs are less than a half mile apart as the crow flies. Unfortunately, terrain and the road network make this a very difficult connection. Coaches go all the way out to 148th Avenue and turn onto Eastgate Way; this amounts to three signalized left turns in the northbound direction, in addition to a lot of added distance.

To enhance linkages between the Park & Ride and College, the preferred land use and transportation vision incorporates a covered walkway on the 142nd Place SE bridge (much like the Totem Lake I-405 direct access ramp has between the Kingsgate Park & Ride and the flyer stops). At present, the walk is exposed to the elements, which reduces the attractiveness of transferring between local and regional service at this location.

In addition to improving pedestrian comfort with weather protection, bus stops would be placed on the 142nd Place SE bridge immediately adjacent to the I-90 flyer stops to allow for seamless transfers between regional service on I-90 and local service to Factoria, Bellevue College, and points beyond. To realize this location's transfer potential (which will lead to greater ridership), the sidewalk on the bridge would be widened to 8 feet to allow for bus stops on the structure (the sidewalk is only 6 feet wide).

Structural modifications of the bridge structure do not appear necessary to advance these improvements. Visual inspection shows that the travel lanes on the 142nd Place SE bridge are 14 feet wide and the sidewalks are 6 feet wide. It appears possible to narrow the travel lanes to 12 feet and widen the sidewalks to 8 feet, which would be required for a bus stop. Buses would stop in-lane on the bridge, which may delay traffic on the bridge at times.

Figure 29 on the previous page shows the concept of a wider/covered pedestrian walkway across the 142nd Place SE bridge connecting with and contributing to the Mountains to Sound Greenway trail concept on the SE 36th Street frontage road. North of the bridge, improvements would be made on Snoqualmie River Road, which includes upgraded pavement to support buses, sidewalks, accessible bus stops, and the south entrance intersection. This capital investment would allow for the bus routing concept depicted in Figure 30 (source: *Bellevue College Transportation Planning Study*; July 2011).

Developing 142nd Place SE as a "transit emphasis corridor" necessitates a partnership between the City of Bellevue, Bellevue College, Sound Transit, and King County Metro to address the following key challenges: (i) a loss

Figure 30 Bellevue College Transit Circulation Concept

Figure 72 Proposed improvements and revised transit routing around Bellevue College along Snoqualmie River Rd, from the *Eastgate/I-90 Transportation Strategies Report*.

SR-520 High-Capacity Plan (2008) – The *SR-520 High Capacity Transit Plan* outlines a strategy for meeting the demand for cross-lake travel with an incremental implementation of bus rapid transit service that connects employment, residential areas, and activity centers on both sides of Lake Washington. The plan recommends how transit can build on capital investments identified for the SR-520 Corridor Program by substantially increasing service and improving off-corridor transit facilities to help meet future growth in travel. Of the plan's three major elements, that most relevant to the TMP is the near-term implementation of bus rapid transit service on SR-520 supported by HOV lanes and direct-access ramps, transit priority treatments at intersections, intelligent transportation systems (ITS), and improvements in fare collection systems and bus stations.

I-405 Bus Rapid Transit Concept Reports – Several reports related to I-405 Corridor BRT planning were reviewed to help inform the TMP Capital Element, including *White Paper: I-405 Bus Rapid Transit Line Concept* (2003) and the *I-405 South Corridor Bus Rapid Transit Pre-Design Report* (2005). The former describes components of the proposed BRT line for the entire I-405 corridor, including HOV lanes, direct access ramps, BRT station locations and designs, fare collection, ITS, and other features. It also presents ridership forecasts for the corridor with and without implementation of the BRT line and estimates the cost of the various infrastructure investments considered by the plan. The latter report builds on earlier I-405 Corridor studies, focusing on the the southern portion of the corridor from Bellevue to Sea-Tac Airport. It assesses the overall feasibility of operating BRT along this section of the corridor in the short- (2014) and long-term (2030), considers current travel times and sources of delay, and identifies infrastructure needed to support BRT operations along with planning-level cost estimates.

Bellevue Transit Improvement Analysis (2005) – In April of 2004, King County Metro, Sound Transit, and the City of Bellevue collaborated to consolidate all of the proposed transit improvements in Bellevue from various prior studies and to identify immediate transit needs. This report summarizes the results of the arterial improvement evaluation and TSP analysis. The goal was to identify routes and corridors with the greatest needs based on a qualitative review of headways, ridership, and historic delay problems. The primary corridors identified include NE 8th St,

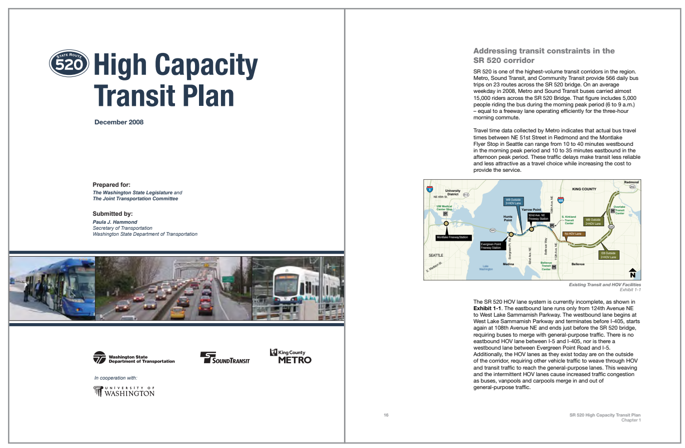


Figure 73 A map depicts the existing transit and HOV facilities on SR-520, from the *SR-520 High-Capacity Plan*.

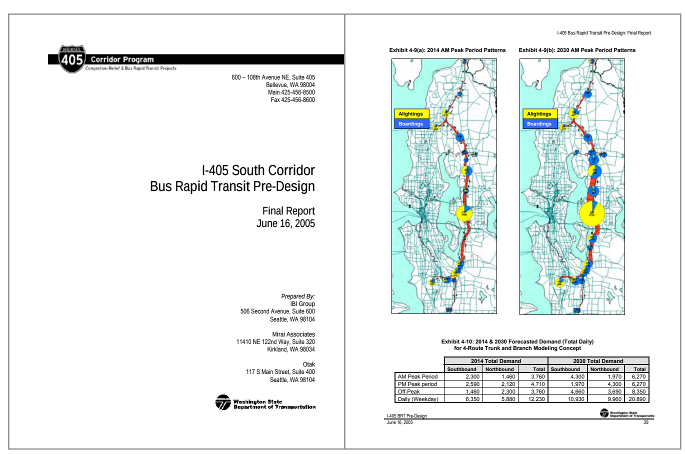
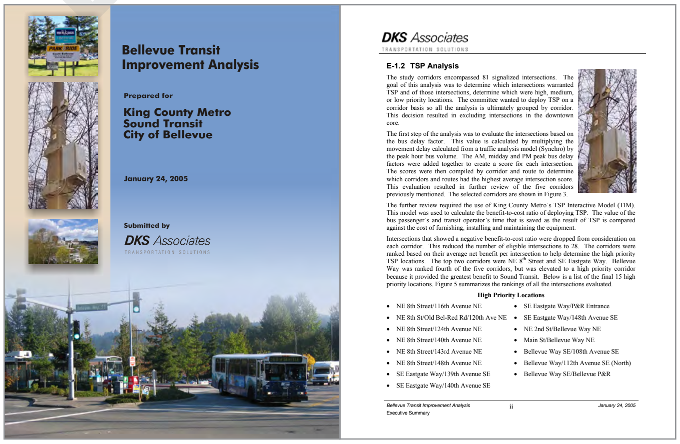


Figure 74 Maps depict I-405 BRT stop-level ridership forecasts for the AM peak period in 2014 and 2030, from the *I-405 Corridor Program: Bus Rapid Transit Line Concept*.



Bellevue Transit Improvement Analysis

Prepared for

King County Metro
Sound Transit
City of Bellevue

January 24, 2005

Submitted by

DKS Associates
TRANSPORTATION SOLUTIONS

DKS Associates
TRANSPORTATION SOLUTIONS

E-1.2 TSP Analysis

The study corridors encompassed 81 signalized intersections. The goal of this analysis was to determine which intersections warranted TSP and of those intersections, determine which were high, medium, or low priority locations. The committee wanted to deploy TSP on a corridor basis so all the analysis is ultimately grouped by corridor. This decision resulted in excluding intersections in the downtown core.

The first step of the analysis was to evaluate the intersections based on the bus delay factor. This value is calculated by multiplying the movement delay calculated from a traffic analysis model (Synchro) by the peak hour bus volume. The AM, midday and PM peak bus delay factors were added together to create a score for each intersection. The scores were then compiled by corridor and route to determine which corridors and routes had the highest average intersection score. This evaluation resulted in further review of the five corridors previously mentioned. The selected corridors are shown in Figure 3.

The further review required the use of King County Metro's TSP Interactive Model (TIM). This model was used to calculate the benefit-to-cost ratio of deploying TSP. The value of the bus passenger's and transit operator's time that is saved as the result of TSP is compared against the cost of furnishing, installing and maintaining the equipment.

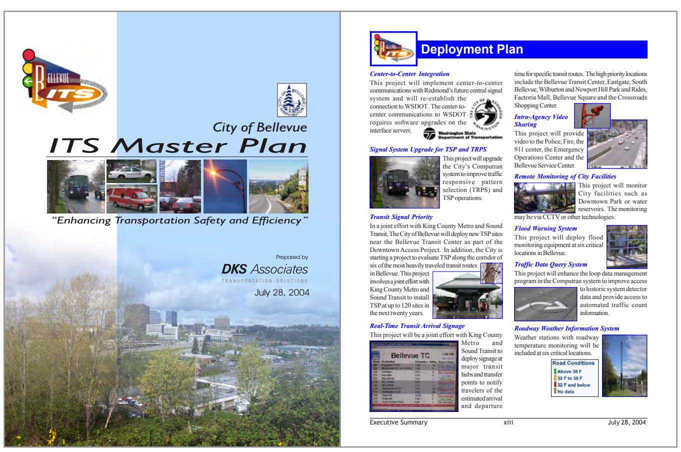
Intersections that showed a negative benefit-to-cost ratio were dropped from consideration on each corridor. This reduced the number of eligible intersections to 28. The corridors were ranked based on their average net benefit per intersection to help determine the high priority TSP locations. The top two corridors were NE 8th Street and SE Eastgate Way. Bellevue Way was ranked fourth of the five corridors, but was elevated to a high priority corridor because it provided the greatest benefit to Sound Transit. Below is a list of the final 15 high priority locations. Figure 5 summarizes the rankings of all the intersections evaluated.

High Priority Locations

- NE 8th Street/116th Avenue NE
- NE 8th St/Old Bel-Red Rd/120th Ave NE
- NE 8th Street/124th Avenue NE
- NE 8th Street/140th Avenue NE
- NE 8th Street/143rd Avenue NE
- NE 8th Street/148th Avenue NE
- SE Eastgate Way/139th Avenue SE
- SE Eastgate Way/140th Avenue SE
- SE Eastgate Way/P&R Entrance
- SE Eastgate Way/148th Avenue SE
- NE 2nd St/Bellevue Way NE
- Main St/Bellevue Way NE
- Bellevue Way SE/108th Avenue SE
- Bellevue Way/112th Avenue SE (North)
- Bellevue Way SE/Bellevue P&R

Bellevue Transit Improvement Analysis ii *January 24, 2005*
Executive Summary

Figure 75 Summary of the TSP analysis process and the fifteen highest-ranked intersections prioritized for transit signal priority (TSP), from the *Bellevue Transit Improvement Analysis*.



City of Bellevue

ITS Master Plan

"Enhancing Transportation Safety and Efficiency"

Prepared by

DKS Associates
TRANSPORTATION SOLUTIONS

July 28, 2004

Deployment Plan

Center-to-Center Integration

This project will implement center-to-center communications with Redmond's future central signal system and will re-establish the connection to WSDOT. The center-to-center communications to WSDOT requires software upgrades on the interface servers.

Signal System Upgrade for TSP and TRPS

This project will upgrade the City's Computran system to improve traffic responsive pattern selection (TRPS) and TSP operations.

Transit Signal Priority

In a joint effort with King County Metro and Sound Transit, The City of Bellevue will deploy new TSP sites near the Bellevue Transit Center as part of the Downtown Access Project. In addition, the City is starting a project to evaluate TSP along the corridor of six of the most heavily traveled transit routes in Bellevue. This project involves a joint effort with King County Metro and Sound Transit to install TSP at up to 120 sites in the next twenty years.

Real-Time Transit Arrival Signage

This project will be a joint effort with King County Metro and Sound Transit to deploy signage at major transit hubs and transfer points to notify travelers of the estimated arrival and departure time for specific transit routes. The high priority locations include the Bellevue Transit Center, Eastgate, South Bellevue, Wilburton and Newport Hill Park and Rides, Factoria Mall, Bellevue Square and the Crossroads Shopping Center.

Intra-Agency Video Sharing

This project will provide video to the Police, Fire, the 911 center, the Emergency Operations Center and the Bellevue Service Center.

Remote Monitoring of City Facilities

This project will monitor City facilities such as Downtown Park or water reservoirs. The monitoring may be via CCTV or other technologies.

Flood Warning System

This project will deploy flood monitoring equipment at six critical locations in Bellevue.

Traffic Data Query System

This project will enhance the loop data management program in the Computran system to improve access to historic system detector data and provide access to automated traffic count information.

Roadway Weather Information System

Weather stations with roadway temperature monitoring will be included at six critical locations.

Executive Summary xiii July 28, 2004

Figure 76 High priority projects identified by the *ITS Master Plan*.

156th Ave NE, Bellevue Way, Eastgate Way, and Factoria Blvd. King County Metro's TSP Interactive Model (TIM) was used to calculate the benefit-to-cost ratio of deploying TSP, wherein the value of the bus passenger's and transit operator's time saved is compared to the cost of furnishing, installing, and maintaining the equipment. Of the 81 signalized intersections originally assessed, most were removed from further consideration on the basis of negative benefit-to-cost ratios, leaving 28 eligible intersections. The fifteen highest ranked locations were estimated to cost $543,000 to furnish and install equipment.

ITS Master Plan (2004) – The Bellevue ITS Plan is a road map to implement an integrated system of transportation strategies based on a set of identified opportunities. The plan's purpose is to establish the need for ITS investments in the region, to identify relative priorities to direct ITS investment, to identify specific projects to be deployed to address identified needs, and to prioritize financial resources for ITS opportunities. The plan was coordinated with regional efforts to ensure that ITS strategies are integrated and complementary, which helps ensure that Bellevue is eligible for federal ITS funding. Among the projects identified is a collaborative evaluation with Metro of the potential to deploy TSP at up to 120 along six of Bellevue's most heavily traveled transit routes, which would be implemented over twenty years.

Factoria Area Transportation Study Update (2005) – This report is an update to the 1996 *Factoria Area Transportation Study*, which was completed three years after the area annexed to Bellevue. The update documents the transportation system capacity analysis that was conducted, addresses the needs of all modes of transportation within the area, and provides design guidance for private sector redevelopment along Factoria Blvd. Further, the update provides a strategy to achieve long-term mobility and safety for all transportation system users. It challenges the existing, disconnected suburban land use pattern, providing transportation and urban design recommendations embraced by the community that would create a well-integrated, transit supportive, pedestrian oriented, mixed-use urban neighborhood.

148th Avenue Mobility Improvement Package (2003) – This study addresses the concerns of residents of East Bellevue neighborhoods, who were concerned that excessive traffic in the 148th Ave corridor was resulting in increased traffic on neighborhood streets. The project's vision is to gain community support for transportation improvements to optimize north-south travel on 148th Ave that maximizes the people-moving capacity of the system while minimizing the impacts on parallel arterials and neighborhood streets. The report identifies short- and mid-term projects to manage congestion problems and protect neighborhoods from cut-through traffic. Some transit projects recommended include TSP at slected locations along 148th Ave and a southbound queue jump at SE 24th St.

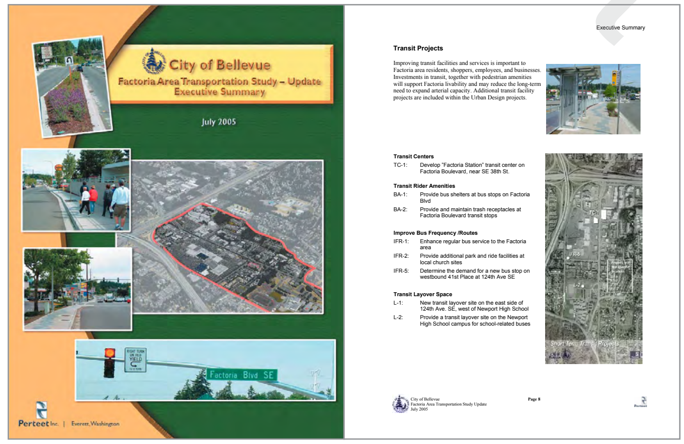


Figure 77 Transit facilities and service improvement projects identified by the *Factoria Area Transportation Study.*

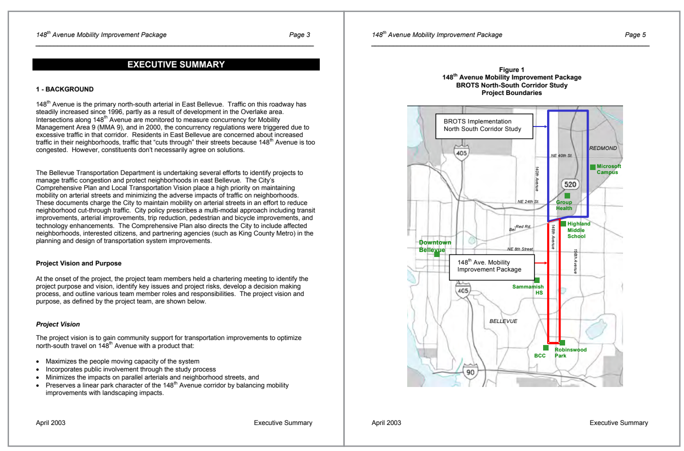


Figure 78 Project extents assessed by the *148th Avenue Mobility Improvement Package.*

This page intentionally left blank.

TRANSIT PRIORITY TOOLBOX

The Transit Priority Toolbox includes a range of transit priority treatments being considered for implementation on Bellevue's transit corridors by 2030. The purpose of the toolbox is to guide capital improvements on Frequent Transit Network (FTN) corridors that will improve the speed and reliability of these services—both to make them more attractive to the public, and to ensure they achieve operating speeds consistent with estimates in the *Transit Service Vision Report*.

Treatments considered in the Transit Priority Toolbox are generally divided into three categories:

1. **Intersection treatments**, including TSP, queue jump lanes, and left turn restrictions;
2. **Bus stop treatments**, including in-lane stops, curb extensions, and transit islands; and
3. **Running way treatments**, including BAT lanes, arterial HOV lanes, transit-only lanes or streets, contra-flow bus lanes, and busways.

Each category includes strategies with different levels of financial investment, degrees of benefit to transit, and impacts to other travel modes. Some improvements are intended for discrete locations, while others are meant to be coordinated along entire corridors. Some locations or corridors may warrant multiple improvements based on existing configurations and level of transit priority deemed appropriate. Figure 79 provides a graphical summary of the treatment types organized according to the degree of transit operational exclusivity they provide. The following pages describe each of the treatments being considered, their advantages, disadvantages, and approximate cost, and include photographs of their application elsehwere in the Puget Sound region.

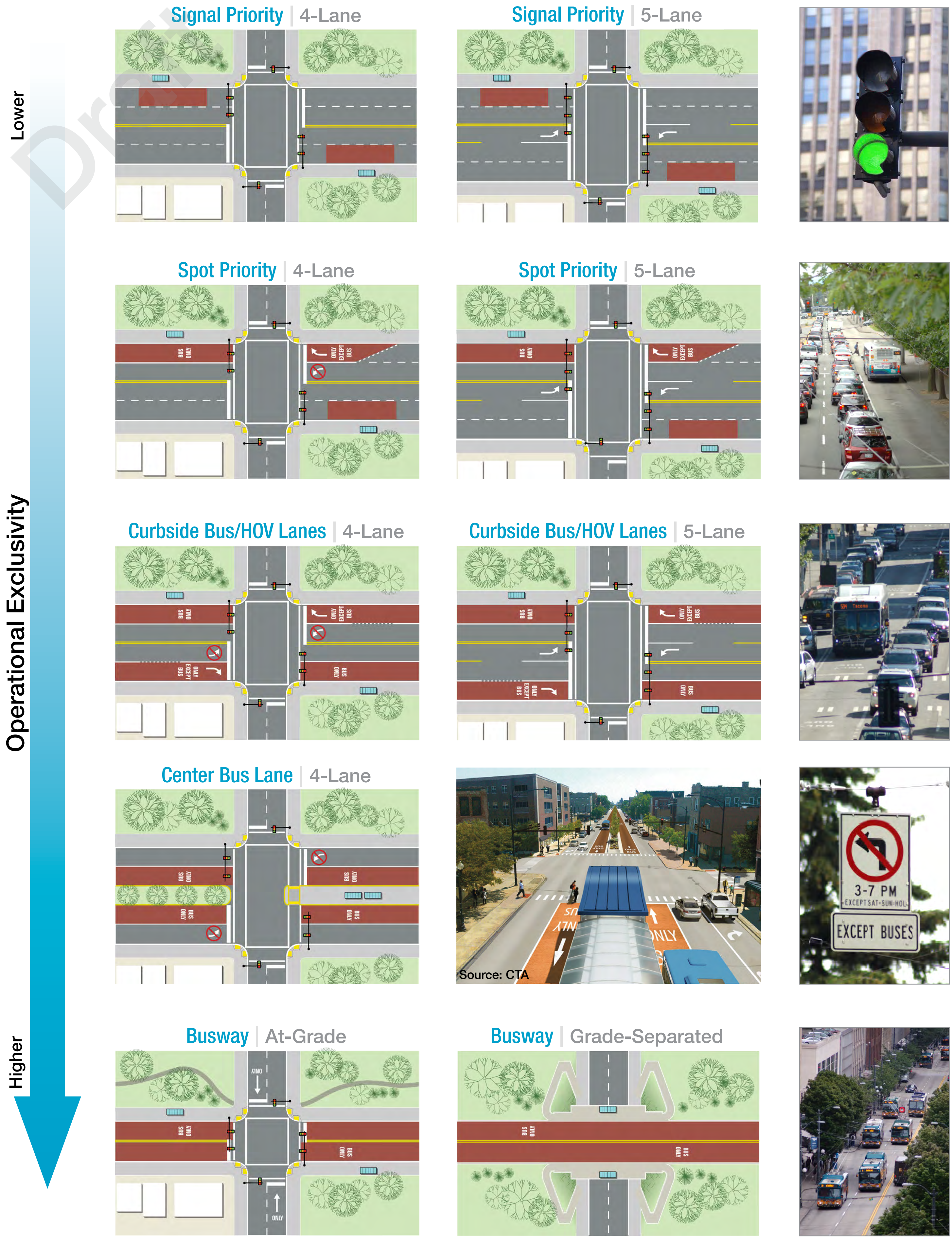


Figure 79 Diagram of the level of operational exclusivity exhibited by the primary categories of treatments in the Transit Priority Toolbox.

INTERSECTION TREATMENTS

Transit Signal Priority

Description

Transit signal priority (TSP) is an operation that adjusts signal timing to prioritize transit vehicle movements along a corridor. There are several types of signal priority treatments, as shown at left, with green extension and early green used most commonly. Intersection context and city policy have a significant impact on the speed and reliability benefits that TSP can provide to transit. Arterials with medium levels of congestion and frequent signalized intersections are ideal for TSP. Many other priority treatments are paired with TSP to improve overall effectiveness.

Passive TSP strategies include signal timing coordination and the addition of a special signal phase. Active TSP offers the additional ability to give a bus priority conditionally based on one or more factors, including whether a bus is running late, the number of passengers on board, and how recently priority was given to another bus. Upgrades to signal controllers and fiber communication lines are often necessary for implementation of active TSP strategies.

Green Extension – This application keeps a signal green for an approaching bus until the bus has passed through an intersection.

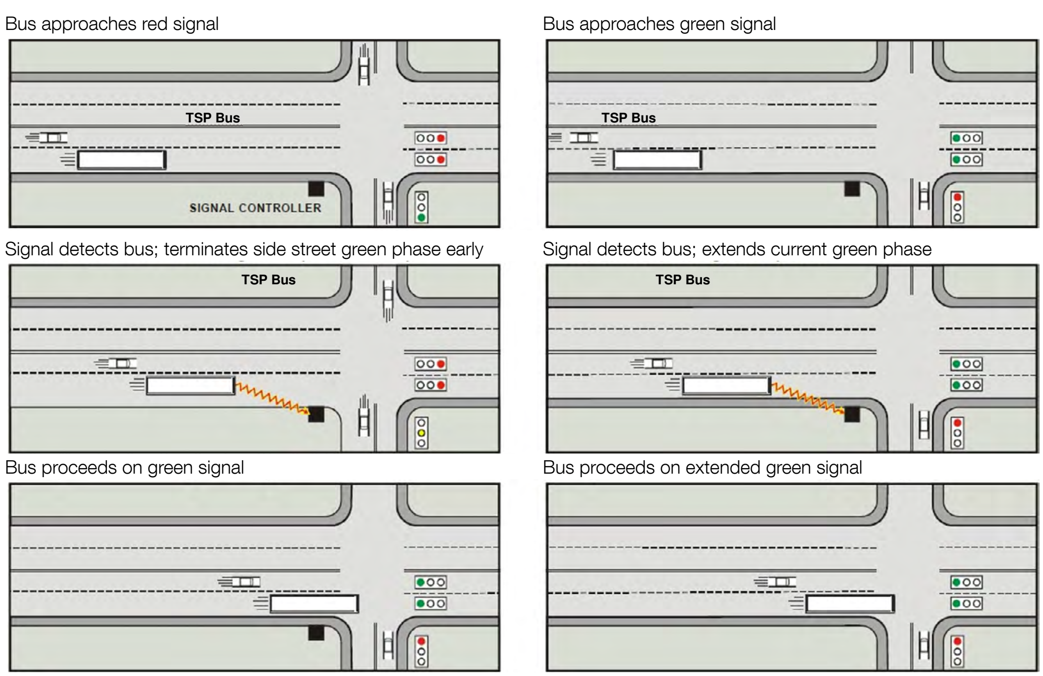
Early Green (Red Truncation) – This application reduces the amount of time a bus waits for a green light by shortening the amount of green time given to other traffic.

Phase Rotation – This application switches the sequence in which signals turn green, most commonly switching a left turn arrow with a through green for an approach.

Pre-emption – This application is typically used by emergency vehicles and at railroad crossings. Designated vehicles receive a green signal upon approaching an intersection or crossing.

Special Phase – This application is used to give a green light to a bus only signal when a bus is present. This type of application is typically used at or near transit centers when buses make unusual movements through an intersection.

Figure 80 Signal timing operations with early green (left) and green extension (right).



Source: URS for Pace Suburban Bus (2011).

Figure 81 Transit signal priority helps to ensure that buses can move along a corridor with minimal delay incurred by red lights.

Advantages

- Provides modest speed and reliability improvement
- Improves overall travel time between three to fifteen percent and can reduce signal delay for transit up to 75%
- No additional right-of-way required
- Produces a minimal overall impact to general traffic, depending on the level of priority assumed
- Can be implemented with other signal and transit enhancements

Considerations

- Performance depends on many factors including:
  - Number of intersections
  - Priority thresholds
  - Extent of priority
- TSP has limited impact when buses are on highly congested corridors
- May disturb the flow of a coordinated signal system
- Requires inter-jurisdiction coordination
- Side-street bus routes may experience additional delay when favored routes receive priority
- Not as effective with far side stops

Queue Jump Lanes

Description

Queue jumps allow buses to bypass congested choke points through a combination of a short bus-only lane and a dedicated bus signal, which gives buses a green light several seconds before other vehicles. This operation allows buses to enter the intersection ahead of general traffic. Queue jumps are primarily used when the right-of-way at a choke point is constrained, but roadways leading up to the choke point have sufficient space for a dedicated bus-only lane.

Figure 82 A bus approaches an intersection in a bus-only queue jump lane.

Benefits

- Allows buses to bypass congestion at critical locations
- Requires less right-of-way than treatments along a full corridor
- Can improve bus travel time by five to twenty-five percent and reduces delay

Considerations

- Impacts to general purpose traffic varies per improvement strategy (i.e. use of a right-turn lane or conversion of second thru-lane to a right-turn only lane with transit queue jump)
- Effectiveness will vary depending on location of intersection transit stop
- Will be less effective with high volume right-turn lanes

Figure 83 The bus-only queue jump lane (right signal) receives a green signal before general purpose traffic (left signal).

Figure 84 Left turn restriction on general purpose traffic.

Figure 85 A bus turns during a protected phase.

Left Turn Restrictions

Description

Turn restrictions are generally used to improve safety or reduce congestion by restricting left-turns during peak periods. In many cases, turn restrictions reduce delays caused by turning vehicles blocking traffic. This is primarily an issue at intersections without dedicated left-turn lanes, such as 2-lane and 4-lane corridors. Turn restrictions are also used in combination with transit priority treatments. A turn restriction maximizes the capacity of the remaining general purpose lanes or restricts unsafe movements that cross bus traffic. Turn restrictions may also give transit priority at locations with heavy traffic delays.

Benefits

- Improves traffic operations at intersections and along corridors where center turn lanes do not exist
- Can be implemented for specific time periods
- Provides priority for transit vehicles when turning left
- Improves travel time for transit

Considerations

- Can cause confusion for general traffic
- Reduces route options for general purpose traffic during peak periods
- Requires active enforcement
- May increase intersection delays caused by vehicle diversion, degrading intersection levels of service
- Can impact safety at adjacent intersections through the consolidation of left-turning traffic

BUS STOP TREATMENTS

In-Lane Bus Stops

Description

In-lane bus stops are locations where a bus stops in a travel lane to pick-up or drop-off passengers. This type of stop typically generates less delay for the bus as compared to bus pullouts, which require the bus to leave the traffic stream and re-enter after serving passengers. Merging back into the main travel lane can significantly delay buses because passenger vehicles often do not yield to a bus attempting to merge into traffic. This causes additional delay and increased potential for conflicts. In-lane stops reduce re-entry delay and increase safety for the bus and other vehicles. In-lane bus stops are particularly effective on roadways with few gaps in traffic.

Figure 86 RapidRide bus at an in-lane bus stop.

Benefits

- Reduces re-entry delay after serving a bus stop
- Increases transit visibility

Considerations

- Increases vehicle delays for general traffic (may vary with one or two lane directional configurations)
- Can increase bike/transit conflicts

Figure 87 Unlike bus pullt-outs, in-lane stops do not incur delay by requiring buses to re-enter the traffic stream.

Curb Extensions

Figure 88 Curb extension on the far-side of an intersection.

Description

Curb extensions are locations where the sidewalk has been extended to allow buses to stop in-lane. This design reduces delays for buses by avoiding re-entry delay, with the added benefit of providing additional sidewalk space for waiting passengers and amenities. Curb extensions are typically used in locations were on-street parking is provided; buses experience delay when re-entering traffic; or additional sidewalk space is needed. Roadway capacity may be reduced, and conflicts between bikes and transit might occur in situations where bicycle lanes exist.

Benefits

- Reduces re-entry delay after serving bus stop
- Allows for retention of on-street parking or load zones
- Increases pedestrian comfort by allowing for wider sidewalks and bus stop amenities
- Can improve pedestrian safety by reducing crossing distance if incorporated into a mid-block crosswalk or intersection treatment

Figure 89 Curb extension following a short parking lane.

Considerations

- Increases vehicle delays for general traffic (may vary with one or two lane directional configurations)
- Can increase bike/transit conflicts

Transit Boarding Islands

Description

Transit islands provide a bus stop in the road right-of-way separated from the curb through a variety of designs. This treatment enables a bus to travel and stop in a lane that is not adjacent to the curb while still providing amenities to the transit riders. For example, buses may use the left lane of a roadway because of a priority treatment or a necessary maneuver, and a transit island allows buses to serve a bus stop without changing lanes. Transit islands can also reduce bike and transit conflicts by routing the bicycle lane behind the transit island. Transit islands are built within the street right-of-way and often reduce effective crossing distances for pedestrians, which may improve pedestrian connectivity and safety.

Figure 90 Transit island with in-lane bus stop.

Benefits

- Integrates with locations configured with a left side transit lane
- Reduces transit vehicle re-entry delay after serving a bus stop
- Reduces bike/transit "leap-frog" conflicts
- Can be useful at intersections with significant parking activity and right turns

Figure 91 Transit island with bus-only lane.

Considerations

- Increases vehicle delays for general traffic, particularly if unable to pass the bus
- Requires space within standard street ROW
- Could create an unsignalized pedestrian crossing for riders to access the transit island, if configured mid-block

Figure 92 Transit island with in-lane bus stop.

Figure 93 Transit island with bus-only lane.

Business Access & Transit Lanes

Description

Business Access and Transit (BAT) Lanes restrict a curbside lane of a multilane arterial to transit and right-turning vehicles only. At intersections, all vehicles (including high occupancy vehicles) are required to turn right while transit can continue straight through the intersection. This preserves access to businesses and side-streets, but reduces vehicle volumes in the curbside lane such that transit speed and reliability are improved. BAT lanes may not benefit transit operations well in locations with frequent right-turn vehicle movements and heavy conflicting pedestrian volumes.

Benefits

- Can result in significant transit speed and reliability improvements through congested corridors where standing queues from intersections increase congestion
- Works well in locations with infrequent right turn movements

Considerations

- Requires significant ROW to construct or conversion of travel or parking lane to BAT lane
- Can increase general purpose congestion through decreasing general purpose capacity
- Can be blocked by cyclist or turning/merging vehicles especially in highly congested locations or locations with high pedestrian volumes
- Effectiveness is limited along high volume commercial areas with high right-turn volumes

Arterial HOV Lanes

Description

Arterial High-Occupancy Vehicle (HOV) Lanes have similar restrictions as freeway HOV lanes. Only transit, motorcycles, and carpools (2+ or 3+ occupants) are allowed to use the lanes. These lanes are typically located in areas with heavy reoccurring congestion and infrequent right-turns. Allowing carpools can increase the person capacity of the lane and works well in coordination with the freeway HOV system.

Benefits

- Speed and reliability improvement for transit and HOV vehicles in congested corridors
- Works well along road segments where transit volumes might not be high enough to justify an exclusive transit lane and HOV demand is high
- Works well in coordination with freeway HOV system and onramps

Considerations

- Can increase general purpose congestion
- Effectiveness is limited along high volume commercial areas with high right-turn volumes
- Requires on-going enforcement which is complicated by carpools

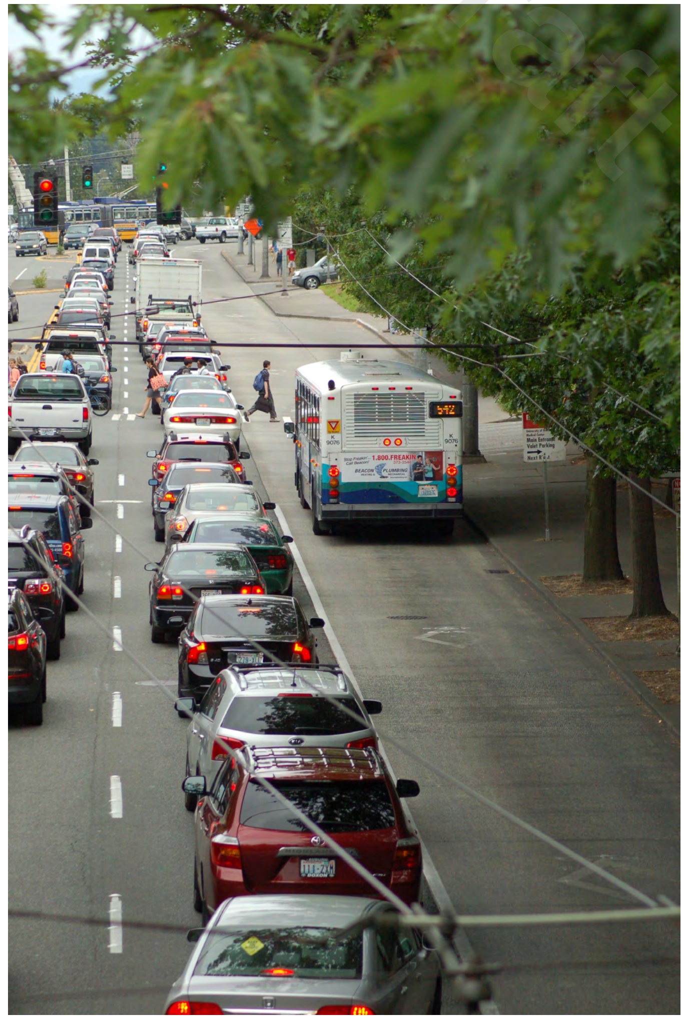


Figure 94 Bus in an HOV lane.

Figure 95 Bus in an HOV lane at a signalized intersection.

Transit-Only Lanes

Description

A transit-only lane reserves a lane for exclusive transit use along a corridor or through a choke point. This provides the highest level of transit priority on "local" streets and is often implemented along corridors with high bus volumes or with median bus rapid transit. Bus-only lanes can result in significant improvements to speed and reliability for transit, especially through choke points. Bus-only lanes can result in turn restrictions for general purpose traffic depending on the overall location and configuration of side streets.

Figure 96 Transit-only lane provides non-curb lane for buses.

Benefits

- Provides the highest level of transit priority of all arterial priority treatments
- Provides significant speed and reliability benefits in congested areas
- Ideal for locations with high bus volumes

Considerations

- Can increase general purpose congestion due to reduced capacity
- Can result in turn restrictions for general purpose traffic
- Generally the most difficult arterial running way treatment to implement
- Requires on-going enforcement

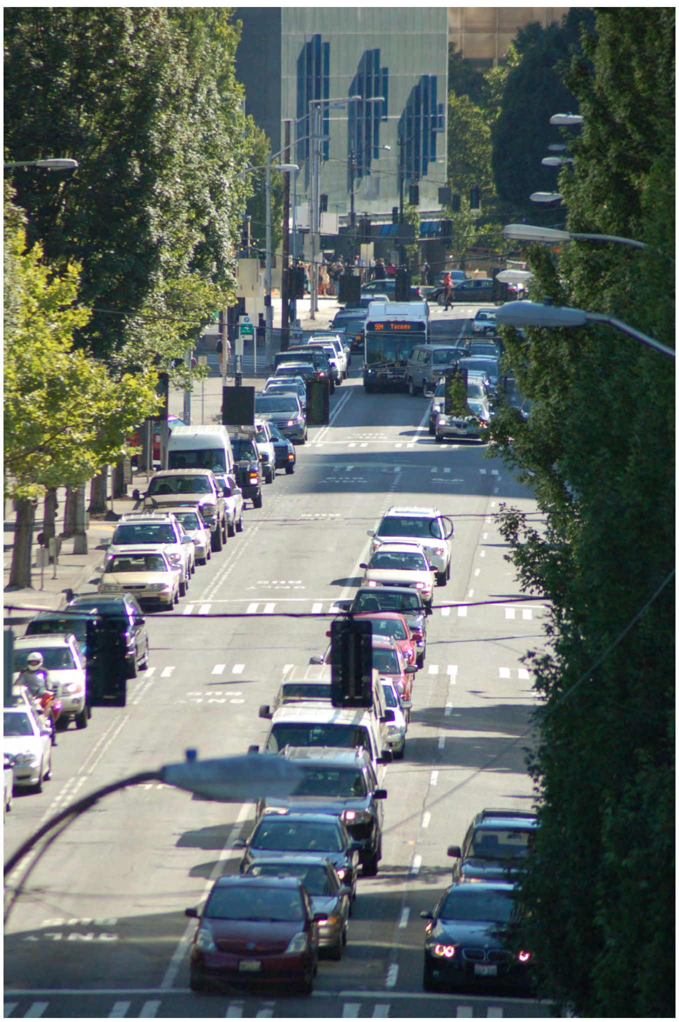


Figure 97 Personal vehicles cannot use a transit-only lane.

Transit-Only Street

Description

A transit-only street is a street that is reserved for transit vehicles for part or all of the day. This designation is often implemented to increase transit capacity of a roadway especially in urban centers and to ensure that buses are insulated from general purpose traffic congestion. Transit-only streets also allow for transit service to be consolidated onto a single street, simplifying and improving frequency of service for riders and reducing the impact of transit on general purpose traffic on parallel corridors.

Figure 98 Transit-only streets provide additional maneuvering space for buses.

Benefits

- Improves speed and reliability of multiple transit routes
- Can reduce transit impacts on parallel streets

Considerations

- Restricts general purpose travel on street and can create confusion for general purpose traffic at the interface with multi-purpose roadways
- Impacts access for general purpose traffic to parking garages and business, but can be managed via signage and allowance for access to mid-block locations
- Can increase congestion on parallel streets due to traffic diversion

Figure 99 Transit-only street during peak hours.

Figure 100 Busways provide dedicated right-of-way for buses.

Figure 101 Busways may include grade-separated lanes for buses.

Busways

Description

Busways are similar to transit only streets, but are typically built in their own right-of-way, such as abandoned railroad right-of-way. Busways can be fully grade-separated, allowing buses to bypass cross-traffic using bridges or tunnels. Busways can also be at-grade with transit signal priority at intersections. A combination of the two is also possible. Busways offer the highest level of speed and reliability benefits, sometimes similar to light rail. Busways can be expensive to build, especially fully grade-separate ones, and conversion of right-of-way to bus use can be complex due to competing objectives for the corridor and concern from adjacent property owners.

Benefits

- Separates buses from vehicles to a high degree, with either full grade-separation or transit signal priority for at-grade intersections.
- Provides a reliable corridor, where traffic can't impact bus travel
- Provides a high-capacity corridor for very frequent transit service
- Can allow for higher travel speeds than allowed on city streets
- Can result in transit service with similar speeds and frequency of light-rail

Considerations

- In most cases is only viable on unused utility or rail corridors
- Needs to incorporate grade separation into access locations or primary crossings
- Can have a significant cost if corridor needs to be acquired or grade-separated crossings are built
- Use of corridor often has competing objectives and potential opposition from adjacent property owners

Contra-flow Bus Lanes

Description

Contra-flow bus lanes allow buses to travel against traffic on a one-way street, turning a one-way street into a two-way street for transit. Contra-flow lanes can vary in length and are generally used to address transit routing/access issues.

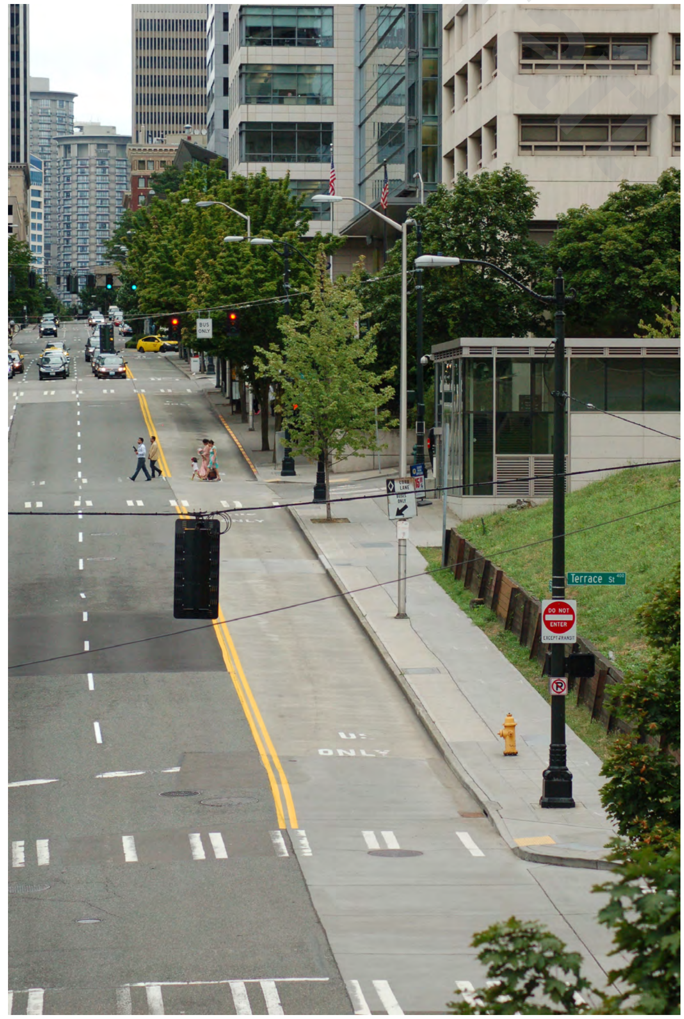


Figure 102 Contraflow lanes provide critical connections for transit networks.

Benefits

- Facilitates direct, congestion-free routing for otherwise complex routing to important connecting facilities
- Bus lane is less likely to be blocked by parked or loading vehicles
- Two-way routing reduces rider confusion

Considerations

- Can increase congestion due to conversion of travel lane to transit only
- Depending on the circulation needs of transit, could reduce efficiency of one-way street because of signal timing

Figure 103 Staff and local stakeholders took part in a field review of several corridors being considered for transit priority investments, including Snoqualmie River Rd on the Bellevue College campus, pictured here.

ISSUE IDENTIFICATION

When the efficiency of transit is reduced, so is its attractiveness to potential riders, and the many economic, social, and environmental benefits that transit provides are then also diminished. While the efficiency of transit service is affected by a variety of factors, the City of Bellevue has the ability to influence some of them, including the timing and coordination of traffic signals, the design of roadways, and the extent to which transit interacts with traffic congestion.

However, changing any of these factors from their current state requires difficult trade-offs to be made between competing interests. Whereas transit service trade-offs deal primarily with competing interests among different groups of transit users, capital investments in transit need to be balanced against the potential impacts on other modes of travel—namely private automobiles, but also bicycles and pedestrians. The extent to which the right-of-way is segmented in favor of any one mode necessarily reduces the availability of this space for other travel modes, so it is vital to carefully consider how alternative courses of action would affect all road users. Due to limitations imposed by financial resources, constrained rights-of-way, and the impacts that transit priority projects could have on other modes of travel, it is not possible to implement such projects everywhere that transit operates. Instead, attention should be directed to locations of particular concern, significance to the success of the overall network, and/or those capable of realizing notable improvement over existing operations.

The issue identification methodology presented in this section highlights candidate roadway segments along Frequent Transit Network corridors (based on congestion, bus volumes, transit usage, and multiple other factors) that would likely benefit from transit speed and reliability improvements.

DATA SOURCES

This section summarizes the data sources used to identify the location and magnitude of transit speed and reliability issues as part of the Capital Element of the TMP. The data sources include multiple measures of existing and future roadway congestion, bus delays as tracked through GPS data from Metro, transit ridership, mode share, bus volumes, and bus operator feedback. Data sources selected for this analysis were considered for the following reasons:

- Data was available in a format that could be used in the analysis.
- Data was relevant to the speed and reliability of transit service in Bellevue.
- Data sources provide information on short- and long-term measurements.

The following provides an overview of each data source used, including a description, review of the data's significance, how it was generated and/or from whom it was obtained, and any limitations that exist. Appendix A summarizes this information.

Figure 104 Bellevue Way NE and NE 12th St facing south. A queue jump lane for northbound buses is among the transit priority projects being considered based on issues identified by the process described here.

Standing Delays

Over the last few years, King County Metro buses have been equipped with a GPS-based tracking system. Data from the GPS system and other instruments like door sensors and the speedometer are integrated and recorded by an onboard computer during every bus trip operated. Using this data, it is possible to estimate the amount of time that buses are stopped by traffic signals and congestion. Time when a bus is stopped to pick up or drop off passengers is not included in this measure, as that is a function of the boarding and exiting process and not related to street congestion.

This is a rich and highly applicable dataset because it is a direct measure of the delay experienced by transit vehicles on a day-to-day basis. Intersections and roadway segments that experience frequent standing delays are easily identified through graphical representation of the data. Standing delay data was provided by King County Metro and compiled by screening GPS data for instances when a bus stopped with its doors closed while not at a bus stop. The data used in this analysis was collected on weekdays between January 7 and February 15, 2013.

Transit Ridership

Transit ridership is measured in terms of the forecasted weekday count of passengers that use transit in both directions along a street segment. Daily transit ridership is critical for highlighting corridors where transit priority investments will benefit the largest number of riders. For example, while transit priority at one location might save five seconds for 1,000 riders, the same improvement on a heavily utilized corridor could save five seconds for 10,000 riders—a tenfold increase. By identifying corridors with strong ridership, high-impact transit priority projects can be identified to ensure greater return on investment.

Weekday ridership data for this measure reflects 2010 observed counts and 2030 forecasts obtained from the Bellevue-Kirkland-Redmond (BKR) travel demand model (EMME version MP30r6.2). Figure 105 on page 124 and Figure 106 on page 125 depict these data sources. Because future transit ridership estimates are based on forecast assumptions, the results may ultimately vary due to real-world divergence from model assumptions.

Bus Volumes

Bus volumes are measured in terms of the number of buses operating each weekday in both directions along a street segment. Total weekday volumes are used—as opposed to volumes during a particular time of day—so that highlighted locations reflect those that exhibit high bus traffic over the course of an entire day, rather than a disproportionate surge exclusively during peak hours.

Bus volumes are an important measure when analyzing the efficiency of the bus network. As with transit ridership, focusing transit priority treatments where the most buses operate multiplies the benefits of transit priority, improving the return on investment. This is important for Metro and the City of Bellevue because each minute of travel, regardless of the number of passengers on-board, costs the same amount of money to operate and hence reflects the same share of total regional service hours allocated locally. The more efficiently transit service can operate within Bellevue, the more service Metro can provide with the same amount of resources. This is true in any circumstance, but it is particularly significant given Metro's continuing budget constraints.

The data used for analysis of bus volumes was compiled by City staff and reflects transit services in Bellevue as operated by the Spring 2012 Baseline Network and consistent with the span and headways

Figure 105 Daily transit usage patterns on Bellevue's arterials in 2010 by transit passenger per day arterial categories.

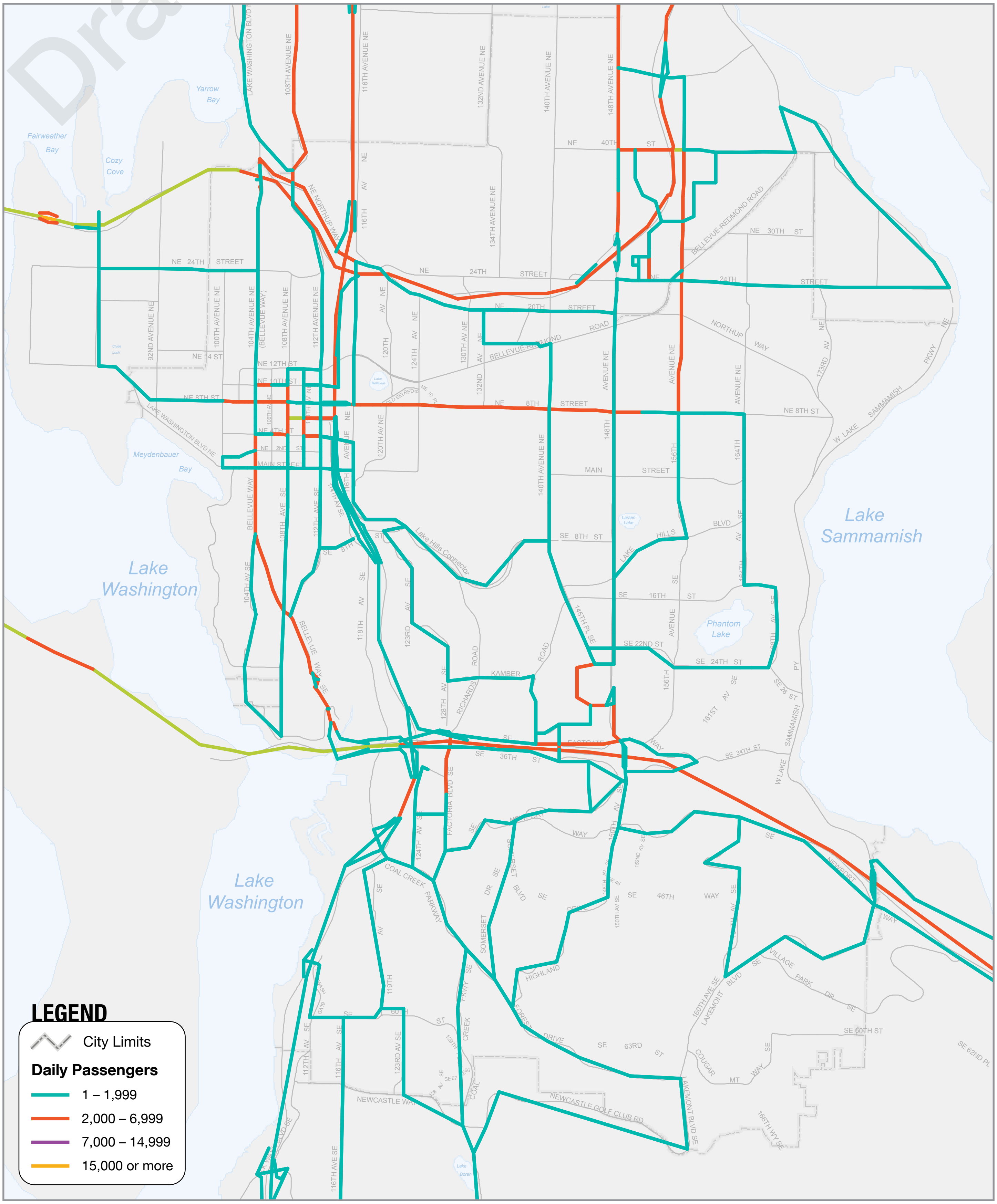


Figure 106 Daily transit usage patterns on Bellevue's arterials in 2030 by transit passenger per day arterial categories (derived from BKR model platform MP30r6.2 with transit routes defined in the 2010 *East Link Bus/Rail Integration Plan*).

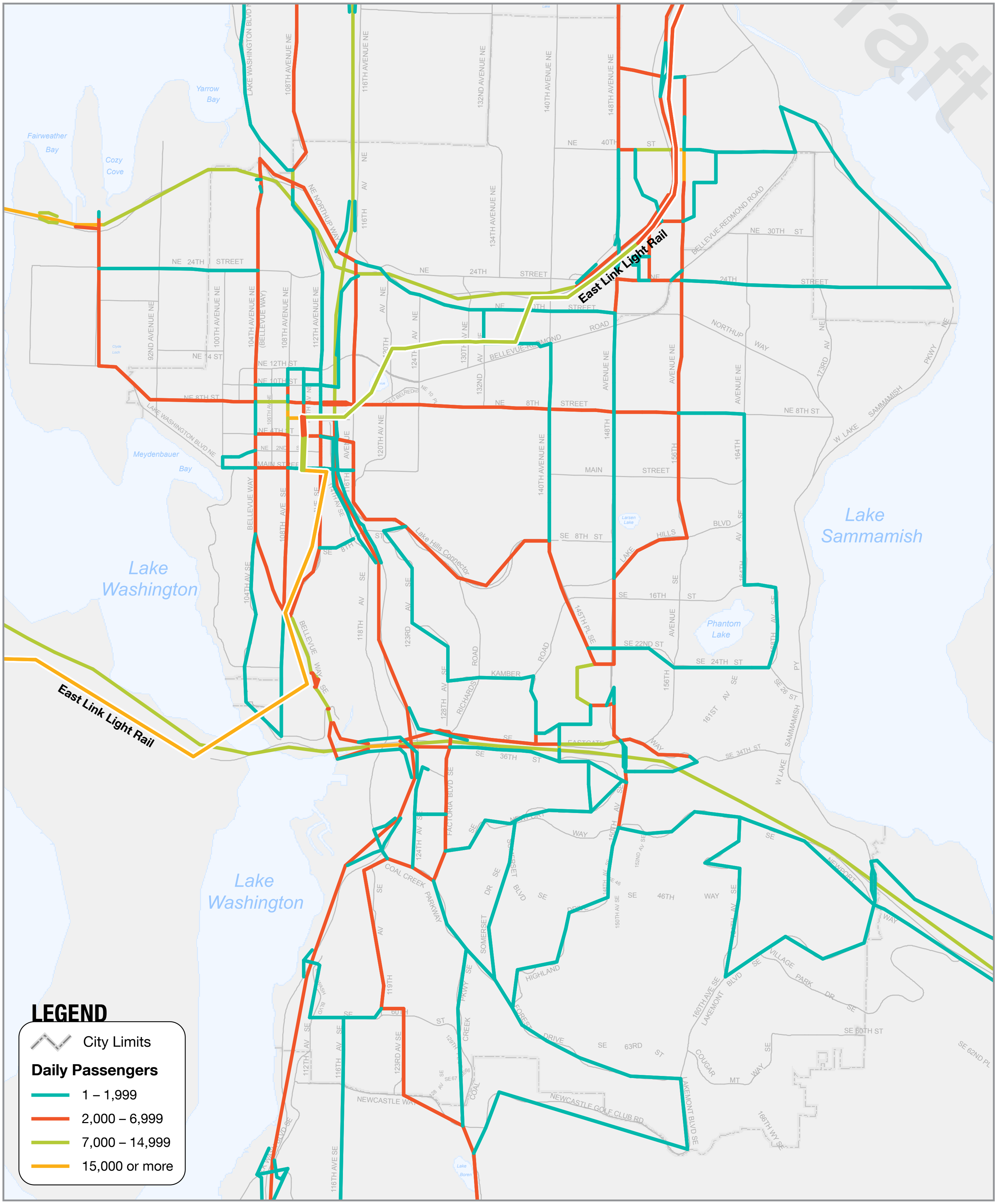


Figure 107 Bus trips operated daily, Spring 2012 Baseline Network.

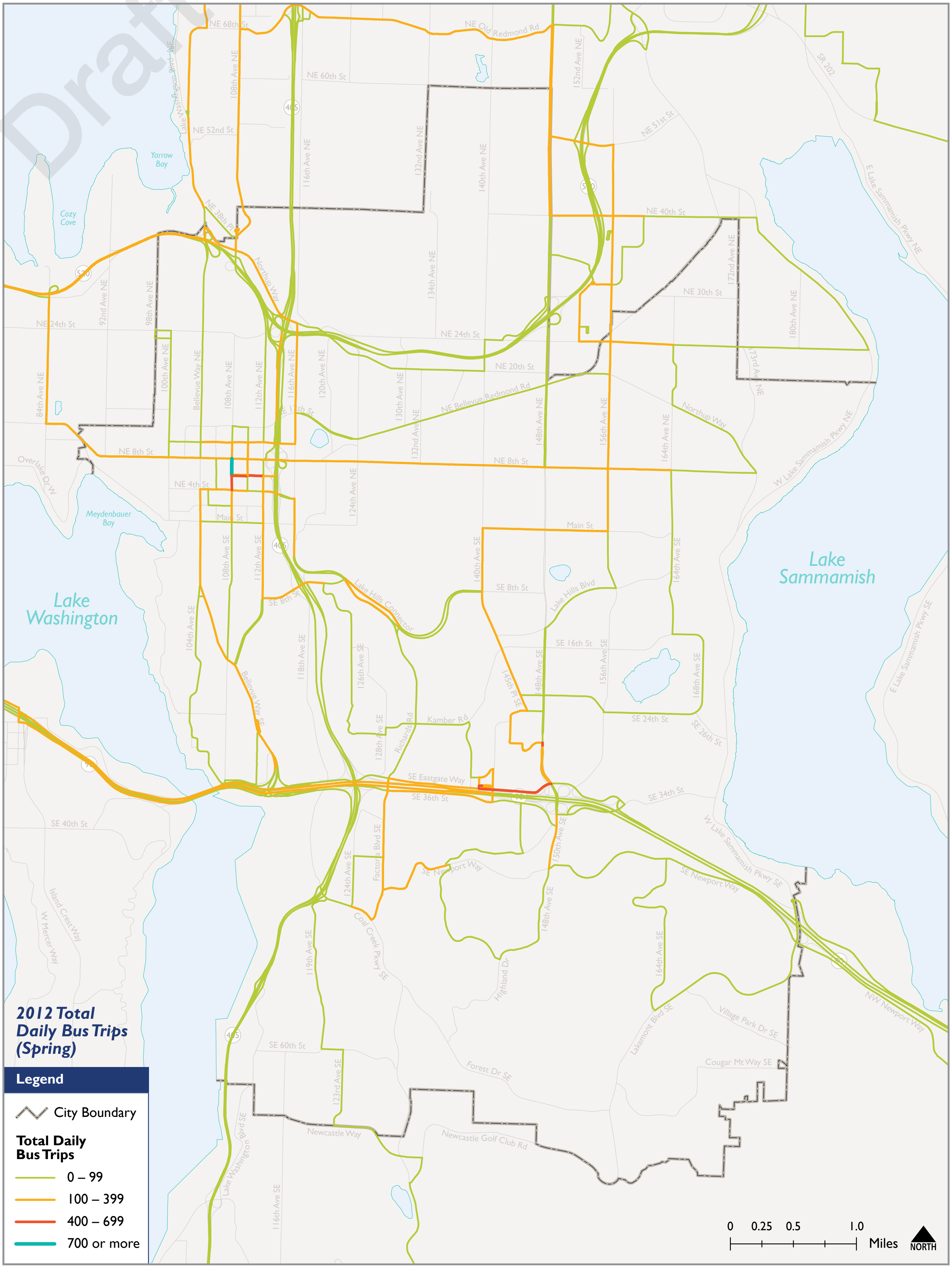
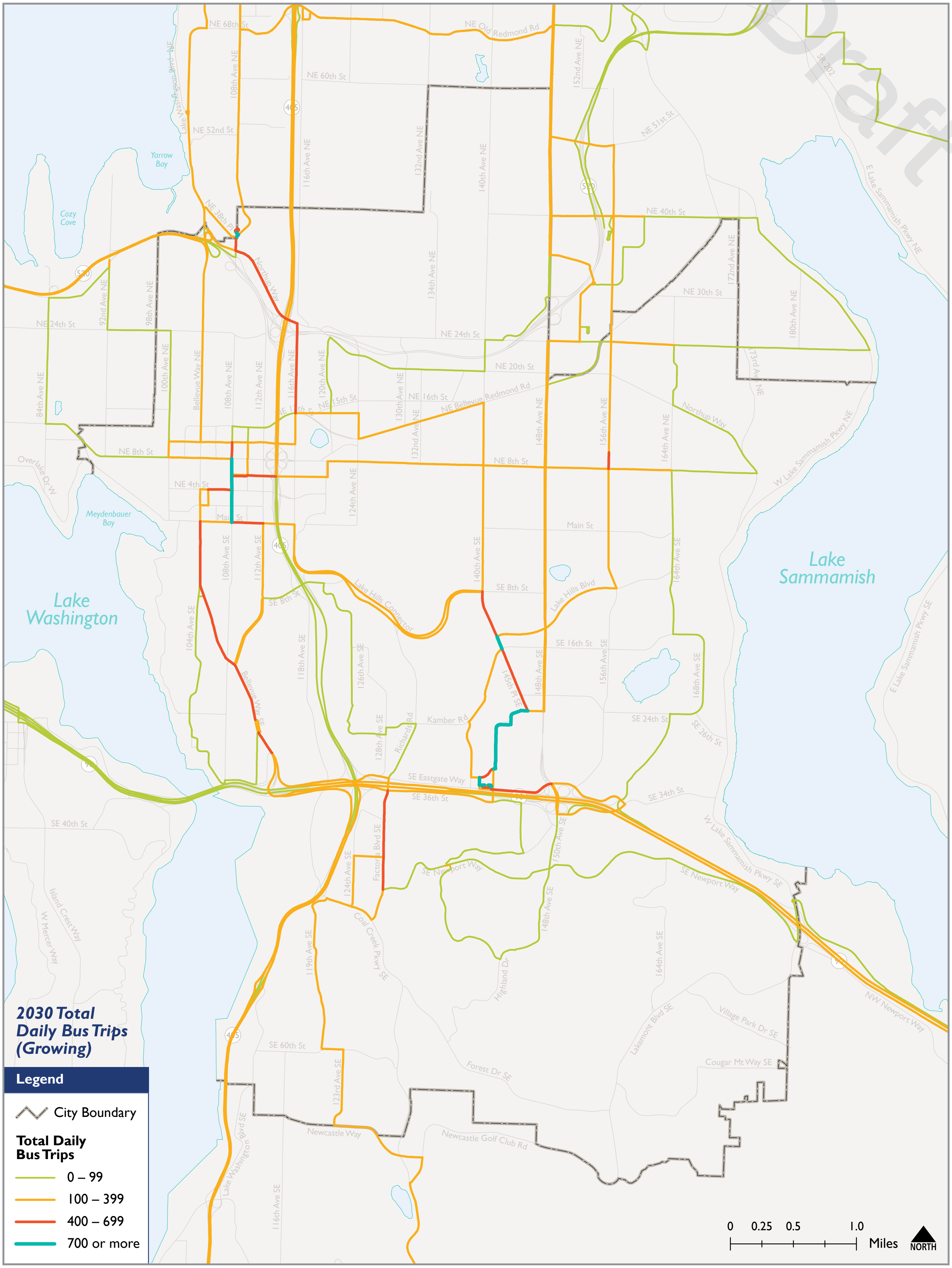


Figure 108 Bus trips operated daily, 2030 Growing Resources Network.



to be operated by the 2030 Growing Resources Network. (See the *Transit Service Vision Report* for details about each of these networks.) Figure 107 on page 126 and Figure 108 on page 127 compare the number of daily bus trips operated in 2012 and 2030, respectively. Among future networks, the bus volume analysis was completed only for the 2030 Growing Resources Network because that represents the maximum number of bus trips that will be operated per day within the TMP's implementation period. All routes were associated to the streets on which they operate, and the number of daily trips operated by each were aggregated for all overlapping segments.

Approach Delay

Delays experienced by vehicles on city streets are primarily the result of intersection related delays from traffic control devices like traffic signals. As vehicle volumes increase during peak periods and congestion builds, delays in the transportation network increase. This is particularly evident at signalized intersections. In congested and high-volume corridors, a single intersection can be a bottleneck for large parts of the network, creating significant delays to general purpose traffic and any buses traveling in general travel lanes.

The measure used in this analysis captures the sum of the average weekday, PM peak intersection approach delay, measured in seconds, along an analysis segment. City staff calculated approach delay for 2010 and 2030 using the Dynameq travel demand model. This model is more detailed than the City's travel demand model because it provides specific operational metrics at an intersection level. However, not all aspects of traffic are modeled, such as the impact of high pedestrian volumes on turning vehicle delays. Only intersection approaches served by bus routes that operate frequent headways were included in the analysis.

Approach Queue

The queue length is measured as the length of vehicles waiting to travel through an intersection. Intersection approach queues are summarized along an analysis segment. The approach queue experienced for an intersection approach is influenced by its signal timing (green time allocated to that approach), signal coordination, and traffic volumes.

Data for the approach queues was included in the TMP Capital Element analysis because it can identify approaches that are currently or expected to experience long vehicle queues, impacting the speed and reliability along key transit corridors. This information can help guide transit priority treatment, such as installation of queue jumps or bus-only lanes so that buses can bypass queued vehicles.

Forecasted average PM peak hour approach queue is reported for 2010 and 2030 in terms of the average length in feet (see Figure 109 on page 130 and Figure 110 on page 131, respectively). This data is based on the City of Bellevue's Dynameq travel demand model.

Intersection Level of Service

The performance of an intersection can be reported in many ways, but intersection level-of-service (LOS) is the measure most commonly used by traffic engineers. LOS uses the average delay experienced by a vehicle at an intersection and assigns a letter grade of A through F, with an intersection of LOS A experiencing little delay and an intersection of LOS F experiencing significant delay.

With respect to transit speed and reliability, intersection level-of-service has several implications. An intersection with a poor LOS indicates a location where transit likely experiences delays; however, it also indicates an intersection where transit priority treatments are likely more difficult to implement successfully due to impacts on other modes or physical limitations. In contrast, intersections with

Figure 109 Intersection level-of-service (LOS) and average queue length (in feet) in 2010 at FTN intersections.

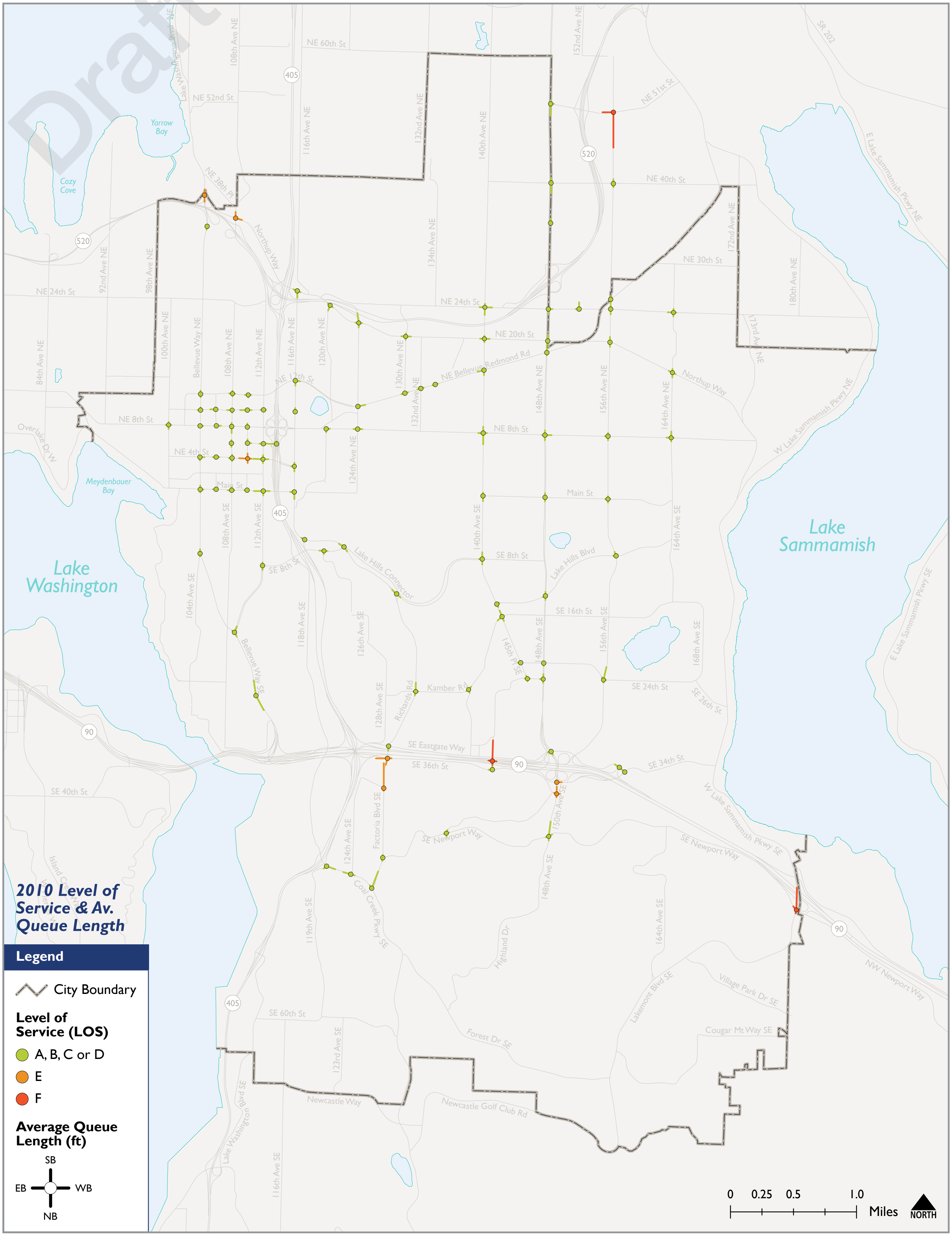
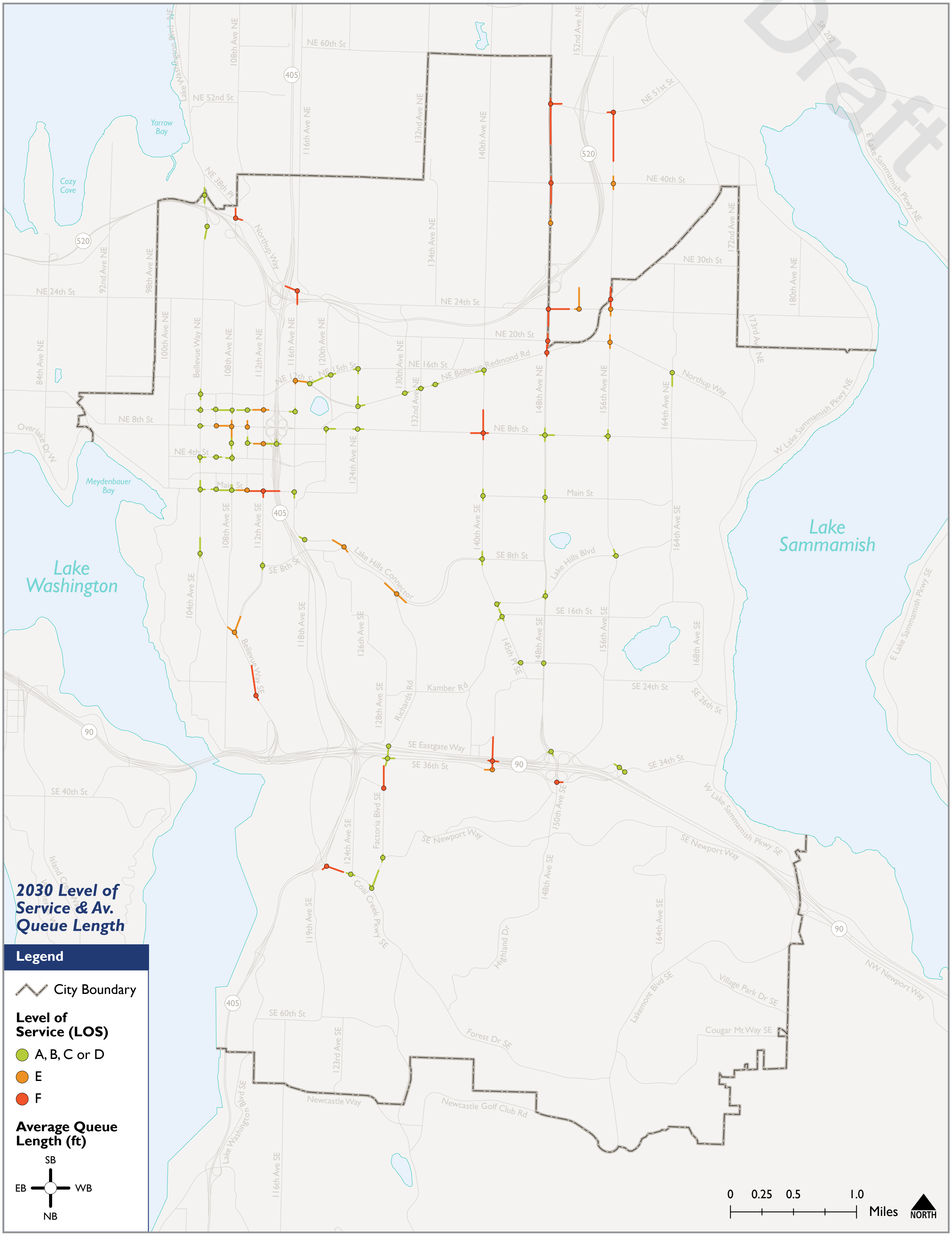


Figure 110 Intersection level-of-service (LOS) and average queue length (in feet) in 2030 at FTN intersections.



Safety – Safety is always a paramount concern for the City of Bellevue and Metro. Safety issue can result in slower and less reliability travel times as operators slow to ensure they are operating coaches safely.

Signal Failure – At some intersections it can take buses multiple green lights to get through an intersection, adding delay and travel time reliability issues. The cause of these delays vary depending on the location.

Signal Timing – Traffic lights are controlled in several ways and are generally timed in a way to minimize vehicle delay. Identifying locations or corridors where coach operators observed potentially unnecessary delay due to timing of the lights will help identify locations where various operational changes like revised traffic light timing could be made friendlier to transit.

Maneuver Delays – Metro coaches are some of the largest vehicles on many of the roads they serve. Locations which are hard for operators to negotiate can cause speed and reliability issues which can repeat hundreds of times a day. Intersections were coaches make a right turn can be particularly troublesome.

General Delays – While traffic models have been used to identify congestion related delays, there may be locations where, due to some local circumstance or roadway design, additional detail from coach operators could help more clearly understand the cause of delays and possible solutions. Locations with left turns are of particular concern as the models used are not sensitive to these delays.

medium or good LOS have less delay and are likely easier to implement transit priority because impacts on other modes are less significant. However, this also means that the benefits realized by any transit priority treatments implemented are more limited because the delays originally experienced are less substantial.

As with approach delay data, City staff generated intersection LOS data based on the 2010 and 2030 PM peak hour Dynameq travel demand model. Intersection LOS was summarized by analysis segment, using the worst intersection LOS along the segment (see Figure 109 on page 130 and Figure 110 on page 131 for 2010 and 2030 data, respectively).

Operator Feedback

Through their work and often years of experience, Metro coach operators learn traffic patterns in a way that most road users likely never will. They see how traffic changes during the day and over the course of a year, as well as how service changes affect interactions between transit and traffic. Coach operators can therefore provide significant insight into existing traffic congestion on Bellevue streets and help identify critical points in the network that could benefit from closer consideration by planners.

An optional survey was used to solicit feedback from coach operators about several general categories of issues related to transit speed and reliability, as shown at the right. This feedback was valuable because it helped to reaffirm some of the data provided by other sources and filled in the gaps left by those sources in some cases. Responses were collected by paper survey with questions, a map, and an area for written response (see the *Coach Operator Outreach Report*). The primary challenge with leveraging operator feedback is combining this more subjective feedback with the more objective measures used in other analyses.

DATA PROCESSING

Several data processing steps were necessary to convert the above data into information that could be used in the issues identification analysis. Data processing was completed using geographic information systems (GIS) due to the spatial nature of the data and analysis.

The City of Bellevue and King County Metro provided data in several formats, primarily GIS shapefiles. Most data sources were derived from a different source, so extensive discussion between the City and Metro occurred to ensure that data was accurately mapped and used. Some format conversion, data integration, and map modifications of the data were required. Several files required modifications to geometry to ensure that lines overlapped, but no numeric data was modified in the process.

Data analysis segments, or the unit at which the analysis was completed on, was also developed. Analysis segments were based off the street network, with segments primarily extending from one signalized intersection to another. Data from each source was summarized using these analysis segments. Appendix 1 contains maps of each data source displayed using the analysis segments. The sections below describe in detail the steps completed to prepare data for analysis.

Data Collection

Approach delay, approach queueing and LOS data were provided by the City of Bellevue in separate GIS shapefile and excel files which were joined and verified to ensure the two data sources were correctly joined. This process was completed in coordination with the City of Bellevue as City staff is intimately familiar with the data. Five batches of operator surveys were provided by Metro to the City. The location of applicable, specific and clear operator survey comments were recorded in GIS.

Data Mapping

Once data was mapped in GIS, several of the data sources did not overlap. Overlap was necessary to combine data in later steps. To ensure that all files overlapped, the lines and points of the transit ridership and bus volume data layers were shifted to overlap with the other layers. These changes were generally minor and only involved moving the location of the lines and points; no changes were made to the numeric values of the data.

Analysis Segment Development

A single common analysis unit is required to compare the multiple data sources used in the issue identification. The following process, illustrated in Figure 111, was used to develop the analysis segments:

1. Street segments on which the 2030 Frequent Transit Network (FTN) operates were identified and selected from the City's GIS street centerline shapefile.
2. These street segments, of which there is one for each city block, were grouped into analysis segments comprised of one or more street segments. Signalized intersections were used as the primary break point between analysis segments, however some unsignalized intersections were used in locations where signalized intersections are infrequent.
3. Each analysis segment was then buffered by 40 feet in all directions, creating an 80-foot wide polygon slightly longer than the analysis segment. This polygon, referred to as the buffered analysis segment, was used in the remainder of the analysis to combine, analyze, and display the issue identification data and composite scores.

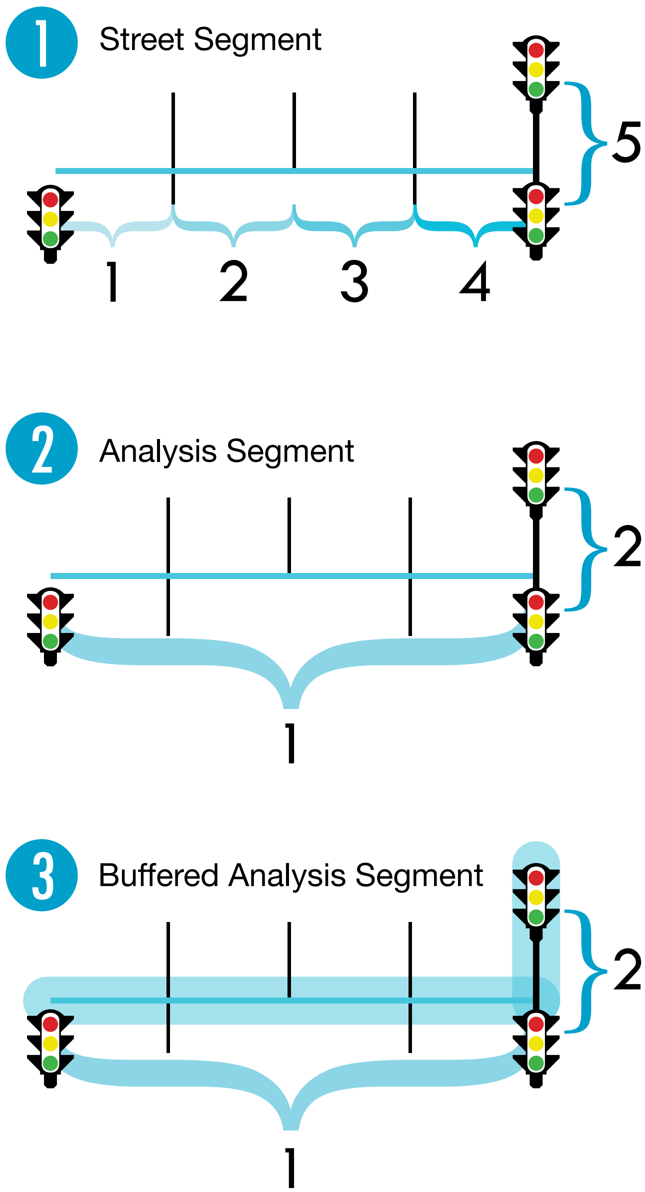


Figure 111 Analysis segment development.

Analysis Segment Data Transfer

After the buffered analysis segments were developed, data from the various GIS data inputs was spatially joined to these segments. Bus volumes and ridership data was spatial joined to the buffered analysis segment using the line's mid-point to reduce overlap issues. GPS-derived standing delays within the buffered analysis segment polygons were summed to compute the total delay occurring inside the polygons. Approach queue and approach delay for all intersections within each buffered analysis segment polygon were likewise summed. Intersection level-of-service (LOS) was assigned to buffer analysis segments based on the worst LOS of all intersections within the buffered analysis segment. Operator feedback was manually associated to relevant buffered analysis segments.

DATA ANALYSIS

The analysis steps outlined below brings multiple critical measures together into two composite scores focused at different time horizons, one for the short-term and another for the long-term. These composite scores help identify locations along the frequent transit network where multiple issues compound creating larger issues for transit speed and reliability.

The combination of multiple measures into the composite score facilitates comparison of the system. Using the analysis segments previously developed, issue identification was completed. This involved scoring, grouping and weighting of the various important measures. This approach was developed and modified with feedback from City and Metro staff.

Table 12 Quartile Scoring.

Quartile	Score
Fourth (Top 25%)	4
Third (Middle-Top 25%)	3
Second (Middle-Bottom 25%)	2
First (Bottom 25%)	1
None / No Data	0

Data Scoring

Each data source was grouped into four quartiles to evenly distribute data for each measure into four groups. Each data source was then assigned a score of 1 to 4 depending on the quartile in which the data was contained. Data with 2010 and 2030 data such as transit ridership and bus volumes were grouped by quartile using the 2030 results. Table 1 illustrates the scoring system.

Intersection LOS and operator comments, which have different scoring systems, were scored in accordance to Table 2. LOS is scored on a letter basis with A indicating little congestion and F indicating significant congestion. The low number of operator comments and general concentration of the comments received necessitated a unique scoring system.

Table 13 LOS and Operator Survey Scoring.

Level-of-Service (LOS)	Score
F	3
E	2
D	1
A, B, C	0

Operator Comments	Score
4-8	4
3	3
2	2
1	1

Composite Scores

The data analysis structure was designed to capture two key issues. The first issue, related to the time horizon, is addressed by developing two composite scores, one for the short-term and another for the long-term. Current and future needs may be different due to changes in the transit and transportation network or change in congestion. The solutions to short- or long-term problems can also vary, from small spot fixes for short-term issues to significant capital investments in locations with both short- and long-term issues.

Additionally, in the short-term, directly measured rather than modeled data is available. This is especially the case with bus GPS standing delays which are a direct measure of existing transit speed and reliability. The use of two composite measures more directly links each composite to a set of speed and reliability tools.

Short-Term Composite – This composite uses existing GPS bus delays, operator feedback, existing bus volumes and existing ridership volumes. This composite highlight locations where investments in speed and reliability will realize short-term benefits.

Long-Term Composite – This composite uses future bus volumes, future ridership volumes, and future modeled congestion. This is key for guiding capital investments to meet future transit needs and congestion.

Data Weighting

The second issue relates to the relative importance and combination of multiple data sources. When combining multiple measures into a composite score, the relative importance of each component needs to be assessed. More important measures should be elevated, while less important measures should be lowered. These adjustments are done using weighting factors.

Approach delay, approach queue, intersection LOS and bus standing delay are all highly related measure. If one of these four measures is scores poorly, the remaining three are also likely to score poorly. To address the overlap of these data sources and respond to City and Metro comments, approach delay, approach queue and intersection LOS were removed from the short-term composite score.

Table 14 Composite Score Weighting.

Measure	Short-Term Composite		Long-Term Composite	
	Weight	Possible Points	Weight	Possible Points
Standing Delays	4x	16	-	-
Transit Ridership	2x	8	2x	8
Bus Volumes	1x	4	1x	4
Approach Delay	-	-	1x	4
Approach Queue	-	-	1x	4
Intersection LOS	-	-	1x	4
Operator Survey	1x	4	-	-
Total	8x	32	6x	24

Weighting of both short- and long-term composite scores were set such that delay or congestion related factors represent half of the overall composite scores.

Additionally, the Transit Master Planning effort has clearly identified transit ridership as the major driver behind investment in transit service. To account for the significant importance of this measure relative to other measures a weighting factor of 2x was assigned to transit ridership in both the short- and long-term composite.

Table 14 on page 137 contains the weighting factors used both in the short-term and long-term analysis as well as the total score possible for each composite. Four measures are used for the short-term composite, while five measures are used for the long-term composite. Although the two measures are related, they cannot be directly related because point allocations and totals are different.

RESULTS

Using the scoring, grouping, and weighting described above and summarized in Table 15, short- and long-term composite measure maps were developed (see). A map for each measure is also contained in Appendix 1. As previously noted, these maps do not necessarily identify priorities; rather, they indicate locations where a confluence of issues is concentrated and more detailed analysis will be necessary. Buffered analysis segments with low composite scores have fewer issues while areas with higher scores have more compounding issues.

Twenty corridors of particular interest were identified for further consideration, including BKR modeling to compare vehicle throughput to person throughput, consistent with guidance from the Measures of Effectiveness Report. Refer to Appendix 3 on page A212 for additional details.

Table 15 Issue Identification: Sources, Measures, and Weighting.

Short-Term Composite Measure	Data Source	Description	Limitations	Metric	Weight
Standing Delays	AVL GPS Data	GPS-based AVL data for standing buses with their doors closed. Data is summarized by intersection.	Raw data had not yet been processed	Sum of weekday bus standing delays between 1/7 and 2/15 in minutes	4x
Transit Ridership	BKR Model	Estimated average daily transit ridership by model segment.		2010 average weekday transit ridership	2x
Bus Volumes	Spring 2013, 2030 BKR Model	Daily transit trips by road segment based on Spring 2012 service.		2013 average weekday bus volumes	1x
Safety Issues	Operator Survey	Safety issues identified by coach operators that impact speed or reliability.	Subjective	Comment	1x
Signal Failure	Operator Survey	Intersections identified by coach operators that consistently take multiple green lights to get through either due to insufficient green time or congestion.		Comment	1x
Signal Timing	Operator Survey	Signals or corridors identified by coach operators with little vehicle congestion and unnecessary delays due to poorly time signals or long signal cycles.	Subjective	Comment	1x
Maneuver Delay	Operator Survey	Locations identified by coach operators which impact speed and reliability due to difficult turning radii, required lane changes, or other roadway geometry issues.		Comment	1x
General Delay	Operator Survey	Consistent congestion-related delays identified by coach operators.	Subjective	Comment	1x
				Total Possible:	32

Long-Term Composite Measure	Data Source	Description	Limitations	Metric	Weight
Transit Ridership	BKR Model	Estimated average daily transit ridership by model segment.		2030 average weekday transit ridership	2x
Bus Volumes	Spring 2013, 2030 BKR Model	Daily transit trips by road segment based on the 2030 Growing Resources Frequent Transit Network (FTN).		2030 average weekday bus volumes	1x
Approach Delay	Dynameq Model	Estimated average PM peak hour delay in second by approach for signalized intersections in the 2030 Growing Resources Frequent Transit Network (FTN).		2030 sum of average weekday PM Peak hour approach delay (seconds of delay)	1x
Approach Queue	Dynameq Model	Estimated average PM peak hour queue length in feet by approach for signalized intersections in the 2030 Growing Resources Frequent Transit Network (FTN).	Determining meaningful threshold, related to approach delay	2030 sum of average weekday PM Peak hour approach queue length (in feet)	1x
Intersection LOS	Dynameq Model	Estimated PM peak hour LOS for signalized intersections in the 2030 Growing Resources Frequent Transit Network (FTN).		2030 intersection LOS	1x
				Total Possible:	24

Measures Considered But Not Used	Data Source	Description	Limitations
Street Congestion	BKR Model	Estimated PM peak hour vehicle volumes divided by estimated roadway capacity. Ratios near or above 1 indicate roadways with congestion.	Less accurate than Dynameq in areas with closely spaced signals and complex vehicle queues.
Mode Share	BKR Model	Estimated PM peak hour HOV person throughout divided by total roadway person throughput. Ratios closer to 1 indicate higher relative person HOV throughput.	Not available for all corridors
Scheduled Speed	TPI Travel Speed	Scheduled travel time by time of day divided by the distance between origin and destination time point.	Not available
Travel Time Variability	TPI Variability	Variation in travel time per TPI. High variation indicates TPIs with travel time reliability issues.	Not available

Figure 112 Short-term composite score.

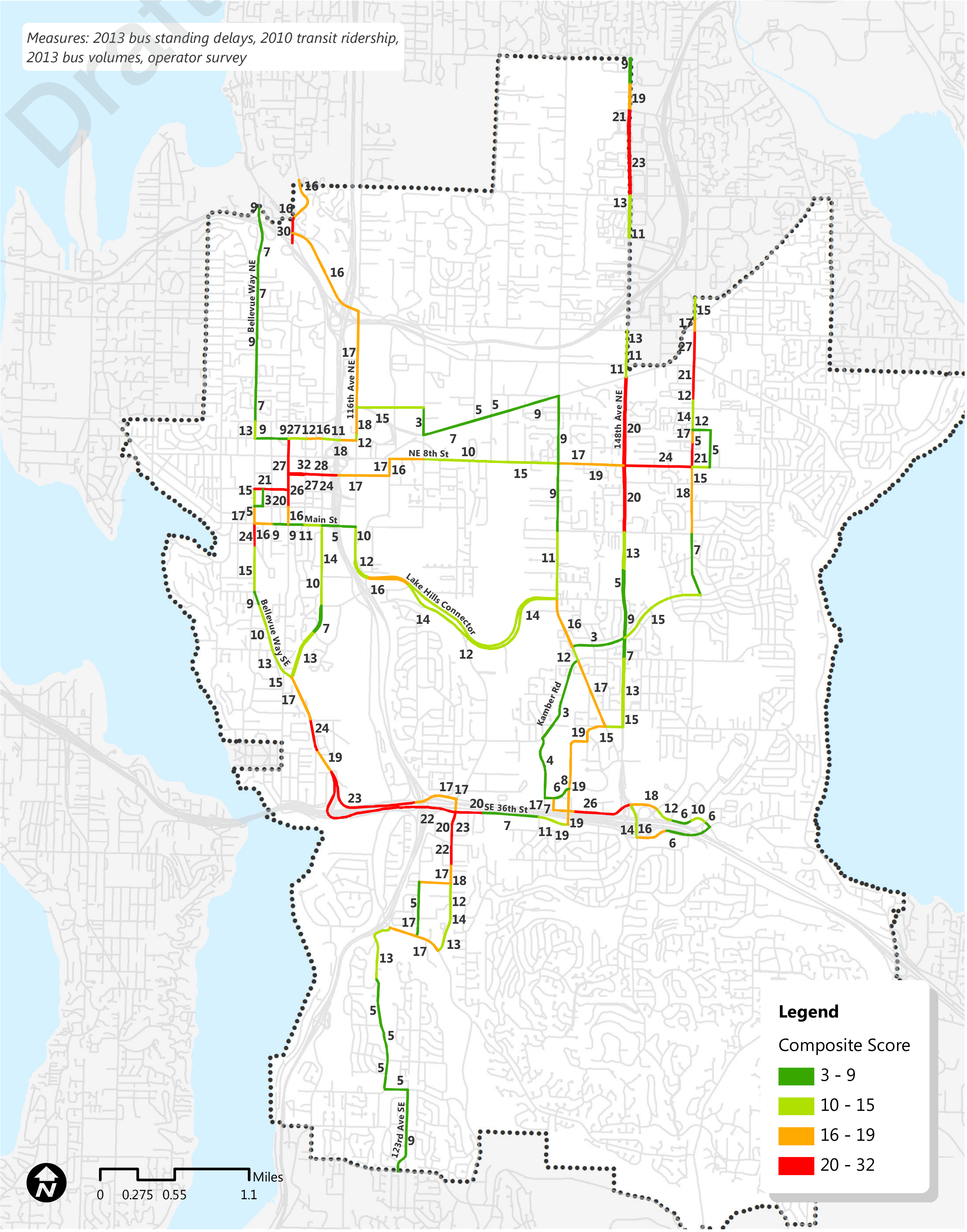
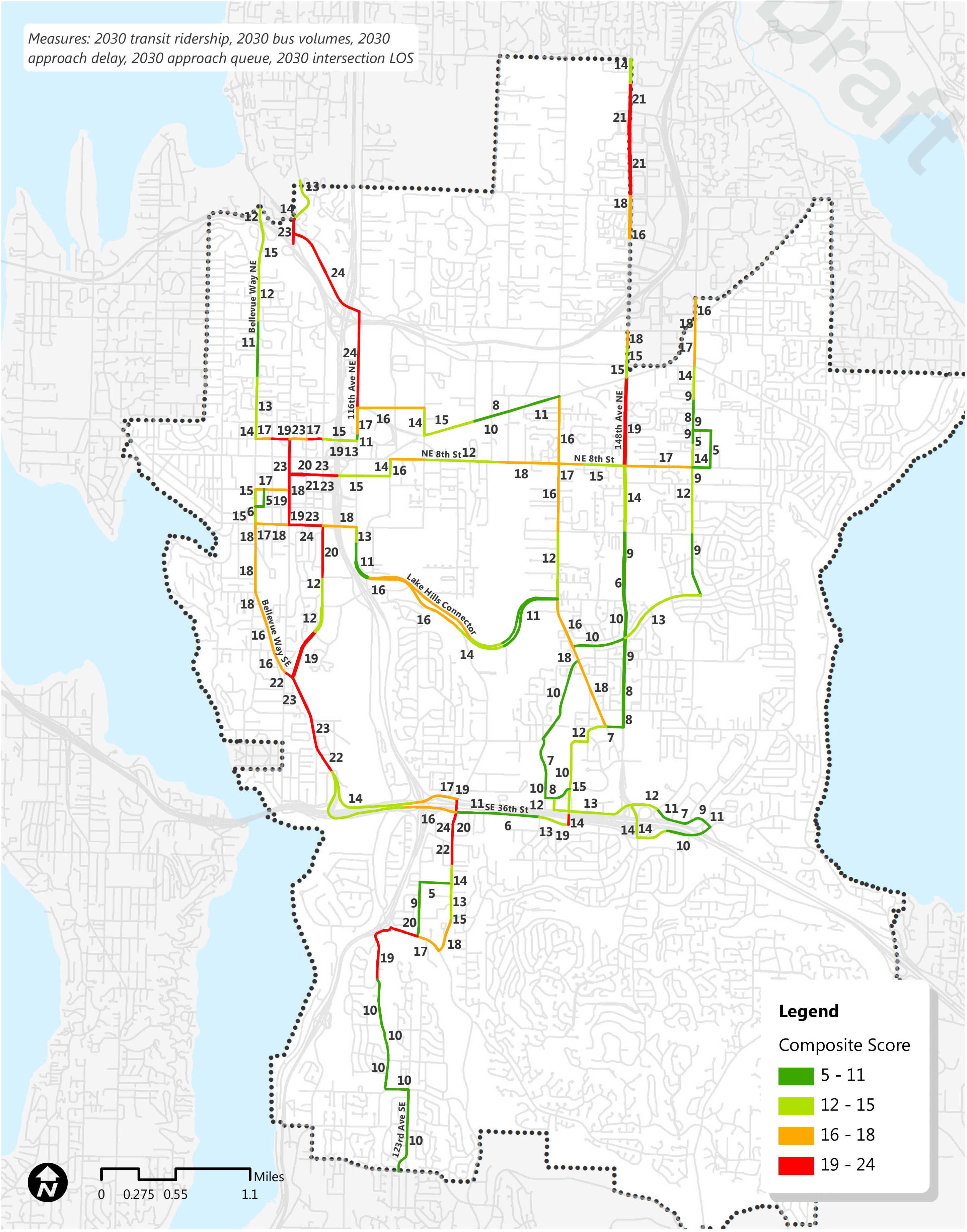


Figure 113 Long-term composite score.



This page intentionally left blank.

POTENTIAL IMPROVEMENTS

This section responds to the Transportation Commission's proposed Capital-Oriented Strategy: "Invest in transit priority measures along Frequent Transit Network corridors" (October 17, 2013). It includes sixty-three discrete running way, spot improvement, or data collection projects, plus forty-four near-term transit signal priority (TSP) projects. Table 16 indicates the number of projects being considered of each type, and Figure 115 on page 145 depicts the location and/or general extent of each project.

This project list and costing was developed by TMP consultant Transpo Group with consideration given to existing data, field investigation, and input from staff and transit agency representatives. The list has undergone various stages of development, review, and refinement, and that presented here includes all of the potentially beneficial projects that have not been eliminated from consideration following preliminary screening based on exceptional technical or contextual limitations. Visualizations have been generated for some of the projects presented here to assist the communication of how a given type of project could be applied to specific situations. It must be emphasized that these visualizations are only conceptual and do not represent final designs or engineering-level detail.

As noted in other sections, the projects identified here include only intersections and roads along Frequent Transit Network (FTN) corridors, a subset of the 2030 Growing Resources scenario. The issue identification results presented in the previous section informed the development of this project list and direct attention to those locations with the most significant issues. Projects identified in past plans are also included in this list. Refinements to the list of potential improvements were informed by the service

Table 16 Summary of speed and reliability projects by type.

Project Type	No. of Projects
Running Way Improvements	19
HOV Lanes	8
BAT Lanes	6
Roadway Construction	5
Spot Improvements	39
Queue Jump Lanes	16
Intersection and Roadway Improvements	13
Signalization Improvements	10
TSP Projects (Near-term)	44
Tracking & Additional Study	5
Total	107

Table 17 Summary of speed and reliability projects by cost.

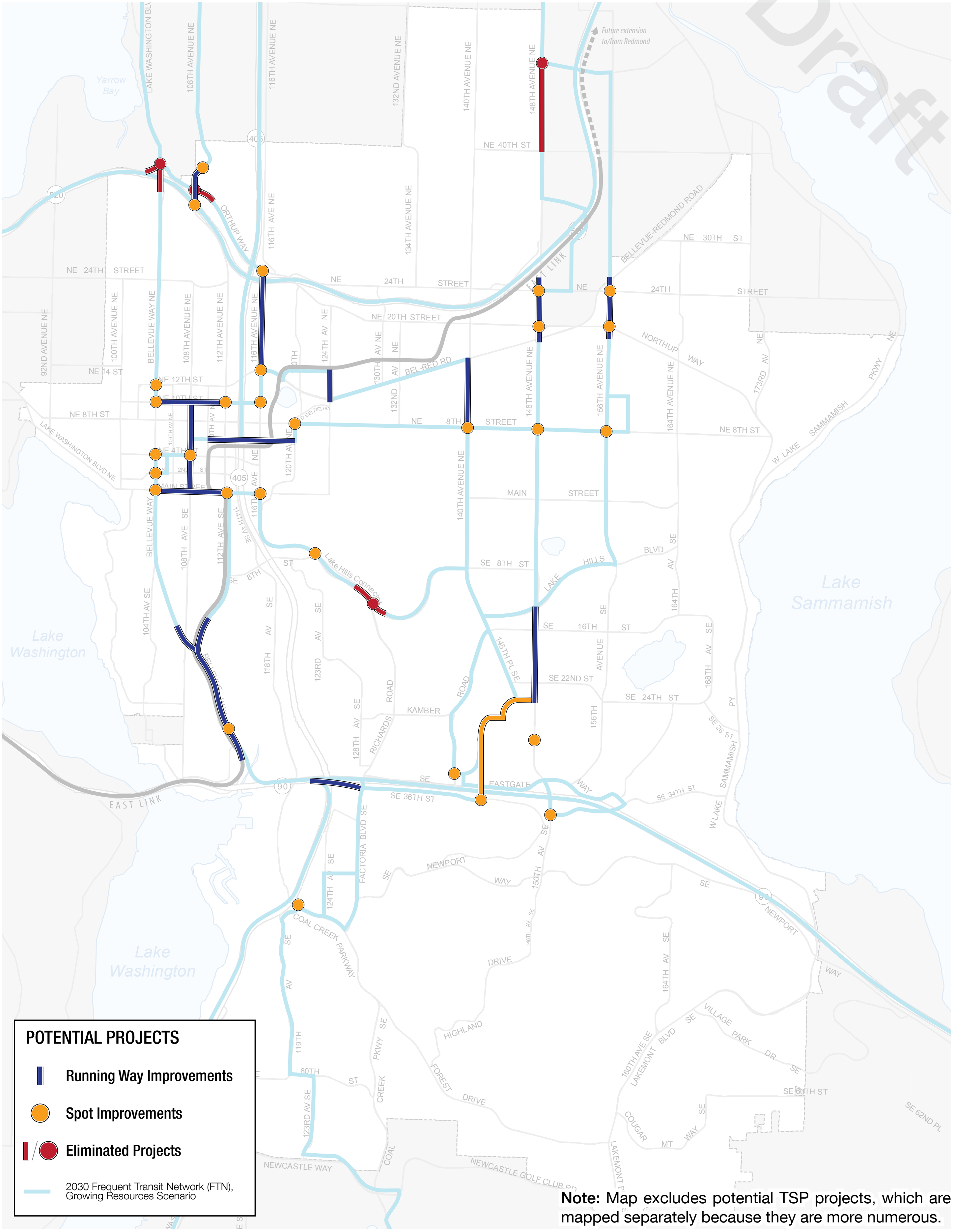
Estimated Project Cost	No. of Projects
No Cost (NC) These projects primarily require staff time to track, review, or revise using existing City resources and staff time.	6
Tens of Thousands ($) These projects primarily include low-cost changes like striping or signal equipment additions or modifications. These projects do not involve any physical changes.	66
Hundreds of Thousands ($$) These projects include more significant striping or signal modification, which could include some small physical modifications to an intersection or signal. More significant projects include lane construction at intersection approaches assuming minimal land acquisition, environmental mitigation, and slope stabilization.	16
Millions ($$$) These projects include construction of new lanes through multiple intersections and/or construction of new lanes along intersections where constraints exist.	18
Not Applicable (N/A) This project highlights a need for improvement but does not recommend a specific solution. Further study of the situation will only require staff time to complete (i.e., no cost), and the cost of subsequent actions can only be estimated after the chosen solution is identified.	1
Total	107

characteristics of bus routes, transit ridership, and bus volumes by time of day; arterial traffic volume by direction; placement of bus stops, intersection geometry, turn movement counts/capacity, and safety considerations; pedestrian and bicycle impacts; and the overall scale of improvements in terms of roadway width and right-of-way.

The cost ranges shown in Table 17 are based on a high-level review of the type and extent of projects, such as re-channelization, widening, signal modification, and sidewalk and road construction, as well as potential environmental mitigation, slope stabilization, utility modifications, or property acquisition. Projects were assigned to each cost range based on a review of the proposed project, site context, and other factors that might impact cost. These ranges are consistent with the scale of the projects, but they do not reflect detailed design or engineering.

Figure 114 Running Way Improvement Project L1: A southbound median HOV lane will be constructed on Bellevue Way SE between the South Bellevue Park-and-Ride and I-90 by Sound Transit as part of the East Link light rail extension project. This will be achieved by constructing a new lane, thereby maintaining all existing general purpose lanes. Aerial images depict roadway striping before and after construction.

Figure 115 Potential spot and running-way improvement projects.



Note: Map excludes potential TSP projects, which are mapped separately because they are more numerous.

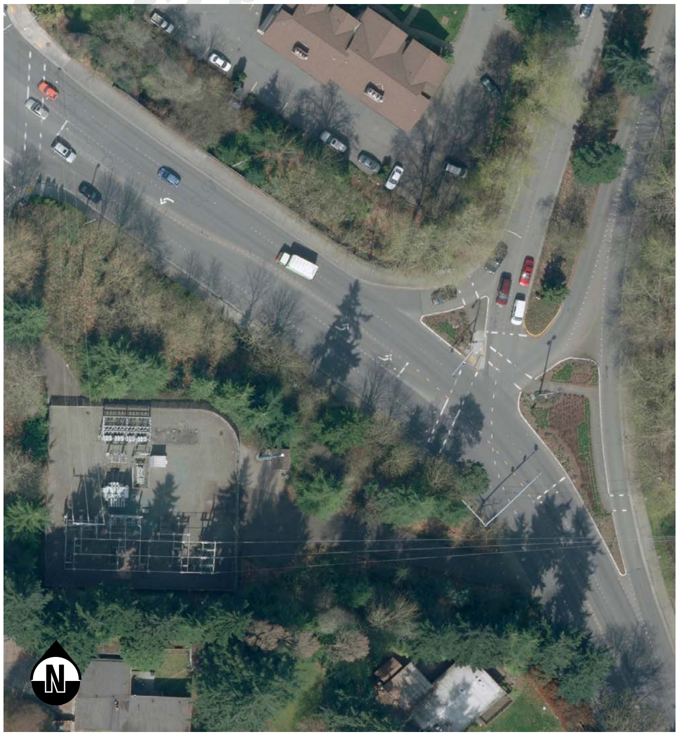


Figure 116 Running Way Improvement Projects L2, L3 and L4: Median HOV lanes on Bellevue Way SE and 112th Ave SE would improve the movement of transit vehicles through this congested Y-intersection southbound to South Bellevue Park-and-Ride. This would be achieved by constructing one lane on Bellevue Way SE and constructing a new median lane on 112th Ave SE. Aerial images depict roadway striping before and after lane reconfiguration. This concept maintains all existing general purpose travel lanes.

TRANSIT RUNNING WAY IMPROVEMENTS

Nineteen projects relating to transit running ways are currently being considered, including the conversion or restriction of general purpose travel lanes and the construction of new lanes for transit (see Figure 118 and Table 18 on the following pages). Potential improvements include High-Occupancy Vehicle (HOV) lanes and Business Access and Transit (BAT) lanes along several Frequent Transit Network (FTN) corridors. Some notable projects include HOV lanes along several segments of Bellevue Way SE and 112th Ave SE (see Figures 60, 62, and 63), BAT lanes and/or other speed and reliability improvements along 108th Ave NE in Downtown, HOV lanes along NE 10th St (see Appendix 5 on page A234), Main St, and the NE 6th St Extension (see Figure 120), and an upgrade of Snoqualmie River Rd through the Bellevue College campus so that it can accommodate bus traffic (see Appendix 6 on page A245).

Figure 116 depicts an early conceptual rendering of how three HOV lane projects (L2, L3, and L4) might be included in the street right-of-way along Bellevue Way SE and 112th Ave SE (see also Figure 117). These treatments are meant to improve travel time for southbound buses through this Y-intersection to the South Bellevue Park-and-Ride (see Appendix 4 on page A233 for 2030 travel time and person and vehicle throughput/volume analysis). Project L2 between the Y-intersection and the park-and-ride was included in Sound Transit's *East Link Extension Cost Savings Work Plan Findings* report in September 2012, but it has since been separated from any improvements being made for East Link by Sound Transit. This corridor ranks among those with the greatest need in the short-term and long-term based on the results of the issue identification process, but it remains a sensitive topic among some members of adjacent neighborhoods. Funding has already been secured for project L1 from the park-and-ride south to I-90 in the 2011 Memordanum of Understanding (MOU) between the City and Sound Transit, and it will be constructed by Sound Transit as part of the East Link project.

Consistent with the Downtown Transportation Plan Update, the *Transit Service Vision Report* proposes that many key routes follow 108th Ave NE through the length of Downtown. BAT lanes and/or other speed and reliability improvements are proposed along 108th (Project L5) to accommodate the significant volume of services that will use this Downtown transit spine, which ranks among the

Figure 117 Running Way Improvement Projects L2: A southbound median HOV lane on Bellevue Way SE would improve the speed and reliability of transit vehicles between 112th Ave SE to South Bellevue Park-and-Ride. This would be achieved by constructing one lane on Bellevue Way SE, thereby maintaining all existing general purpose travel lanes. Aerial images depict roadway striping before and after construction.

Figure 118 Map of potential transit running way projects.

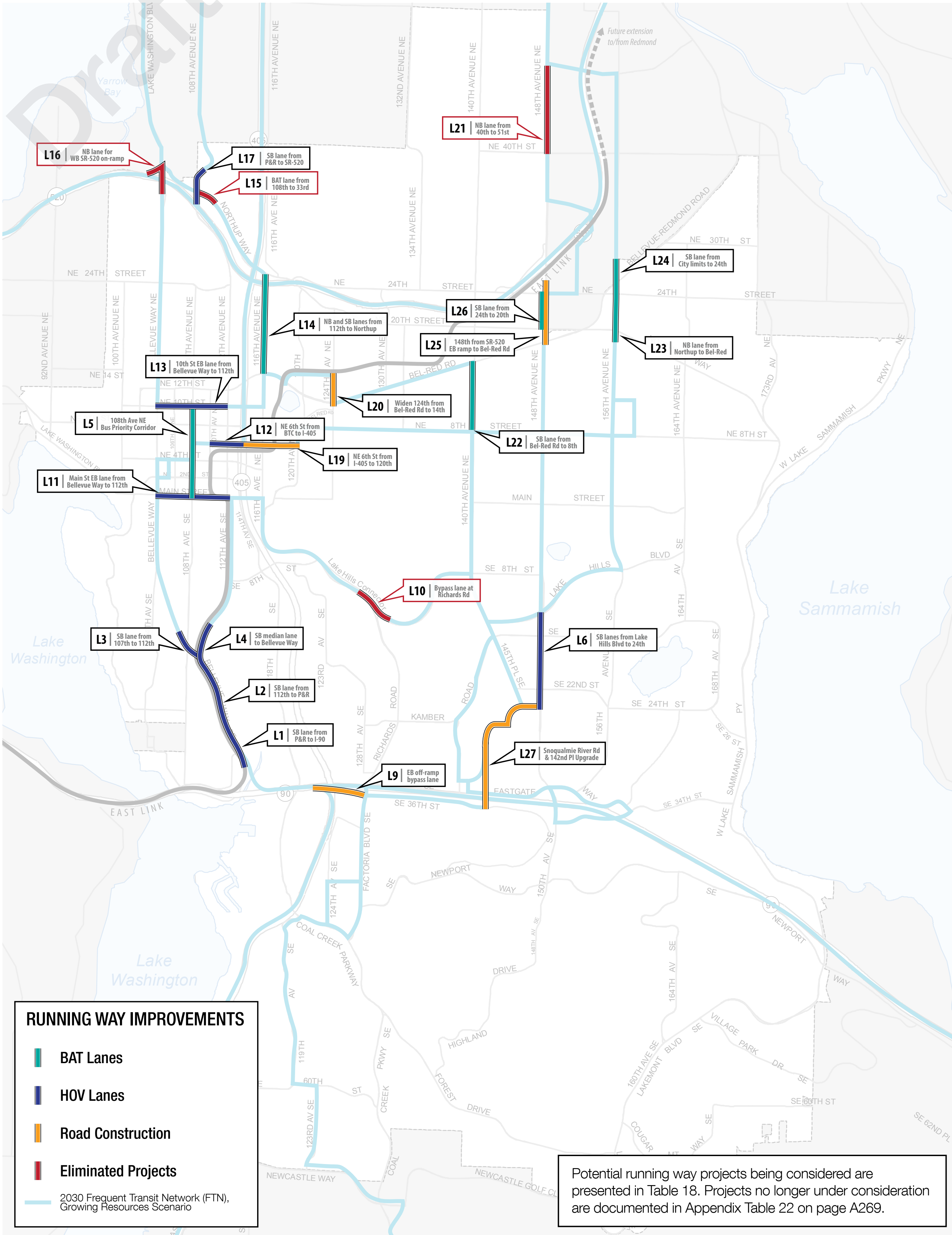


Table 18 Potential transit running way projects.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need / Potential Issues	Cost Range
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
L1	Bellevue Way SE HOV Lane - South Bellevue P&R	Lane Construction	1, 3, 11	~3 / 3-4 / 5-6	Construct a southbound HOV Lane on Bellevue Way SE between South Bellevue Park-and-Ride and I-90.	19	22	Previously noted in multiple plans including East Link Cost Saving Negotiations, Bellevue Transit Plan, Bellevue Transit Improvement Analysis, and Transportation Facilities Plan. See TIP-54 and TFP-242.	$$$
L2	Bellevue Way SE HOV Lane - South Bellevue P&R Extension	Lane Construction	1, 3, 11	~3 / 3-4 / 5-6	Construct a southbound HOV lane on Bellevue Way SE between South Bellevue Park and Ride and Y intersection with 112th Ave.	17–24	23	Previously noted in Bellevue plans. See TIP-55 and TFP-242.	$$$
L3	Bellevue Way SE HOV Lane - 112th Ave SE Extension	Lane Conversion/ Restriction	3, 11	4 / 5-8 / 15-20	Construct a southbound median HOV Lane on Bellevue Way SE from 112th Ave SE to approximately 107th Ave SE.	13–15	16–22	Addresses operator feedback, 2030 LOS of E and 2030 queuing, and frequent service. Property impacts on the west side of Bellevue Way SE at the intersection with 112th Ave SE.	$$$
L4	112th Ave SE HOV Lane	Lane Construction	1	8 / 10-15 / 30	Construct a southbound median HOV Lane on 112th Ave SE from Bellevue Way SE to slightly beyond end of intersection queue.	13	19	Addresses operator feedback, 2030 LOS of E and 2030 queuing. See TFP-242. Property impacts on the west side of Bellevue Way SE at the intersection with 112th Ave SE.	$$$
L5	108th Ave NE Transit Corridor	Lane Restrictions	1, 2, 3, 5, 6, 11, 13	~1 / 1-2 / ~2	Convert existing lanes along 108th Ave NE into BAT lanes and/or implement other speed and reliability treatments as identified by the Downtown Transportation Plan Update from NE 10th St to Main St.	16–27	19–23	Very high bus volumes, revised circulation patterns, increased bus layover needs, and higher passenger boarding/alighting volumes will require additional transit capacity. Previously noted in several plans including the Downtown Transportation Plan Update, Bellevue Transit Plan, and Bellevue Transit Improvement Analysis. See TIP-51 and TFP-230 .	$$
L6	148th Ave SE Improvements - Bellevue College	Lane Construction	12	8 / 10 / 15	Construct a southbound HOV lane and transit queue jump lanes and install TSP on 148th Ave SE between Lake Hills Blvd and SE 24th St.	7–15	8–9	Previously noted in the Bellevue Transit Plan. See TIP-66.	$$$
L9	I-90 Factoria Blvd Exit Expansion	General Purpose Lane Construction	11	8 / 10 / 15	In coordination with the Mountains to Sound Greenway, relocate the current trail undercrossing of the ramp between northbound I-405 and eastbound I-90 to a new bridge south of the existing undercrossing, and add a second off-ramp lane to the current ramp undercrossing. Evaluate how to best stripe the off-ramp lanes to ensure reliable transit operations.	22	16	Addresses 2010 intersection LOS of E and queuing issues. Could be funded in coordination with TIP-35, CIP W/B-78, and TFP-243.	$$$
L11	Main St HOV Lane	Lane Restriction	1, 13	4 / 5-8 / 15-20	Convert one eastbound general purpose lane to a PM peak-only HOV lane on Main St from Bellevue Way NE to 112th Ave NE.	9–11	23–24	Addresses 2030 intersection LOS of E/F at multiple intersections as well as significant queuing issues.	$$
L13	NE 10th ST HOV Lane	Lane Restrictions	5	8 / 10 / 15	Convert one eastbound general purpose lane to a PM peak-only HOV lane on NE 10th St from Bellevue Way NE to 112th Ave NE.	9–16	17–19	Addresses LOS of E at one intersection and long queues at multiple intersections in 2030.	$$
L14	NE 116th Ave NE BAT Lanes	Lane Restrictions	5, 14	4 / 5 / ~8	Modify the channelization to allow BAT lanes between NE 12th St and Northup Way when approaching intersections and/or implement other speed and reliability treatments.	17	24	Addresses LOS of F and long intersection queues at north end of corridor. Very frequent service on corridor.	$$
L17	108th Ave HOV Lanes	Lane Construction	4, 5, 14	~3 / 3-4 / 5-6	Construct a southbound lane for SR-520 westbound traffic and restrict the second lane for SR-520 eastbound and HOV traffic between the SR-520 direct access ramps and the South Kirkland Park-and-Ride.	16–30	14–23	Addresses current and future LOS issues (E and F respectively Very frequent service on this segment. This project represents an expansion by one lane of the intersection's north approach relative to the reconfiguration project currently being implemented by WSDOT as part of the SR-520 Bridge Replacement and HOV Program. Further analysis is required prior to the advancement of this project to ensure effective coordination with the changes currently being made.	$$$
L19	NE 6th St Extension	Road Extension	2, 6	4 / 5-8 / 15-20	Conduct a pre-design analysis for the extension of NE 6th St from its current terminus in the median of I-405 to the east over the northbound lanes of I-405 and 116th Ave NE to a new intersection with 120th Ave NE. Evaluate for additional transit improvements.	17	15	Addresses delay associated with signalized turns. Previously noted in the Bellevue Capital Investment Program and Transportation Facilities Plan. See TIP-14, CIP R-162, and TFP-211.	$
L20	124th Ave NE - Bel-Red Road to NE 14th Street	Road Upgrade	14	8 / 10 / 15	Complete a preliminary design for the widening (to 5 lanes) of 124th Ave NE from Bel-Red Rd to NE 14th St. Coordinate with PW-R-166. Evaluate for additional transit improvements.	3	14	Addresses delay associated with signalized turns. Previously noted in the Bellevue Capital Investment Program and Transportation Facilities Plan. See TIP-18, CIP R-169, and TFP-213.	$
L22	140th Ave NE BAT Lane	Lane Construction	14	8 / 10 / 15	Construct a southbound BAT lane from Bel-Red Rd to NE 8th St.	9	16	Addresses future LOS of F as well as significant queuing.	$$$
L23	156th Ave NE BAT Lane - Northbound	Lane Construction	7	8 / 10 / 15	Construct a northbound BAT lane from south of Northup Way to just north of NE 24th St.	17–27	17–18	Addresses future LOS and queue length issues at multiple intersections.	$$$
L24	156th Ave NE BAT Lane - Southbound	Lane Construction	7	8 / 10 / 15	Construct a southbound BAT lane from City Limits to just south of NE 24th St.	15–17	16–18	Addresses future LOS and queue length issues at multiple intersections.	$$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

Table 7 continued.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need	Potential Issues
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
L25	148th Avenue NE Master Plan Improvements	Road Upgrade	12	8 / 10 / 15	Construct the following: – A third NB through lane on 148th Ave NE from 350 ft south of Bel-Red Rd to the SR-520 eastbound on-ramp; – NB right turn lane and EB/WB dual left turn lanes at 148th Ave NE/Bel-Red Rd; – EB/WB dual left-turn lanes at NE 20th St/148th Ave NE; – Extend NB and WB right turn lanes at NE 24th St/148th Ave NE; – EB and WB dual left-turn lanes at NE 24th St/148th Ave NE; – Configure the NB three-lane approach on 148th Ave NE at the SR-520 eastbound on-ramp to right-turn only.	11–13	15–18	Investigate how improvements can be implemented to prioritize HOV and transit. Previously noted in the Transportation Facilities Plan. See TIP-61 and TFP-250.	$$$
L26	148th Ave NE BAT Lane - Overlake	Lane Construction/ Restriction	12	8 / 10 / 15	Modify the channelization to allow BAT lanes on 148th Ave NE between NE 24th St and NE 20th St.	11–13	15–18	Addresses future LOS of F for multiple intersections.	$$
L27	Bellevue College Connection: 142nd Pl SE/ Snoqualmie River Road Multimodal Corridor	Road Upgrade	14	8 / 10 / 15	Upgrade the Snoqualmie River Rd roadway surface and facilities to support very frequent transit service. Includes stronger road surface, sidewalks, bicycle facilities, bus stops, and parking relocation components. Non-motorized improvements to the NE 142nd Pl SE bridge are also included.	15–19	7–19	Previously noted in the Eastgate/I-90 Land Use and Transportation Project. See TIP-63 and TFP-252.	$$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

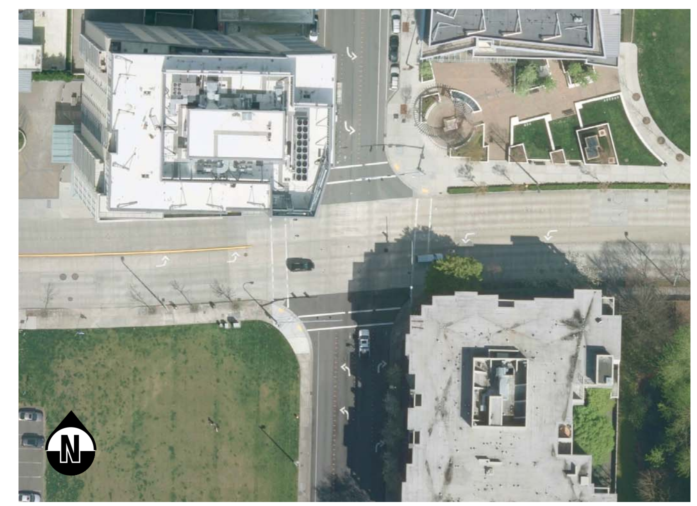


Figure 119 Running Way Improvement Project L13: PM peak-only HOV lane on NE 10th St for eastbound buses between Bellevue Way NE and NE 112th St. Aerial images depict roadway striping before and after lane reconfiguration.

corridors with the greatest long-term needs for speed and reliability investments based on projected ridership, bus volumes, approach delay, and queue length (see Appendix 3 page A214). As a complement to the 108th corridor improvements, eastbound HOV lanes are being considered along NE 10th St (see Figure 119) and Main St between Bellevue Way and 112th Ave NE to address approach delay and queue length issues, as well as high bus volumes and projected ridership. Both HOV projects would convert an existing travel lane during PM peak hours only. See Appendix 5 on page A234 for the results of a Vissim micro-simulation traffic model analysis of these Downtown HOV lane projects.

Another important project assumed by the *Transit Service Vision Report* to be complete by 2030 is the NE 6th St HOV Extension, which is already included in Bellevue's Capital Investment Program (Project L19; see Figure 120). This project will extend the existing NE 6th St HOV direct access ramp bridge from the center of I-405 east to 120th Ave NE. This would make it possible to remove all transit services from NE 8th St west of 120th Ave NE, thereby bypassing multiple intersections with long approach queues, delays, and poor level-of-service (LOS) associated with general purpose traffic entering and exiting I-405.

Projects L23 and L24, both pictured in Figure 121, provide examples of how BAT lanes would be implemented in Bellevue, in this case on 156th Ave NE. Project L23 is a northbound BAT lane that extends from just south of Northup Way to just north of NE 24th St, while Project L24 is a southbound BAT lane extending from the city limits to just south of NE 24th St. Both of these projects involve the construction of an additional lane to address long queue lengths and an LOS of 'E' and 'F' at multiple intersections along this segment in 2030. Because these projects are BAT lanes, the additional road capacity would primarily benefit transit, but by providing right-turn access to businesses for general purpose traffic, these projects would also benefit private vehicles by moving turning vehicles out of the general purpose travel lanes.

Another project specifically noted by the *Transit Service Vision Report*—and previously proposed by the *Eastgate/I-90 Transportation Strategies Report*—is an upgrade of Snoqualmie River Rd, which is a central factor in increasing service frequency and reliability through Bellevue College. This project (L27) involves improving the roadway surface to be capable of supporting very frequent bus service, new bus stops, and associated pedestrian and bicycle facilities. Without this improvement, long route deviations would continue to be required to serve both Bellevue College and the Eastgate Park-and-Ride, resulting in an unreasonable waste of limited transit resources and a likely need to reconsider the route structure in the Eastgate area. See Appendix 6 on page A245 for a preliminary design concept to improve circulation to and through the campus for transit, pedestrians, and bicyclists.

Also being considered is a unique roadway project that would relocate a portion of the Mountains to Sound Greenway Trail and expand the I-90 eastbound off-ramp roadway to two lanes (Project L9; see

Figure 120 Running Way Improvement Project L19: Artist rendering of East Link LRT integrated with the NE 6th St HOV Extension.

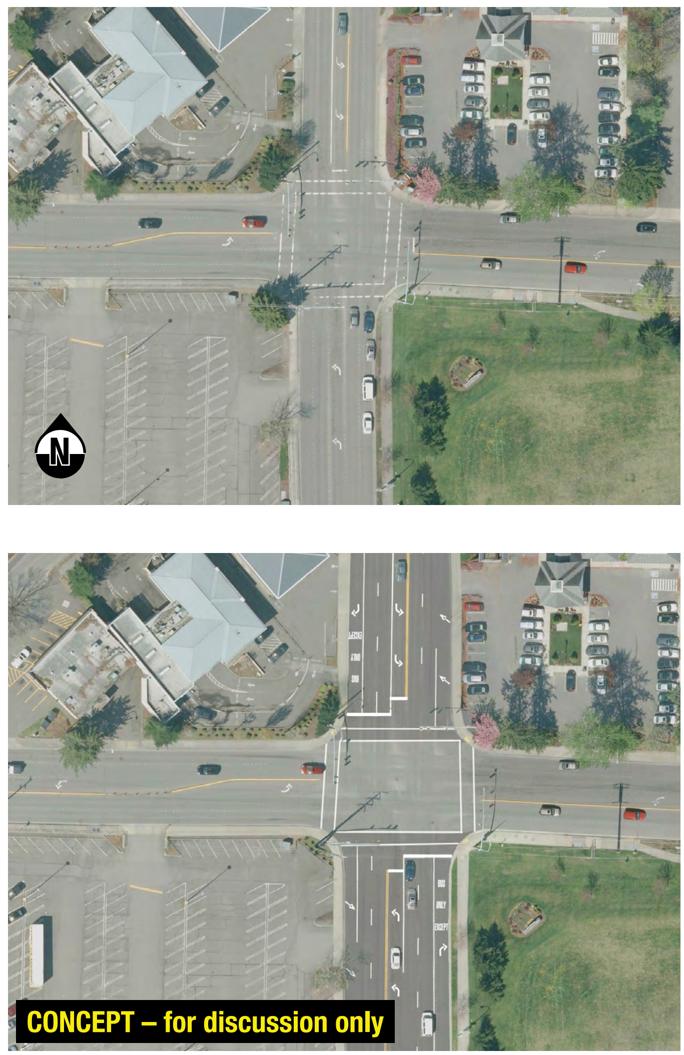
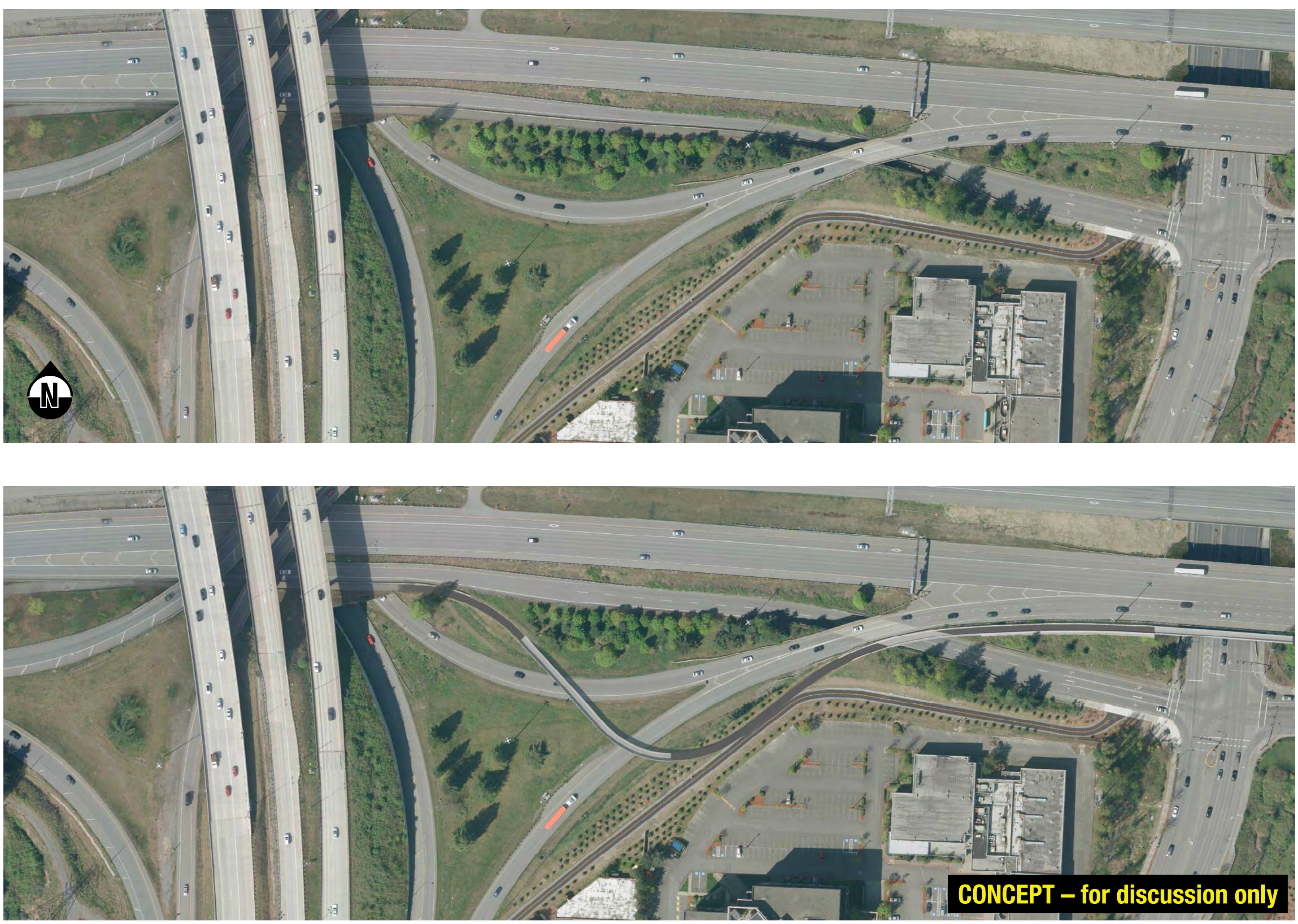


Figure 121 Running Way Improvement Projects L23 and L24: BAT lanes would be constructed on 156th Ave NE northbound from Northup Way to NE 24th St and southbound from city limits to NE 24th St, respectively. Aerial images depict roadway striping before and after lane reconfiguration. These concepts both maintain all existing general purpose travel lanes.

Figure 122). Presently, the off-ramp diverges from one lane to three in the short distance between the underpass and the intersection with Factoria Blvd, causing long queues, signal operation issues, and a PM peak LOS of 'E'. Widening the existing bridge to accommodate both an additional lane and the trail would be expensive, but the existing pavement width passing under the bridge is sufficiently wide to accommodate two vehicular travel lanes if the trail is relocated. The concept design shown in Figure 122 considers constructing a bridge for the trail that spans both I-405 ramps to I-90 eastbound, which also facilitates a direct connection from the Greenway Trail to the existing Factoria Trail before continuing east adjacent to I-90. This would improve the Greenway Trail while simultaneously alleviating delays to transit and general purpose traffic exiting I-90 eastbound to Factoria. As such, funding for Project L9 could be pursued in coordination with the ongoing Mountains to Sound Greenway Trail project (TFP-243). Further study is required to determine how to best utilize the additional lane to the benefit of transit and other road users.

Although the Transit Priority Toolbox (pages 105 through 119) includes improvements that afford transit greater operational exclusivity—treatments like bus-only lanes and transit-only streets—no such projects are included in this list.

Figure 122 Running Way Improvement Project L9: The eastbound I-90 off-ramp would be widened from one lane to two by relocating the Mountains to Sound Greenway Trail. This project would help reduce signal and queuing delay caused by the signal at Factoria Blvd, helping both transit and general purpose traffic.

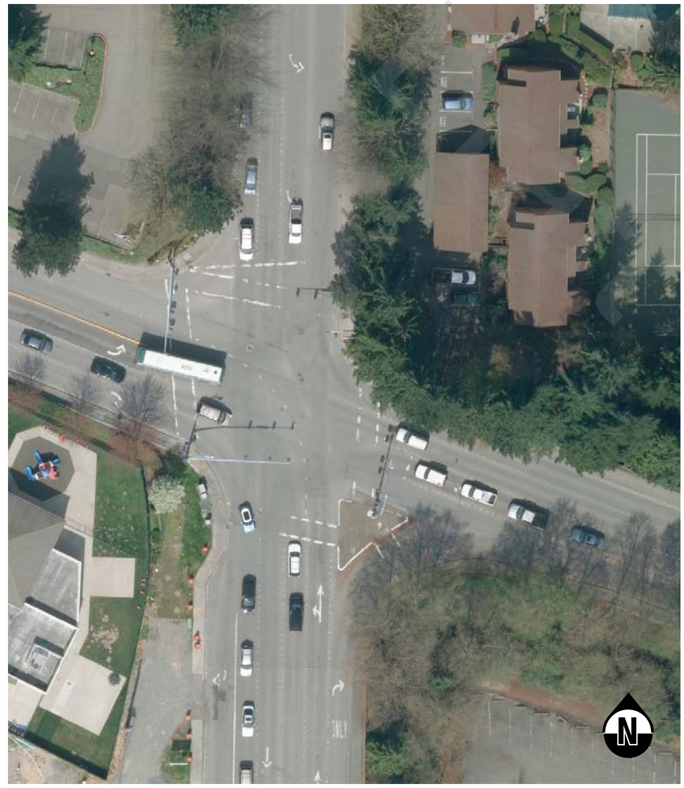


SPOT IMPROVEMENTS

Thirty-nine spot improvement projects are currently being considered, including sixteen queue jump lanes, thirteen intersection or roadway improvement projects, and ten signalization improvement projects. Intersection and roadway projects relate primarily to turning movements and include improvements to turn radii and the construction of new turning lanes. Signalization improvements relate primarily to adjusting signal timing to increase the amount of green time allocated to movements operated by FTN routes, but they also include some turn restrictions on general purpose traffic during peak hours and improvements to the responsiveness of existing TSP controllers.

Queue Jumps

Queue jumps can be implemented in one of three basic configurations, as shown in Figure 125. Which variant is pursued for any given project depends primarily on the amount of right-of-way available on the near and far sides of the intersection. Queue jumps require either a complimentary lane on the far-side of the intersection (right diagram) or TSP treatment to allow buses to advance through the intersection before general purpose traffic (left and center diagrams). Where permitted by the amount of right-of-way available, it is operationally preferable to use a designated queue jump lane with an advance green signal, as shown by the left and right diagrams. The alternative depicted by the center diagram involves restriction of the right lane so that only transit vehicles can continue through the intersection; for general purpose traffic, it becomes a right-turn only lane. This latter configuration is less desirable both because it removes a through-lane from general purpose traffic and because of the potential for buses to be caught behind a queue of right-turning vehicles, reducing the benefit afforded to transit by the queue jump.



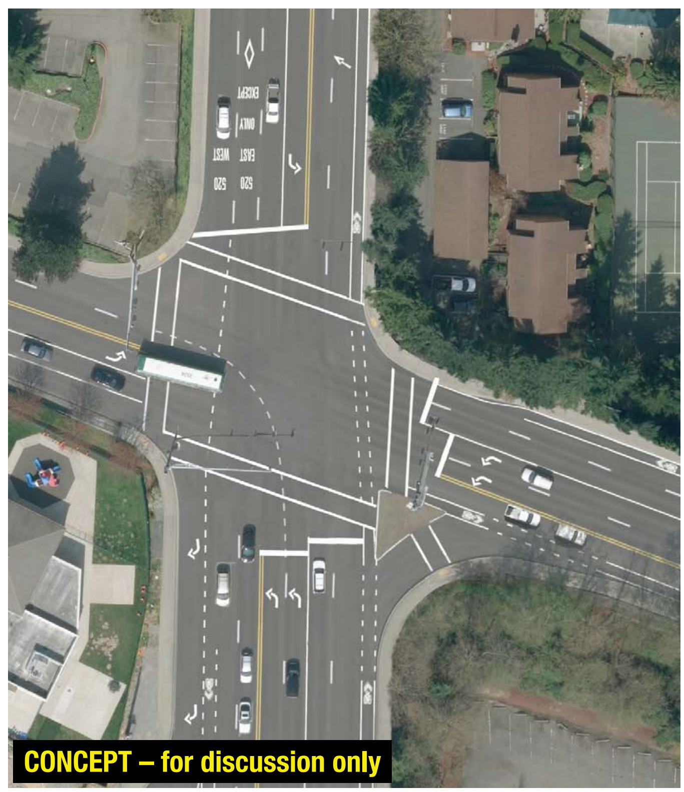


Figure 123 Running Way Improvement Project L17: Construction of a southbound HOV lane on 108th Ave NE between South Kirkland Park-and-Ride and SR-520. Aerial images depict roadway striping before and after lane reconfiguration. This concept adds one lane to the north approach relative to the WSDOT intersection reconfiguration currently being implemented. A northbound queue jump lane was also previously being considered at this intersection (see Project Q4 on page A271), but it is no longer being considered because it cannot be accommodated by WSDOT's plans.

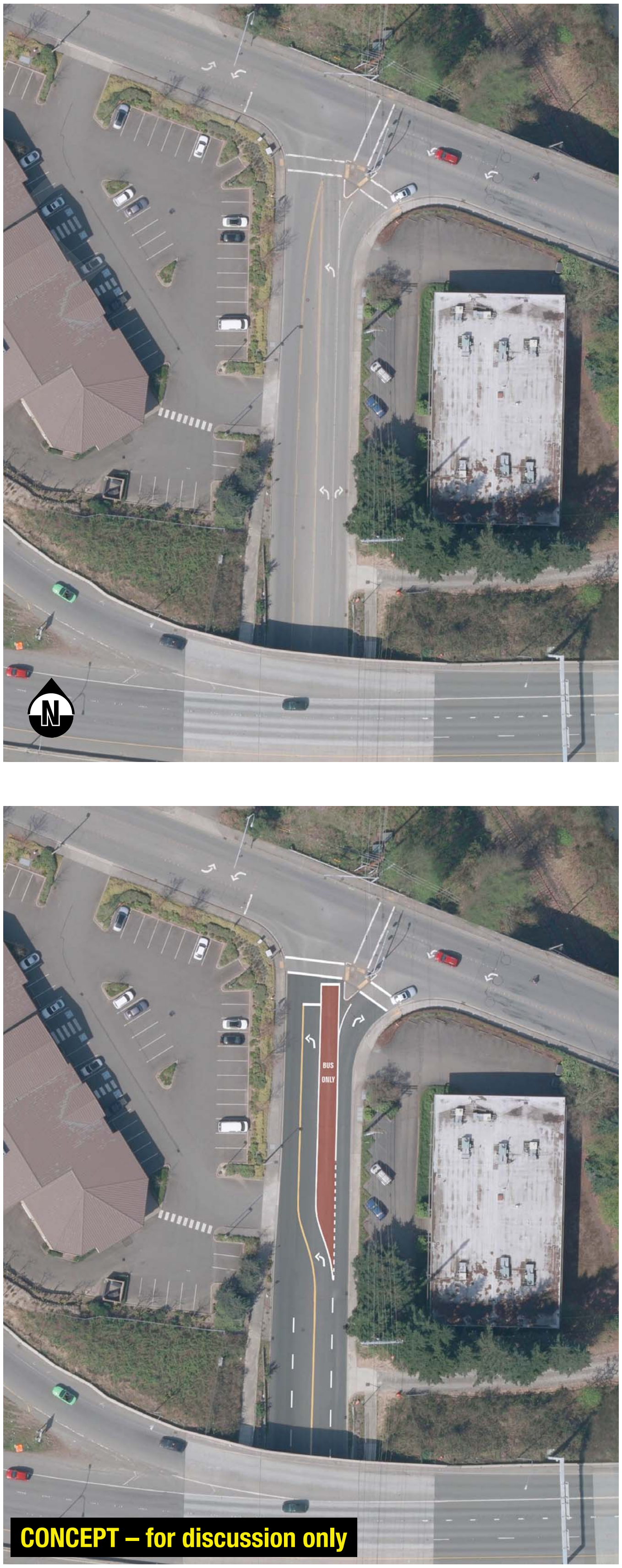


Figure 124 Spot Improvement Project Q5: Queue jump lane on NE 116th St for left turning, northeast-bound traffic at Northup Way. Aerial images depict roadway striping before and after lane reconfiguration. This concept maintains all general purpose travel lanes and requires no new lane construction—both suitable qualities for a potential 'quick win' project.

Although the conceptual visualizations presented here reflect one of these three configurations, this does not imply that there is only one way to implement a queue jump at a given location. Specific queue jump configurations have not yet been determined for any of the potential projects, but the conceptual renderings indicate one possibility. As queue jump projects are advanced through feasibility screening and project prioritzation, potential design strategies will be assessed based on signal operations, right-of-way availability, and constructability restrictions.

Some notable queue jump projects being considered include one on 116th Ave NE for northbound buses turning west (left) onto Northup Way (see Figure 124) and two for nothbound traffic on Bellevue Way NE—one at Main St and another at NE 12th St. A potential queue jump for northbound buses on 108th Ave NE at Northup Way, considered in the *Draft Capital Element Background Report (Volume 1: Speed and Reliability)*, was removed from the project list due to space constraints created by the SR-520 Bridge Replacement and HOV Project (see Appendix 7 page A271).

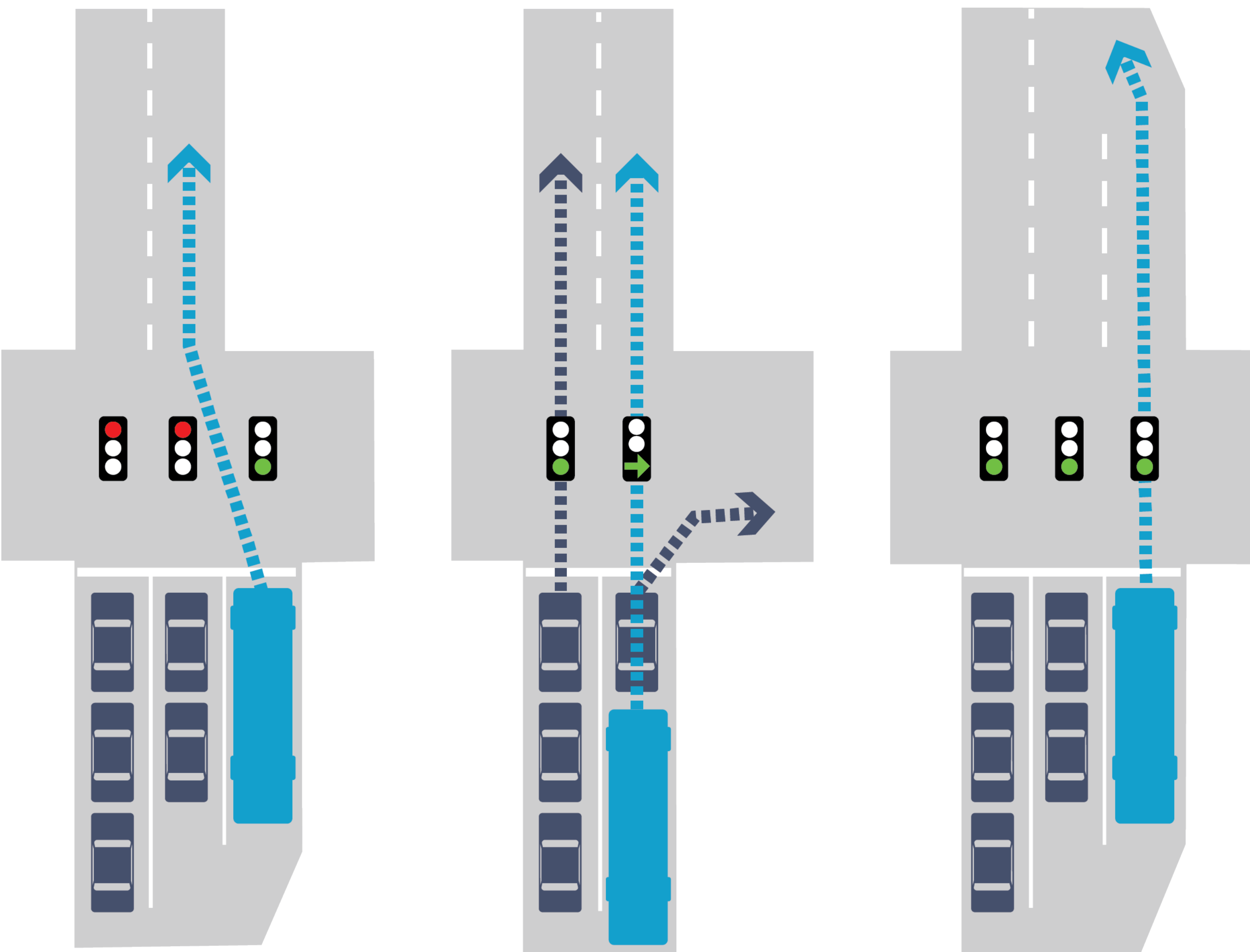
Intersection & Roadway Improvements

All but one of the potential intersection and roadway improvement projects deal with improving turn radii to better accommodate buses or adding new turn lanes to increase traffic flow and help buses pass through intersections more reliably in a single signal cycle. The only project that does not fall into these two categories (R14) simply seeks to improve the clarity of the existing channelization on NE 10th St. No negative impacts to general purpose traffic are anticipated from these improvements, as any right-of-way adjustments are lane additions, not conversions, and are not restricted to use by HOVs or buses.

Signalization Improvements

Signalization improvements relate primarily to extending the length of green phases associated with troublesome transit turning movements, either by adjusting normal signal timings or improving existing TSP controller responsiveness. New TSP implementation projects are categorized separately and are addressed in the following section. Two city-wide projects are also being considered—one to upgrade any non-SCATS traffic signals to that system, and another to coordinate with Metro to establish standards for TSP equipment and software.

Figure 125 Various configurations of queue jump lanes.



Queue Jump through Advanced Green Signal

Queue Jump through Transit Vehicle Exception

Queue Jump through Transit Receiving/Merge Lane

Figure 126 Potential spot improvement projects.

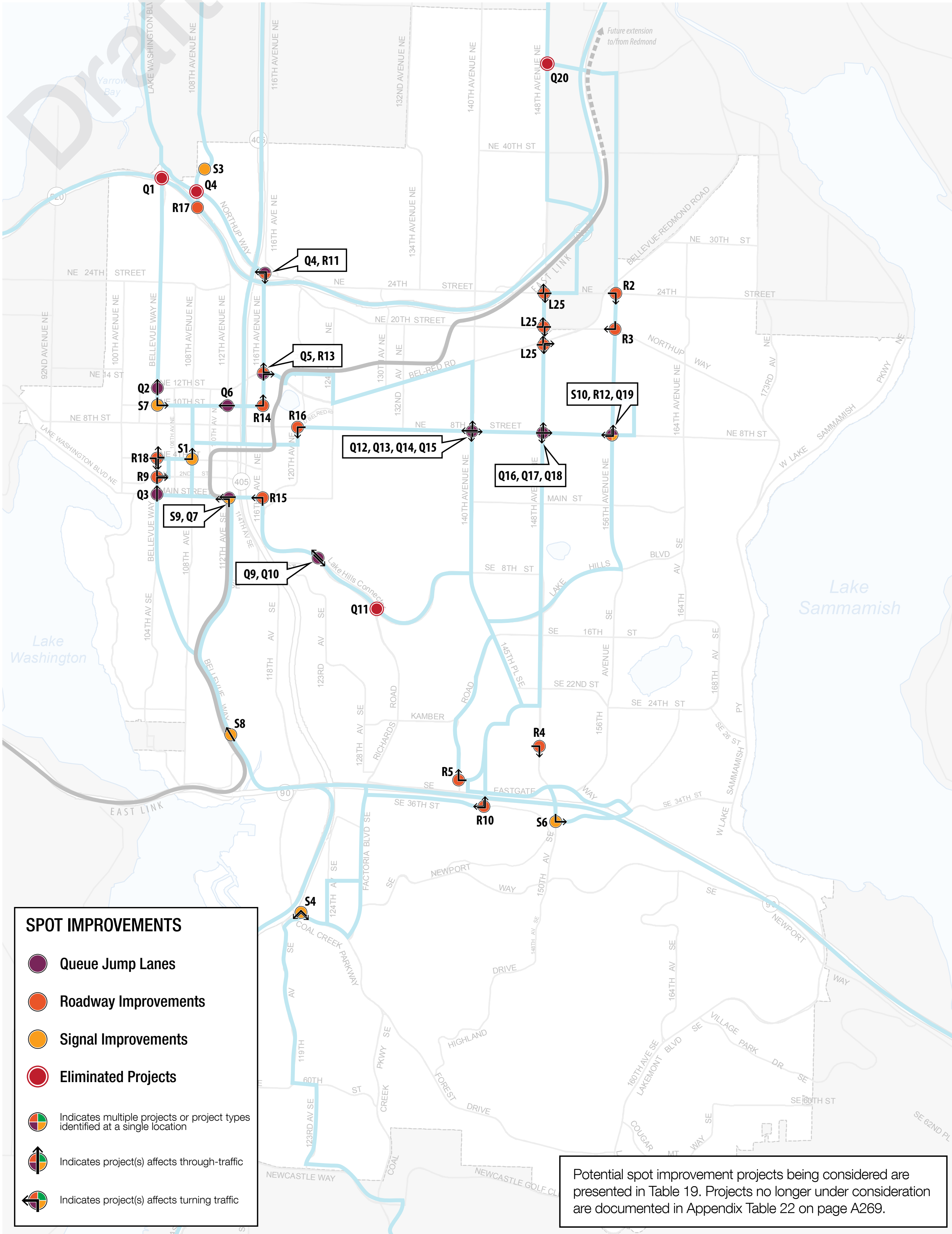


Table 19 Potential queue jump, intersection, roadway, and signalization projects.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need / Potential Issues	Cost Range
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
Queue Jump Lanes									
Q2	Bellevue Way and NE 12th St - Northbound	Queue Jump	1	8 / 10-15 / 30	Add a queue jump to the northbound right turn lane.	13	14	High frequency transit service	$
Q3	Bellevue Way and Main St - Northbound	Queue Jump	3, 11	4 / 5-8 / 15-20	Modify channelization to allow a northbound queue jump.	24	18	Addresses operator comments and high bus volumes. Uses existing facilities to prioritize transit.	$
Q4	Northup Way and 116th Ave NE - Northbound	Queue Jump	2, 5, 14	2-3 / 3-4 / 8-10	Add a northbound to westbound queue jump lane.	17	24	Addresses future LOS and queuing issues, and very high bus volumes	$
Q5	116th Ave NE and NE 12th St - Southbound	Queue Jump	5, 14	4 / 5 / ~8	Add a queue jump without a far side lane to the northbound approach in the right-turn only lane.	17	24	Addresses high bus volumes	$
Q6	NE 10th St and 112th Ave NE - Westbound	Queue Jump	5	8 / 10 / 15	Add a queue jump to the westbound approach in the right-turn only lane.	11	15	Addresses future intersection LOS of E.	$
Q7	Main St and 112th Ave NE - Westbound	Queue Jump	1, 13	4 / 5-8 / 15-20	Add a queue jump to the westbound approach in the right-turn only lane.	11	24	Addresses future intersection LOS of F and significant queuing.	$
Q9	Lake Hills Connector and SE 8th St - Eastbound	Queue Jump	13	8 / 10 / 15	Add a queue jump to the eastbound approach in the right-turn only lane.	16	16	Addresses future intersection LOS of E and significant queuing.	$$
Q10	Lake Hills Connector and SE 8th St - Westbound	Queue Jump	13	8 / 10 / 15	Add a queue jump to the westbound approach in a newly constructed queue jump lane.	14	16	Addresses future intersection LOS of E.	$$
Q12	NE 8th Street and 140th Ave NE - Eastbound	Queue Jump	6	8 / 10 / 15	Add a queue jump to the eastbound approach in the right-turn only lane.	15	18	Addresses future intersection LOS of E and queuing.	$
Q13	NE 8th Street and 140th Ave NE - Northbound	Queue Jump	6, 14	4 / 5 / ~8	Add a queue jump to the northbound approach in a newly constructed queue jump lane.	9	16	Addresses future intersection LOS of E.	$
Q14	NE 8th Street and 140th Ave NE - Westbound	Queue Jump	6, 14	4 / 5 / ~8	Add a queue jump to the westbound approach in a newly constructed queue jump lane.	17	17	Addresses future intersection LOS of E.	$$$
Q15	NE 8th Street and 140th Ave NE - Southbound	Queue Jump	6, 14	4 / 5 / ~8	Add a queue jump to the southbound approach in the right-turn only lane.	9	16	Addresses future intersection LOS and significant queuing issues.	$
Q16	NE 8th St and 148th Ave NE - Eastbound	Queue Jump	6, 12	4 / 5 / ~8	Add a queue jump to the eastbound approach in the right-turn only lane.	19	15	Addresses operator comments. Right turn volumes might be too high to make this viable.	$
Q17	NE 8th St and 148th Ave NE - Northbound	Queue Jump	6, 12	4 / 5 / ~8	Add a queue jump to the northbound approach in the right-turn only lane.	20	14	Addresses operator comments.	$
Q18	NE 8th St and 148th Ave NE - Southbound	Queue Jump	6, 12	4 / 5 / ~8	Add a queue jump to the southbound approach in the right-turn only lane.	20	19	Addresses operator comments.	$
Q19	NE 8th St and 156th Ave NE (NB)	Queue Jump	6, 7	4 / 5 / ~8	Modify channelization to allow a queue jump.	21	14		$
Intersection and Roadway Improvements									
R2	156th Ave NE and NE 24th St Turn Radii	Turn Radii	7	8 / 10 / 15	Improve the turn radius for the eastbound right turn on 156th Ave NE at NE 24th St.	N/A	N/A	Previously noted in the Eastgate/I-90 Land Use and Transportation Project.	$$
R3	Northrup Way and 156th Ave NE Turn Radii	Turn Radii	7	8 / 10 / 15	Improve the turn radius for the southbound right turn on Northup Way at 156th Ave NE.	27	17	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$
R4	Landerholm Circle and 148th SE Radii Improvements	Turn Radii	7, 13	4 / 5 / ~8	Improve the turn radius for the eastbound right turn on 148th Ave SE at Landerholm Circle.	N/A	N/A	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$
R5	SE 32nd St and 139th Ave SE Radii Improvement	Turn Radii	14	8 / 10 / 15	Improve the turn radius for the westbound right turn on 139th Ave SE at SE 32nd St.	7	8	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$
R9	NE 2nd St and Bellevue Way NE Turn Improvement	Road Upgrade	3, 5, 6	~3 / 3-4 / 5-6	Add a northbound right-turn lane and a second southbound left turn lane.	15–17	15	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$$
R10	SE 36th ST and 142nd Ave SE	Turn Lanes	7	8 / 10 / 15	Improve eastbound to northbound and southbound to westbound turn movement through construction of southbound right turn lane and northbound bus stop pullout.	11–19	13–19	Previously noted in the Eastgate/I-90 Land Use and Transportation Project.	$$$
R11	Northup Way and NE 116th St Turn Improvement	Turn Lanes	5, 14	4 / 5 / ~8	Add an eastbound to southbound right turn lane.	16	24	Addresses future intersection LOS of F with queuing issues, high bus frequency.	$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

Table 8 continued.

ID	Project	Type	FTN Service Routes	FTN Service Frequency (Peak/Base/Night)	Project Description	Composite Scores Short-Term	Composite Scores Long-Term	Project Need	Cost Range
Intersection and Roadway Improvements (cont.)									
R12	NE 8th St and 156th Ave NE Turn Radii	Turn Radii	6, 7	4 / 5 / ~8	Improve the southbound to westbound turn radius.	21	14	Addresses operator comment.	$$
R13	NE 12th St and 116th Ave NE Turn Lane	Turn Lanes	5, 14	4 / 5 / ~8	Add a westbound to northbound right turn lane.	15	16	Addresses future intersection LOS of E and queuing issues.	$$
R14	NE 10th St and 116th Ave NE Channelization	Channelization	5	8 / 10 / 15	Clarify channelization of the eastbound approach such that right lane feeds into curb right-turn only lane and first left-turn only lane.	18	13	Prioritizes lane with transit at closely spaced intersection.	$
R15	116th Ave SE and Main St Turn Lane	Turn Lanes	13	8 / 10 / 15	Add a second northbound to westbound turn lane. Time of day ITS solutions might eliminate the need for lane construction.	10	13	Addresses existing left turn queuing issues.	$$$
R16	NE 8th St and 120th Ave NE Turn Lane	Turn Lane	6	8 / 10 / 15	Add a second westbound to southbound turn lane and restrict to HOV and transit.	16	16	Addresses existing left turn queuing issues.	$$
R18	NE 4th St and Bellevue Way Turn Improvement	Turn Improvement	3, 5, 6	~3 / 3-4 / 5-6	Add a southbound right turn lane, a westbound right turn lane, and dual westbound left turn lanes.	21	17	Previously noted in the Transportation Facilities Plan. See TIP-48 and TFP-222.	$$$
Signalization Improvements									
Citywide-S1	Traffic Computer System Upgrade	ITS	NA	NA	Citywide replacement of traffic signal and software to upgrade to SCATS traffic system.	N/A	N/A	SCATS implementation has shown to reduce travel times across, which will generally result in improved speed and reliability of transit service.	NC
Citywide-S2	Controller Equipment and Software Standards	Standards	NA	NA	Coordinate with King County Metro on equipment and software TSP standards for all new signal controllers.	N/A	N/A	Ensures TSP treatments can be easily implemented in the future with existing equipment and software	NC
S1	NE 4th St and 108th Ave Turn Improvement	Turn Improvement	3, 6	4 / 5-8 / 15-20	Improve the eastbound left turn level-of-service (LOS) for transit through increased time allocation or TSP. Explore strategies to reduce southbound right turn delays caused by pedestrians.	26	18	Addresses top operator comment location.	$
S3	South Kirkland P&R Signalizations	Signalization	4, 5, 14	~3 / 3-4 / 5-6	Signalize 108th Ave NE at the South Kirkland Park-and-Ride entrance.	16	13–14	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis	$$
S4	Coal Creek Pkwy SE and 119th Ave SE Turn Improvement	Turn Improvement	11	8 / 10 / 15	Improve the westbound to southbound and northbound to eastbound turn movements through timing prioritization and TSP.	13–17	19–20	Addresses future intersection LOS of F and queuing issues.	$
S6	SE 37th St and 150th Ave SE Turn Restriction	Turn Restriction	13	8 / 10 / 15	Restrict southbound to eastbound turns during PM peak hours to HOV and transit to reduce volumes and ensure that eastbound SE 37th St is not blocked by queuing traffic from I-90 eastbound.	14	14	Addresses existing and future LOS of E and F.	$
S7	Bellevue Way and NE 10th St Turn Improvement	Turn Improvement	1	4 / 5 / 15	Improve the southbound to eastbound turn movement through signal timing prioritization and TSP. Improve the westbound to northbound movement through conversion of the right through lane to a right-turn only lane.	13	14	Reduces intersection signal delay	$
S8	Bellevue Way and South Bellevue Park and Ride TSP Improvement	TSP Improvement	1, 3, 11	~3 / 3-4 / 5-6	Improve the responsiveness of northbound TSP operations.	19	22	Addresses multiple operator comments that northbound TSP was not responsive enough	$
S9	112th Ave NE and NE Main St Turn Improvement	Turn Improvement	1, 13	4 / 5-8 / 15-20	Improve the northbound to westbound turn movement through timing prioritization and TSP.	14	20	Addresses future intersection LOS of F.	$
S10	NE 8th St and 156th Ave NE Turn Improvement	Turn Improvement	6, 7	4 / 5 / ~8	Improve the eastbound to northbound left turn through timing prioritization and TSP. If improvements are inadequate, consider construction of a second left turn lane.	24	17	Addresses multiple operator comments.	$$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

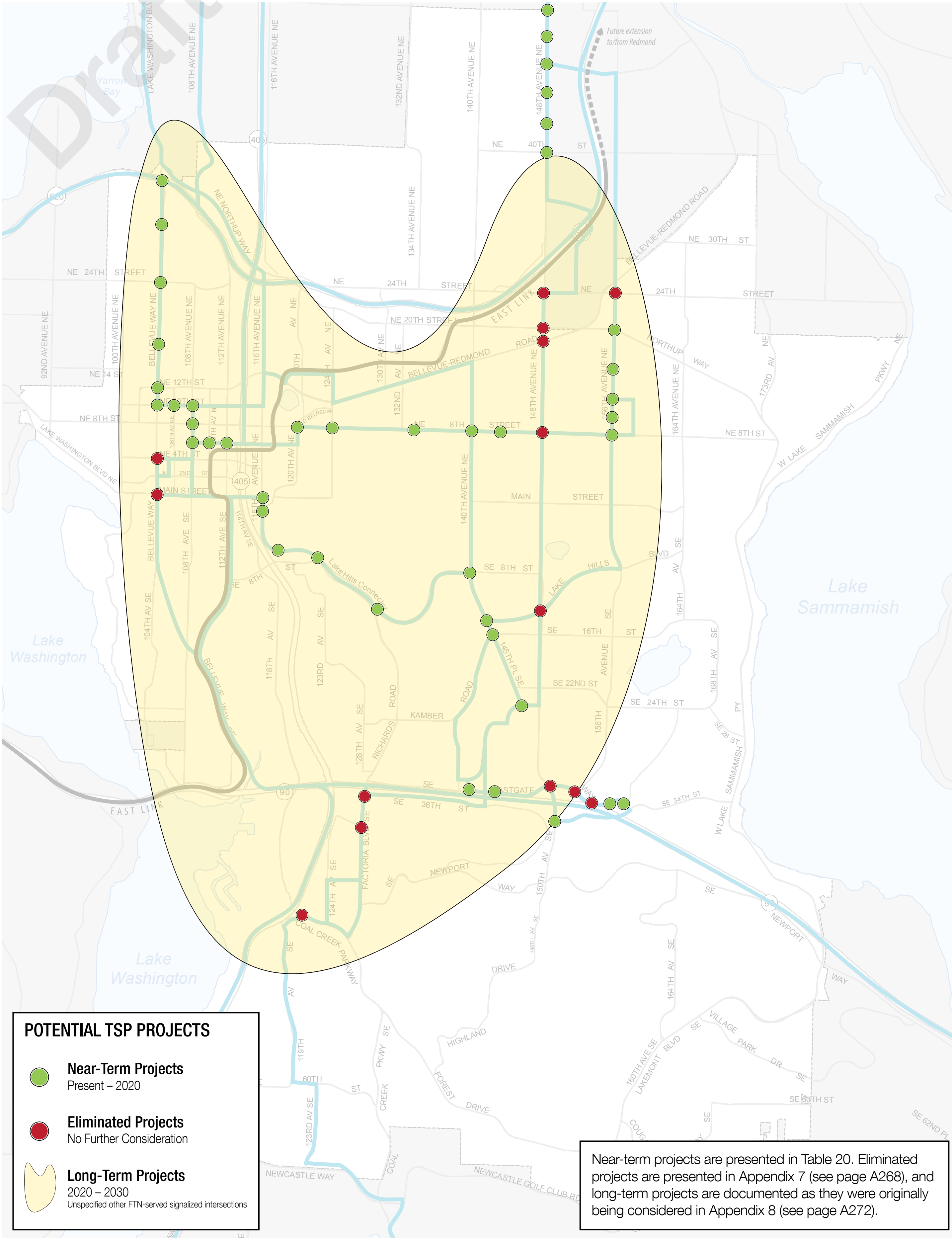
TRANSIT SIGNAL PRIORITY

Potential transit signal priority (TSP) projects were initially being considered at all signalized intersections through which 2030 Frequent Transit Network (FTN) routes will operate. Following the completion of early feasibility screening, potential transit signal priority (TSP) projects were then divided into three groups. The first group, shown in Table 20 on page 161, includes forty-four near-term projects that will be pursued through 2020. These represent all signalized intersections that are served by existing Route 271 (FTN Routes 1 and 13) and the RapidRide B Line (FTN Routes 6 and 7) that have not been eliminated by early feasibility screening. While TSP has already been deployed on some intersections served by the B Line, near-term projects along NE 8th St, 156th Ave NE, and 148th Ave NE would complete implementation associated with that route.

A cost estimate is not provided for near-term TSP projects in Table 20 because the cost of implementation at each intersection is estimated to be $15,000. TSP costs for each intersection were estimated based on approximate costs provided by King County Metro. These estimates do not include capital or operational costs of communication, nor do they include signal controller, cabinet, or foundation upgrades. More detailed analysis of the communication, cabinet, controller, and signal upgrades necessary for TSP implementation is required for more detailed cost estimates to be developed.

The second group of projects (see Appendix Table 23 on page A270) are those that have been eliminated from further consideration following 'fatal flaw' early feasibility screening. Twelve intersections for which potential signal projects were identified have been eliminated based on known signal and/or roadway limitations, and two additional intersections were removed by project consultants. Generally, the intersections with 'fatal flaws' identified are those that

Figure 127 Potential transit signal priority (TSP) projects.



Near-term projects are presented in Table 20. Eliminated projects are presented in Appendix 7 (see page A268), and long-term projects are documented as they were originally being considered in Appendix 8 (see page A272).

Table 20 Potential near-term transit signal priority (TSP) projects.

Intersection ID	Cross Streets	Direction(s)	Approach Composite Scores		FTN Route(s)	Previous TSP Priority	Related TMP Project	Related TFP Project
			Short-Term	Long-Term				
5	Bellevue Way NE & NE 12th Ave	Northbound, Southbound	7–13	13–14	1			
6	Bellevue Way NE & NE 10th Ave	Southbound, Westbound	9–13	14–17	1		X	
21	NE 8th St & 108th Ave NE	Northbound, Southbound	27	23	1, 5		X	X
33	NE 8th St & 120th Ave NE	Northbound, Westbound	16–17	14–16	6		X	X
35	NE 8th St & 124th Ave NE	Eastbound, Westbound	10–16	12–16	6	X		
41	NE 8th St & 140th Ave NE	Eastbound, Westbound, Northbound, Southbound	9–17	16–18	6, 14		X	
43	Lake Hills Connector & 140th Ave SE	Eastbound, Northbound, Southbound	11–16	11–16	13, 14			X
43	Lake Hills Connector & SE 8th St	Northbound, Southbound	12–16	12–16	13, 14			X
44	Lake Hills Blvd & 145th Pl SE	Eastbound, Northbound, Southbound	11–16	11–16	7, 13, 14			X
45	Kamber Rd & 145th Pl SE	Northeastbound, Northwestbound, Southeastbound	3–17	10–18	7, 13, 14			X
46	NE 8th St & 143rd Ave NE	Eastbound, Westbound	17–19	15–17	6	X		
54	SE 24th St & 145th Pl SE	Eastbound, Southbound	17–19	12–18	7, 12, 13			
62	156th Ave NE & Northup Way	Northbound, Southbound	21–27	14–17	7		X	
63	NE 8th St & 156th Ave NE	Eastbound, Westbound, Northbound, Southbound	15–24	9–17	6, 12		X	
66	156th Ave NE & NE 15th St	Northbound, Southbound	12–14	8–9	6, 7			
67	156th Ave NE & NE 10th St	Northbound, Southbound	17–21	9–14	7			
69	Bellevue Way NE & NE 24th Ave	Northbound, Southbound	7–9	11–12	1			
70	156th Ave NE & NE 13th Way	Northbound, Southbound	12–14	8–9	7			
73	Main St & 116th Ave	Eastbound, Northbound	5–10	13–18	13		X	
79	148th Ave NE & NE 40th St	Northbound, Southbound	13–23	18–21	12		X	
91	SE Eastgate Way & 160th Ave SE	Westbound	10	9	13			
92	SE Eastgate Way & 161st Ave SE	Westbound	6	7	13			
107	NE 6th St & 112th Ave NE	Eastbound, Westbound	24–28	23	2, 6		X	
124	NE 6th St & 110th Ave NE	Eastbound, Westbound	27–32	20–21	2, 6		X	
126	NE 6th St & 108th Ave NE	Northbound, Southbound, Westbound	26–32	18–23	1, 2, 5, 6		X	X
131	116th Ave SE & SE 1st St	Northbound, Southbound	10–12	11–13	13			
134	Lake Hills Connector & Richards Rd	Eastbound, Westbound	12–14	14–16	13		X	
136	Bellevue Way NE & 2900 Block Crosswalk	Northbound, Southbound	7	12–15	1			
137	Bellevue Way NE & 1700 Block Crosswalk	Northbound, Southbound	7–9	11–13	1			
154	NE 10th St & 106th Ave NE	Eastbound, Westbound	9	17–19	1		X	
190	NE 10th St & 108th Ave NE	Eastbound, Northbound, Westbound	9–27	19–23	1, 5		X	X
213	Bellevue Way NE & SR-520 SPUI	Northbound, Eastbound	7	15	1		X	
227	150th Ave SE & SE 37th St	Southbound	14	14	13		X	
249	148th Ave NE & NE 51st St	Northbound, Southbound, Westbound	19–21	21	7, 12		X	
272	SE Eastgate Way & 139th Ave SE	Eastbound, Westbound, Southbound	7–26	12–14	13, 14	X		
287	148th Ave NE & NE 60th St	Northbound, Southbound	9	14	7, 12			
288	NE 8th St & 13300 Block Crosswalk	Eastbound, Westbound	10–15	12–18	6			
299	NE 8th St & 158th Ave NE	Eastbound, Westbound	5–15	5–14	6			
319	SE Eastgate Way & 140th Ave SE	Eastbound, Southbound, Westbound	17	12–15	7, 13, 14	X		
NA_1	Lake Hills Connector & I-405 NB off-ramp	Eastbound, Westbound	12–16	11–16	13			
NA_2	SE Eastgate Way & Eastgate P&R Entrance	Westbound, Eastbound	19–26	13–14	13			
NA_3	148th Ave NE & NE 4200 Block	Northbound, Southbound	13–23	18–21	12		X	
NA_3	148th Ave NE & NE 5600 Block	Northbound, Southbound	9–19	14–21	7, 12			
NA_4	148th Ave NE & NE 46th St	Northbound, Southbound	21–23	21	12		X	

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

have such significant congestion—often in all travel directions—that the use of signal pre-emption for transit would seriously interfere with signal phasing and cause unacceptable delays to cross traffic. For example, the intersections of 148th Ave NE/NE 20th St and Factoria Blvd/SE 36th St both experience substantial congestion due to nearby freeway interchanges, making TSP implementation untenable there.

The final group of potential TSP projects are those that may be pursued between 2020–2030. This group includes an unspecified number of the remaining signalized intersections served by 2030 FTN routes, indicated in Figure 127 by a yellow area covering much of the city (see Appendix 8 on page A272). If transit efficiency and reliability were the only two considerations necessary in determining where TSP should be deployed—that is, if cost were no object, impacts to other travel modes were deemed insignificant, and no technical limitations existed on where TSP could be deployed—then TSP might reasonably be pursued at all or most of these signals. However, this is of course not the case, as all of these other factors are also critical considerations in determining where transit priority can and should be implemented. Therefore, the specific projects that may be included in this group will not be identified until after 2020, after Metro has identified its anticipated capacity to expand its TSP capabilities.

Unfold for full sheet

TRACKING & FURTHER STUDY

In addition to the physical infrastructure improvement projects proposed, five projects dealing with performance tracking and further study have also been identified (Table 21). Though less visible than the 'brick-and-mortar' running way and spot improvement projects, and less immediately impactful to transit operations than transit signal priority projects, these tracking and study projects would provide valuable opportunities for the City to ensure that its investments in transit priority are functioning as intended and providing the greatest return on investment possible.

The tracking and study projects include two targeted projects and three city-wide projects. Project L12 would track the volumes of traffic between Bellevue Transit Center and the NE 6th St direct-access ramp to I-405 to ensure that speed and reliability do not decline over time, and Project R17 would study how speed and reliability could be improved for westbound buses from SR-520 to the South Kirkland Park-and-Ride. Citywide-R1 would track the adequacy of turn pocket lengths along FTN corridors and adjust signal timing as needed. Citywide-S3 and Citywide-S4 both deal with TSP performance. The former would develop TSP performance standards and track the resulting measures to ensure that TSP systems are functional and optimized, while the latter project would conduct a before-and-after study of the benefits provided to transit by TSP at selected intersections, as well as its impacts on general purpose traffic. None of these projects have associated capital costs, and Project R17 is the lone project whose cost was identified as 'N/A' (see Table 17 on page

Table 21 Tracking projects and studies.

ID	Project	Type	FTN Service		Composite Scores		Project Description	Project Need
			Routes	Frequency (Peak/Base/Night)	Short-Term	Long-Term		
L12	NE 6th St Bus Priority Corridor	Tracking	1, 2, 3, 5, 6, 11, 13	~1 / 1-2 / ~2	24–28	23	Highlight transit priority over general purpose and HOV traffic on NE 6th St from BTC to I-405 direct access ramps. Track general purpose and HOV volumes to ensure they do not result in degradation of speed and reliably below existing levels, and take steps to mitigate growing HOV volumes if needed.	Addresses very high bus volumes between BTC and I-405.
Citywide-R1	Transit Turn Priority	Tracking	NA	NA	N/A	N/A	Monitor right and left turn pockets used by Frequent Transit Network (FTN) routes for level-of-service and adequacy of pocket length. Use signal timing work to prioritize these movements to ensure fast and reliable transit service.	Turning moments at major intersections with long signal cycles can have a significant impact on the speed and reliability of routes.
R17	SR-520 and 108th Ave NE Exit Transit Priority	Study	4	8 / 10-15 / 30	30	23	Improve the speed and reliability of SR-520 westbound buses to South Kirkland Park-and-Ride through signal operations, striping, or construction of bus facilities.	Addresses 2010 and 2030 intersection LOS of E and F.
Citywide-S3	TSP Performance Tracking and Optimization	Tracking	NA	NA	N/A	N/A	Develop TSP performance standards in coordination with King County Metro. Track performance and ensure that TSP is operational and optimized.	Develop shared goals of successful TSP implementation between the City of Bellevue and King County Metro.
Citywide-S4	TSP Before and After Study	Study	NA	NA	N/A	N/A	Complete a before and after study at select intersections to assess the benefits of TSP to transit and the impacts on general purpose traffic. Use person throughput and person delay as performance measures.	Provides a local example of the benefits and impacts on TSP implementation for staff and policy makers.

This page intentionally left blank.

PROJECTED OUTCOMES

This section summarizes the results of initial efforts to model the impacts of implementing some of the potential projects considered in this report. The results presented here were generated using Dynameq, a dynamic traffic simulaton application that is capable of assessing traffic patterns under congested conditions. This software models vehicles of multiple modes and captures lane-based effects and explicit signal timing, making it a useful tool for considering how HOV and BAT lane projects would affect transit and automobile travel time along Frequent Transit Network (FTN) corridors. Other project types like queue jumps and TSP cannot be modeled with this application and are therefore not considered in this analysis. It should be noted that at this level of study, the modeling is done on the set of proposed HOV and BAT lane projects as a group (identified as the HOV/BAT Lane scenario; see Table 18 on page 149 for details about all of the projects included). As implementation of the Transit Master Plan progresses, more detailed modeling will be done to assess the benefits of individual projects.

This Dynameq-based assessment suggests that implementation of every HOV and BAT lane project being proposed will improve the average transit travel speed for each category of FTN service by roughly 1 mph (Table 22). Although this may sound like a small improvement, this level of speed increase represents approximately half of the total improvement needed for Frequent Local (FL) routes to achieve the operating speeds assumed in the *Transit Service Vision Report*. Frequent Rapid (FR) routes achieve about one-third of the improvement in average speed required, and Frequent Express (FX) routes about one-quarter.

Table 22 Average transit and general purpose travel speeds by FTN service category before and after HOV and BAT lane implementation.

Scenario	Avg. Speed Along FTN Corridors by Service Type (mph)		
	FX	FR	FL
Transit			
Baseline	18	12	12
HOV/BAT Lane Projects	19	13	13
2030 Targets	22	15	14
General Purpose Traffic			
Baseline	20	13	13
HOV/BAT Lane Projects	21	14	14

Source: Dynameq model D30R1.0.3, for November 14, 2013 Transportation Commission meeting.

Table 23 Transit and general purpose travel time by FTN route before and after HOV and BAT lane implementation.

FTN Route	FTN Type	From / To	Dir.	Dist. (miles)	Baseline		HOV/BAT Lane Projects	
					Avg. Travel Time (min)	Avg. Speed (mph)	Avg. Travel Time (min)	Avg. Speed (mph)
Transit								
1	FX	Lakemond Interchange to NE 84th St	In	11.41	37.1	18.4	34.9	19.6
			Out	11.15	46.8	14.3	44.1	15.2
2	FX	NE 124th St Interchange to NE 102nd Ave	In	8.03	22.8	21.1	21.1	22.8
			Out	7.64	40.4	11.3	40.7	11.3
3	FX	Kennydale to Bellevue Transit Center	In	8.34	18.6	25.9	18.4	27.2
			Out	8.34	34.0	13.8	30.2	16.6
4	FX	Union Hill/SR520 to NE 84th Ave	In	10.05	24.2	24.9	20.8	28.9
			Out	8.91	20.5	26.1	21.4	25.0
5	FR	NE 124th St Interchange to Bellevue Transit Center	In	9.17	34.8	15.8	37.9	14.5
			Out	9.42	53.4	10.6	53.5	10.6
6	FR	Crossroads to Bellevue Way/NE 4th	In	3.62	23.3	9.3	22.5	9.6
			Out	3.55	20.8	10.2	19.5	10.7
7	FR	Town Square to Factoria Mall	In	12.55	57.3	13.1	55.8	13.5
			Out	11.97	54.5	13.2	48.8	14.6
11	FL	Newcastle Way to Bellevue Transit Center	In	7.94	34.4	13.9	35.6	13.5
			Out	7.99	47.0	10.2	41.8	11.3
12	FL	148th/Old Redmond Rd to Eastgate Park-and-Ride	In	7.20	32.3	13.4	32.5	13.3
			Out	7.20	40.0	10.8	33.0	13.1
13	FL	Bellevue Transit Center to Eastgate Park-and-Ride	In	7.89	39.4	12.0	38.3	12.4
			Out	7.95	36.3	13.1	31.5	15.1
14	FL	Eastgate Park-and-Ride to Lake Wash Blvd	In	7.91	37.2	12.7	32.9	14.4
			Out	7.88	39.6	11.9	38.4	12.3
General Purpose Traffic								
1	FX	Lakemond Interchange to NE 84th St	In	11.41	35.2	19.4	31.4	21.8
			Out	11.15	42.6	15.7	41.8	16.0
2	FX	NE 124th St Interchange to NE 102nd Ave	In	8.03	22.2	21.7	18.3	26.3
			Out	7.64	35.5	12.9	37.8	12.1
3	FX	Kennydale to Bellevue Transit Center	In	8.34	17.7	28.2	17.9	27.9
			Out	8.34	31.7	16.0	23.6	21.5
4	FX	Union Hill/SR520 to NE 84th Ave	In	10.05	22.0	27.4	20.2	29.8
			Out	8.91	18.1	29.5	18.1	29.5
5	FR	NE 124th St Interchange to Bellevue Transit Center	In	9.17	30.4	18.1	34.6	15.9
			Out	9.42	47.2	12.0	51.5	11.0
6	FR	Crossroads to Bellevue Way/NE 4th	In	3.62	21.5	10.1	17.4	12.5
			Out	3.55	20.5	10.4	21.1	10.1
7	FR	Town Square to Factoria Mall	In	12.55	51.5	14.6	51.2	14.7
			Out	11.97	53.1	13.5	46.4	15.5
11	FL	Newcastle Way to Bellevue Transit Center	In	7.94	28.6	16.6	30.2	15.8
			Out	7.99	42.2	11.4	39.7	12.1
12	FL	148th/Old Redmond Rd to Eastgate Park-and-Ride	In	7.20	28.8	15.0	29.4	14.7
			Out	7.20	40.4	10.7	31.6	13.7
13	FL	Bellevue Transit Center to Eastgate Park-and-Ride	In	7.89	39.5	12.0	39.7	11.9
			Out	7.95	37.7	12.7	33.4	14.3
14	FL	Eastgate Park-and-Ride to Lake Wash Blvd	In	7.91	29.4	16.2	30.0	15.8
			Out	7.88	33.5	14.1	32.0	14.8

Source: Dynameq model D30R1.0.3, for November 14, 2013 Transportation Commission meeting.
Notes: The above figures reflect only the length of each route operating either wholly within Bellevue or to the nearest bus stop outside of Bellevue city limits. For example, Route 3 terminates at Kennydale Park-and-Ride for the purposes of this modeling exercise. This is done to minimize the extent to which route segments outside of Bellevue's jurisdiction, which do not benefit from the HOV and BAT lane projects being considered in Bellevue, affect the average speeds and travel times realized as a result of these potential improvements.

That Frequent Express routes would realize less substantial improvements than Frequent Local routes stands to reason given the nature of these routes and the projects reflected in this analyis. Frequent Express routes operate long segments on highways, while all of the HOV and BAT lane projects assessed here are on local streets over which Bellevue has jurisdiction. To achieve additional improvement to Frequent Express travel times, some transit accommodations may be necessary on SR-520, I-90, and I-405, such as increasing HOV lane use requirements from 2+ to 3+ passengers, for example. By contrast, Frequent Local routes operate entirely on local arterial streets, so these running way projects are able to more directly target the range of issues affecting them.

Table 23 indicates that most routes would realize travel time improvements of two minutes or more in one or both travel directions, including Route 1FX, Route 3FX outbound, Route 4FX inbound, Route 5FR inbound, Route 7FR outbound, Route 11FL outbound, Route 12FL outbound, Route 13FL outbound, and Route 14FL inbound. Note that many potential HOV and BAT lane projects apply only to one direction of travel, hence the benefits are not realized equally by inbound and outbound trips. Outbound trips of Routes 7FR, 11FL, and 12FL would realize the largest improvements—roughly six minutes for each—which may suggest that Projects L1-L3, L6, L23, L24, and L26 are particularly effective in addressing the speed and reliability issues affecting transit on these corridors. However, because all projects are modeled simultaneously, as noted above, it is not clear from this analysis which of these projects has the greatest impact.

Table 24 reflects the systemwide impacts of implementing every potential HOV and BAT lane project currently being considered. Although the number of signalized intersections with an LOS of 'B' decreases and those rated 'C' increase, intersections with an LOS of 'D', 'E', and 'F' all decline, resulting in an overall improvement in citywide vehicle delay of 2 seconds.

Stated simply, time is money. In this case, this addage applies both to the value of transit users' time spent riding the bus and to the cost for transit providers to operate the service. For riders, time spent traveling could be better used to achieve more productive ends. For transit operators, minutes lost to traffic congestion can mean the difference between requiring three buses or four to operate the same route at a given frequency. The improvements in speed and travel time realized by implementing HOV and BAT lane projects can therefore be monetized to estimate the aggregate value of the time saved. As shown in Table 25, these improvements in travel time translate to societal savings of between $2.5–$4.2 million annually during the PM peak alone, depending on the rate at which riders' time spent traveling is valued relative to the region's mean hourly wage. Additional savings would also be realized during other times of day, particularly in the AM peak, but because travel demand model outputs reflect PM peak conditions, no assumptions are made here about the savings realized during other periods.

For transit operators, the calculation is somewhat more complicated for two reasons. First, the ability to remove a bus from a schedule while maintaining the same headways depends on multiple factors that

Table 24 2030 PM peak hour signalized intersection LOS before and after HOV and BAT lane implementation.

		2030 Reduced Funding w/o HOV/BAT Projects	2030 Growing Resources w/o HOV/BAT Projects	2030 Growing Resources with HOV/BAT Projects
Level of Service (LOS)	A	8	8	8
	B	27	31	28
	C	49	49	54
	D	50	53	52
	E	33	30	33
	F	28	24	20
Citywide LOS		D	D	D
Citywide Avgerage Vehicle Delay (sec)		51.8	49.9	48.3
Citywide Total Delay Hours		8,141	7,665	7,350

Source: Dynameq model D30R1.0.3, for November 14, 2013 Transportation Commission meeting.

are not reflected by this analysis. Second, the travel demand models used here to assess transit travel speed assume the service frequencies defined by the 2030 Growing Resources scenario as model inputs. However, it will only be possible to operate these frequencies within the budget defined by the *Funding Scenarios Report* if transit travel speeds meet or exceed the speeds assumed for each service type in the *Service Vision Report*. Nevertheless, it is still instructive to estimate the operating cost savings attributable to implementing these HOV and BAT lane projects, even if these savings are reinvested in prodiving service at the frequencies being proposed. To that end, Table 26 indicates that transit service providers would save between about $510,000–$780,000 annually based on the travel time savings achieved in the PM peak period alone, depending on the assumed operating cost per hour. See Appendix 9 on page A275 for additional information about how these figures for the value of travel time savings were calculated.

Given that only a portion of the proposed transit priority projects can be modeled (i.e. HOV and BAT lanes), it can be expected that implementation of the entire package of improvements would result in greater travel time savings than are reflected here. This is because HOV and BAT lanes are often paired with other improvements, such as queue jump lanes and/or TSP to help transit pass through problematic intersections more efficiently. This assessment therefore only presents part of the picture—the degree of benefit achieved by HOV and BAT lanes in isolation of any other related transit priority projects—so the results presented in Table 22 should not be understood to mean that the City will be unable to achieve the target travel speeds assumed in the *Transit Service Vision Report*. The other types of priority projects being considered will also contribute to transit travel speed improvement, but those projects' benefits will need to be assessed using more detailed applications.

Table 25 Value of Annualized PM Peak Travel Time Savings for Transit Users from Proposed HOV/BAT Projects.

FTN Service Type	Annualized PM Peak Pass Hours Saved	Value of Pass Hours Saved		
		Low	Medium	High
FX	148,592	$1,439,564	$2,056,519	$2,344,432
FR	17,414	$168,711	$241,016	$274,759
FL	99,779	$966,655	$1,380,936	$1,574,267
Annual Total:		**$2,574,930**	**$3,678,471**	**$4,193,457**

Notes: Value of travel time savings based on the May 2012 mean hourly wage for Seattle-Everett-Bellevue of $27.68, obtained from the US Department of Labor Bureau of Labor Statistics. Low, Medium, and High estimates are based on the percentage of that wage considered when valuing transit passenger time, reflecting 35%, 50%, and 57%, respectively. Higher rates of time valuation relative to the mean hourly wage correspond to reduced perceived convenience due to lower intersection LOS (e.g. High corresponds to LOS 'D') and/or standing rather than sitting. See Appendix 9 on page A275 for details.

Table 26 Value of Annualized PM Peak Travel Time Savings to Transit Operators from Proposed HOV/BAT Projects.

FTN Service Type	Annualized PM Peak Revenue Hours Saved	Value of Revenue Hours Saved	
		Low[1]	High[2]
FX	2,352	$209,285	$319,054
FR	521	$46,399	$70,736
FL	2,869	$255,322	$389,238
Annual Total:		**$511,007**	**$779,027**

1. Low estimate based on King County Metro's 2010 marginal hourly operating cost of $89.
2. High estimate based on King County Metro's 2012 'Transit Operating Cost per Vehicle Hour', as reported on the agency's website at: http://metro.kingcounty.gov/am/reports/annual-measures/financial.html#cost-per-hour. See Appendix 9 on page A275 for details.

This page intentionally left blank.

SECTION 5:
APPENDICES

This page intentionally left blank.

APPENDIX A

APPENDIX A1:
INSERT APPENDIX NAME

This page intentionally left blank.

APPENDIX B

APPENDIX B1: TRANSIT PRIORITY PEDESTRIAN AND BICYCLE PROJECT LISTS

Consistent with the maps presented on The following pages itemize all transit priority pedestrian and bicycle projects in four parts:

1. Sidewalk projects
2. Bicycle projects
3. Offstreet Path projects
4. Trail projects

All projects reflected in these tables are derived from the 2009 Pedestrian and Bicycle Transportation Plan Report except for projects P-1, P-2, S-1, I-1, I-2, I-3, and I-4, which all come from the Eastgate/I-90 Transportation Strategies Report. Additionally, the descriptions and extents of two projects derived from the 2009 Ped-Bike Plan have been revised in these tables: sidewalk project S-464 and bicycle project B-146. These projects have been updated to reflect the details of Running Way Project L27—the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor—proposed in this report. Thus, revised project S-464 recommends constructing a sidewalk on the west side of 142nd Pl SE from SE 36th St to SE 32nd St, on the east and south sides of the re-aligned Snoqualmie River Rd from SE 32nd St to SE 24th St. And whereas project B-146 previously recommended the installation of a bicycle lane on both the east and west sides of 142nd Pl SE from SE 36th St to SE 28th St, the revised project recommends constructing an off-street bicycle facility only on the east side from SE 36th St to SE 32nd St and on the west side of Snoqualmie River Rd from SE 32nd St to SE 24th St.

Appendix Table 1 Transit priority sidewalk projects.

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-101-N	NE 8th St	116th Ave NE to 120th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 8th Street from 116th Avenue NE to 120th Avenue NE where not complete.	High
Sidewalk	S-101-S	NE 8th St	116th Ave NE to 120th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 8th Street from 116th Avenue NE to 120th Avenue NE where not complete.	High
Sidewalk	S-102-E	100th Ave SE/SE Bellevue Pl	Meydenbauer Way SE to Main St	Add a 12 foot wide sidewalk and 4 foot wide planter strip on the east side of 100th Avenue SE and SE Bellevue Place from Meydenbauer Way SE to Main Street.	High
Sidewalk	S-200-E	124th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot side planter strip on the east side of 124th Avenue NE from Northup Way to Bel-Red Road where not complete.	High
Sidewalk	S-200-W	124th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot side planter strip on the west side of 124th Avenue NE from Northup Way to Bel-Red Road where not complete.	High
Sidewalk	S-204-S	NE 11th St	111th Ave NE to 112th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 11th Street from 111th Avenue NE to 112th Avenue NE.	High
Sidewalk	S-205-W	105th Ave NE	NE 4th St to NE 2nd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the west side of 105th Avenue NE from NE 4th Street to NE 2nd Street.	High
Sidewalk	S-207-E	111th Ave NE	NE 4th St to NE 2nd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 111th Avenue NE from NE 4th Street to NE 2nd Street.	High
Sidewalk	S-207-W	111th Ave NE	NE 4th St to NE 2nd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 111th Avenue NE from NE 4th Street to NE 2nd Street.	High
Sidewalk	S-209-S	NE 1st St (Old Bellevue Sidewalks)	103rd Ave NE to Bellevue Way	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 1st Street from 103rd Avenue NE to Bellevue Way.	High
Sidewalk	S-210-W	107th Ave NE	NE 2nd St to Main St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 107th Avenue NE from NE 2nd Street to Main Street where not complete.	High
Sidewalk	S-211-W	110th Ave NE	NE 2nd St to Main St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the west side of 110th Avenue NE from NE 2nd Street to Main Street where not complete.	High
Sidewalk	S-212-S	NE 2nd St	Bellevue Way to 106th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 2nd Street from Bellevue Way to 106th Avenue NE.	High
Sidewalk	S-213-N	Main St	Bellevue Way to 116th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the north side of Main Street from Bellevue Way to 116th Avenue NE.	High
Sidewalk	S-214-E	120th Ave NE	Bel-Red Road to Northup Way	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 120th Avenue NE from NE Bel-Red Road to Northup Way where not compete.	High
Sidewalk	S-214-W	120th Ave NE	Bel-Red Road to Northup Way	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 120th Avenue NE from Bel-Red Road to Northup Way where not compete.	High
Sidewalk	S-215-E	102nd Ave NE	NE 10th St to NE 8th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the east side of 102nd Avenue NE from NE 10th Street to NE 8th Street where not complete.	High
Sidewalk	S-217-E	150th Ave SE	SE 38th St to SE 43rd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 150th Avenue SE from SE 38th Street to SE 43rd Street where not complete.	High
Sidewalk	S-217-W	150th Ave SE	SE 37th St to SE 43rd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west of 150th Avenue SE from SE 37th Street to SE 43rd Street where not complete.	High
Sidewalk	S-301-N	Northup Way	NE 33rd Pl to 124th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of Northup Way from NE 33rd Place to 124th Avenue NE where not complete.	High
Sidewalk	S-301-S	Northup Way	Bellevue Way to 124th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of Northup Way from Bellevue Way NE to 124th Avenue NE where not complete.	High
Sidewalk	S-303-W	112th Ave NE	108th Ave NE to 400' S of NE 24th St	Add a 6 foot wide sidewalk and a 4 foot-wide planter strip along the west side of 112th Avenue NE from 108th Avenue NE to 400 feet south of NE 24th Street.	High
Sidewalk	S-305-N	NE 40th St	140th Ave NE to 142nd Pl NE	Add a curb, gutter, and separated pathway or sidewalk where physical constraints exist, on the north side of NE 40th Street from 140th Avenue NE to 142nd Place NE. (shared lanes and planter strip where feasible)	High
Sidewalk	S-308-N	NE 24th St	105th Ave NE to 108th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 24th Street from 105th Avenue NE to 108th Avenue NE.	High
Sidewalk	S-308-S	NE 24th St	Bellevue Way NE to 108th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 24th Street from Bellevue Way NE to 108th Avenue NE.	High
Sidewalk	S-310-E	132nd Ave NE	NE 16th St to NE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 132nd Avenue NE from NE 16th Street to NE 8th Street where not complete.	High
Sidewalk	S-310-W	132nd Ave NE	Bel-Red Rd to NE 8th St	Add an 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 132nd Avenue NE from Bel-Red Road to NE 8th Street where not complete.	High
Sidewalk	S-311-N	Northup Way	161st Ave NE to NE 8th St	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the north side of Northup Way from 161st Avenue NE to NE 8th Street where not complete.	High
Sidewalk	S-311-S	Northup Way	156th Ave NE to NE 170th Ave NE	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the south side of Northup Way from 156th Avenue NE to 170th Avenue NE where not complete.	High
Sidewalk	S-313-E	100th Ave NE	NE 14th St to NE 24th St	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the east side of 100th Avenue SE from NE 14th Street to NE 24th Street.	High
Sidewalk	S-314-E	108th Ave NE	NE 24th St to NE 14th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the east side of 108th Avenue NE from NE 24th Street to NE 14th Street where not complete.	High
Sidewalk	S-314-W	108th Ave NE	NE 24th St to NE 12th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the west side of 108th Avenue NE from NE 24th Street to NE 12th Street where not complete.	High
Sidewalk	S-316-E	160th Ave NE	Crossroads Park to NE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Sidewalk	S-316-W	161st Ave NE	NE 8th to Crossroads Park	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Sidewalk	S-319-W	128th Ave NE/SE	NE 7th St to SE 7th Pl	Add a 6 foot wide sidewalk along the west side of 128th Avenue NE/SE from NE 7th Street to SE 7th Place, except in front of Wilburton Park.	High
Sidewalk	S-321-S	NE 6th St	148th Ave NE to 164th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 6th Street from 148th Avenue NE to 164th Avenue NE where not complete.	High
Sidewalk	S-326-N	Main St	118th Ave SE to 124th Ave NE	Add a 6 foot wide sidewalk and a 4 foot planter strip on the north side of Main Street from 118th Avenue SE to 124th Avenue NE.	High
Sidewalk	S-327-E	124th Ave NE	NE 4th Pl to Main St	Add a 6 foot wide sidewalk and a 4 foot planter strip on the east side of 124th Avenue NE from NE 4th Place to Main Street.	High
Sidewalk	S-327-W	124th Ave NE	NE 2nd St to Main St	Add a 6 foot wide sidewalk and a 4 foot planter strip on the west side of 124th Avenue NE from NE 2nd Street to Main Street.	High

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-328-E	118th Ave SE	Main Street to SE 4th Pl (Botanical Garden frontage)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 118th Avenue SE from Main Street to SE 4th Place where not complete. (mainly Botanical Garden frontage)	High
Sidewalk	S-328-W	118th Ave SE	Main Street to SE 4th Pl (Botanical Garden frontage)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 118th Avenue SE from Main Street to SE 4th Place where not complete. (mainly Botanical Garden frontage)	High
Sidewalk	S-329-E	114th Ave SE	SE 6th to SE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 114th Avenue SE from SE 6th Street to SE 8th Street.	High
Sidewalk	S-329-W	114th Ave SE	SE 6th to SE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 114th Avenue SE from SE 6th Street to SE 8th Street.	High
Sidewalk	S-330-N	SE 8th St	121th Ave SE to Lake Hills Connector	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the north side of SE 8th Street from 121st Avenue SE to Lake Hills Connector.	High
Sidewalk	S-330-S	SE 8th St	114th Ave/118th Ave SE to 121st Avenue SE	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the south side of SE 8th Street from 114th Avenue SE/118th Avenue SE to 121st Avenue SE.	High
Sidewalk	S-331-N	SE 7th Pl	Lake Hills Connector to 128th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the north side of SE 7th Place from Lake Hills Connector to 128th Avenue SE where not complete.	High
Sidewalk	S-333-N	Lake Hills Blvd	143rd Ave SE to SE 12th Pl	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the north side of Lake Hills Boulevard from 143rd Avenue SE to SE 12th Place where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-333-S	Lake Hills Blvd	144th Ave SE to SE 12th Pl	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the south side of Lake Hills Boulevard from 143rd Avenue SE to SE 12th Place, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-334-N	Lake Hills Blvd	155th Ave SE to 156th Ave SE	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip along the north side of Lake Hills Boulevard from 155th Avenue SE to 156th Avenue SE, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-335-S	SE 6th St	100th Ave SE to 102nd Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of SE 6th Street from 100th Avenue SE to 102nd Avenue SE.	High
Sidewalk	S-338-E	SE 20th Pl/128th Ave SE	123rd Ave SE to SE 30th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of SE 20th Place and 128th Avenue SE from 123rd Avenue SE to SE 30th Street where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-338-W	SE 20th Pl/128th Ave SE	123rd Ave SE to SE 32nd St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of SE 20th Place and 128th Avenue SE from 123rd Avenue SE to SE 32nd Street where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-344-E	145th Pl SE	SE 24th St to Landerholm Cir SE (BCC campus)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 145th Place SE from SE 24th Street to Landerholm Circle SE and the Bellevue Community College campus.	High
Sidewalk	S-344-W	145th Pl SE	SE 24th St to Landerholm Cir SE (BCC campus)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 145th Place SE from SE 24th Street to Landerholm Circle SE and the Bellevue Community College campus where not complete.	High
Sidewalk	S-345-N	SE 24th St	145th Pl SE to 148th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the north side of SE 24th Street from 145th Place SE to 148th Avenue SE where not complete.	High
Sidewalk	S-346-N	SE 16th St	148th Ave SE to 156th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of SE 16th Street from 148th Avenue SE to 156th Avenue SE where not complete.	High
Sidewalk	S-346-S	SE 16th St	148th Ave SE to 156th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of SE 16th Street from 148th Avenue SE to 156th Avenue SE where not complete.	High
Sidewalk	S-348-N	Phillips Hill Rd (SE 35th Pl and SE 34th St)	162nd Pl SE to 168th Pl SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of Phillips Hills Road (SE 35th Place and SE 34th Street) from 162nd Place SE to 168th Place SE.	High
Sidewalk	S-353-N	SE 40th Ln	Factoria Blvd to 133rd Ave SE	Add a 6 foot sidewalk and a 4 foot planter strip on the north side of SE 40th Lane from Factoria Boulevard to 131st Avenue SE.	High
Sidewalk	S-353-S	SE 40th Ln	Factoria Blvd to 133rd Ave SE	Add a 6 foot sidewalk and a 4 foot planter strip on the south side of SE 40th Lane from Factoria Boulevard to 131st Avenue SE.	High
Sidewalk	S-364-N	SE 60th St	112th Ave SE/Lake Washington Blvd to 120th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of SE 60th Street from 112th Avenue SE/Lake Washington Boulevard to 120th Avenue SE where not complete.	High
Sidewalk	S-364-S	SE 60th St	114th Pl SE to 116th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of SE 60th Street from 114th Place SE to 116th Avenue SE where not complete.	High
Sidewalk	S-367-E	123rd Ave SE	SE 60th St to SE 64th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 123rd Avenue SE from SE 60th Street to SE 64th Place where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-367-W	123rd Ave SE	SE 60th St to SE 64th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 123rd Avenue SE from SE 60th Street to SE 64th Place where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-368-N	SE 60th St	126th Ave SE to 129th Ave SE	Add a 6 foot wide sidewalk on the north side of SE 60th Street from 126th Avenue SE to 129th Avenue SE where not complete.	High
Sidewalk	S-368-S	SE 60th St	123rd Ave SE to 129th Ave SE	Add a 6 foot wide sidewalk on the south side of SE 60th Street from 123rd Avenue SE to 129th Avenue SE where not complete.	High
Sidewalk	S-377-S	Coal Creek Pkwy	I-405 to Factoria Blvd SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of Coal Creek Parkway from Factoria Boulevard SE to I-405.	High
Sidewalk	S-378-N	Eastgate Way	Richards Rd to 139th Ave SE	Add a 6 foot wide sidewalk and 4 foot wide planter strip on the north side of Eastgate Way from Richards Road to 139th Avenue SE where not complete.	High
Sidewalk	S-414-N	NE 5th St	120th Ave NE to 124th Ave NE	Add a 5 foot wide sidewalk on the north side of NE 5th Street from 120th Avenue NE to 124th Avenue NE.	High
Sidewalk	S-414-S	NE 5th St	120th Ave NE to 123rd Ave NE	Add a 5 foot wide sidewalk on south side of NE 5th Street from 120th Avenue NE to 123rd Avenue NE where not complete.	High
Sidewalk	S-418-N	NE 6th St	148th Ave NE to 164th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 6th Street from 148th Avenue NE to 164th Avenue NE.	High
Sidewalk	S-419-E	160th Ave NE/158th Pl NE/SE	NE 4th St to SE 16th St	Add a 5 foot wide sidewalk on the east side of 160th Avenue NE and 158th Place NE/SE from NE 4th Street to SE 16th Street where not complete.	High
Sidewalk	S-419-W	160th Ave NE/158th Pl NE/SE/160th Ave SE	NE 4th St to Phantom Way	Add a 5 foot wide sidewalk on the west side of 160th Avenue NE, 158th Place NE/ SE, and 160th Avenue SE from NE 4th Street to Phantom Way where not complete.	High
Sidewalk	S-423-S	Meydenbauer Way SE	SE Bellevue Pl to 101st Ave SE	Add a 5 foot wide sidewalk on the south side of Meydenbauer Way SE from SE Bellevue Place to 101st Avenue SE where not complete.	High

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-425-E	105th Ave SE	SE Cliff Pl to Wolverine Way (high school)	Add a 5 foot wide sidewalk on the east side of 105th Avenue SE from SE Cliff Place to Wolverine Way (high school) where not complete.	High
Sidewalk	S-425-W	105th Ave SE	SE Cliff Pl to Wolverine Way (high school)	Add a 5 foot wide sidewalk on the west side of 105th Avenue SE from SE Cliff Place to Wolverine Way (high school) where not complete.	High
Sidewalk	S-428-N	SE 5th St	118th Ave SE to Wilburton Hill Community Park	Add a 5 foot-wide sidewalk on the north side of SE 5th Street from 118th Avenue SE to Wilburton Hill Community Park where not complete.	High
Sidewalk	S-429-S	SE 7th Pl	Lake Hills Connector to 128th Ave SE	Add a 5 foot wide sidewalk along the south side of SE 7th Place from Lake Hills Connector to 128th Avenue SE where not complete.	High
Sidewalk	S-430-S	Lake Hills Connector	134th Ave SE (Bannerwood Sports Park) to 140th Ave SE	Add a 5 foot wide sidewalk on the south side of Lake Hills Connector from 134th Avenue SE (Bannerwood Sports Park) to 140th Avenue SE.	High
Sidewalk	S-431-N	SE 6th St	100th Ave SE to Bellevue Way SE	Add a 5 foot wide sidewalk along the north side of SE 6th Street from 100th Avenue SE to Bellevue Way SE where not complete.	High
Sidewalk	S-431-S	SE 6th St	102th Ave SE to Bellevue Way SE	Add a 5 foot wide sidewalk along the south side of SE 6th Street from 102nd Avenue SE to Bellevue Way SE where not complete.	High
Sidewalk	S-435-N	SE 16th St	104th Ave SE to 108th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 16th Street from 104th Avenue SE to 108th Avenue SE where not complete.	High
Sidewalk	S-435-S	SE 16th St	104th Ave SE to 108th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 16th Street from 104th Avenue SE to 108th Avenue SE.	High
Sidewalk	S-436-W	107th Ave SE	Bellevue Way SE to SE 20th St	Add a 5 foot wide sidewalk along the west side of 107th Avenue SE from Bellevue Way SE to SE 20th Street with a planter strip where feasible.	High
Sidewalk	S-443-E	120th Ave SE	SE 35th St to Lake Washington Blvd	Add a 5 foot wide sidewalk on the east side of 120th Avenue SE from SE 35th Street to Lake Washington Boulevard.	High
Sidewalk	S-443-W	120th Ave SE	SE 35th St to Lake Washington Blvd	Add a 5 foot wide sidewalk on the west side of 120th Avenue SE from SE 35th Street to Lake Washington Boulevard.	High
Sidewalk	S-448-E	130th Ave SE/130th Pl SE	Newport Way to SE 48th Pl	Add a 5 foot wide sidewalk on the east side of 130th Avenue SE and 130th Place SE from Newport Way to SE 48th Place where not complete.	High
Sidewalk	S-465-E	112th Ave SE	SE 30th St to SE 34th St	Add a 5 foot wide sidewalk on the east side of 112th Avenue SE from SE 30th Street to SE 34th Street.	High
Sidewalk	S-465-W	112th Ave SE	SE 30th St to SE 34th St	Add a 5 foot wide sidewalk on the west side of 112th Avenue SE from SE 30th Street to SE 34th Street where not complete.	High
Sidewalk	S-100-N	15th/16th St NE	NE 12th St to 140th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the north side of 15th/16th Street NE from NE 12th Street to 140th Avenue NE.	Medium
Sidewalk	S-100-S	15th/16th St NE	NE 12th St to 140th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the south side of 15th/16th Street NE from NE 12th Street NE to 140th Avenue NE.	Medium
Sidewalk	S-201-E	130th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 130th Avenue NE from Northup Way to Bel-Red Road where not complete.	Medium
Sidewalk	S-201-W	130th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 130th Avenue NE from Northup Way to Bel-Red Road where not complete.	Medium
Sidewalk	S-202-E	136th Pl NE	NE 20th St to NE 16th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 136th Place NE from NE 20th Street to NE 16th Street.	Medium
Sidewalk	S-202-W	136th Pl NE	NE 20th St to NE 16th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 136th Place NE from NE 20th Street to NE 16th Street.	Medium
Sidewalk	S-203-S	Bel-Red Rd	NE 32nd St (alignment) to NE 24th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of Bel-Red Road from NE 32nd Street (alignment) to NE 24th Street where not complete.	Medium
Sidewalk	S-206-N	NE 3rd Pl	110th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 3rd Place from 110th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-206-S	NE 3rd Pl	110th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 3rd Place from 110th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-219-N	NE 2nd Pl	110th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 2nd Place from 110th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-219-S	NE 2nd Pl	108th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 2nd Place from 108th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-307-S	NE 24th St	98th Ave NE to Bellevue Way	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 24th Street from 98th Avenue NE to Bellevue Way.	Medium
Sidewalk	S-309-W	116th Ave NE	NE 21st St to NE 12th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 116th Avenue NE from NE 21st Street to NE 12th Street.	Medium
Sidewalk	S-322-E	156th Ave NE/SE	NE 6th St to Lake Hills Blvd	Add a 6 foot wide sidewalk on the east side of 156th Avenue NE/SE from NE 6th Street to Lake Hills Boulevard where not complete, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-332-E	121st Ave SE/SE 12th St/123rd Ave SE	SE 8th St to SE 20th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 121st Avenue SE, SE 12th Street, and 123rd Avenue SE from SE 8th Street to SE 20th Pl.	Medium
Sidewalk	S-337-E	104th Ave SE	SE 8th St to SE 25th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 104th Avenue SE from SE 8th Street to SE 25th Street.	Medium
Sidewalk	S-337-W	104th Ave SE	SE 8th St to SE 25th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 104th Avenue SE from SE 8th Street to SE 25th Street.	Medium
Sidewalk	S-340-W	Bellevue Way SE	SE 27th Pl (alignment) to SE 30th St Connector	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of Bellevue Way SE from SE 27th Place (alignment) to SE 30th Street Connector.	Medium
Sidewalk	S-342-S	Kamber Rd (SE 26th St)	Richards Rd (132nd Ave SE) to 138th Ave SE (Sunset Mini Park)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of Kamber Road from Richards Road to 138th Avenue SE and Sunset Mini Park where not complete, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-354-N	SE Allen Rd	SE Newport Way to SE 38th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of SE Allen Road from SE Newport Way to SE 38th Street, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-354-S	SE Allen Rd	SE Newport Way to SE 38th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of SE Allen Road from SE Newport Way to SE 38th Street, while preserving the existing on-street bicycle facility.	Medium

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-356-W	130th Ave SE/130th Pl SE	Newport Way to SE 48th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter on west side of 130th Avenue SE and 130th Place SE from Newport Way to SE 48th Place where not complete.	Medium
Sidewalk	S-366-E	120th Ave SE	SE 60th St to SE 64th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 120th Avenue SE from SE 60th Street to SE 64th Street.	Medium
Sidewalk	S-366-W	120th Ave SE	SE 60th St to SE 64th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 120th Avenue SE from SE 60th Street to SE 64th Street.	Medium
Sidewalk	S-413-N	NE 7th St	126th Ave NE to 128th Ave NE	Add a 5 foot wide sidewalk on the north side of NE 7th Street from 126th Avenue NE to 128th Avenue NE.	Medium
Sidewalk	S-413-S	NE 7th St	126th Ave NE to 128th Ave NE	Add a 5 foot wide sidewalk on the south side of NE 7th Street from 126th Avenue NE to 128th Avenue NE.	Medium
Sidewalk	S-415-E	128th Ave NE/SE	NE 7th St to SE 7th Pl	Add a 5 foot wide sidewalk along the east side of 128th Avenue NE/SE from NE 7th Street to SE 7th Place.	Medium
Sidewalk	S-417-S	Main St	136th Ave to 140th Ave	Add a 5 foot-wide sidewalk on the south side of Main Street from 136th Avenue to 140th Avenue.	Medium
Sidewalk	S-426-W	109th Ave SE	SE 2nd St to SE 4th St	Add a 5 foot wide sidewalk on the west side of 109th Avenue SE from NE 2nd Street to SE 4th Street, while preserving the existing on-street bicycle facilitiy	Medium
Sidewalk	S-427-S	SE 4th St/111th Ave SE	109th Ave SE to 112th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 4th Street and 111th Avenue SE from 109th Avenue SE to 112th Avenue SE where not complete, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-433-E	102nd Ave SE	SE 6th St to SE 8th St	Add a 5 foot wide sidewalk on the east side of 102nd Avenue SE from SE 6th Street to SE 8th Street.	Medium
Sidewalk	S-433-W	102nd Ave SE	SE 6th St to SE 8th St	Add a 5 foot wide sidewalk on the west side of 102nd Avenue SE from SE 6th Street to SE 8th Street.	Medium
Sidewalk	S-434-N	SE 7th St/SE 8th St	99th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the north side of SE 7th Street and SE 8th Street from 99th Avenue SE to Bellevue Way.	Medium
Sidewalk	S-434-S	SE 7th St/SE 8th St	99th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the south side of SE 7th St and SE 8th Street from 99th Avenue SE to Bellevue Way.	Medium
Sidewalk	S-439-W	137th Ave SE	Kamber Rd(SE 26th St) to SE 24th St	Add a 5 foot wide sidewalk and a 4 foot wide planter strip on the west side of 137th Avenue SE from Kamber Rd to SE 24th Street.	Medium
Sidewalk	S-442-N	SE 32nd St	125th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 32nd Street from 125th Avenue SE to 128th Avenue SE.	Medium
Sidewalk	S-442-S	SE 32nd St	125th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 32nd Street from 125th Avenue SE to 128th Avenue SE.	Medium
Sidewalk	S-445-N	SE 38th St	154th Ave SE to 156th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 38th Street from 154th Avenue SE to 156th Avenue SE, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-445-S	SE 38th St	154th Ave SE to 156th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 38th Street from 154th Avenue SE to 156th Avenue SE, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-446-E	156th Ave SE/SE 42nd St	SE 38th St to 153rd Ave SE	Add a 5 foot wide sidewalk on the east side of 156th Avenue SE and the south side of SE 42nd Street from SE 38th St to 153rd Avenue SE, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-446-W	156th Ave SE/SE 42nd S/153rd Ave SE	SE 38th St to SE Newport Way	Add a 5 foot wide sidewalk on the west side of 156th Avenue SE, the north side of SE 42nd Street, and the west side of 153rd Avenue SE from SE 38th St to SE Newport Way, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-452-E	123rd Ave SE	150 feet north of SE 52nd St (approx) to SE 56th St	Add a 5 foot wide sidewalk on the east side of 123rd Avenue SE from 150 feet north of SE 52nd Street (approx) to SE 56th Street.	Medium
Sidewalk	S-452-W	123rd Ave SE	151 feet north of SE 52nd St (approx) to SE 56th St	Add a 5 foot wide sidewalk on the west side of 123rd Avenue SE from 150 feet north of SE 52nd Street (approx) to SE 56th Street.	Medium
Sidewalk	S-454-N	SE 56th St	119th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 56th Street from 119th Avenue SE to 128th Avenue SE where not complete.	Medium
Sidewalk	S-454-S	SE 56th St	126th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 56th Street from 126th Avenue SE to 128th Avenue SE where not complete.	Medium
Sidewalk	S-456-E	126 Ave SE	SE 56th St to SE 60th St	Add a 5 foot wide sidewalk on the east side of 126th Avenue SE from SE 56th Street to SE 60th Street where not complete.	Medium
Sidewalk	S-456-W	126 Ave SE	SE 56th St to SE 59th St	Add a 5 foot wide sidewalk on the west side of 126th Avenue SE from SE 56th Street to SE 59th Street where not complete.	Medium
Sidewalk	S-463-N	SE 30th St Connector	112th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the north side of SE 30th Street connector from 112th Avenue SE to Bellevue Way.	Medium
Sidewalk	S-463-S	SE 30th St Connector	112th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the south side of SE 30th Street connector from 112th Avenue SE to Bellevue Way where not complete.	Medium
Sidewalk	S-464-E	Snoqualimie River Road Connection	SE 24th Street to SE 28th Street alignment	Add a 5 foot-wide sidewalk along the east side of Snoqualimie River Road from SE 24th Street to SE 28th Street alignment.	Medium
Sidewalk	S-315-S	NE 20th St	Bellevue Way to 108th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 20th Street from Bellevue Way to 108th Avenue NE.	Low
Sidewalk	S-320-N	NE 4th St Extension	116th Ave NE to 120th Ave NE	Add a 6 foot-wide sidewalk and 4 foot wide planter strip on the north side of NE 4th Street Extension from 116th Avenue NE to 120th Avenue NE.	Low

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-320-S	NE 4th St Extension	116th Ave NE to 120th Ave NE	Add a 6 foot-wide sidewalk and 4 foot wide planter strip on the south side of NE 4th Street Extension from 116th Avenue NE to 120th Avenue NE.	Low
Sidewalk	S-323-S	NE 4th St	156th Ave NE to 164th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 4th Street from 156th Avenue NE to 164th Avenue NE.	Low
Sidewalk	S-325-S	Main St	159th Ave to 164th Ave	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of Main Street from 159th Avenue to 164th Avenue where not complete, while preserving the existing on-street bicycle facility.	Low
Sidewalk	S-362-N	Lake Washington Blvd SE at I-405	I-405 overpass	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of Lake Washington Boulevard SE at the I-405 overpass.	Low
Sidewalk	S-369-E	112th Avenue SE/SE 68th St/SE 69th Way (SE Newport Way)	SE 64th St to Coal Creek Pkwy	Add a 6 foot-wide sidewalk and a 4 foot-wide planter on the east side of 112th Avenue SE and the north side of SE 68th Street/SE 69th Way(SE Newport Way) from SE 64th Street to Coal Creek Parkway where not complete, while preserving the existing on-street bicycle facility.	Low
Sidewalk	S-376-W	115th Ave NE	railroad tracks, under I-405 to 116th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the west side of 115th Avenue NE from the railroad tracks, under I-405, to 116th Avenue NE.	Low
Sidewalk	S-408-N	NE 20th St	Bellevue Way to 108th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 20th Street from Bellevue Way to 108th Avenue NE.	Low
Sidewalk	S-409-N	NE 17th St	Bellevue Way to 108th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 17th Street from Bellevue Way to 108th Avenue NE where not complete.	Low
Sidewalk	S-409-S	NE 17th St	Bellevue Way to 108th Ave NE	Add a 5 foot wide sidewalk along the south side of NE 17th Street from Bellevue Way to 108th Avenue NE where not complete.	Low
Sidewalk	S-420-N	NE 4th St	156th Ave NE to 164th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 4th Street from 156th Avenue NE to 164th Avenue NE.	Low
Sidewalk	S-421-N	Main St	156th Ave to 164th Ave	Add a 5 foot wide sidewalk along the north side of Main Street from 156th Avenue to 164th Avenue, while preserving the existing on-street bicycle facility.	Low
Sidewalk	S-444-S	SE 37th St/I-90 south Frontage Road	150th Ave SE to 164th Ave SE	Add a 5 foot-wide sidewalk on the south side of SE 37th Street and I-90 South Frontage Road from 150th Avenue SE to 164th Avenue SE.	Low

Appendix Table 2 Transit priority bicycle projects.

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-100-N	Northup Way	Bellevue Way to 120th Ave NE	Add a 5 foot-wide bike lane on the north side of Northup Way from Bellevue Way to 120th Avenue NE.	High
Bicycle	B-100-S	Northup Way	Bellevue Way to 120th Ave NE	Add a 5 foot-wide bike lane on the south side of Northup Way from Bellevue Way to 120th Avenue NE.	High
Bicycle	B-101-E	108th Ave NE/NE 38th St	northern city limits to Northup Way	Add a 5 foot-wide bike lane on the east side of 108th Avenue NE and NE 38th Street from the northern city limits to Northup Way. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-101-W	108th Ave NE/NE 38th St	northern city limits to Northup Way	Add a 5 foot-wide bike lane on the west side of 108th Avenue NE and NE 38th Street from the northern city limits to Northup Way. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-104-E	112th Ave NE	Northup Way to NE 12th St	Add a 5 foot-wide bike lane on the east side of 112th Avenue NE from Northup Way to NE 12th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-104-W	112th Ave NE	Northup Way to NE 12th St	Add a 5 foot-wide bike lane on the west side of 112th Avenue NE from Northup Way to NE 12th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-112-E	140th Ave NE	NE 24th St to NE 8th St	Add 5 foot-wide bike lanes on the east side of 140th Avenue NE between NE 24th Street and NE 8th Street. Component of priority bike corridor; NS-4: Somerset-Redmond Connection.	High
Bicycle	B-112-W	140th Ave NE	NE 24th St to NE 8th St	Add 5 foot-wide bike lanes on the west side of 140th Avenue NE between NE 24th Street and NE 8th Street. Component of priority bike corridor; NS-4: Somerset-Redmond Connection.	High
Bicycle	B-115-E	Bel-Red Rd	156th Ave NE to NE 20th St	Add a 5 foot-wide bike lane on the east side of Bel-Red Road from 156th Avenue NE to NE 20th Street.	High
Bicycle	B-115-W	Bel-Red Rd	156th Ave NE to NE 20th St	Add a 5 foot-wide bike lane on the west side of Bel-Red Road from 156th Avenue NE to NE 20th Street.	High
Bicycle	B-117-N	Northup Way	NE 8th St to 156th Ave NE	Add a 5 foot-wide bike lane on the north side of Northup Way from NE 8th Street to 156th Avenue NE.	High
Bicycle	B-117-S	Northup Way	NE 8th St to 156th Ave NE	Add a 5 foot-wide bike lane on the south side of Northup Way from NE 8th Street to 156th Avenue NE.	High
Bicycle	B-119-E	120th Ave NE	Northup Way to NE 4th Street	Add a 5 foot-wide bike lane on the east side of 120th Avenue NE from Northup Way to the NE 4th Street extension.	High
Bicycle	B-119-W	120th Ave NE	Northup Way to NE 4th Street	Add a 5 foot-wide bike lane on the west side of 120th Avenue NE from Northup Way to the NE 4th Street extension.	High
Bicycle	B-120-E	124th Ave NE	West Tributary Trail to Main St	Add a 5 foot-wide bike lane on the east side of 124th Avenue NE from West Tributary Trail to Main Street.	High
Bicycle	B-120-W	124th Ave NE	West Tributary Trail to Main St	Add a 5 foot-wide bike lane on the west side of 124th Avenue NE from West Tributary Trail to Main Street.	High
Bicycle	B-126-E	112th Ave NE	NE 12th St to NE 6th St	Add a 5 foot-wide bike lane on the east side of 112th Avenue NE from NE 12th Street to NE 6th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-126-W	112th Ave NE	NE 12th St to NE 6th St	Add a 5 foot-wide bike lane on the west side of 112th Avenue NE from NE 12th Street to NE 6th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-127-E	114th Ave NE (Frontage Road)	NE 6th St to SE 8th St	Add a 5 foot-wide bike lane on the east side of 114th Avenue NE (Frontage Road), from NE 6th Street to SE 8th Street. Implement mid-block connections through redevelopment and complete a 10 foot connection along the north side of the NE 6th Street HOV ramp. Preserve opportunities for an off-street multi-purpose pathway between NE 6th Street and SE 8th Street in the event the facilities are displaced by future improvements to I-405. Improvements in this segment are constrained by I-405 to the east and an existing stream channel to the west. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-127-W	114th Ave NE (Frontage Road)	NE 6th St to SE 8th St	Add a 5 foot-wide bike lane on the west side of 114th Avenue NE (Frontage Road), from NE 6th Street to SE 8th Street. Implement mid-block connections through redevelopment and complete a 10 foot connection along the north side of the NE 6th Street HOV ramp. Preserve opportunities for an off-street multi-purpose pathway between NE 6th Street and SE 8th Street in the event the facilities are displaced by future improvements to I-405. Improvements in this segment are constrained by I-405 to the east and an existing stream channel to the west. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-129-N	Main St	Bellevue Way NE to 116th Ave NE	Add a 5 foot-wide bike lane on the north side of Main Street from Bellevue Way NE to 116th Avenue NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-134-N	Main St	NE 1st St to 124th Ave NE	Add a 5 foot-wide bike lane on the north side of Main Street from NE 1st Street to 124th Avenue NE.	High
Bicycle	B-135-N	SE 8th St	114th Ave SE to Lake Hills Connector	Add a 5 foot-wide bike lane on the north side of SE 8th Street from 114th Avenue SE to Lake Hills Connector. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-137-N	Bellevue Way	108th Ave SE to 112th Ave SE	Add a 5 foot-wide bike lane on the north side of Bellevue Way from 108th Avenue SE to 112th Avenue SE.	High
Bicycle	B-137-S	Bellevue Way	108th Ave SE to 112th Ave SE	Add a 5 foot-wide bike lane on the south side of Bellevue Way from 108th Avenue SE to 112th Avenue SE.	High
Bicycle	B-141-N	SE 16th St	148th Ave SE to 156th Ave SE	Add a 5 foot-wide bike lane on the north side of SE 16th Street from 148th Avenue SE to 156th Avenue SE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-141-S	SE 16th St	148th Ave SE to 156th Ave SE	Add a 5 foot-wide bike lane on the south side of SE 16th Street from 148th Avenue SE to 156th Avenue SE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-142-N	SE 24th St	145th Pl SE to 148th Ave SE	Add a 5 foot-wide bike lane on the north side of SE 24th Street from 145th Place SE to 148th Avenue SE.	High
Bicycle	B-142-S	SE 24th St	145th Pl SE to 148th Ave SE	Add a 5 foot-wide bike lane on the south side of SE 24th Street from 145th Place SE to 148th Avenue SE.	High
Bicycle	B-144-S	Eastgate Way	Richards Road to 148th Ave SE	Add a 5 foot-wide bike lane on the south side of Eastgate Way from Richards Road (132nd Avenue SE) to 148th Avenue SE.	High
Bicycle	B-145-S	SE 32nd St	139th Ave SE to 142nd Ave SE	Add a 5 foot wide bike lane on the south side of SE 32nd Street from 139th Avenue SE to 142nd Avenue SE.	High
Bicycle	B-147-N	Eastgate Way	148th Ave SE to Phillips Hill Rd (SE 35th St)	Add a 5 foot-wide bike lane on the north side of Eastgate Way from 148th Avenue SE to Phillips Hill Road (SE 35th Street).	High
Bicycle	B-147-S	Eastgate Way	148th Ave SE to Phillips Hill Rd (SE 35th St)	Add a 5 foot-wide bike lane on the south side of Eastgate Way from 148th Avenue SE to Phillips Hill Road (SE 35th Street).	High
Bicycle	B-202-E	100th Ave NE	NE 24th St to NE 8th St	Add a wide bike shoulder on east side of 100th Avenue NE from NE 24th Street to NE 8th Street.	High
Bicycle	B-202-W	100th Ave NE	NE 24th St to NE 8th St	Add a wide bike shoulder on the west side of 100th Avenue NE from NE 24th Street to NE 8th Street.	High
Bicycle	B-205-N	NE 24th St	Bel-Red Rd to 172nd Ave NE	Add a wide bike shoulder on the north side of NE 24th Street from Bel-Red Road to 172nd Avenue NE, in front of Ardmore Park.	High
Bicycle	B-205-S	NE 24th St	Bel-Red Rd to 172nd Ave NE	Add a wide bike shoulder on the south side of NE 24th Street from Bel-Red Road to 172nd Avenue NE, in front of Ardmore Park.	High

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-210-N	Main St	100th Ave NE to Bellevue Way NE	Add a wide bike shoulder on the north side of Main Street from 100th Avenue NE to Bellevue Way NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-210-S	Main St	100th Ave NE to Bellevue Way NE	Add a wide bike shoulder on the south side of Main Street from 100th Avenue NE to Bellevue Way NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-212-S	Lake Hills Connector	Main St to 140th Ave SE	Add a wide bike shoulder on the south side of Lake Hills Connector from Main Street to 140th Avenue SE where not complete. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-213-N	SE 16th St	104th Ave SE to 108th Ave SE	Add a wide bike shoulder on the north side of SE 16th Street from 104th Avenue SE to 108th Avenue SE.	High
Bicycle	B-213-S	SE 16th St	104th Ave SE to 108th Ave SE	Add a wide bike shoulder on the south side of SE 16th Street from 104th Avenue SE to 108th Avenue SE.	High
Bicycle	B-400-S	NE 24th St	140th Ave NE to 148th Ave NE	Add a wide outside lane on the south side of NE 24th Street from 140th Avenue NE to 148th Avenue NE where not complete. Portion from 140th Ave NE to NE 29th Place is a component of priority bike corridor; NS-4: Somerset-Redmond Connection.	High
Bicycle	B-404-E	139th Ave SE	Eastgate Way to the southern edge of Sunset Mini Park	Add a wide outside lane on the east side of 139th Avenue SE from Eastgate Way to the southern edge of Sunset Mini Park where not complete.	High
Bicycle	B-404-W	139th Ave SE	Eastgate Way to the southern edge of Sunset Mini Park	Add a wide outside lane on the west side of 139th Avenue SE from Eastgate Way to the southern edge of Sunset Mini Park where not complete.	High
Bicycle	B-501-E	160th Ave NE	Crossroads Park and Community Center to NE 8th St	Add a shared wide outside lane on the east side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Bicycle	B-501-W	160th Ave NE	Crossroads Park and Community Center to NE 8th St	Add a shared wide outside lane on the west side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Bicycle	B-502-N	Lake Hills Blvd	156th Ave SE to 159th Pl SE	Add a shared wide outside lane on the north side of Lake Hills Boulevard from 156th Avenue SE to 159th Place SE.	High
Bicycle	B-106-S	NE 40th St	140th Ave NE to 148th Ave NE	Convert the existing wide shoulder on the south side NE 40th Street from 140th Avenue NE to 148th Avenue NE into a bicycle climbing lane.	Medium
Bicycle	B-108-E	Bellevue Way	NE 24th St to NE 12th St	Convert the existing wide shoulder on the south side NE 40th Street from 140th Avenue NE to 148th Avenue NE into a bicycle climbing lane.	Medium
Bicycle	B-108-W	Bellevue Way	NE 24th St to NE 12th St	Add a 5 foot-wide bike lane on east side of Bellevue Way from NE 24th Street to NE 12th Street.	Medium
Bicycle	B-109-E	116th Ave NE	Northup Way to Main St	Add a 5 foot-wide bike lane on the west side of Bellevue Way from NE 24th Street to NE 12th Street.	Medium
Bicycle	B-109-W	116th Ave NE	Northup Way to Main St	Add a 5 foot-wide bike lane on the east side of 116th Avenue NE between Main Street and Northup Way.	Medium
Bicycle	B-111-N	Northup Way/NE 20th St	124th Ave NE to 140th Ave NE	Add a 5 foot-wide bike lane on the north side of Northup Way/NE 20th Street from 124th Avenue NE to 140th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-111-S	Northup Way/NE 20th St	124th Ave NE to 140th Ave NE	Add a 5 foot-wide bike lane on the south side of Northup Way/NE 20th Street from 124th Avenue NE to 140th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-114-N	Bel-Red Rd	NE 40th St to 156th Ave NE	Add a 5 foot-wide bike lane on the north side of Bel-Red Road from NE 40th Street to 156th Avenue NE.	Medium
Bicycle	B-114-S	Bel-Red Rd	NE 40th St to 156th Ave NE	Add a 5 foot-wide bike lane on the south side of Bel-Red Road from NE 40th Street to 156th Avenue NE.	Medium
Bicycle	B-116-N	NE 20th St	Bel-Red Rd to 156th Ave NE	Add a 5 foot-wide bike lane on the north side of NE 20th Street from Bel-Red Road to 156th Avenue NE.	Medium
Bicycle	B-116-S	NE 20th St	Bel-Red Rd to 156th Ave NE	Add a 5 foot-wide bike lane on the south side of NE 20th Street from Bel-Red Road to 156th Avenue NE.	Medium
Bicycle	B-118-S	NE 12th St	100th Ave NE to 112th Ave NE	Add a 5 foot-wide bike lane on the south side of NE 12th Street from 100th Avenue NE to 112th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-121-E	136th Pl NE	NE 16th St to NE 20th St	Add a 5 foot-wide bike lane on the east side of 136 Place NE from NE 16th Street to NE 20th Street. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-121-W	136th Pl NE	NE 16th St to NE 20th St	Add a 5 foot-wide bike lane on the west side of 136 Place NE from NE 16th Street to NE 20th Street. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-125-E	108th Ave NE	NE 12th St to Main Street	Add a 5 foot-wide bike lane on the east side of 108th Avenue NE from NE 12th Street to Main Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-125-W	108th Ave NE	NE 12th St to Main Street	Add a 5 foot-wide bike lane on the west side of 108th Avenue NE from NE 12th Street to Main Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-133-S	SE 5th St	116th Ave SE to BNSF corridor	Add a 5 foot wide bike lane on the south side of SE 5th Street from 116th Avenue SE to the BNSF corridor.	Medium
Bicycle	B-146-E	142nd Pl SE	SE 28th St to SE 36th St	Add a 5 foot-wide bike lane on the east side of 142nd Place SE from SE 28th Street to SE 36th Street.	Medium
Bicycle	B-146-W	142nd Pl SE	SE 28th St to SE 36th St	Add a 5 foot-wide bike lane on the west side of 142nd Place SE from SE 28th Street to SE 36th Street.	Medium
Bicycle	B-149-E	124th Ave SE/SE 38th St	SE 38th St at Factoria Blvd SE to 124th St at SE 41st Pl	Add a 5 foot-wide bike lane on the east side of 124th Avenue SE from SE 41st Place to SE 36th Street and on the south side of SE 38th Street from 124th Avenue SE to Factoria Boulevard.	Medium
Bicycle	B-149-W	124th Ave SE/SE 38th St	SE 38th St at Factoria Blvd SE to 124th St at SE 41st Pl	Add a 5 foot-wide bike lane on the west side of 124th Avenue SE from SE 41st Place to SE 36th Street and on the north side of SE 38th Street from 124th Avenue SE to Factoria Boulevard.	Medium
Bicycle	B-151-E	Factoria Blvd/SE Newport Way	Coal Creek Pkwy to 129th Pl SE	Add a 5 foot-wide bike lane on the east side of Factoria Boulevard and SE Newport Way from Coal Creek Parkway to 129th Place SE.	Medium
Bicycle	B-151-W	Factoria Blvd/SE Newport Way	Coal Creek Pkwy to 129th Pl SE	Add a 5 foot-wide bike lane on the west side of Factoria Boulevard and SE Newport Way from Coal Creek Parkway to 129th Place SE.	Medium
Bicycle	B-153-E	Lake Washington Blvd SE	106th Ave SE to SE 60th St	Add a 5 foot-wide bike lane on the east side of Lake Washington Boulevard SE from 106th Avenue SE to SE 60th Street where not complete. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-153-W	Lake Washington Blvd SE	106th Ave SE to SE 60th St	Add a 5 foot-wide bike lane on the west side of Lake Washington Boulevard SE from 106th Avenue SE to SE 60th Street where not complete. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium
Bicycle	B-157-N	SE 60th St	Lake Washington Blvd to Coal Creek Pkwy	Add a 5 foot-wide bike lane on the north side of SE 60th Street from Lake Washington Boulevard to 129th Avenue SE; and then only on the north side from 129th Avenue SE to Coal Creek Parkway. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium
Bicycle	B-157-S	SE 60th St	Lake Washington Blvd to Coal Creek Pkwy	Add a 5 foot-wide bike lane on the south side of SE 60th Street from Lake Washington Boulevard to 129th Avenue SE; and then only on the north side from 129th Avenue SE to Coal Creek Parkway. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium
Bicycle	B-201-N	NE 24th St	Bellevue Way NE to 112th Ave NE	Add a wide bike shoulder on the north side of NE 24th Street from Bellevue Way to 112th Avenue NE. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-201-S	NE 24th St	Bellevue Way NE to 112th Ave NE	Add a wide bike shoulder on the south side of NE 24th Street from Bellevue Way to 112th Avenue NE. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-204-E	108th Ave NE	NE 24th St to NE 12th St	Add a wide bike shoulder on the east side where not complete on 108th Avenue NE from NE 24th Street to NE 12th Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-204-W	108th Ave NE	NE 24th St to NE 12th St	Add a wide bike shoulder on the west side where not complete on 108th Avenue NE from NE 24th Street to NE 12th Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-209-E	100th Ave NE	NE 8th St to Main St	Add a wide bike shoulder on the east side of 100th Avenue NE from Main Street to NE 8th Street.	Medium
Bicycle	B-209-W	100th Ave NE	NE 8th St to Main St	Add a wide bike shoulder on the west side of 100th Avenue NE from Main Street to NE 8th Street.	Medium
Bicycle	B-401-N	NE 2nd St	102nd Ave SE to 114th Ave NE	Add a wide outside lane on the north side of NE 2nd Street from 102nd Avenue SE to 114th Avenue NE.	Medium
Bicycle	B-401-S	NE 2nd St	102nd Ave SE to 114th Ave NE	Add a wide outside lane on the south side of NE 2nd Street from 102nd Avenue SE to 114th Avenue NE.	Medium
Bicycle	B-402-E	Bellevue Way	Main St to 108th Ave SE	Add a wide outside lane on the east side of Bellevue Way SE from Main Street to 108th Avenue SE where not complete.	Medium
Bicycle	B-402-W	Bellevue Way	Main St to 108th Ave SE	Add a wide outside lane on the west side of Bellevue Way SE from Main Street to 108th Avenue SE where not complete.	Medium
Bicycle	B-403-N	SE 22nd St	145th Pl SE to 156th Ave SE	Widen the existing 11 foot-wide lane to 14 feet (without fog line) on the north side of SE 22nd Street from 145th Place SE to 156th Avenue SE.	Medium
Bicycle	B-403-S	SE 22nd St	145th Pl SE to 156th Ave SE	Widen the existing 11 foot-wide lane to 14 feet (without fog line) on the south side of SE 22nd Street from 145th Place SE to 156th Avenue SE.	Medium
Bicycle	B-102-E	NE 36th Pl/115th Ave NE	113th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lane on the east side of NE 36th Place and 115th Avenue NE from 113th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-102-W	NE 36th Pl/115th Ave NE	113th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lane on the west side of NE 36th Place and 115th Avenue NE from 113th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-103-E	Bellevue Way	NE 24th St to 103rd Ave NE	Add a 5 foot bike lane on the east side of Bellevue Way from NE 24th Street to 103rd Avenue NE.	Low
Bicycle	B-103-W	Bellevue Way	NE 24th St to 103rd Ave NE	Add a 5 foot bike lane on the west side of Bellevue Way from NE 24th Street to 103rd Avenue NE.	Low
Bicycle	B-107-N	NE 24th St	98th Ave NE to 100th Ave NE	Add a 5 foot-wide bike lane on the north side of NE 24th Street from 98th Avenue NE to 100th Avenue NE.	Low
Bicycle	B-130-N	NE 4th Street extension	120th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lanes on the north side of the NE 4th Street extension from 120th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-130-S	NE 4th Street extension	120th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lanes on the south side of the NE 4th Street extension from 120th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-131-E	132nd Ave NE	Bel-Red Rd to NE 8th St	Add a 5 foot-wide bike lane on the east side of 132nd Avenue NE from Bel-Red Road to NE 8th Street.	Low
Bicycle	B-131-W	132nd Ave NE	Bel-Red Rd to NE 8th St	Add a 5 foot-wide bike lane on the west side of 132nd Avenue NE from Bel-Red Road to NE 8th Street.	Low
Bicycle	B-132-N	Main St	156th Ave NE to 158th Pl NE	Add a 5 foot-wide bike lane on the north side of Main Street from 156th Avenue NE to 158th Place NE.	Low
Bicycle	B-136-N	SE 7th Pl	Lake Hills Connector to east edge of Wilburton Hill Community Park	Add a 5 foot-wide bike lane on the north side of SE 7th Place from Lake Hills Connector to the east edge of Wilburton Hill Community Park.	Low
Bicycle	B-136-S	SE 7th Pl	Lake Hills Connector to east edge of Wilburton Hill Community Park	Add a 5 foot-wide bike lane on the south side of SE 7th Place from Lake Hills Connector to the east edge of Wilburton Hill Community Park.	Low
Bicycle	B-139-N	Kamber Road (SE 26th St)	Richards Rd (132nd Ave SE) to 145th Pl SE	Add 5 foot-wide bike lanes on the north side of Kamber Road (SE 26th Street) between Richards Road (132nd Avenue SE) to 145th Place SE.	Low
Bicycle	B-139-S	Kamber Road (SE 26th St)	Richards Rd (132nd Ave SE) to 145th Pl SE	Add 5 foot-wide bike lanes on the south side of Kamber Road (SE 26th Street) between Richards Road (132nd Avenue SE) to 145th Place SE.	Low
Bicycle	B-148-N	Phillips Hill Rd/164th Pl SE/SE 38th St	Eastgate Way to West Lake Sammamish Pkwy	Add a 5 foot-wide bike lane on the north side of SE 38th Street, 164th Place SE, and Phillips Hill Road from Eastgate Way to West Lake Sammamish Parkway SE.	Low
Bicycle	B-148-S	Phillips Hill Rd/164th Pl SE/SE 38th St	Eastgate Way to West Lake Sammamish Pkwy	Add a 5 foot-wide bike lane on the south side of SE 38th Street, 164th Place SE, and Phillips Hill Road from Eastgate Way to West Lake Sammamish Parkway SE.	Low
Bicycle	B-154-E	119th Ave SE	Coal Creek Pkwy to SE 60th St	Add a 5 foot-wide bike lane on the east side of 119th Avenue SE from Coal Creak Parkway to SE 60th Street.	Low
Bicycle	B-154-W	119th Ave SE	Coal Creek Pkwy to SE 60th St	Add a 5 foot-wide bike lane on the west side of 119th Avenue SE from Coal Creak Parkway to SE 60th Street.	Low
Bicycle	B-200-S	NE 24th St	98th Ave NE to Bellevue Way NE	Add a wide bike shoulder on the south side of NE 24th Street from 98th Avenue NE to Bellevue Way NE where not complete.	Low
Bicycle	B-211-E	101 Ave SE to 100th Ave SE to 98th Ave SE to SE 97th Pl	Main St to SE 16th St	Provide bike shoulders on 101 Avenue SE - 100th Avenue SE - 98th Avenue SE - SE 97th Place from Main Street to SE 16th Street when overlayed if feasible, particularly on uphill lanes; implement slow street design that accommodates bicycles.	Low

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-211-W	101 Ave SE to 100th Ave SE to 98th Ave SE to SE 97th Pl	Main St to SE 16th St	Provide bike shoulders on 101 Avenue SE - 100th Avenue SE - 98th Avenue SE - SE 97th Place from Main Street to SE 16th Street when overlayed if feasible, particularly on uphill lanes; implement slow street design that accommodates bicycles.	Low
Bicycle	B-215-E	112th Ave SE/SE 34th St	Bellevue Way SE (Mercer Slough Nature Park) to 108th Ave SE	Add a wide bike shoulder on the east side of 112th Avenue SE and SE 34th Street from SE Bellevue Way SE (Mercer Slough Nature Park) to 108th Avenue SE.	Low
Bicycle	B-215-W	112th Ave SE/SE 34th St	Bellevue Way SE (Mercer Slough Nature Park) to 108th Ave SE	Add a wide bike shoulder on the west side of 112th Avenue SE and SE 34th Street from SE Bellevue Way SE (Mercer Slough Nature Park) to 108th Avenue SE.	Low
Bicycle	B-216-E	156th Ave SE	SE 27th St to SE Eastgate Way	Add a wide bike shoulder on the east side of 156th Avenue SE from SE 27th Street to SE Eastgate Way.	Low
Bicycle	B-216-W	156th Ave SE	SE 27th St to SE Eastgate Way	Add a wide bike shoulder on the west side of 156th Avenue SE from SE 27th Street to SE Eastgate Way.	Low
Bicycle	B-219-N	SE 56th St	119th Ave SE to 128th Ave SE	Add a wide bike shoulder the north side of SE 56th Street and 119th Avenue SE to 128th Avenue SE where not complete.	Low
Bicycle	B-219-S	SE 56th St	119th Ave SE to 128th Ave SE	Add a wide bike shoulder on the south side of SE 56th Street and 119th Avenue SE to 128th Avenue SE where not complete.	Low
Bicycle	B-303-N	SE Allen Rd	139th Ave SE to SE 40th St	Add a shared shoulder on the north side of SE Allen Road from 139th Avenue SE to SE 40th Street.	Low
Bicycle	B-400-N	NE 24th St	140th Ave NE to 148th Ave NE	Add a wide outside lane on the north side of NE 24th Street from 140th Avenue NE to 148th Avenue NE where not complete.	Low
Bicycle	B-500-E	130th Ave NE	NE 16th St to Bel-Red Rd	Add a shared wide outside lane on the east side of 130th Avenue NE from NE 16th Street to Bel-Red Road.	Low
Bicycle	B-500-W	130th Ave NE	NE 16th St to Bel-Red Rd	Add a shared wide outside lane on the west side of 130th Avenue NE from NE 16th Street to Bel-Red Road.	Low

Appendix Table 3 Transit priority offstreet path projects.

Type	Project #	Link	Limits	Description	Priority
Offstreet Path	O-100-S	SR520 / NE Points Dr	Bellevue Way Interchange area to Bellevue Way	Add a 10-14 foot-wide off street path along the south side of NE Points Drive from the western part of the interchange area to the south side of Northup Way just east of the interchange. Component of priority bike corridor; EW-1: SR-520 Trail.	High
Offstreet Path	O-101	SR520 / NE Points Dr	Bellevue Way Interchange area (just north of SR-520) to Bellevue Way	Add a 10-14 foot-wide off street path along SR-520 connecting NE Points Drive to Northup Way over the Bellevue Way Interchange area (just north of SR-520). Component of priority bike corridor; EW-1: SR-520 Trail.	High
Offstreet Path	O-103	SR-520 Regional Trail	Evergreen Point Bridge to 124th Ave NE	Construct 10-14 foot-wide path from Bellevue Way/Evergreen Point Bridge to the west terminus of existing SR-520 trail at 124th Avenue NE. This facility extends east of Bellevue Way along the south side of Northup Way to 108th Avenue NE; along the east side of 108th Avenue NE; continuing east along the north side of SR-520 and eventually leading back to the proposed BNSF regional trail. East of the BNSF regional trail, completing the connection along the north side of SR-520 and south side of NE 24th Street to the existing trail system. Component of priority bike corridor; EW-1: SR-520 Trail.	High
Offstreet Path	O-115	Crossroads E-W Connection	156th Ave NE to 164th Ave NE	Add a 10-14 foot-wide off street path south of Highland Middle School connecting 148th Avenue NE to 156th Avenue NE, called the Crossroads east-west Connection.	High
Offstreet Path	O-116	trail	159th Ave NE to Crossroads Park and Community Center	Add a 10-14 foot-wide off street path connecting 159th Avenue NE and Northup Way to Crossroads Park and Community Center.	High
Offstreet Path	O-121-S	Main St	Bellevue Way NE to 116th Ave NE	Add a 10 to 14 foot wide off street path on the south side of Main Street from Bellevue Way NE to 116th Avenue NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Offstreet Path	O-123-N	Lake Hills Connector	Main St to 140th Ave SE	Add a 10-14 foot-wide off street path on the north side of Lake Hills Connector from Main Street to 140th Avenue SE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Offstreet Path	O-124-S	Main St	NE 1st St to 124th Ave NE	Add a 10-14 foot-wide off street path on the south side of Main Street from NE 1st Street to 124th Avenue NE where not complete.	High
Offstreet Path	O-127-S	SE 8th St	114th Ave SE to Lake Hills Connector	Add a 10-14 foot-wide off street path on the south side of SE 8th Street from 114th Avenue SE to Lake Hills Connector. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Offstreet Path	O-128-S	SE 7th Pl	Edge of Wilburton Hill Community Park to 128th Ave SE	Add a 10-14 foot-wide off street path on the south side of SE 7th Place from edge of Wilburton Hill Community Park to 128th Avenue SE.	High
Offstreet Path	O-130-S	SE 8th St	112th Ave SE to 114th Ave SE	Add a 10-14 foot-wide off street path on the south side of SE 8th Street from 114th Avenue SE to 112th Avenue SE.	High
Offstreet Path	O-102-E	Bellevue Way	Northup Way to 103rd Ave NE	Add a 10-14 foot-wide off street path along the east side of Bellevue Way from 103rd Avenue NE to Northup Way.	Medium
Offstreet Path	O-104	Burlington Northern Bike Path	southern city limits to northern city limits	Add a 10-14 foot-wide off-street path along the Burlington Northern Santa Fe railroad right-of-way from the southern city limits to the northern city limits. This is part of a proposed regional trail that would connect eastside communities from Renton to Woodinville. Approximately 7.5 miles of the trail is located within the City of Bellevue. The regional trail shall have connections to pedestrian and non-motorized city facilities and be compliant with current trail standards. Potential trail connections include Newcastle Beach Park, Greenwich Crest, the I-90 trail, Woodridge, the Wilburton area, downtown Bellevue, Bel-Red, NE 15th St, the West Tributary Trail and the SR 520 trail. Identified as priority bike corridor NS-3: BNSF Trail Corridor.	Medium
Offstreet Path	O-108-N	NE 12th St	100th Ave NE to 116th Ave NE	Add a 10 to 14 foot wide off-street path on the north side of NE 12th Street from 100th Avenue NE to 116th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Offstreet Path	O-110-N	NE 16th St	116th Ave NE to 140th Ave NE	Add 10-14 foot-wide off street path along the north side of NE 16th Street from 116th Avenue NE to 140th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Offstreet Path	O-114	trail	Highland Middle School to NE 8th St	Add a 10-14 foot-wide off street path connecting Highland Middle School to NE 8th Street.	Medium
Offstreet Path	O-117	NE 6th St (ped corridor)	Bellevue Way to 110th Ave NE	Construct NE 6th Street "Pedestrian Corridor" between Bellevue Way and 110th Avenue NE consistent with design guidelines; pursue interim improvements (ahead of full redevelopment) where appropriate.	Medium
Offstreet Path	O-118-S	NE 6th St extension	112th Ave NE to 120th Ave NE	Add a 10-14 foot wide off street path along the south side of the NE 6th Street extension, across I-405, from 112th Avenue NE to 120th Avenue NE.	Medium
Offstreet Path	O-131-E	112th Ave SE/Bellevue Way SE	SE 8th St to I-90 trail	Add a 10-14 foot-wide off street path on the east side of 112th Avenue SE and Bellevue Way SE from SE 8th Street to 113th Avenue SE (I-90 trail).	Medium
Offstreet Path	O-132-N	BCC Thruway	142nd Pl SE to 144th Ave SE	Add a 10-14 foot-wide off street path along the north side of the BCC Thruway from 142nd Place SE to 144th Avenue SE.	Medium
Offstreet Path	O-134	161st Ave SE across Landfill Park Site	156th Ave SE to SE Eastgate Way	Add a 10-14 foot-wide off street path on along 161st Avenue SE from 156th Avenue SE to SE Eastgate Way. Component of priority bike corridor; NS-5: Spirit Ridge-Sammamish River Connection.	Medium
Offstreet Path	O-135-S	I-90 Tunnel	SE37th St to SE Eastgate Way	Increase sidewalk width on south side of I-90 tunnel to 10 feet to offer cyclists improved accommodation from SE 37th Street. under I-90 to Eastgate Way/SE 35th Place intersection. Coordinate with WSDOT to improve lighting within the tunnel. Improve signing to the tunnel to increase awareness of cyclists. Component of priority bike corridor; NS-5: Spirit Ridge-Sammamish River Connection.	Medium
Offstreet Path	O-137-N	Mountains to Sound Greenway	Factoria Blvd to Sunset Pedestrian Bridge	A paved multiuse trail of 10 feet or greater paved width is proposed beginning at the current end of the trail at Factoria Blvd and running eastward along the north side of SE 36th St to the curve near the southwest quadrant's ramps of the 148th-150th Ave SE interchange, then following a new independent alignment to the 150th Avenue SE/SE 37th St intersection at 150th Ave SE. Eastward from 150th Ave SE the trail would follow SE 37th St (which here serves as an I-90 frontage road) to the Sunset Pedestrian Bridge where cyclists will cross to the north side of I-90 and make use of the Sunset Trail to WLSP. Construction of the recommended MTSG I-90 trail links such as the segment along SE 36th St should not eliminate existing on-street bicycle facilities; the latter should be maintained, and improved where improvement is needed, such as in the vicinity of the 148th-150th Ave interchange as SE 36th St curves to become SE 37th St. Additional coordination between City of Bellevue, WSDOT, King County, and Greenway Trust required to study this route. Identified as priority bike corridor EW-4.	Medium
Offstreet Path	O-139-W	Coal Creek Pkwy	124th Ave SE to the southern city limits	Add a 10-14 foot-wide off street path along the west side of Coal Creek Parkway from 124th Avenue SE to the southern city limits. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Offstreet Path	O-109	West Tributary Trail	BNSF Corridor to Bel-Red Rd	Add a 10-14 foot-wide off street path along the West Tributary of Kelsey Creek between the BNSF Corridor and Bel-Red Road. Provide grade separation of this trail at arterial crossings.	Low
Offstreet Path	O-111-E	132nd Ave NE	NE 20th St to Bel-Red Rd	Add a 10-14 foot-wide off street path on the east side of 132nd Avenue NE from NE 20th Street to Bel-Red Road.	Low
Offstreet Path	O-112	East Highland/ Rockwood	140th Ave NE to 141st Pl NE	Add a 10-14 foot-wide off street path connecting Rockwood/East Highland from 140th Avenue NE to 141st Place NE.	Low
Offstreet Path	O-113	trail	148th Ave NE to 156th Ave NE	Add a 10-14 foot-wide off street path south of Highland Middle School connecting 148th Avenue NE to 156th Avenue NE.	Low
Offstreet Path	O-119	Bel-Red Mini Park	Bel-Red Rd at 122nd Ave (alignment) to Bel-Red Rd at 124th Ave NE	Add a 10-14 foot-wide off street path through the Bel-Red Mini Park from Bel-Red Road at 112nd Avenue (alignment) to Bel-Red Road at 124th Avenue NE.	Low
Offstreet Path	O-122	Main St extension	116th Ave NE to BNSF	Add a 10-14 foot wide off street path along the Main St extension from 116th Avenue NE to the BNSF corridor.	Low
Offstreet Path	O-125	Existing BBG/Wilburton Hill Trails	118th Ave SE to SE 4th Pl	Add a 10-14 foot wide off street path along the existing trails through the Bellevue Botanical Garden and Wilburton Hill Community Park from approximately 118th Avenue SE in the BBG to SE 4th Place outside of Wilburton Hill Community Park.	Low
Offstreet Path	O-133	Robinswood to Eastgate	SE 28th St to Eastgate Way	Add a 10-14 foot-wide off street path along the connection from Robinswood to Eastgate from SE 28th Street to SE Eastgate Way.	Low
Offstreet Path	O-138	156th Ave SE	SE 37th St to intersection with east/ west portion of B-256	Add a 10-14 foot-wide off street path along 156th Avenue SE from SE 38th Street to the intersection where it connects with project B-256. Improve ROW to create connection.	Low
Offstreet Path	O-142	Pipeline Trail	SE 60th St to SE 68th Pl	Add a 10-14 foot-wide off street path along the Pipeline Trail from SE 60th Street to SE 68th Place.	Low
Offstreet Path	O-300	Northtowne Center Trail	106th Ave NE to Bellevue Way via shopping center	Add a 6 foot-wide off street path as a connection thru the shopping center site, extending the existing neighborhood-shopping center trail to Bellevue Way and Northtowne Park. Obtain easement and maintain existing trail to shopping center .	Low
Offstreet Path	O-302	NE 28th St	Bel-Red Road to NE 28th St and MS Campus	Add a 6 foot-wide off street path along NE 28th Street right-of-way from Bel-Red Road to NE 28th Street and MS Campus.	Low

Appendix Table 4 Transit priority trail projects.

Type	Project #	Link	Limits	Description	Priority
Trail	T-202	Rockwood to Highland	NE 14th St to Bel-Red Rd	Construct 6-10 foot wide boardwalk along Rockwood to Highland from NE 14th Street to Bel-Red Road.	High
Trail	T-203	SE 10th St	Bellevue Way to 106th Ave NE	Add a 6-10 foot wide boardwalk along SE 10th Street from Bellevue Way to 106th Avenue NE.	High
Trail	T-204	Kelsey Creek Park	Kelsey Creek to Richards Valley	Add a 6-10 foot wide boardwalk through Kelsey Creek Park connecting Kelsey Creek to Richards Valley.	High
Trail	T-205	Richards Valley Nature Trail	Richards Valley open space to the Lake Hills Connector	Add a 6-10 foot wide boardwalk called Richards Valley Nature Trail connecting the Richards Valley open space to Lake Hills Connector.	High
Trail	T-206	128th Ave SE	SE 25th St SE to SE 32nd St SE	Construct 6-10 foot wide boardwalk along 128th Avenue SE from SE 25th Street SE to SE 32nd Street SE.	High
Trail	T-207	SE 30th St	128th Ave SE to Richards Rd	Add a 6-10 foot wide boardwalk along 128th Avenue SE from SE 24th Street to SE 32nd Street .	High
Trail	T-208	Monthaven-Factoria Connector	132nd Ave SE @ Sunset Elementary School to 132nd Ave SE at Newport Office Pk; and to SE 38th St	Construct 6-10 foot wide boardwalk along the Monthaven-Factoria Connector from 132nd Ave SE @ Sunset Elementary School to 132nd Ave SE at Newport Office Pk; and to SE 38th Street.	High
Trail	T-209	SE 41st St	Factoria Blvd to 133rd Ave SE	Add a 6-10 foot wide boardwalk along SE 41st Street from Factoria Boulevard to 133rd Avenue SE.	High
Trail	T-302	136th Avenue Powerline Corridor	Bel-Red Rd to SE 3rd Pl	Add an 8-12 foot wide multiple use gravel trail called the 136th Avenue Powerline Corridor connecting Bel-Red Road to SE 3rd Place.	High
Trail	T-303	Bellefield Office Park	SE 8th St to SE 18th St alignment	Add an 8-12 foot wide multiple use gravel trail through the Bellefield Office Park connecting SE 8th Street to SE 18th Street alignment.	High
Trail	T-304	Lake Hills Connector	SE 8th St to Richards Road	Add an 8-12 foot wide multiple use gravel trail along Lake Hills Connector from SE 8th Street to Richards Road.	High
Trail	T-305	Richards Valley on SE 24th St	145th Pl SE to Kamber Rd	Add an 8-12 foot wide multiple use gravel trail through Richards Valley along SE 24th Street connecting 145th Place SE to Kamber Road.	High
Trail	T-306	Seattle Water Pipeline	Coal Creek Parkway to 128th Ave SE @ Newport Way	Add an 8-12 foot wide multiple use gravel trail called the Seattle Water Pipeline Trail from Coal Creek Parkway to 128th Avenue SE at Newport Way.	High
Trail	T-408	Unigard Trail System	Northup to NE 24th St E/O 156th Avenue NE	Add a 2-6 foot wide pedestrian walking trail within the Unigard Trail System connecting Northup Way to either NE 24th Street or 156th Avenue NE.	High
Trail	T-409	Hillaire to Crossroads	NE 6th Street to NE 8th Street	Add a 2-6 foot wide multiple use gravel trail from Hillaire to Crossroads connecting NE 6th Street to NE 8th Street.	High
Trail	T-410	Hillaire Access Trail	NE 4th Street to Hillaire Park	Add a 2-6 foot wide multiple use gravel trail called the Hillaire Access Trail connecting NE 4th Street to Hillaire Park.	High
Trail	T-415	Richards Valley Nature Trail	Richards Valley open space to Kamber Road	Add a 2-6 foot wide pedestrian walking trail called the Richards Valley Nature Trail connecting Richards Valley open space to Kamber Road.	High
Trail	T-423	Newport Creek	Coal Creek Parkway to 119th Ave SE at SE 56th St (swim club)	Add a 2-6 foot wide pedestrian walking trail along Newport Creek connecting Coal Creek Parkway to 119th Avenue SE at SE 56th Street (swim club).	High
Trail	T-100	Mercer Slough Park Trail	I-90 to 118th Ave SE	Add a 6-10 foot wide boardwalk called the Mercer Slough Park Trail connecting I-90 to 118th Avenue SE.	Medium
Trail	T-301	126th Ave NE	Wilburton Hill Park and NE 4th Pl	Add an 8-12 foot wide multiple use gravel trail called the 126th Avenue NE Trail connecting Wilburton Hill Park and NE 4th Place.	Medium
Trail	T-401	NE 28th St ROW Trail	116th Ave NE to 120th Ave NE	Add a 2-6 foot wide pedestrian walking trail called the NE 28th Street ROW Trail connecting 116th Avenue NE to 120th Avenue NE.	Medium
Trail	T-413	Woodridge to Lk Hills Connect	Woodridge Div 9 to Lake Hills Connector	Add a 2-6 foot wide multiple use gravel trail that connects Woodridge Div 9 to Lake Hills Connector.	Medium
Trail	T-418	Vasa Creek System	Newport Way to I-90	Add a 2-6 foot wide pedestrian walking trail within the Vasa Creek System connecting Newport Way and I-90.	Medium
Trail	T-421	Park & Ride Connection	I-405 Park & Ride to SE 60th St	Add a 2-6 foot wide pedestrian walking trail called the Park & Ride Connection connecting I-405 Park & Ride to SE 60th Street.	Medium
Trail	T-424	123rd Ave SE Connection	123rd Ave SE to Coal Creek Parkway	Add a 2-6 foot wide pedestrian walking trail called the 123rd Avenue SE Connection connecting 123rd Avenue SE to Coal Creek Parkway.	Medium
Trail	T-200	35th PL NE	Western City Limits to 31st Pl NE	Add a 6-10 foot wide boardwalk along approximately 35th Place NE from the Western City Limits to 31st Place NE.	Low
Trail	T-308	SE 64th Pl	127th SE to 129th Ave SE	Add an 8-12 foot wide multiple use gravel trail along SE 64th Place from 127th Avenue SE to 129th Avenue SE.	Low
Trail	T-422	Newport Hills Connection	Park & Ride Connection to 116th Ave SE	Add a 2-6 foot wide pedestrian walking trail called the Eastside Catholic Connection connecting the Park & Ride to 116th Avenue SE.	Low

Appendix Table 5 Transit priority multimodal intersection improvement projects.

Type	Project #	Intersection	Description	Priority
Multimodal Intersection	I-1	Factoria Blvd / SE 36th St	Redesign the Factoria Blvd and SE 36th St intersection to enhance pedestrian and bicycle crossings.	N/A
Multimodal Intersection	I-2	150th Ave SE / SE Eastgate Way	Redesign 150th Ave SE and SE Eastgate Way intersection to enhance traffic flow, upgrade pedestrian and bicycle crossings, and establish a gateway treatment, potentially to include developing a modern roundabout.	N/A
Multimodal Intersection	I-3	156th Ave SE / SE Eastgate Way	Redesign 156th Ave SE and SE Eastgate Way intersection to enhance traffic flow, upgrade pedestrian and bicycle crossings, and establish a gateway treatment, potentially to include developing a modern roundabout.	N/A
Multimodal Intersection	I-4	150th Ave SE / I-90 Eastbound Off-Ramp	Redesign 150th Ave SE and I-90 Eastbound Off-Ramp (SE 37th St) intersection to enhance traffic flow, upgrade pedestrian and bicycle crossings, and establish a gateway treatment, potentially to include developing a modern roundabout.	N/A

Unfold for full sheet

APPENDIX C

APPENDIX C1:
BUS STOP APPENDIX?
???????????

APPENDIX C2:

Appendix Table 8 Historic utilization of park-and-ride lots for the I-405 and I-90 corridors.

	2000	2008	2009	2010	2011	2012	2013
I-90 Corridor Park-and-Rides	1,950	3,442	3,660	3,830	4,044	4,314	4,447
I-405 Corridor Park-and-Rides	3,425	3,660	3,627	3,956	4,162	4,109	4,332
Total Number of P&R spaces used daily	5,375	7,102	7,287	7,786	8,206	8,423	8,779

Appendix Table 9 Constrained and unconstrained demand for park-and-ride lots along the I-90 corridor.

	2013	2030
Constrained Model	4,236	5,838
Unconstrained Model	4,236	11,901

Appendix Table 10 Constrained and unconstrained demand for park-and-ride lots along the I-405 corridor.

	2013	2030
Constrained Model	3,977	5,516
Unconstrained Model	3,977	9,914

Appendix Table 7 Distances traveled by users to reach the South Bellevue Park-and-Ride.

Place of Residence	
Survey Date: August 2013	
Park-and-Ride Capacity	519
# of Washington registered vehicles	517
< 1 mile	28
1-2 miles	54
2-3 miles	84
3-4 miles	58
4-5 miles	48
> 5 miles	212
Total	484

Note: Of the 517 Washington-registered vehicles, 6% could not be geocoded.

Appendix Table 6 Distances traveled by users to reach the Eastgate Park-and-Ride.

Place of Residence	
Survey Date: August 2013	
Park-and-Ride Capacity	1,614
# of Washington registered vehicles	1,078
< 1 mile	116
1-2 miles	309
2-3 miles	255
3-4 miles	115
4-5 miles	41
> 5 miles	242
Total	1078

Note: Of the 1,078 Washington-registered vehicles, 4% could not be geocoded.

This page intentionally left blank.

APPENDIX D

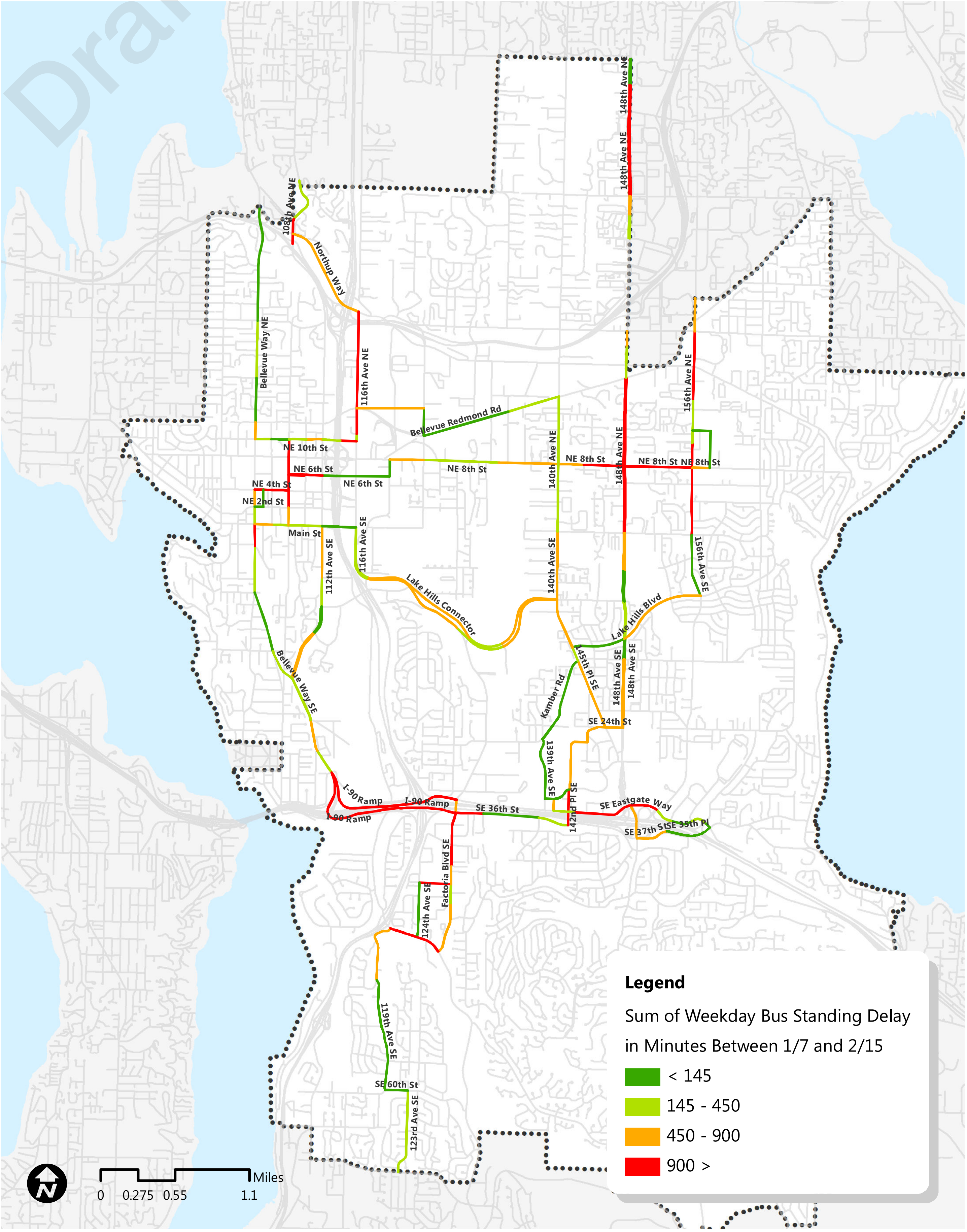
APPENDIX D1: ISSUE IDENTIFICATION MEASURE MAPS

The maps on the following pages present all of the measures used in the issue identification methodology described on pages 27-49. This includes the following measures:

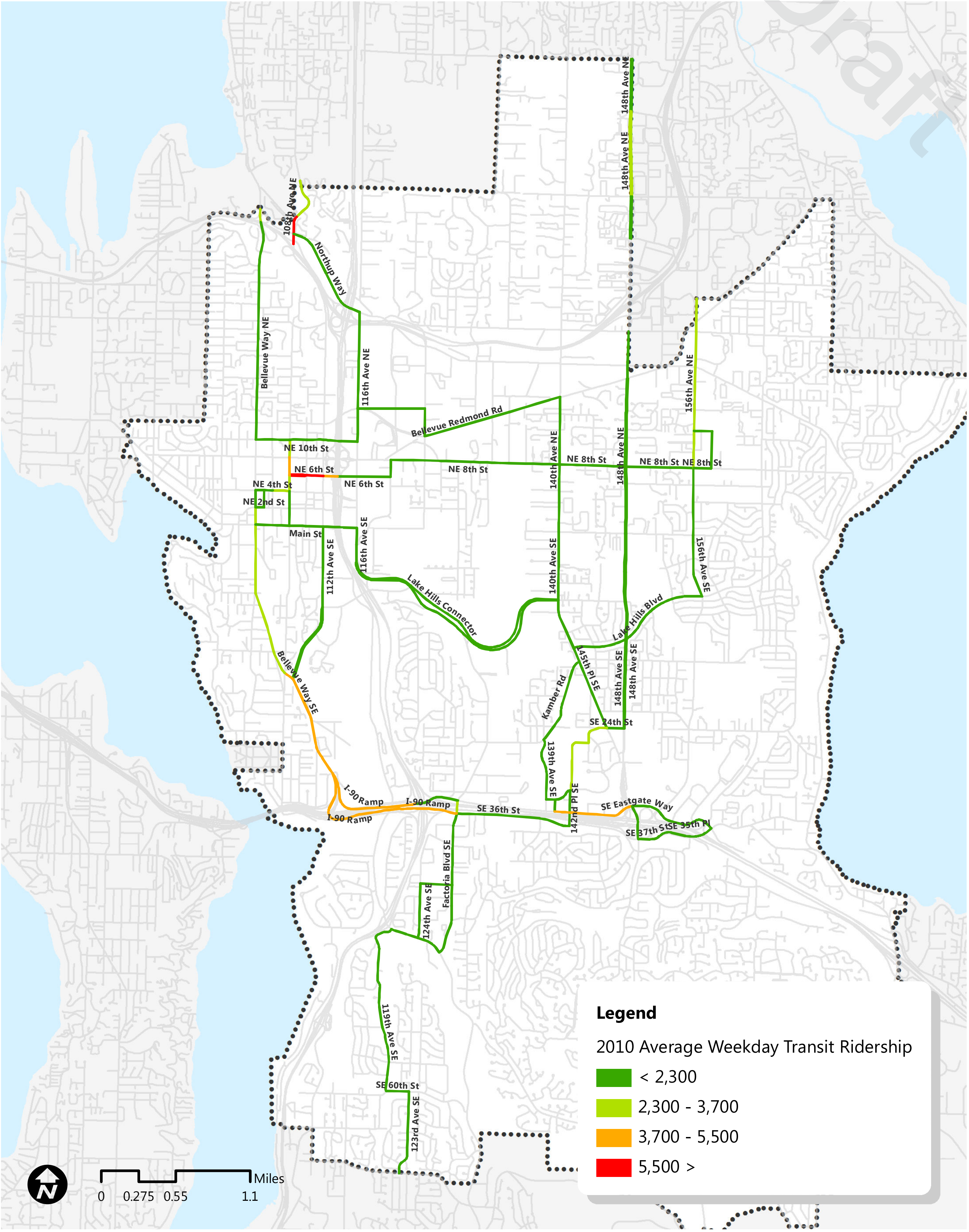
- Short Term Measures:
  - Weekday bus standing delay (in minutes)
  - 2010 average weekday transit ridership
  - 2013 weekday bus volumes
  - Coach operator survey comments

- Long-Term Measures:
  - 2030 projected average weekday transit ridership
  - 2030 planned weekday bus volumes
  - 2030 projected sum of average weekday PM peak approach delay (in seconds)
  - 2030 projected sum of average weekday PM peak approach queue length (in feet)
  - 2030 projected intersection level-of-service (LOS)

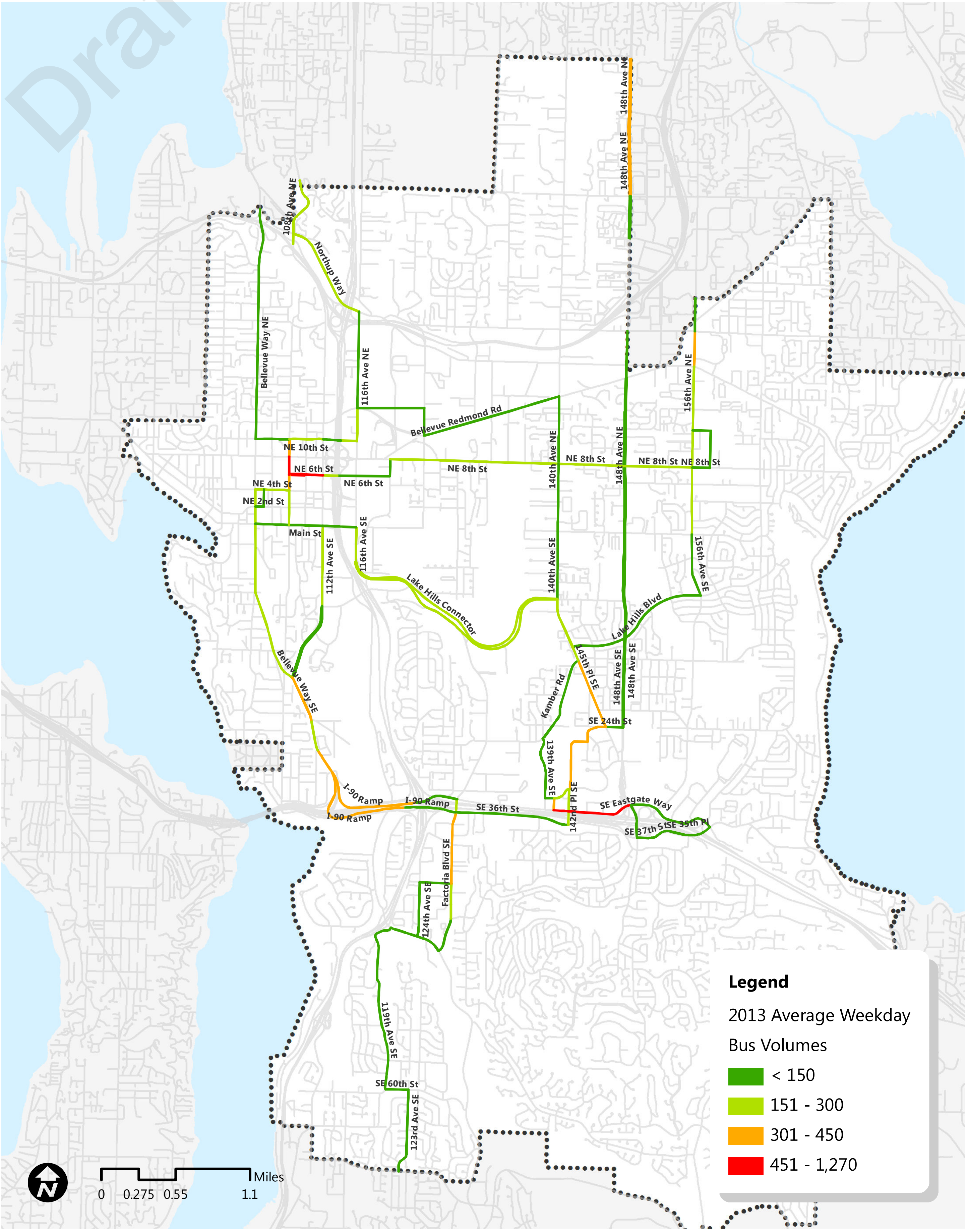
Appendix Figure 1 Short-Term: Weekday Bus Standing Delay.



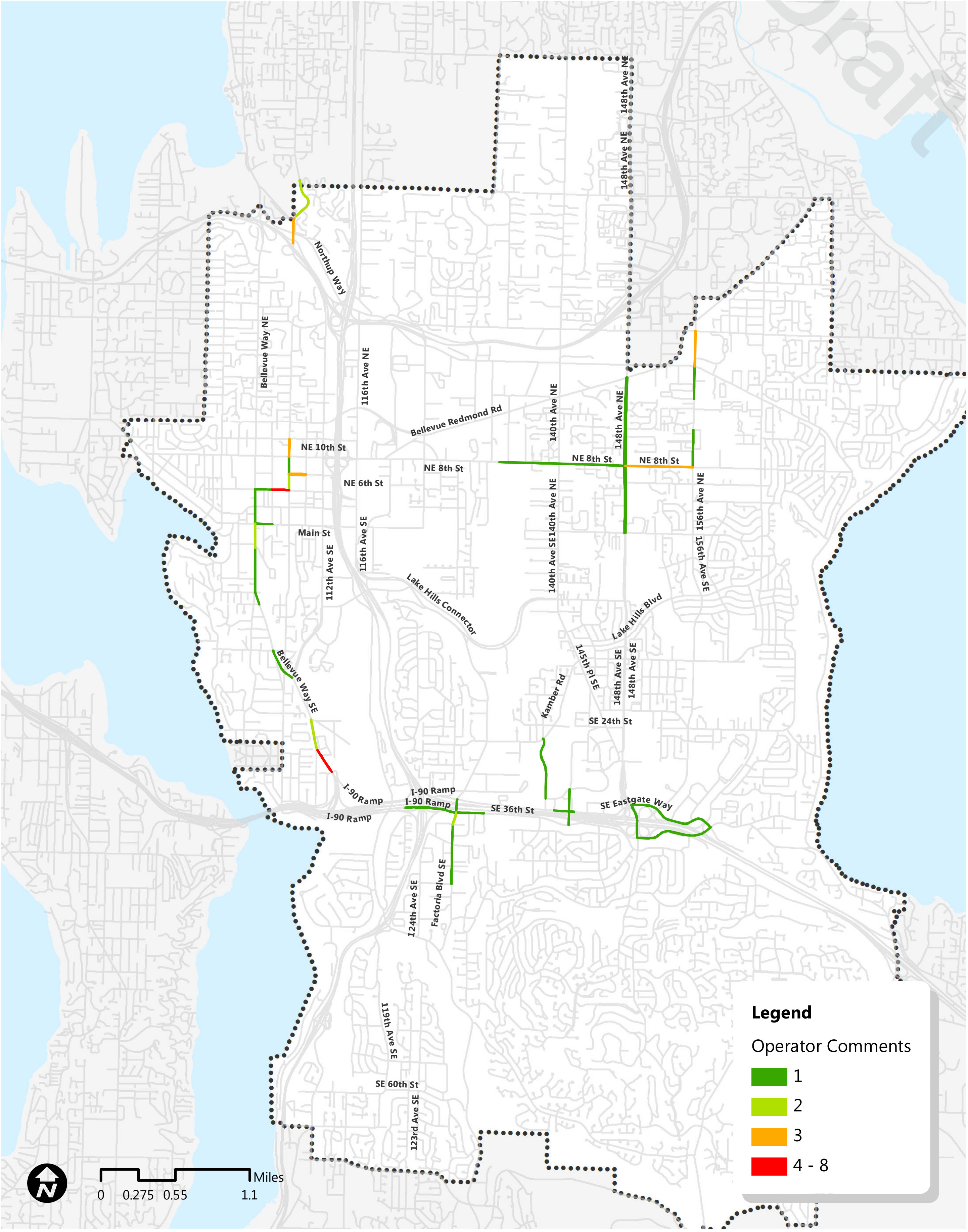
Appendix Figure 2 Short-Term: 2010 Average Weekday Transit Ridership.



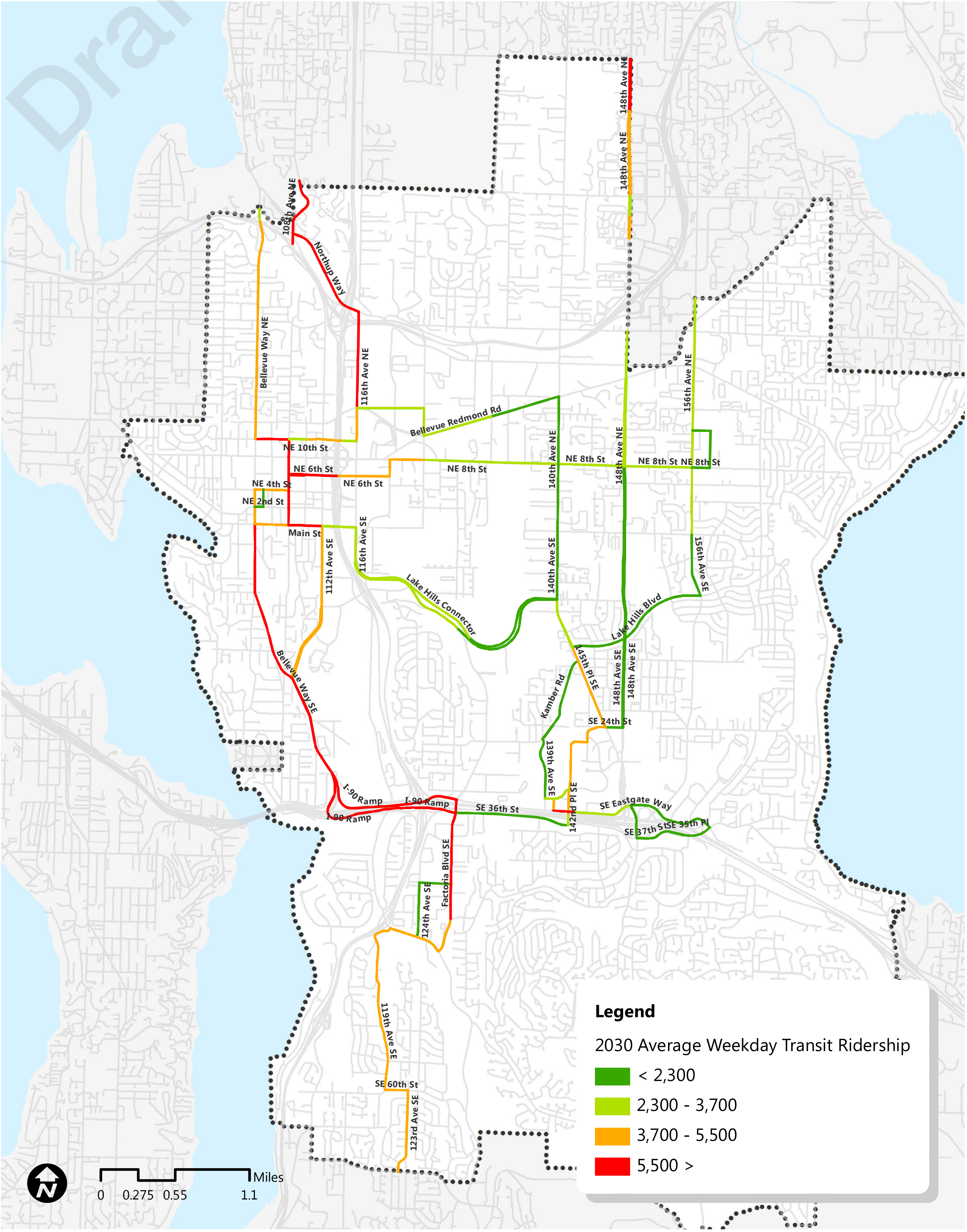
Appendix Figure 3 Short-Term: 2013 Weekday Bus Volumes.



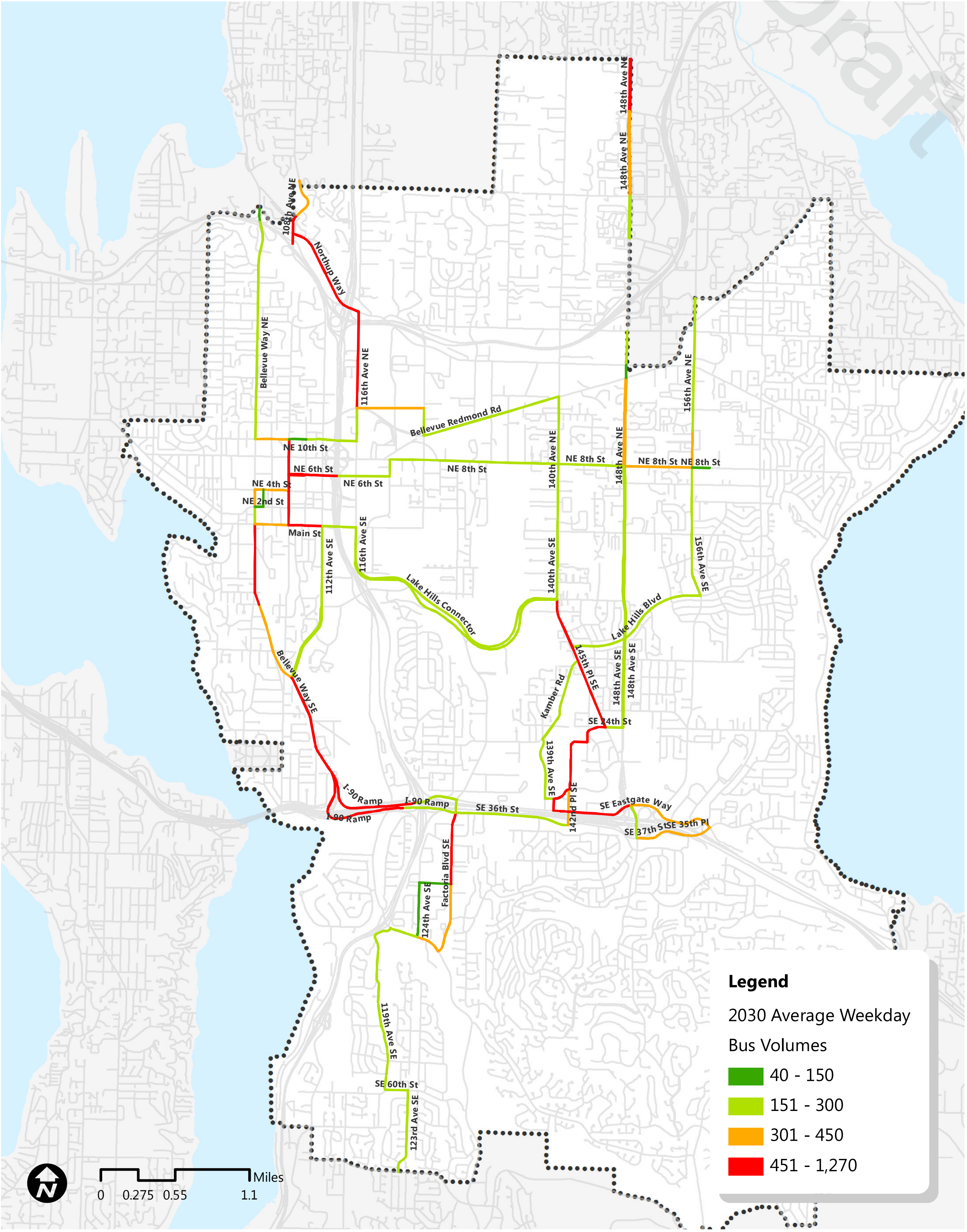
Appendix Figure 4 Short-Term: Operator Survey Comments.



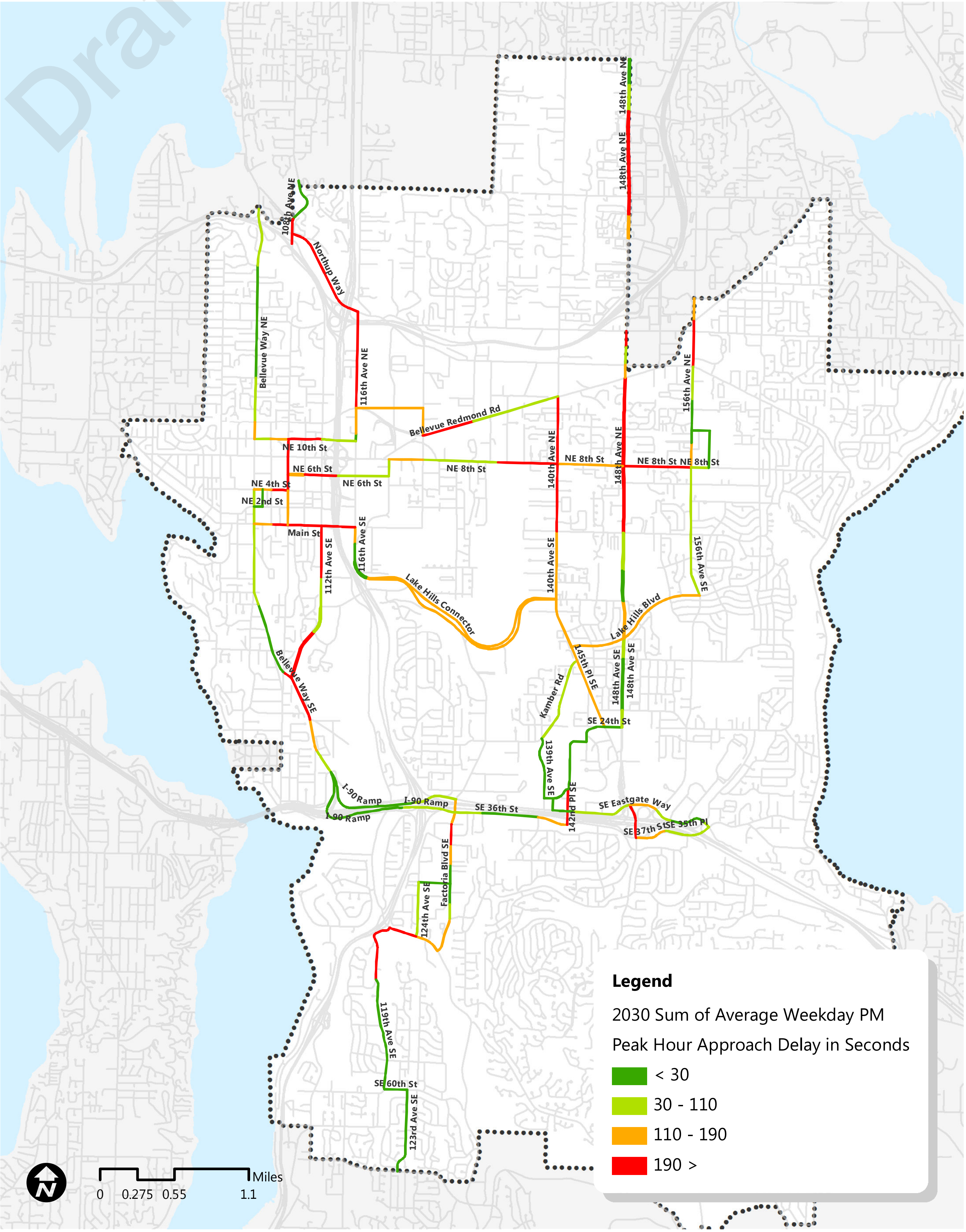
Appendix Figure 5 Long-Term: 2030 Average Weekday Transit Ridership.



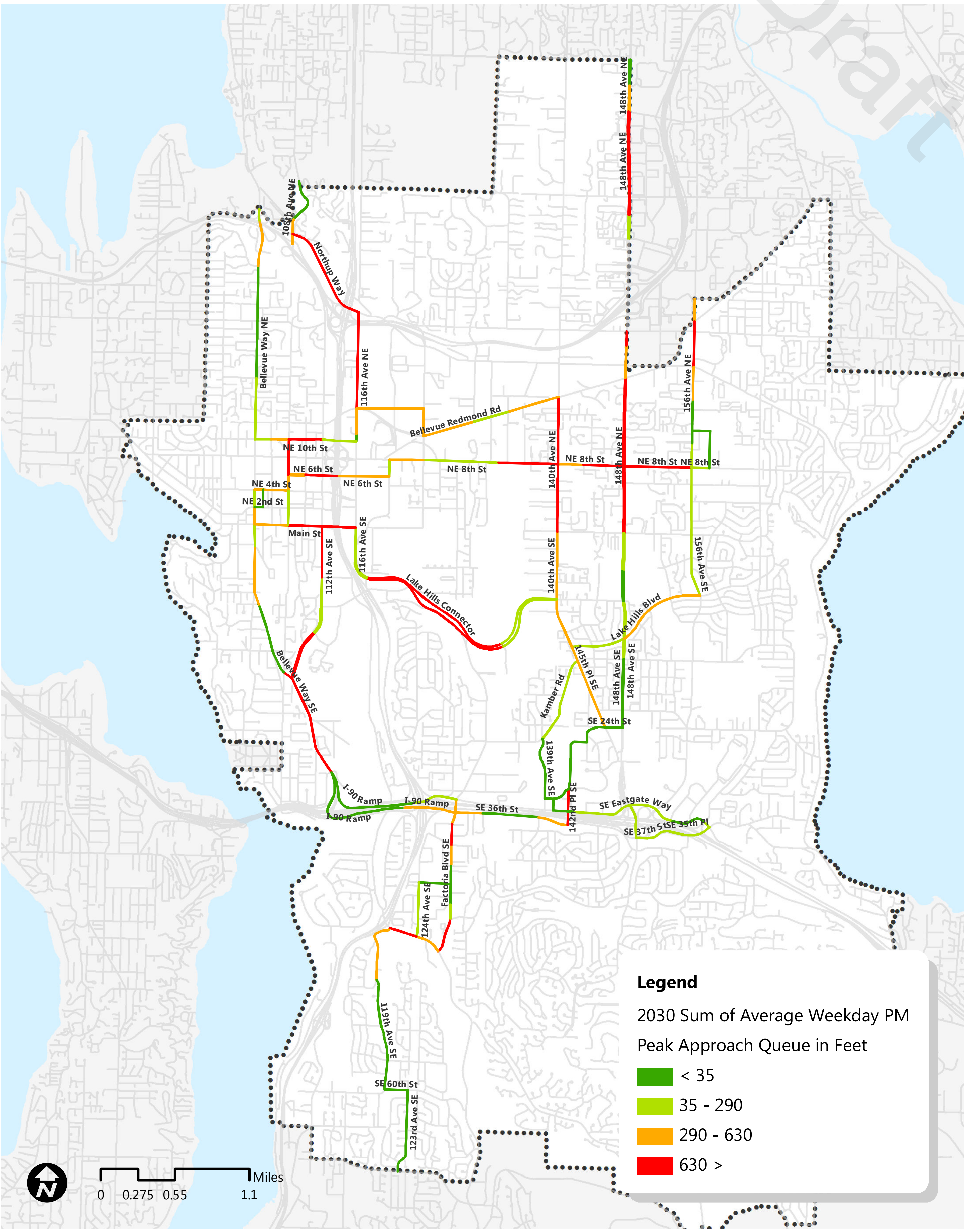
Appendix Figure 6 Long-Term: 2030 Weekday Bus Volumes.



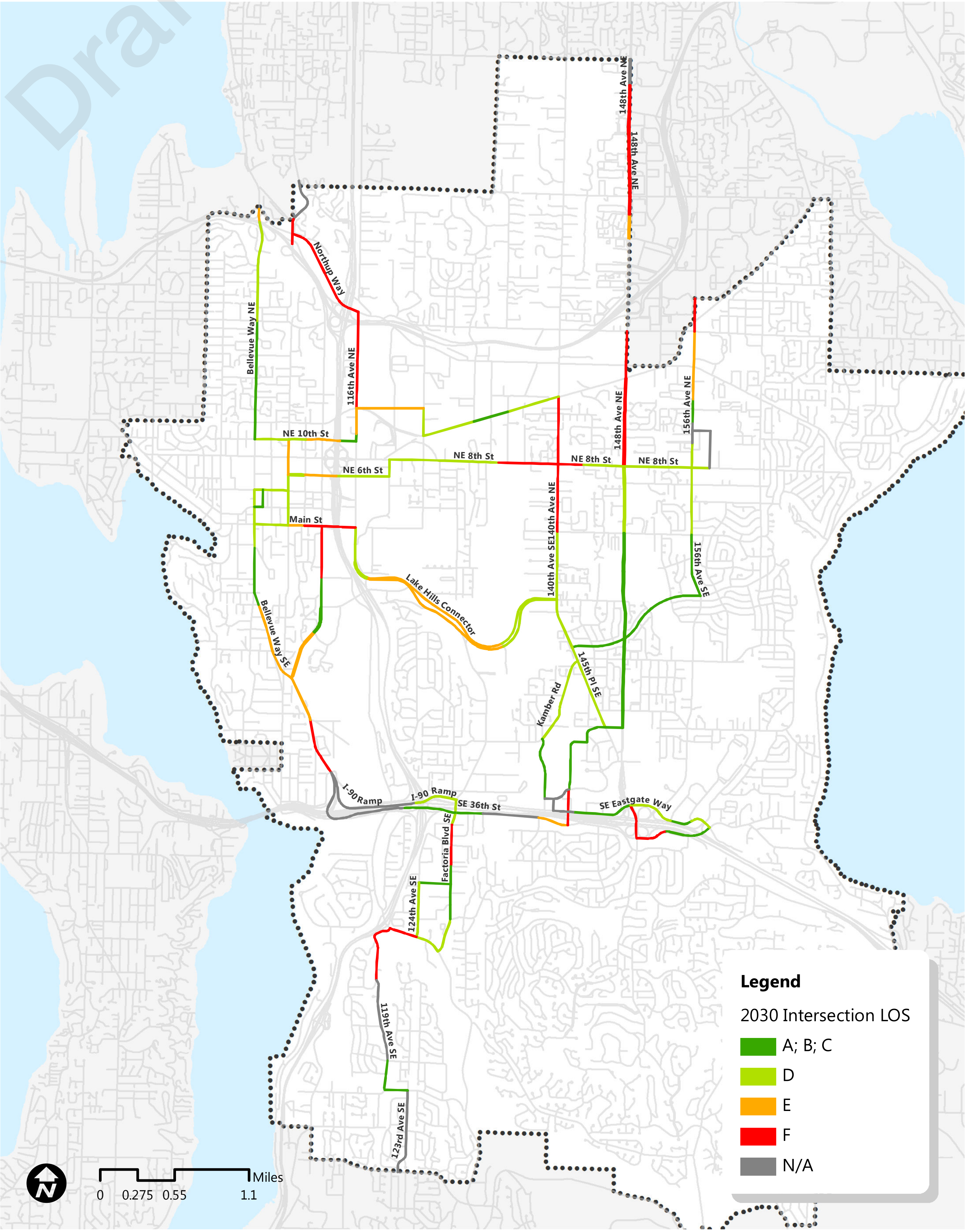
Appendix Figure 7 Long-Term: 2030 Average Weekday PM Peak Approach Delay.



Appendix Figure 8 Long-Term: 2030 Average Weekday PM Peak Approach Queue Length.



Appendix Figure 9 Long-Term: 2030 Intersection Level-of-Service (LOS).



APPENDIX D2: DATA SOURCES CONSIDERED BUT NOT USED

After additional review several data sources which were presented at the project kickoff meeting or discussed with staff will not be used. These data sources, while related to transit speed and reliability, had various issues which made them poorly fitted to the analysis, unavailable, tedious to use, or simply less useful than other similar data sources.

On-Time Performance

On-time performance is measured as the percent of trips which depart their respective time points less than two minutes early or five minutes late. For example, RapidRide B Line on-time performance is measured as the percent of trips within +/- three minute of that trip's scheduled headway. Multiple issues were identified with this data source:

1. The data is coarse, with data available only for an entire route or at some time points. Only some terminal time points can be used due to known issues with data when buses layover.
2. Delays from insufficient recovery time at route terminals can contribute to poor on-time performance.
3. On-time performance is calculated by comparing actual departure times against scheduled departure time. By adding time to a schedule, Metro planners can improve on-time performance without actually improving the speed and reliability of routes.
4. Delays occurring outside the city, especially on highways, are not directly relevant to this analysis, but their impact cannot be removed from the data.

Because of these issues and the more detailed data provided by bus GPS data, on-time performance is not used at this time.

Street Congestion

Congestion on road segments can be measured as the ratio of vehicles to roadway capacity. The closer vehicle volumes are to the capacity of the roadway, the more delay a road segment experiences. This measure was originally identified because it could help identify road segments where buses might experience delay when reentering traffic after stopping at an out-of-lane bus stop. However, because very few locations in Bellevue require buses to merge back into traffic and intersection delay is available from the more detailed Dynameq model, it was determined that this data was duplicative.

Travel Time Reliability

Reliability of travel time is highly important for transit systems. When transit travel times are unreliable the service operator must schedule extra time at the end of each trip to ensure the bus can depart on time for its next trip. This additional time, called recovery time, is necessary to operate a reliable transit system but also results in "wasted" service hours because buses are not carrying passengers during this time.

The reliability of travel time can be measured as the variation of travel time throughout the day from one time point to another. The lower the variability, the more reliable a time point interval is. While presented at the project kickoff meeting as a very important data point, further discussion with King County Metro revealed that Metro's database structure is set up in such a way that this measure could not be calculated. Alternative approaches to use this data were reviewed because of the value of this data but no good alternative was ultimately identified.

Scheduled Speed

The average scheduled travel speed between two time points can be calculated using the scheduled travel time and distance between the time points. The first reason this data was not used is due to the lack of detail with regards to time point intervals, the route between time points, which can be several miles long. The second, more practical reason, is because King County Metro doesn't have a shapefile which time point interval data can be joined to.

Mode Share

Mode share is a ratio that describes the relative use of a street by different modes of transportation such single occupant vehicles (SOVs), high occupancy vehicles (HOVs), buses, pedestrians, and bicyclists. Whereas low-density, auto-oriented areas have a high SOV mode share, areas like Downtown have a higher non-SOV mode share. The mode share of key transit corridors will be used to identify and prioritize the locations for transit priority treatments, but this data is not available for all areas served by the Frequent Transit Network (FTN).

APPENDIX D3: CORRIDOR THROUGHPUT ANALYSIS

Appendix Table 11 Legend of Long-Term Weighted Score color-coded tables.

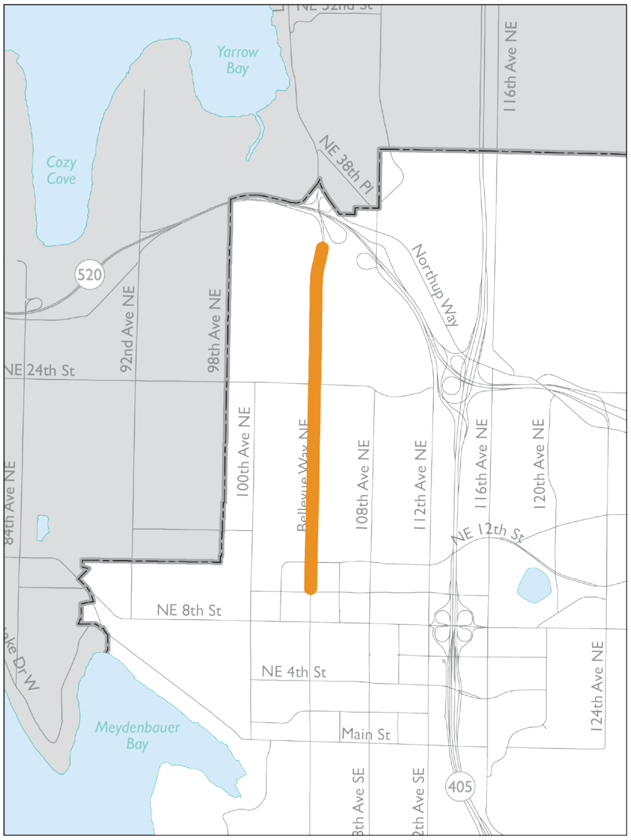
LEGEND	Weighted Scores[2] Long-Term			
Composite Score	5-11	12-15	16-18	19-24
Weekday Ridership	0-2	4	6	8
Weekday Bus Volumes	1	2	3	4
Approach Delay (sec)	1	2	3	4
Approach Queue Length (ft)	1	2	3	4
Intersection LOS	0-1	2	3	4

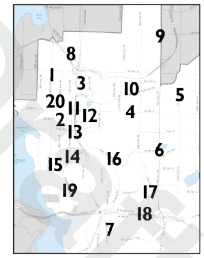
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Following the development of composite scores for all FTN analysis segments (see pages 120 through 141), twenty corridor segments of particular interest were identified for further consideration. As reflected in the tables and charts on the following pages, composite scores and their constituent parts were compiled for each corridor, and the BKR travel demand model (MP30R6.2) was leveraged to compare vehicle throughput to person throughput, consistent with guidance from the Measures of Effectiveness Report.

The BKR model produces Peak-Period Person Throughput (PPPT) by mode for the corridor segments that comprise the Frequent Transit Network (FTN). This takes into account average vehicle occupancy for personal vehicles and buses, thereby facilitating a comparison of vehicle and person throughput for both transit and personal vehicles along FTN corridors. For example, on Bellevue Way NE between NE 10th St and NE 32nd Pl, the 2030 projected PPPT on transit is 36 percent of all person trips, yet transit represents only 0.8 percent of all vehicle trips along this corridor. Clearly, bus service is projected to make efficient use of the roadway capacity here.

Whereas the composite scores indicate how great a particular corridor's need is for transit speed and reliability investments relative to other FTN corridors, the throughput analysis provides insight into the relative share of total person trips served by transit and private vehicles. The composite scores help to prioritize corridors for potential projects based solely on characteristics that directly affect transit operations, while throughput by mode helps to assess how reasonable it might be to allocate limited right-of-way to one mode or another based on their relative ability to move people. The larger the share of person trips served by transit along a corridor, the more appropriate it may be to consider transit priority projects.





1 Bellevue Way NE btw NE 10th St and NE 32nd Pl

Buses[1]	16
Total Vehicles[1]	2,109
Percent Transit[1]	0.8%

Person Trips – Transit[1]	1,583
Person Trips – Total[1]	4,420
Percent Transit[1]	36%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]

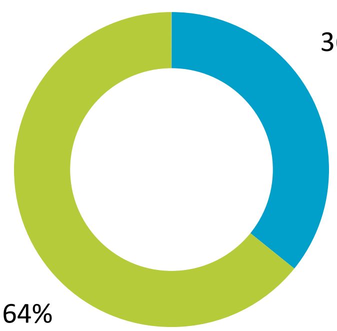
Long-Term

Composite Score	11 - 15 (13.0)
Weekday Ridership	6
Weekday Bus Volumes	2
Approach Delay (sec)	1 - 3 (1.8)
Approach Queue Length (ft)	1 - 3 (1.8)
Intersection LOS	1 - 2 (1.4)

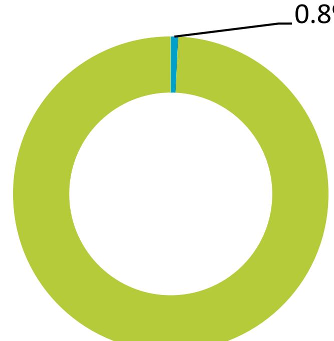
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

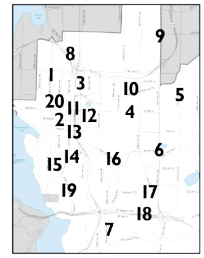


Person Throughput



Vehicle Throughput

Bus Auto



2 108th Ave NE btw Main St and NE 10th St

Buses[1]	62
Total Vehicles[1]	2,022
Percent Transit[1]	3.0%
Person Trips – Transit[1]	3,966
Person Trips – Total[1]	6,678
Percent Transit[1]	59%

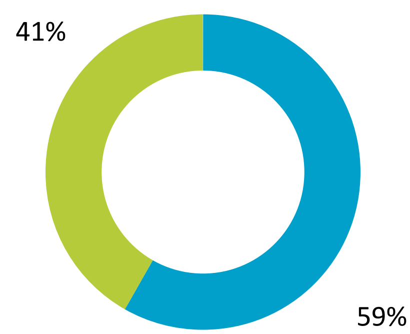
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]
Long-Term

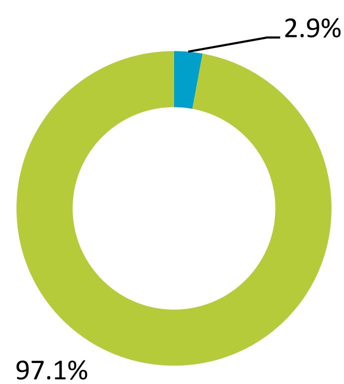
Composite Score	19 - 23 (21.0)
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	3 - 4 (3.6)
Approach Queue Length (ft)	2 - 4 (3.0)
Intersection LOS	2 - 3 (2.4)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



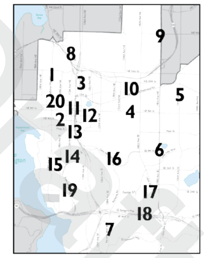
Person Throughput



Vehicle Throughput

Bus Auto

3 116th Ave NE btw NE 12th St and Northup Way



Buses[1]	23
Total Vehicles[1]	1,518
Percent Transit[1]	1.5%

Person Trips – Transit[1]	1,480
Person Trips – Total[1]	3,465
Percent Transit[1]	43%

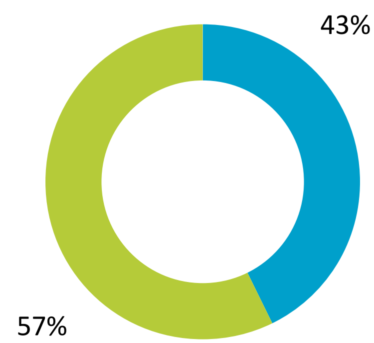
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

	Weighted Scores[2] Long-Term
Composite Score	24
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	4
Approach Queue Length (ft)	4
Intersection LOS	4

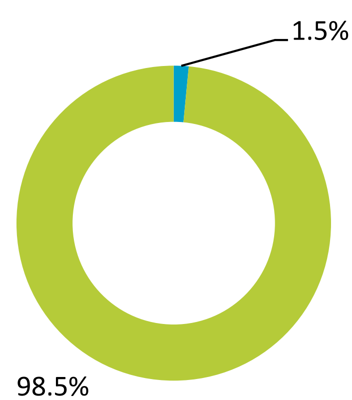
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

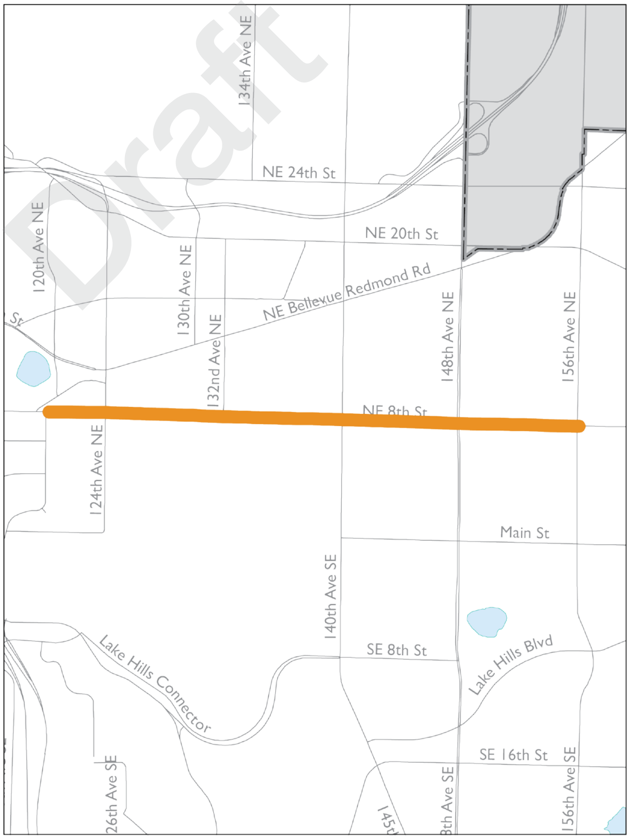


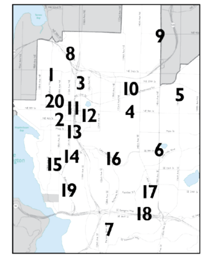
Person Throughput



Vehicle Throughput

Bus Auto





4 NE 8th St btw 120th Ave NE and 156th Ave NE

Buses[1]	17
Total Vehicles[1]	2,703
Percent Transit[1]	0.6%

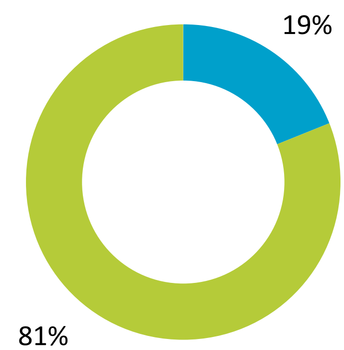
Person Trips – Transit[1]	871
Person Trips – Total[1]	4,606
Percent Transit[1]	19%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

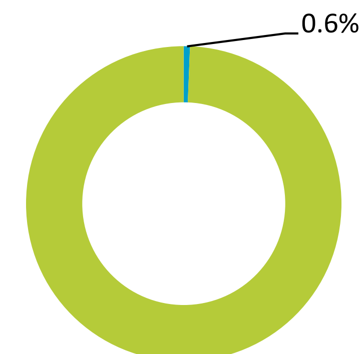
	Weighted Scores[2] Long-Term
Composite Score	12 - 18 (15.8)
Weekday Ridership	4 - 6 (4.3)
Weekday Bus Volumes	2 - 3 (2.2)
Approach Delay (sec)	2 - 4 (3.3)
Approach Queue Length (ft)	2 - 4 (3.3)
Intersection LOS	2 - 4 (2.7)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

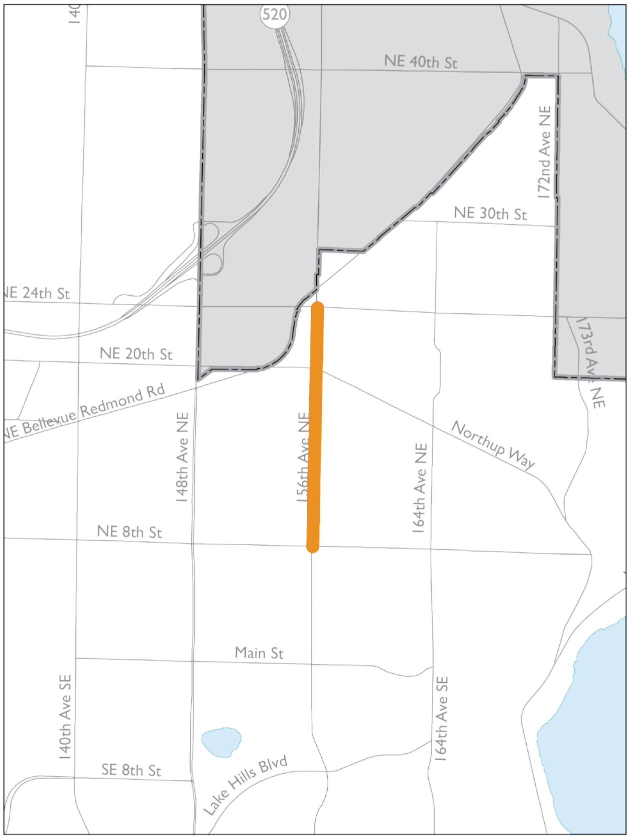


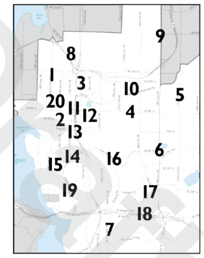
Person Throughput



Vehicle Throughput

Bus Auto





5 156th Ave NE btw NE 8th St and Bel-Red Rd

Buses[1]	22
Total Vehicles[1]	2,799
Percent Transit[1]	0.8%
Person Trips – Transit[1]	903
Person Trips – Total[1]	4,547
Percent Transit[1]	20%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]

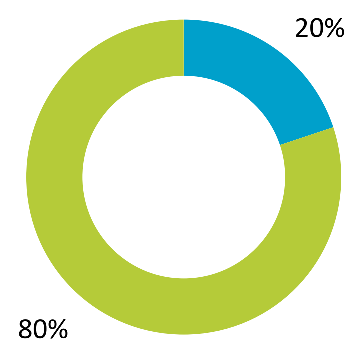
Long-Term

Composite Score	8 - 17 (11.4)
Weekday Ridership	4
Weekday Bus Volumes	2 - 3 (2.3)
Approach Delay (sec)	1 - 4 (1.9)
Approach Queue Length (ft)	1 - 4 (1.9)
Intersection LOS	0 - 3 (1.4)

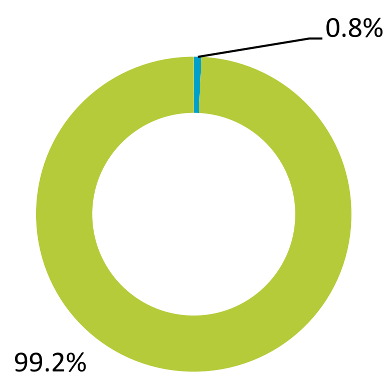
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

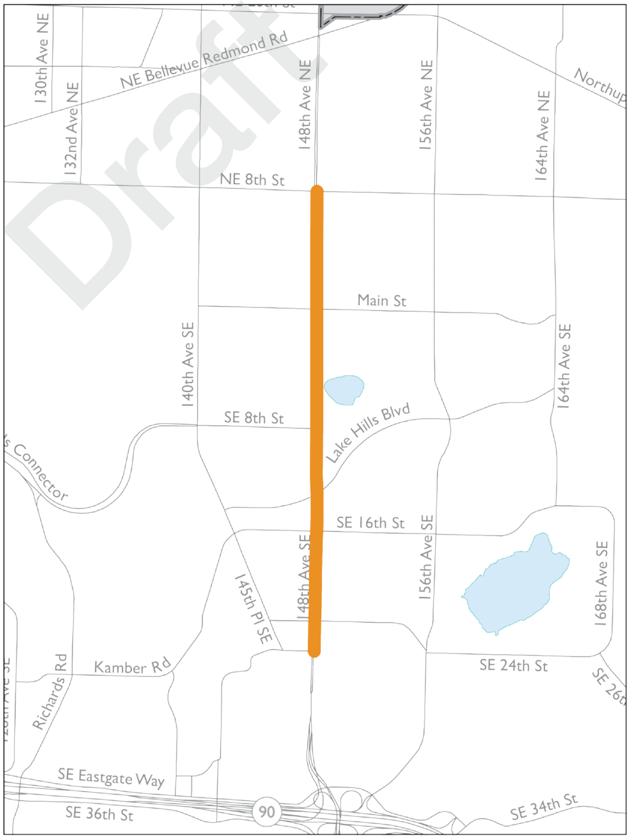


Person Throughput

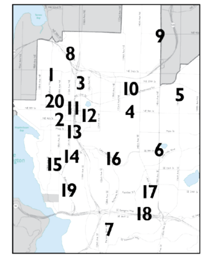


Vehicle Throughput

Bus Auto



6 148th Ave NE btw NE 8th St and SE 24th St



Buses[1]	16
Total Vehicles[1]	3,281
Percent Transit[1]	0.5%

Person Trips – Transit[1]	432
Person Trips – Total[1]	4,527
Percent Transit[1]	10%

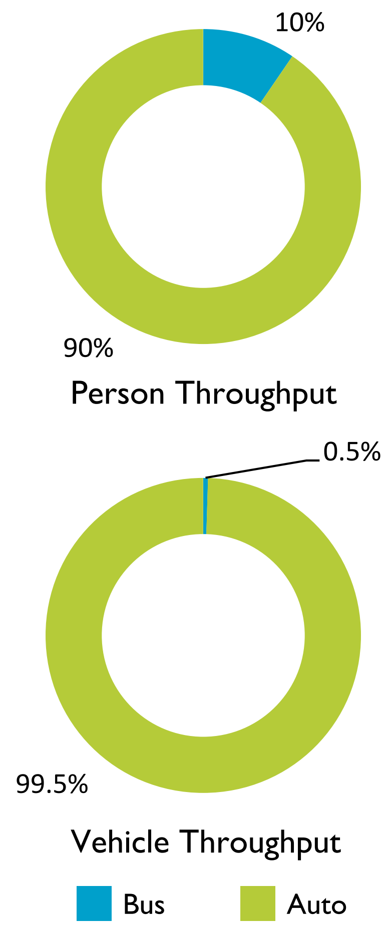
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

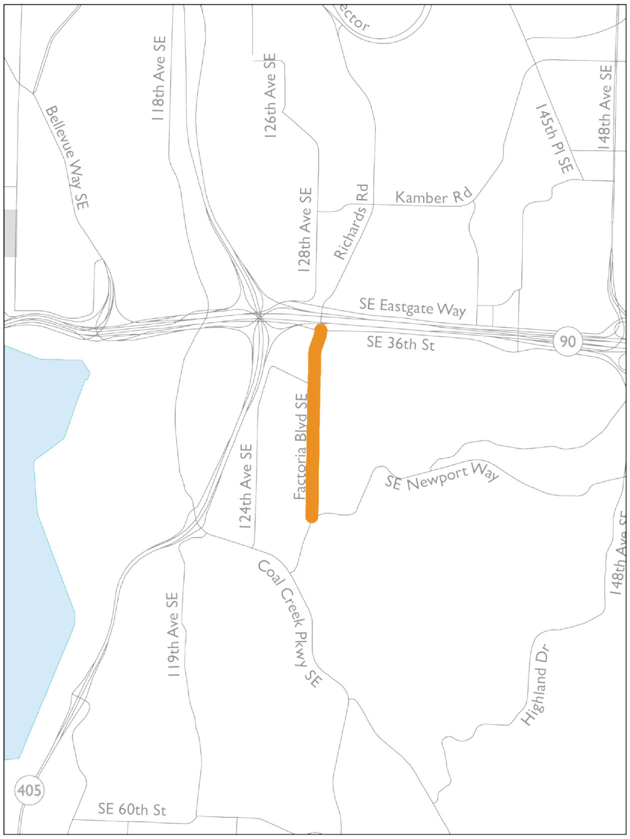
Weighted Scores[2]
Long-Term

Composite Score	6 - 14 (9.1)
Weekday Ridership	2
Weekday Bus Volumes	2
Approach Delay (sec)	1 - 4 (2.3)
Approach Queue Length (ft)	1 - 4 (1.9)
Intersection LOS	0 - 2 (1.0)

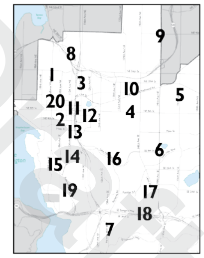
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak





7 Factoria Blvd SE btw SE 36th St and SE Newport Way



Buses[1]	34
Total Vehicles[1]	3,597
Percent Transit[1]	0.9%
Person Trips – Transit[1]	1,515
Person Trips – Total[1]	6,080
Percent Transit[1]	25%

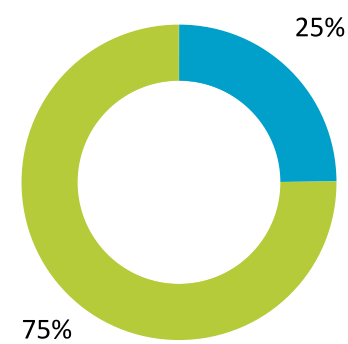
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

	Weighted Scores[2] Long-Term
Composite Score	13 - 24 (16.8)
Weekday Ridership	8
Weekday Bus Volumes	3 - 4 (3.6)
Approach Delay (sec)	1 - 4 (2.0)
Approach Queue Length (ft)	1 - 4 (2.0)
Intersection LOS	0 - 4 (1.2)

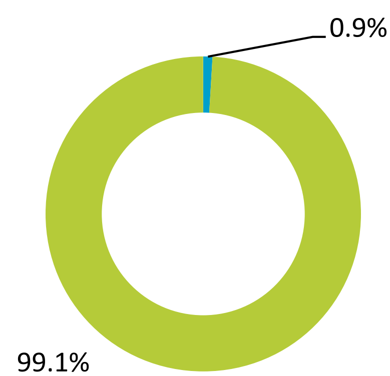
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

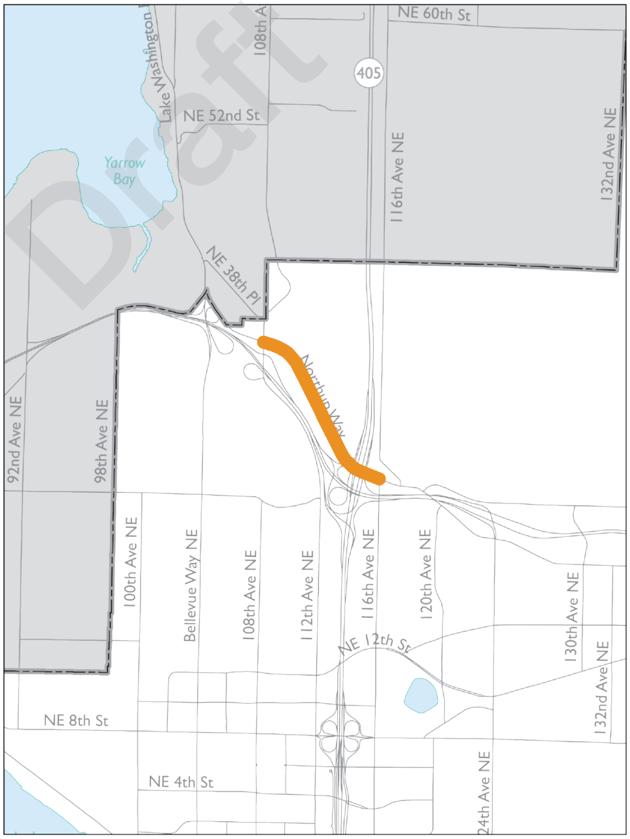


Person Throughput

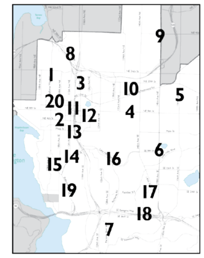


Vehicle Throughput

Bus Auto



8 Northup Way btw 108th Ave NE and 116th Ave NE



Buses[1]	30
Total Vehicles[1]	1,460
Percent Transit[1]	2.1%

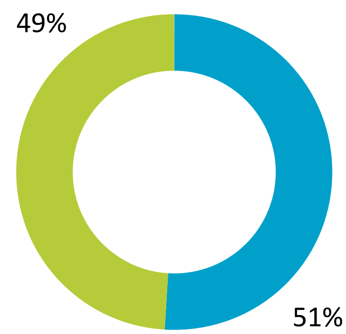
Person Trips – Transit[1]	1,850
Person Trips – Total[1]	3,620
Percent Transit[1]	51%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

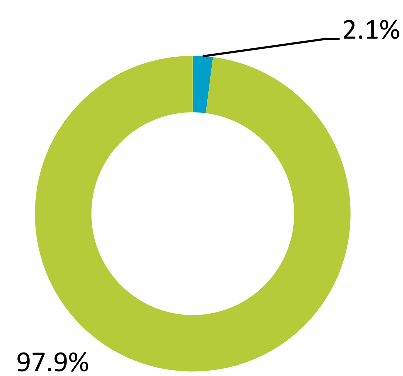
	Weighted Scores[2] Long-Term
Composite Score	24
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	4
Approach Queue Length (ft)	4
Intersection LOS	4

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

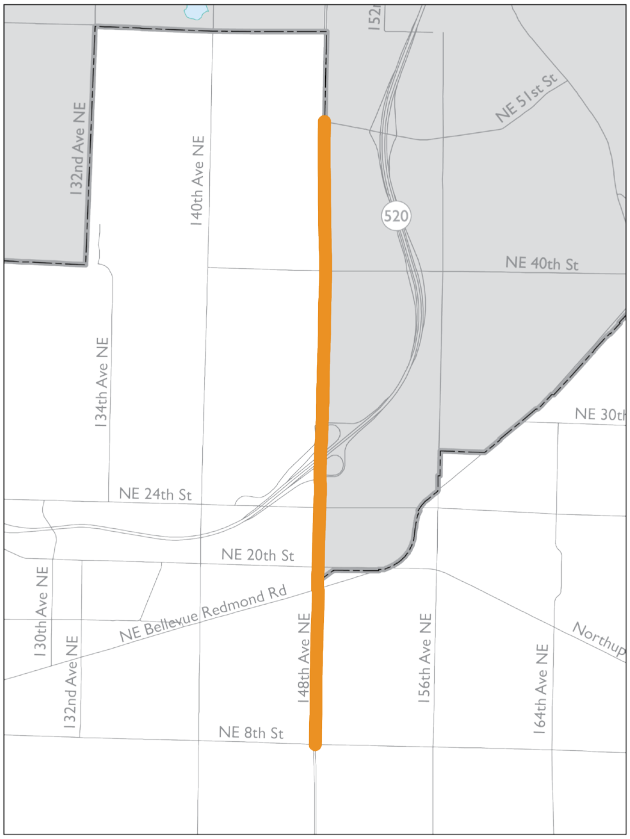


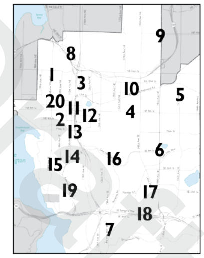
Person Throughput



Vehicle Throughput

Bus Auto





9 148th Ave NE btw NE 8th St & NE 51st St

Buses[1]	15
Total Vehicles[1]	3,606
Percent Transit[1]	0.4%

Person Trips – Transit[1]	699
Person Trips – Total[1]	5,359
Percent Transit[1]	13%

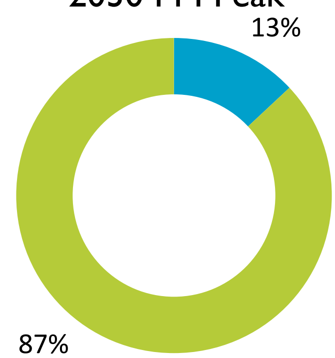
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]
Long-Term

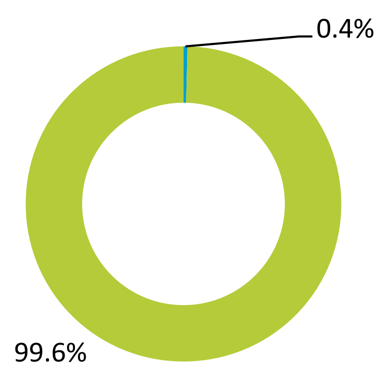
Composite Score	14 - 21 (17.8)
Weekday Ridership	4 - 8 (5.4)
Weekday Bus Volumes	1 - 4 (2.6)
Approach Delay (sec)	1 - 4 (3.1)
Approach Queue Length (ft)	1 - 4 (3.2)
Intersection LOS	0 - 4 (3.5)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

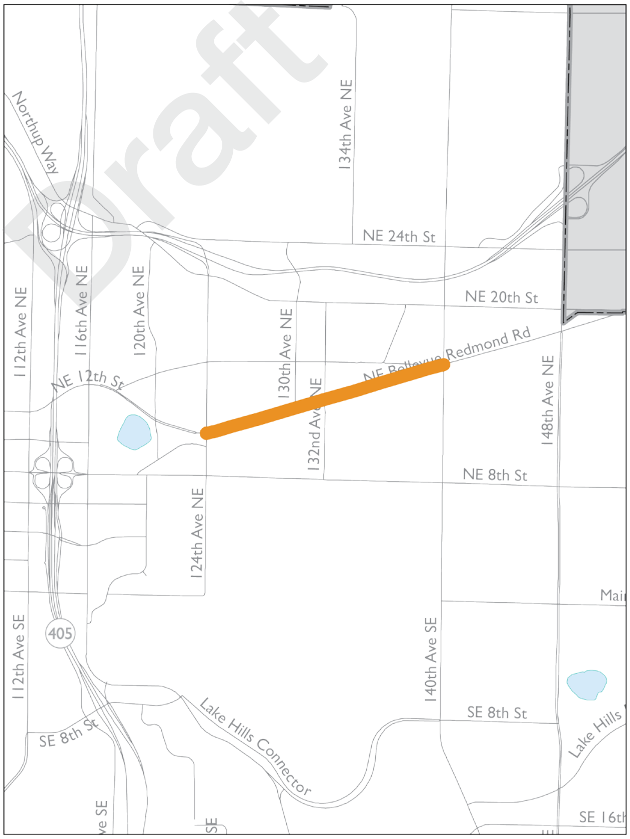


Person Throughput

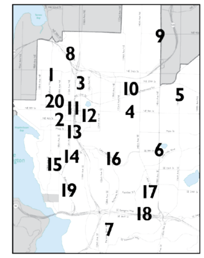


Vehicle Throughput

Bus Auto



10 Bel-Red Rd btw 124th Ave NE and 140th Ave NE



Buses[1]	16
Total Vehicles[1]	3,266
Percent Transit[1]	0.5%

Person Trips – Transit[1]	558
Person Trips – Total[1]	4,935
Percent Transit[1]	11%

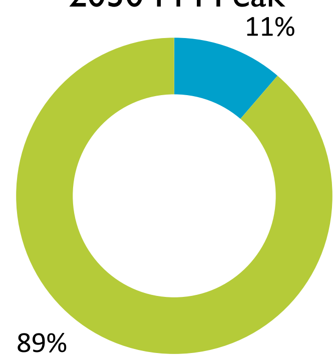
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]
Long-Term

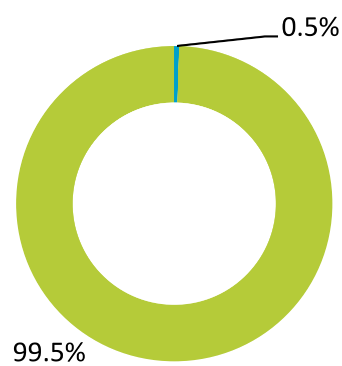
Composite Score	8 - 15 (11.0)
Weekday Ridership	2 - 4 (3.0)
Weekday Bus Volumes	2
Approach Delay (sec)	2 - 4 (2.5)
Approach Queue Length (ft)	2 - 3 (2.5)
Intersection LOS	0 - 2 (1.0)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



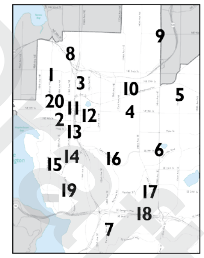
Person Throughput



Vehicle Throughput

Bus Auto

11 NE 8th St btw Bellevue Way NE and 120th Ave NE



Buses[1]	14
Total Vehicles[1]	3,412
Percent Transit[1]	0.4%

Person Trips – Transit[1]	670
Person Trips – Total[1]	5,230
Percent Transit[1]	13%

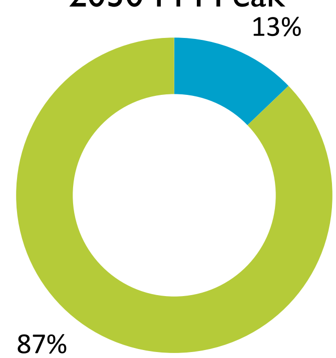
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

	Weighted Scores[2] Long-Term
Composite Score	**N/A**
Weekday Ridership	**N/A**
Weekday Bus Volumes	**N/A**
Approach Delay (sec)	**N/A**
Approach Queue Length (ft)	**N/A**
Intersection LOS	**N/A**

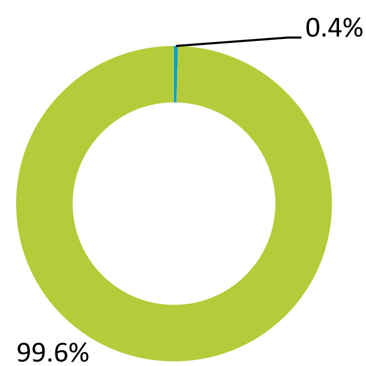
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

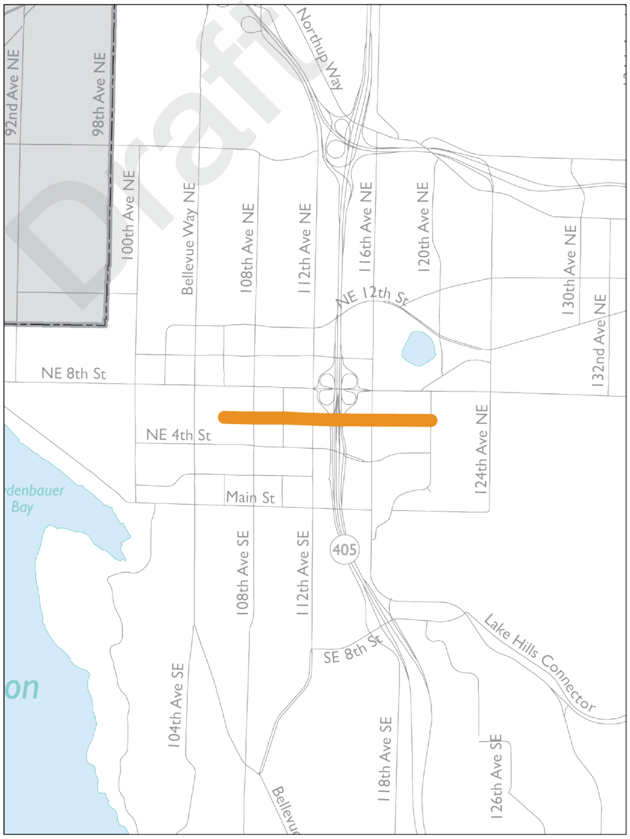


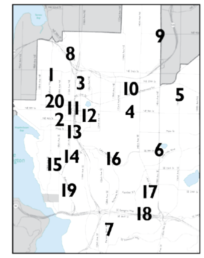
Person Throughput



Vehicle Throughput

Bus Auto





12 NE 6th St btw 106th Ave NE and 120th Ave NE

Buses[1]	71
Total Vehicles[1]	2,588
Percent Transit[1]	2.7%
Person Trips – Transit[1]	5,713
Person Trips – Total[1]	9,920
Percent Transit[1]	58%

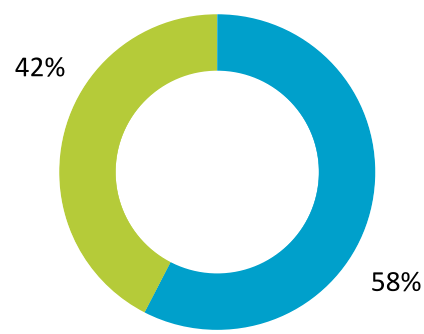
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]
Long-Term

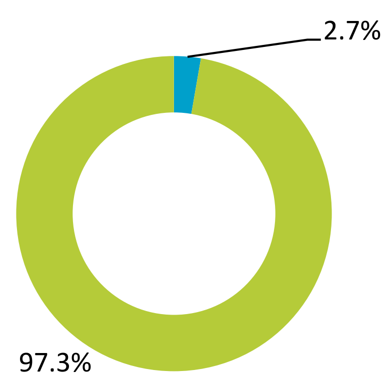
Composite Score	15 - 23 (20.3)
Weekday Ridership	6 - 8 (7.5)
Weekday Bus Volumes	2 - 4 (3.5)
Approach Delay (sec)	2 - 4 (3.3)
Approach Queue Length (ft)	3 - 4 (3.5)
Intersection LOS	2 - 3 (2.5)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

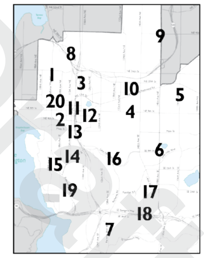


Person Throughput



Vehicle Throughput

Bus Auto



13 Main St btw Bellevue Way NE and 116th Ave NE

Buses[1]	23
Total Vehicles[1]	2,583
Percent Transit[1]	0.9%

Person Trips – Transit[1]	1,410
Person Trips – Total[1]	4,750
Percent Transit[1]	30%

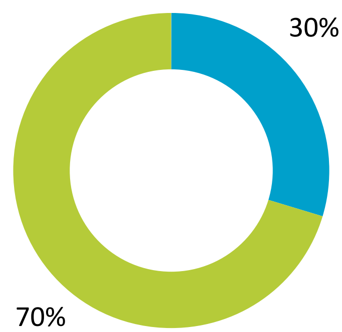
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

	Weighted Scores[2] Long-Term
Composite Score	17 - 24 (20.0)
Weekday Ridership	4 - 8 (6.4)
Weekday Bus Volumes	2 - 4 (3.2)
Approach Delay (sec)	3 - 4 (3.8)
Approach Queue Length (ft)	3 - 4 (3.6)
Intersection LOS	2 - 4 (3.0)

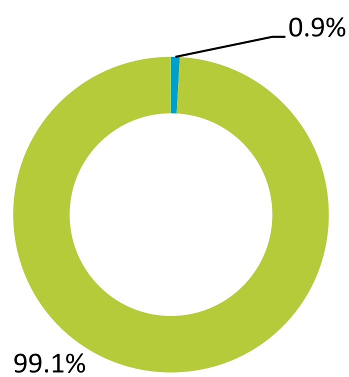
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak



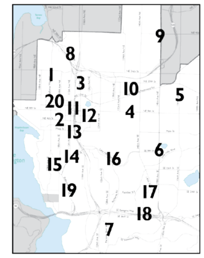
Person Throughput



Vehicle Throughput

Bus Auto

14 112th Ave SE btw Main St and Bellevue Way SE



Buses[1]	16
Total Vehicles[1]	2,311
Percent Transit[1]	0.7%
Person Trips – Transit[1]	1,370
Person Trips – Total[1]	4,450
Percent Transit[1]	31%

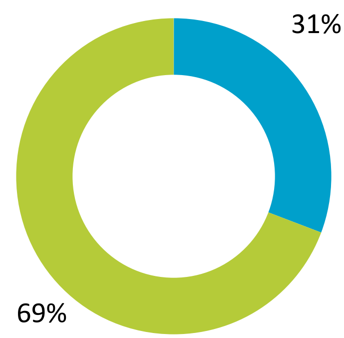
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

	Weighted Scores[2] Long-Term
Composite Score	12 - 20 (15.8)
Weekday Ridership	6
Weekday Bus Volumes	2
Approach Delay (sec)	2 - 4 (3.0)
Approach Queue Length (ft)	2 - 4 (3.0)
Intersection LOS	0 - 4 (1.8)

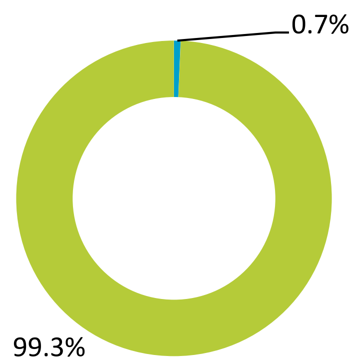
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

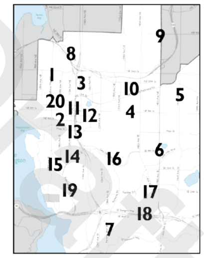


Person Throughput



Vehicle Throughput

Bus Auto



15 Bellevue Way SE btw SE 8th St and 113th Ave SE

Buses[1]	36
Total Vehicles[1]	3,230
Percent Transit[1]	1.1%
Person Trips – Transit[1]	3,363
Person Trips – Total[1]	7,705
Percent Transit[1]	44%

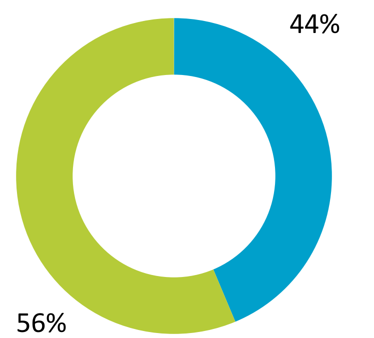
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]
Long-Term

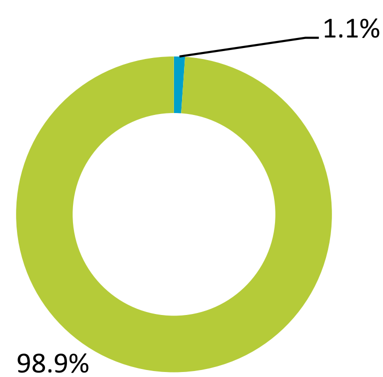
Composite Score	16 - 22 (18.0)
Weekday Ridership	8
Weekday Bus Volumes	3 - 4 (3.3)
Approach Delay (sec)	1 - 4 (2.0)
Approach Queue Length (ft)	1 - 4 (2.3)
Intersection LOS	1 - 3 (2.5)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



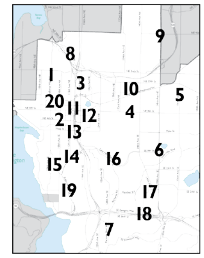
Person Throughput



Vehicle Throughput

Bus Auto

16 Lake Hills Connector btw SE 1st St and 150th Ave SE



Buses[1]	16
Total Vehicles[1]	3,081
Percent Transit[1]	0.5%
Person Trips – Transit[1]	595
Person Trips – Total[1]	4,498
Percent Transit[1]	13%

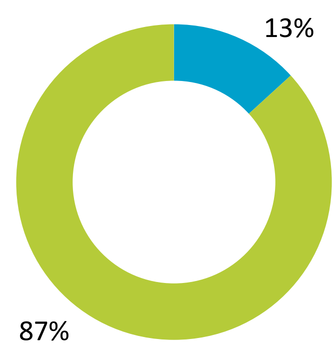
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

	Weighted Scores[2] Long-Term
Composite Score	11 - 16 (13.6)
Weekday Ridership	2 - 4 (3.2)
Weekday Bus Volumes	2
Approach Delay (sec)	1 - 3 (2.6)
Approach Queue Length (ft)	2 - 4 (3.2)
Intersection LOS	2 - 3 (2.6)

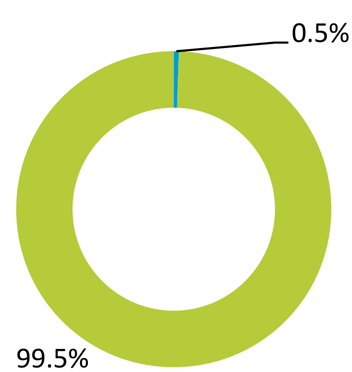
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

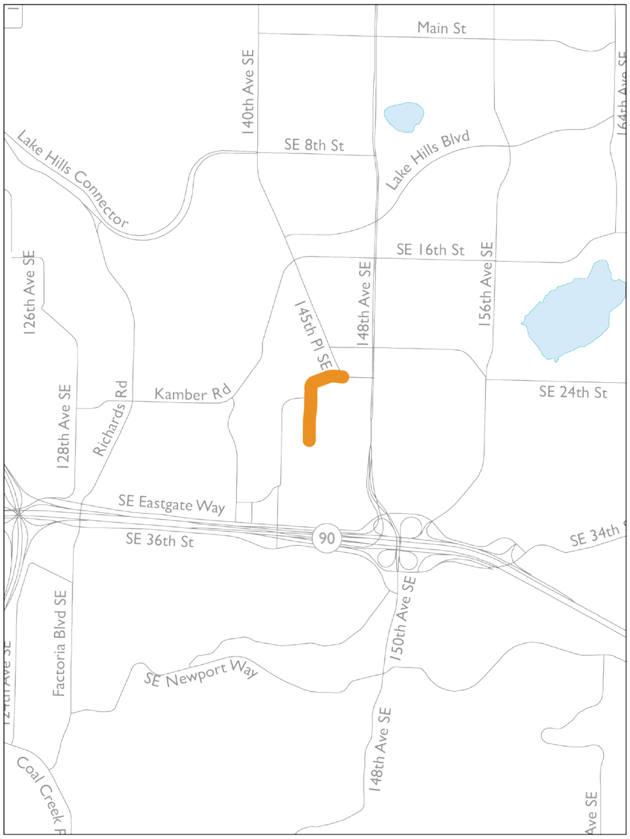


Person Throughput

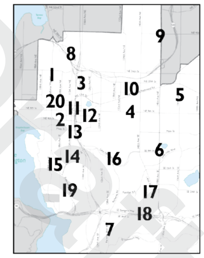


Vehicle Throughput

Bus Auto



17 Kelsey Creek Rd btw 145th Pl SE and Tyee River Rd



Buses[1]	46
Total Vehicles[1]	276
Percent Transit[1]	17%
Person Trips – Transit[1]	1,350
Person Trips – Total[1]	1,620
Percent Transit[1]	83%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]

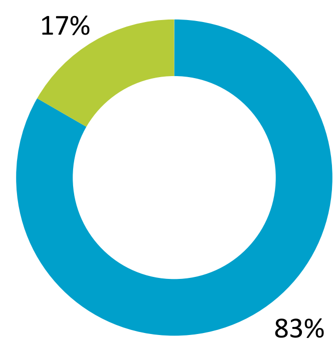
Long-Term

Composite Score	12
Weekday Ridership	6
Weekday Bus Volumes	4
Approach Delay (sec)	1
Approach Queue Length (ft)	1
Intersection LOS	0

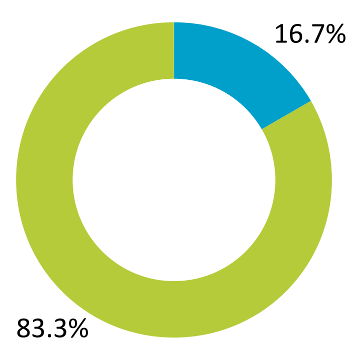
1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]

2030 PM Peak

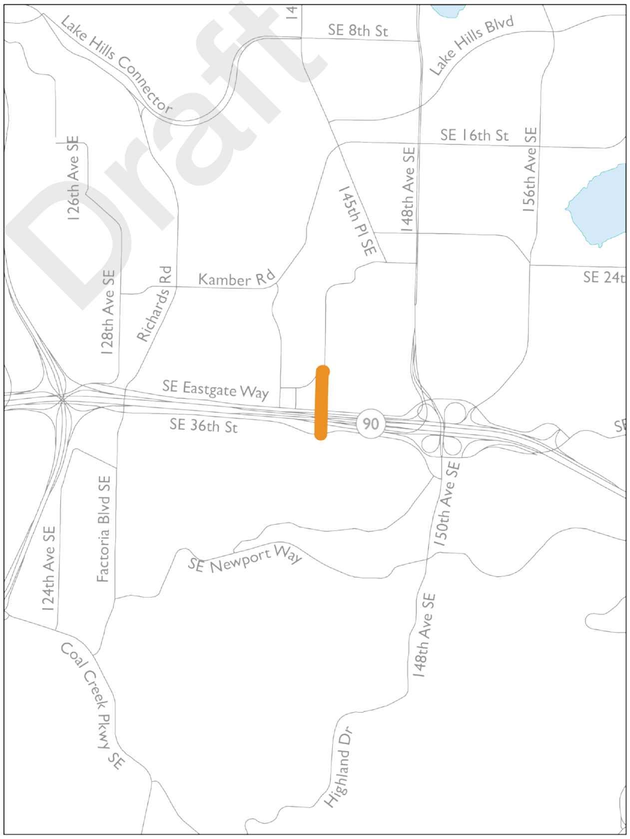


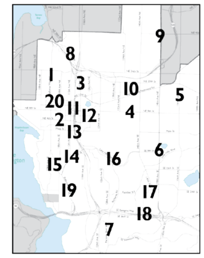
Person Throughput



Vehicle Throughput

Bus Auto





18 142nd Pl SE btw Coal Creek Rd and SE 36th St

Buses[1]	40
Total Vehicles[1]	625
Percent Transit[1]	6%

Person Trips – Transit[1]	1,025
Person Trips – Total[1]	1,920
Percent Transit[1]	53%

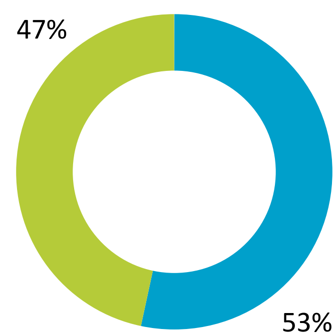
[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

Weighted Scores[2]
Long-Term

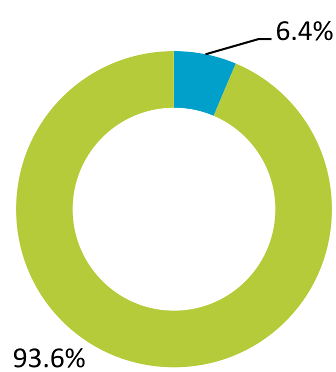
Composite Score	15 - 19 (17.0)
Weekday Ridership	0 - 4 (2.0)
Weekday Bus Volumes	3
Approach Delay (sec)	4
Approach Queue Length (ft)	4
Intersection LOS	4

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

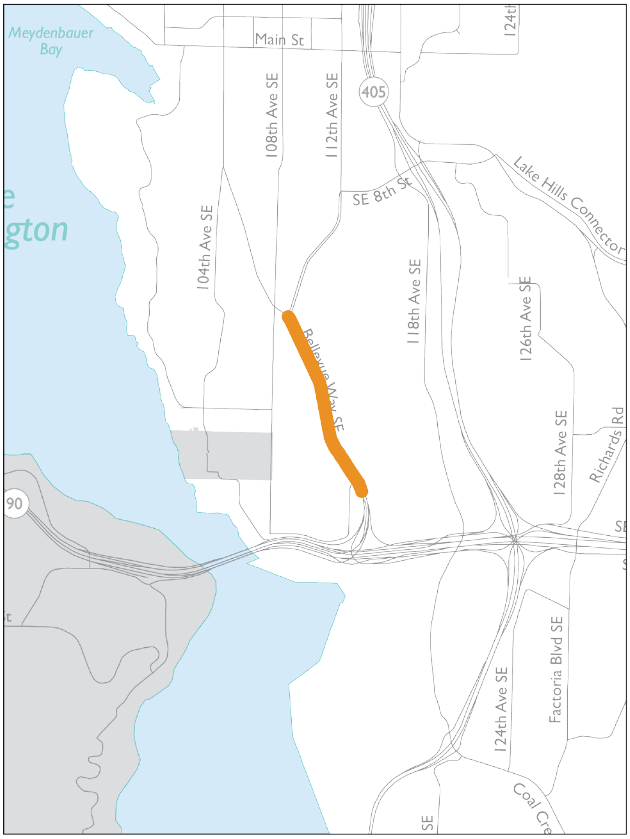


Person Throughput

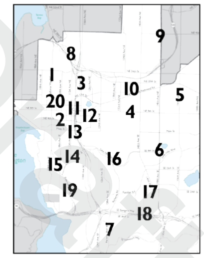


Vehicle Throughput

Bus Auto



19 Bellevue Way SE btw 113th Ave SE and I-90



Buses[1]	48
Total Vehicles[1]	4,618
Percent Transit[1]	1%

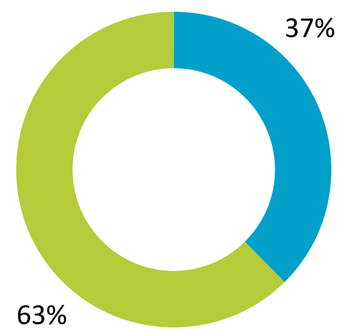
Person Trips – Transit[1]	3,830
Person Trips – Total[1]	10,330
Percent Transit[1]	37%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

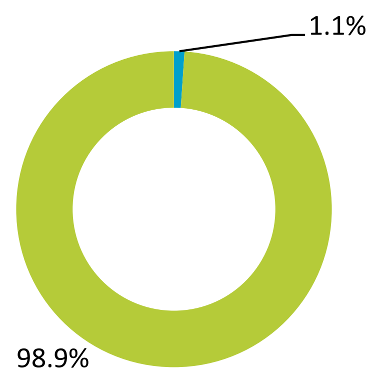
	Weighted Scores[2] Long-Term
Composite Score	22 - 23 (22.7)
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	2 - 4 (3.0)
Approach Queue Length (ft)	4
Intersection LOS	3 - 4 (3.7)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

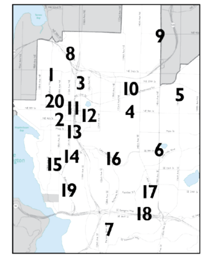


Person Throughput



Vehicle Throughput

Bus   Auto



20 NE 10th St btw Bellevue Way NE and 112th Ave NE

Buses[1]	24
Total Vehicles[1]	2,349
Percent Transit[1]	1%

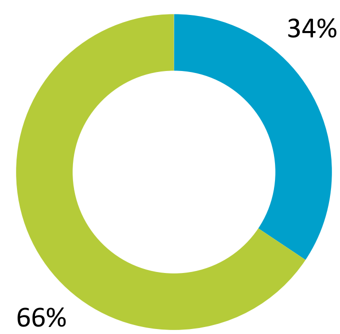
Person Trips – Transit[1]	1,658
Person Trips – Total[1]	4,823
Percent Transit[1]	34%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

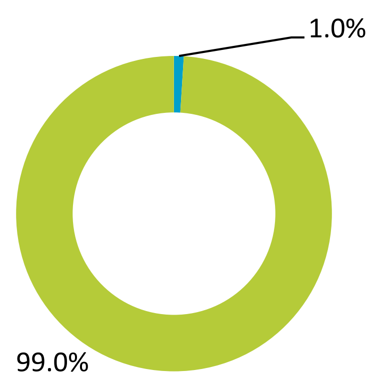
	Weighted Scores[2] Long-Term
Composite Score	17 - 19 (18.0)
Weekday Ridership	6 - 8 (7.0)
Weekday Bus Volumes	1 - 3 (2.3)
Approach Delay (sec)	2 - 4 (3.3)
Approach Queue Length (ft)	2 - 4 (3.3)
Intersection LOS	2 - 3 (2.3)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



Person Throughput



Vehicle Throughput

Bus Auto

APPENDIX D4: BELLEVUE WAY SE TRAFFIC ANALYSIS SUMMARY

City of Bellevue

Bellevue Way SE Traffic Analysis Summary

January 24, 2013

Numerous analyses of Bellevue Way SE have been conducted during the planning and preliminary engineering stage of the East Link project. Initially, analyses were focused on the effects of the East Link project itself, with a focus on ensuring that the 900+/- stall expansion of the South Bellevue Park and Ride would be adequately mitigated. Subsequently, the City Council expressed an interest in addressing underlying corridor traffic congestion. For the purposes of this summary, the "Project" is defined as the addition of the southbound HOV lane from the "Y" to the South Bellevue Park and Ride Lot.

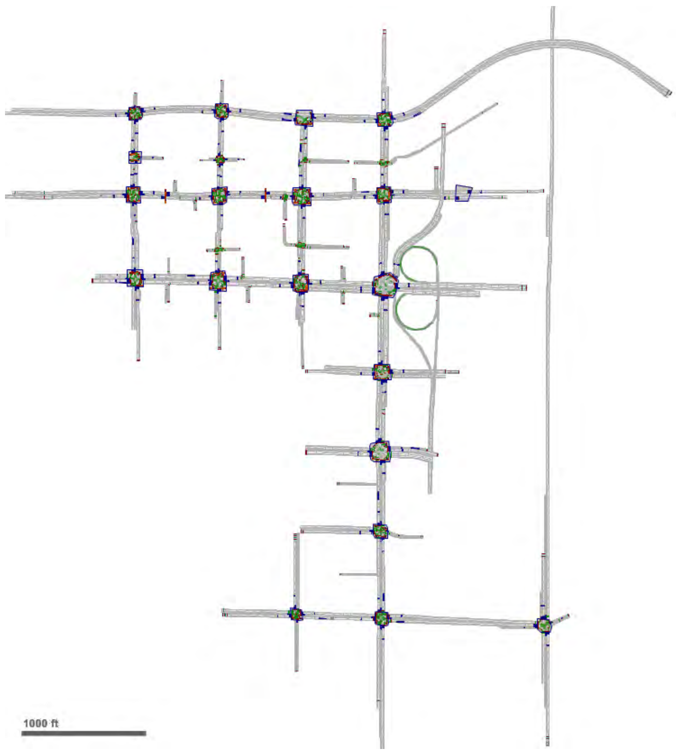
PM Peak Hour Indicators:

Summary: The Project would substantially reduce transit, HOV, and general purpose travel times while increasing person and vehicle throughput/volumes. At the same time it would reduce neighborhood cut-through traffic. Overall, the Project would result with a more efficient transportation system.

"Y" to Park and Ride	No Build/East Link Mitigated	Project	Change	Percent Change
Travel Time Minutes				
General purpose	3.4	2.0	-1.4	-41%
Transit	3.9	1.4	-2.5	-64%
HOV	3.4	1.2	-2.2	-65%
Volumes				
Bellevue Way SE southbound vehicles	2390	1840 GP 1160 HOV 3000 total	+610	+26%
Transit routes	9	9	0	0
Person trips – total	4440	6030	1590	+36%
Person trips – transit	1520	1690	170	+11%
Person trips – Auto-HOV	2920	1830 + 2510	1420	+49%
Southbound neighborhood vehicle volumes	470 (108th Ave SE) 300 (104th Ave SE) 770 total	210 (108th Ave SE) 190 (104th Ave SE) 400 total	-260 (108th) -110 (104th) -370 total	-55% -37% -48% total
Cost				
	$18-20m (City build independently)	$11m (City share of $22m joint project)		

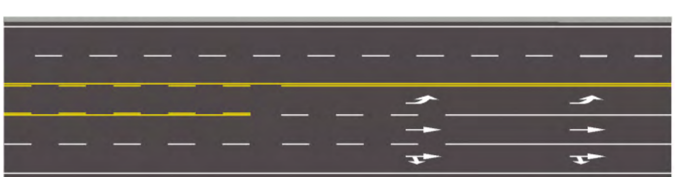
Belway HOV Summary Table For Council 1-24-13.Docx

APPENDIX D5: DOWNTOWN BELLEVUE MICRO-SIMULATION ANALYSIS

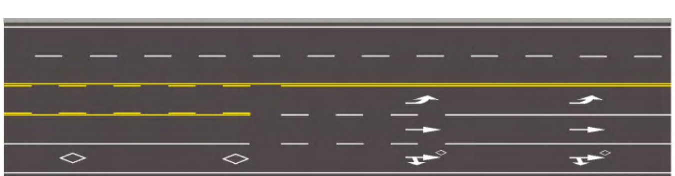


Appendix Figure 10 Downtown Bellevue study area boundaries.

Existing Configuration



Future with Improvement



Appendix Figure 11 Existing configuration of the roadway and the proposed restriping for both NE 10th Street and Main Street.

In the *Draft Speed and Reliability Project List* (November 2013), Bellevue staff brought forward a number of potential arterial High-Occupancy Vehicle (HOV) lane projects for Transportation Commission consideration. These projects are intended to support Bellevue's Frequent Transit Network (FTN) vision of enabling more people to reach more destinations in less time (see the *Transit Service Vision Report*).

At its November 14, 2013 meeting, the Commission requested additional information about Running Way Projects L11 and L13, eastbound HOV lanes between Bellevue Way and 112th Ave NE on Main Street and NE 10th St, respectively. Both projects propose converting an existing general purpose travel lane in the eastbound direction into an HOV lane. This memo summarizes the results of a VISSIM micro-simulation traffic model analysis of these Downtown Bellevue HOV alternatives.

The VISSIM model used in this assessment of potential HOV lanes is based on the platform developed for the Downtown Bellevue Light Rail Alternatives Analysis (see *Documentation Report,* February 2010). VISSIM is a microscopic, time step- and behavior-based simulation developed to model urban traffic and public transit operations. The program can analyze traffic and transit operations under constraints such as lane configuration, traffic composition, traffic signals, and transit stops, thus making it a useful tool for the evaluation of various alternatives based on transportation engineering and planning measures of effectiveness. Appendix Figure 10 shows the Downtown Bellevue study area boundaries considered in this assessment.

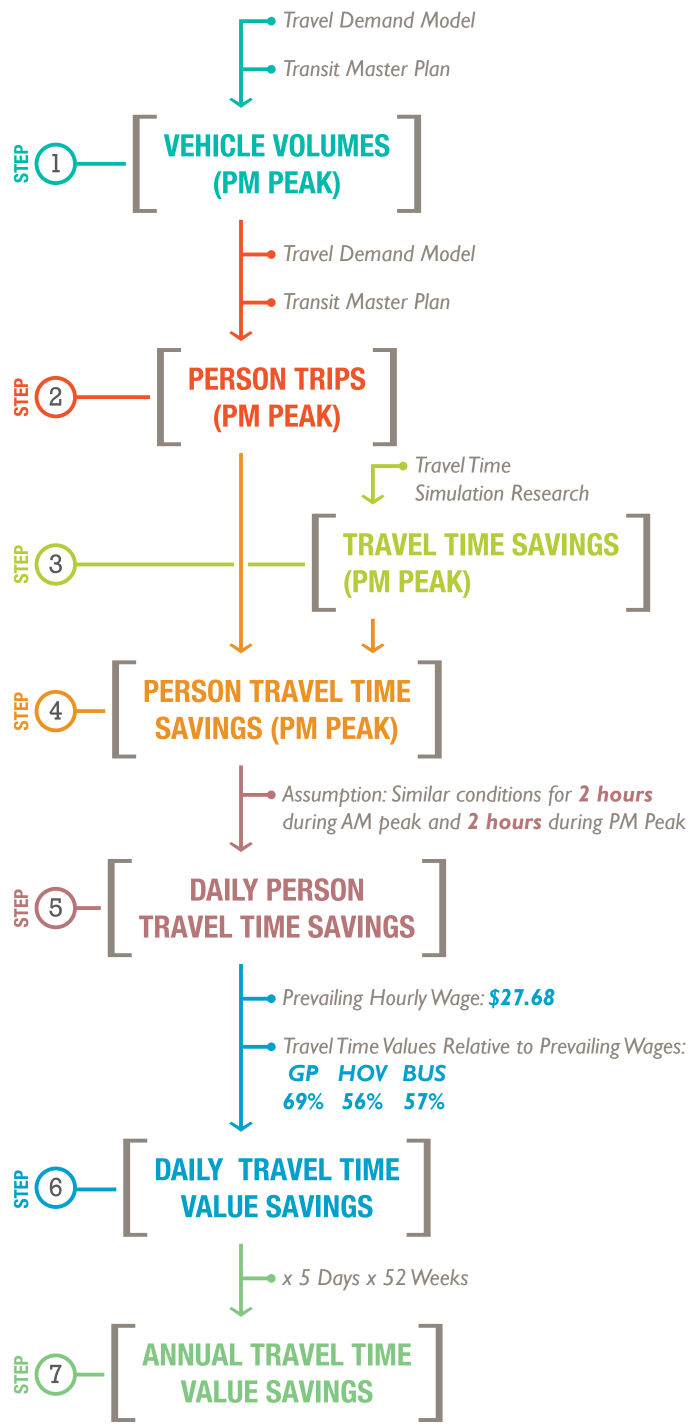
Appendix Figure 11 depicts the existing configuration of the roadway and the proposed restriping for both NE 10th St and Main St. As noted, these projects remain within existing street rights-of-way. The HOV lane alternative incorporates Transit Signal Priority (TSP) along NE 10th St at 106th Ave NE, 108th Ave NE, 110th Ave NE, and 112th Ave NE.

Traffic Analysis Methodology

VISSIM was used to assess the 2030 PM peak impacts of the HOV lane alternative on general purpose (GP), high-occupancy vehicle (HOV), and transit (Bus) travel times, as well as measurements of vehicle and person delay. Travel time is one of the largest categories of transport costs, and time savings are often claimed to be the greatest benefit of transport projects like roadway and public transit improvements. Appendix Figure 12 reflects the seven step methodology used for the travel time analysis:

1. Factor inbound volume at 108th Ave NE/ NE 10th St to route volume based on EMME travel demand model output.
2. Factor vehicle volume to person volume based on occupancy rate for each mode.
3. Vehicle travel time difference from baseline to HOV Alternative for each route/mode.
4. Multiply travel time difference with total person for each route/mode.
5. Factor PM Peak-Hour improvement to daily improvement.
6. Factor hourly wages into travel time values for each mode. Multiply person travel time savings with travel time values for each route/mode.
7. Extend travel time savings from daily to annual for each route/mode.

Appendix Figure 12 Seven step traffic analysis methodology.



Route 1:
From: Bellevue Way NE/NE 10th Street
To: 112th Avenue NE/NE 10th Street

Route 2:
From: Bellevue Way NE/NE 10th Street
To: 108th Avenue NE/NE 8th Street

Route 3:
From: 112th Avenue NE/NE 10th Street
To: Bellevue Way NE/NE 10th Street

Route 4:
From: 112th Avenue NE/NE 10th Street
To: 108th Avenue NE/NE 8th Street

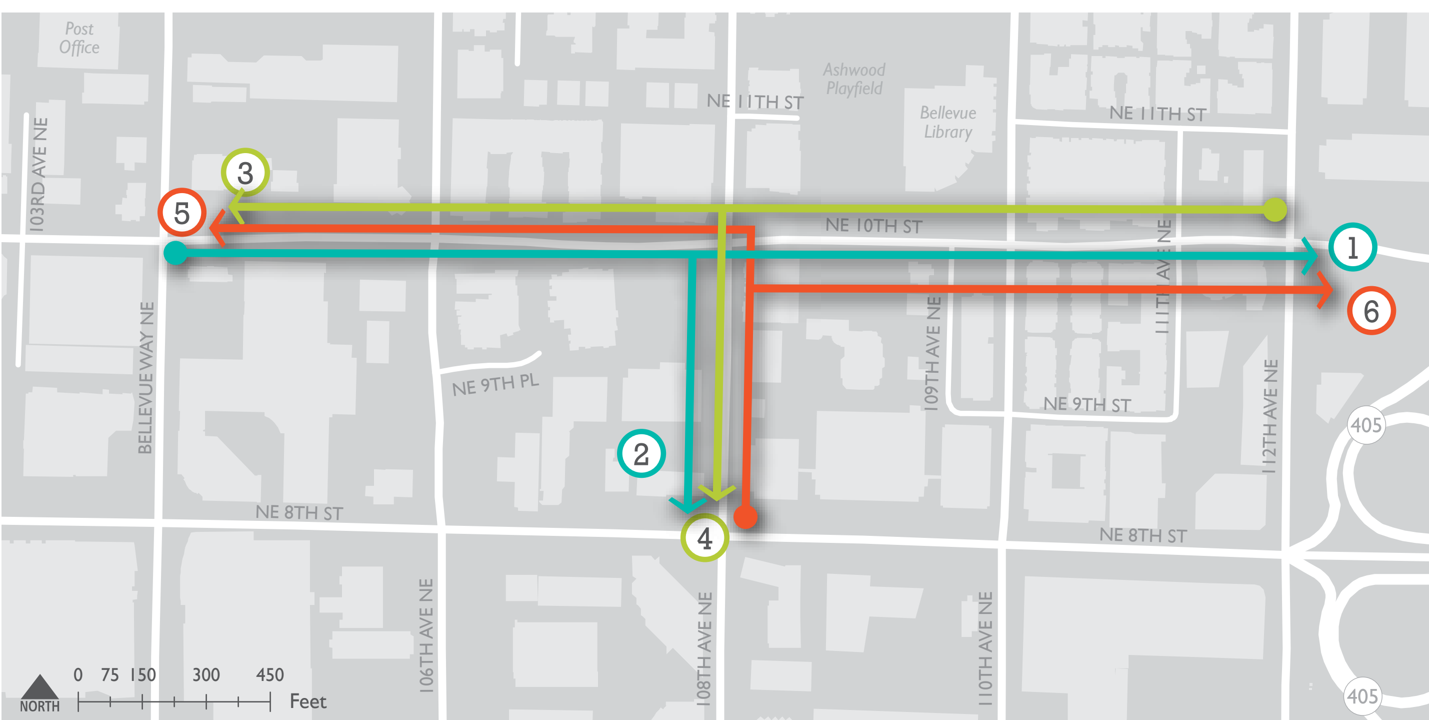
Route 5:
From: 108th Avenue NE/NE 8th Street
To: Bellevue Way NE/NE 10th Street

Route 6:
From: 108th Avenue NE/NE 8th Street
To: 112th Avenue NE/NE 10th Street

As indicated, this methodology produces PM peak vehicle travel time (in seconds) and person travel time (in hours) statistics by mode (GP, HOV, and Bus). Daily person travel time savings figures are derived from these statistics and then monetized based on the average hourly wage of workers in the Seattle-Bellevue-Everett Metropolitan Division (Source: *Bureau of Labor Statistics*, May 2012). The valuation of time is cross-referenced with adjustment factors to reflect qualitative factors such as comfort, convenience, and reliability using Level-of-Service ratings for various modes (Source: *Victoria Transport Policy Institute*, see page 5.2-10). The final step of the analysis annualizes the value of daily travel time savings.

The analysis methodology for the NE 10th St improvements considers the travel time impact on general purpose (GP), high-occupancy vehicle (HOV), and transit (Bus) for the six different routes to/from and along NE 10th Street described at left (see Appendix Figure 13).

Appendix Figure 13 Six routes to/from and along NE 10th Street.



NE 10th Street Analysis Results

Appendix Tables 2 through 9 below and on the following pages provide the results from the analysis methodology for each of the six routes identified for the NE 10th St analysis.

Appendix Table 12 Routes vehicle volume estimation (PM Peak-Hour) values derived from factoring inbound volumes at 108th Ave NE/NE 10th Street to route volume based on EMME travel demand model output.

From EMME Travel Demand Model						*In Vissim Model*			
Total Inbound Volume @ 108th & 10th		Route	Vol at Start	Vol at the End	Total Vol	Total Inbound Volume @ 108th & 10th		Route	Total Vol
Eastbound	*1,156*	*1*	*728*	*815*	*513*	*Eastbound*	*1,262*	*1*	*560*
		2	*728*	*99*	*62*			*2*	*68*
Westbound	*1,308*	*3*	*936*	*549*	*393*	*Eastbound*	*576*	*3*	*173*
		4	*936*	*355*	*254*			*4*	*112*
Northbound	*849*	*5*	*849*	*79*	*79*	*Northbound*	*574*	*5*	*53*
		6	*849*	*269*	*269*			*6*	*182*

Estimated Volumes per Route per Mode								
Mode Split				Vehicle Volume				
GP	HOV-2	HOV-3+	HV	GP	HOV-2	HOV-3+	HV	BUS
70%	*21%*	*7%*	*2%*	*392*	*118*	*39*	*11*	—
70%	*21%*	*7%*	*2%*	*48*	*14*	*5*	*1*	*8*
70%	*21%*	*7%*	*2%*	*121*	*36*	*12*	*3*	—
70%	*21%*	*7%*	*2%*	*78*	*23*	*8*	*2*	*8*
70%	*21%*	*7%*	*2%*	*37*	*11*	*4*	*1*	*8*
70%	*21%*	*7%*	*2%*	*127*	*38*	*13*	*4*	*8*

Appendix Table 13 Routes person volume estimation (PM Peak-Hour) values derived from factoring vehicle volume to person volume based on occupancy rate for each mode.

Benefit - HOV+TSP	*Vehicle Volume*				
Route	GP	HOV-2	HOV-3+	HV	BUS
1	*392*	*118*	*39*	*11*	*—*
2	*48*	*14*	*5*	*1*	*8*
3	*121*	*36*	*12*	*3*	*—*
4	*78*	*23*	*8*	*2*	*8*
5	*37*	*11*	*4*	*1*	*8*
6	*127*	*38*	*13*	*4*	*8*

Person Volume				
GP	HOV-2	HOV-3+	HV	BUS
1	*2*	*3.5*	*2*	*90*

Benefit - HOV+TSP	*Person Volume*				
Route	GP	HOV-2	HOV-3+	HV	BUS
1	*392*	*236*	*136.5*	*22*	*—*
2	*48*	*28*	*17.5*	*2*	*720*
3	*121*	*72*	*42*	*6*	*—*
4	*78*	*46*	*28*	*4*	*720*
5	*37*	*22*	*14*	*2*	*720*
6	*127*	*76*	*45.5*	*8*	*720*

Appendix Table 14 Travel time difference (PM Peak-Hour) values based on vehicle travel time difference from baseline to HOV Alternative for each route/mode.

Baseline (Direct output from VISSIM)

Vehicle Travel Time Measurement	TRAVTM(ALL)	TRAVTM(1)	TRAVTM(10)	TRAVTM(12)	TRAVTM(13)	TRAVTM(20)	TRAVTM(31)
1	247.44	247.19	247.02	243.87	259.69	255.18	0
2	209.57	212.15	210.74	213.09	150.77	177.51	215.69
3	139.33	139.91	139.4	136.34	143.86	151.98	0
4	160	165.9	146.94	137.62	141.33	183.46	193.54
5	197.31	200.37	247.33	169.91	320.28	168.08	160.8
6	241.52	243.9	244.08	235.77	235.55	213	248.2

HOV + TSP (Direct output from VISSIM)

Vehicle Travel Time Measurement	TRAVTM(ALL)	TRAVTM(1)	TRAVTM(10)	TRAVTM(12)	TRAVTM(13)	TRAVTM(20)	TRAVTM(31)
1	309.88	343.34	343.48	231.88	236.82	333.93	0
2	245.18	247.69	277.35	228.69	217.47	305.72	188.29
3	142.55	141.21	141.72	144.01	148.82	130.95	0
4	209.9	211.97	200.59	186.23	195.1	109.87	234.45
5	180.19	173.17	216.77	216.95	142.46	70.54	127.4
6	224.9	227.28	230.79	217.1	225.03	214.17	187.67

Vehicle Travel Time Change (in seconds) - TSP+HOV

Route	GP	HOV-2	HOV-3+	HV	BUS
1	96.46	-11.99	-22.87	78.75	0
2	66.61	15.6	66.7	128.21	-27.4
3	2.32	7.67	4.96	-21.03	0
4	53.65	48.61	53.77	-73.59	40.91
5	-30.56	47.04	-177.82	-97.54	-33.4
6	-13.29	-18.67	-10.52	1.17	-60.53

Appendix Table 15 Person travel time savings (PM Peak-Hour) values derived from multiplying the travel time difference with total person for each route/mode.

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	10.50	-0.79	-0.87	0.48	—	9.33
2	0.89	0.12	0.32	0.07	-5.48	-4.08
3	0.08	0.15	0.06	-0.04	—	0.25
4	1.16	0.62	0.42	-0.08	8.18	10.30
5	-0.31	0.29	-0.69	-0.05	-6.68	-7.45
6	-0.47	-0.39	-0.13	0.00	-12.11	-13.10
Total by Mode	**11.85**	**0.00**	**-0.89**	**0.38**	**-16.08**	**-4.74**

Appendix Table 16 Person travel time savings (daily) values derived from factoring PM Peak-Hour improvement to daily improvement.

PM Peak-Hour to Daily Rate

GP	HOV-2	HOV-3+	HV	BUS
4	4	4	4	4

*** Assumes 2 hours during PM and same benefitial impact during AM 2 hour period*

Person Travel Time Change (in hours) - TSP+HOV (Daily)

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	42.01	-3.14	-3.47	1.93	—	37.33
2	3.55	0.49	1.30	0.28	-21.92	-16.30
3	0.31	0.61	0.23	-0.14	—	1.02
4	4.65	2.48	1.67	-0.33	32.73	41.21
5	-1.26	1.15	-2.77	-0.22	-26.72	-29.81
6	-1.88	-1.58	-0.53	0.01	-48.42	-52.40
Total by Mode	**47.40**	**0.01**	**-3.57**	**1.54**	**-64.34**	**-18.96**

Draft

Appendix Table 17 Travel time values derived from factoring hourly wages into travel time values for each mode.

Average Hourly Wage: $27.68

	GP	HOV-2	HOV-3+	HV	BUS
Relative to Prevailing Wages	*67%*	*57%*	*53%*	*135%*	*57%*
Travel Time Values	*$18.55*	*$15.78*	*$14.67*	*$37.37*	*$15.78*

Appendix Table 18 Total travel time savings (daily) values derived from multiplying travel time savings with travel time values for each route/mode.

Daily Travel Time Savings - TSP+HOV

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	*$779.10*	*($49.54)*	*($50.91)*	*$72.12*	—	*$750.77*
2	*$65.84*	*$7.73*	*$19.07*	*$10.46*	*($345.84)*	*($242.74)*
3	*$5.75*	*$9.62*	*$3.37*	*($5.23)*	—	*$13.52*
4	*$86.24*	*$39.13*	*$24.50*	*($12.33)*	*$516.40*	*$653.93*
5	*($23.37)*	*$18.14*	*($40.64)*	*($8.22)*	*($421.58)*	*($475.66)*
6	*($34.87)*	*($24.93)*	*($7.78)*	*$0.37*	*($763.95)*	*($831.15)*
Total by Mode	**$878.69**	**$0.16**	**($52.37)**	**$57.17**	**($1,014.97)**	**($131.32)**

Appendix Table 19 Total travel time savings (annual) values derived from extending travel time savings from daily to annual for each route/mode.

Workdays per Week: 5
Weeks per Year: 52

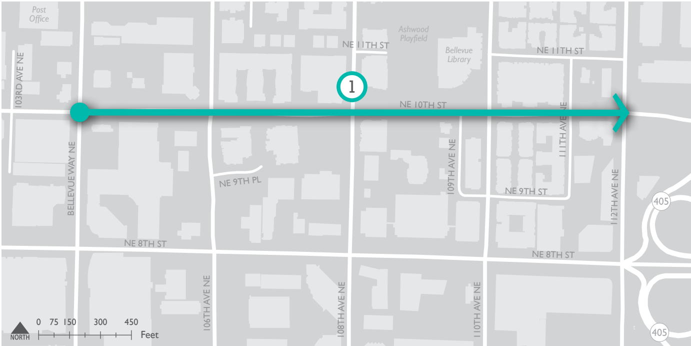
Annual Travel Time Savings - TSP+HOV (in thousands)

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	*$202.57*	*($12.88)*	*($13.24)*	*$18.75*	—	*$195.20*
2	*$17.12*	*$2.01*	*$4.96*	*$2.72*	*($89.92)*	*($63.11)*
3	*$1.49*	*$2.50*	*$0.88*	*($1.36)*	—	*$3.51*
4	*$22.42*	*$10.17*	*$6.37*	*($3.21)*	*$134.26*	*$170.02*
5	*($6.08)*	*$4.72*	*($10.57)*	*($2.14)*	*($109.61)*	*($123.67)*
6	*($9.07)*	*($6.48)*	*($2.02)*	*$0.10*	*($198.63)*	*($216.10)*
Total by Mode	**$228.46**	**$0.04**	**($13.62)**	**$14.86**	**($263.89)**	**($34.14)**

NE 10th Street Summary

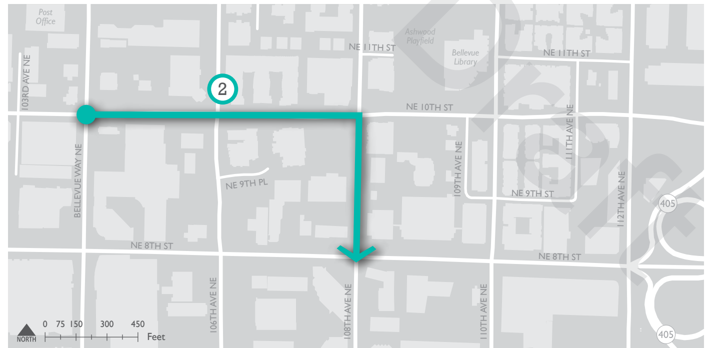
Appendix Figure 14 on page A243 provides a summary of the travel time impact on general purpose (GP), high-occupancy vehicle (HOV), and transit (Bus) for the six different routes to/from and along NE 10th St described above. Some routes experience travel time penalties while others experience travel time benefits. When all of the various routes to/from and along NE 10th St are taken into account, the HOV lane alternative results in an annual travel time savings of $34,140. After considering these impacts at two meetings (on January 22, 2014 and January 23, 2014), the Transportation Commission was in unanimous agreement that these Downtown Bellevue HOV lane projects should remain in the Transit Master Plan for consideration when bus frequencies along these corridors justify this lane conversion.

Appendix Figure 14 Travel time impacts to the six routes to/from and along NE 10th St.



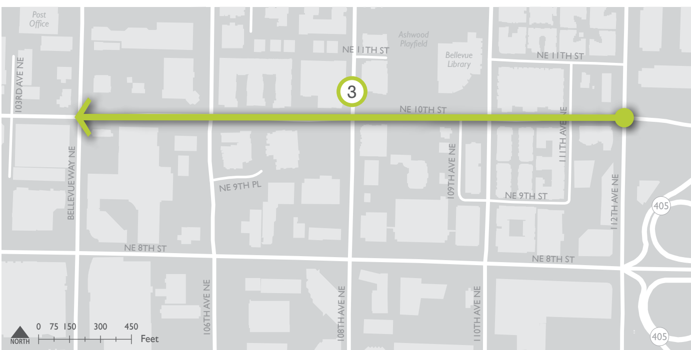
Route 1

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$173.56 +19.7%
95.97	-14.71	—	10.98	-1.65	—	



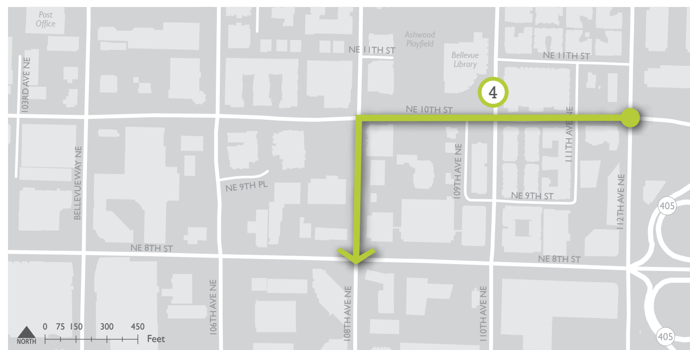
Route 2

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$56.10 -7.8%
68.32	28.38	-27.40	0.96	0.44	-5.48	



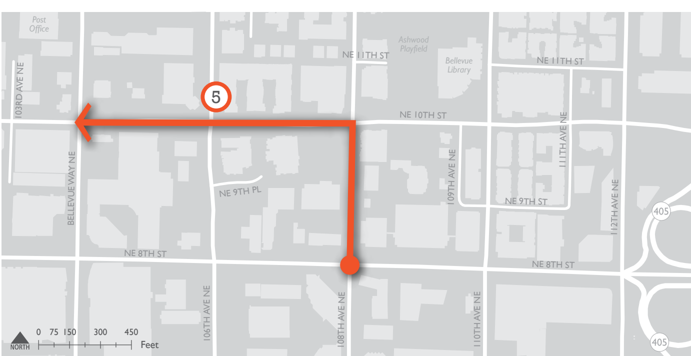
Route 3

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$3.15 +2.1%
1.67	6.99	—	0.04	0.21	—	



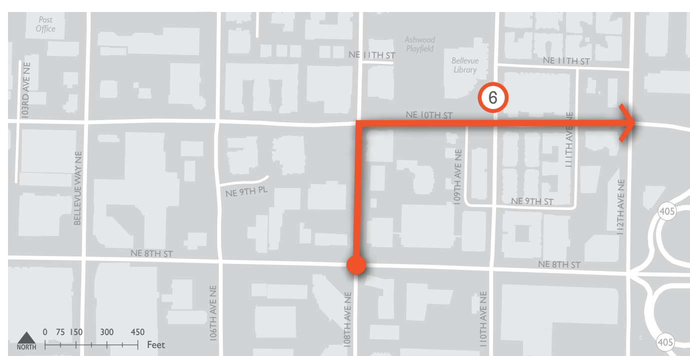
Route 4

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$151.24 +22.7%
50.12	49.90	40.91	1.08	1.04	8.18	



Route 5

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$109.92 -20.1%
-32.42	-9.18	-33.40	-0.36	-0.40	-6.68	



Route 6

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$192.16 -19.2%
-12.89	-16.63	-60.53	-0.47	-0.52	-12.11	

Main Street Analysis

The improvement evaluated at the Main Street/112th Avenue intersection included the conversion of the eastbound general purpose curb lane to an HOV lane (Project L11) and the widening of Main Street to provide a dedicated eastbound right-turn lane. The analysis assumed that right-turns for general purpose traffic would be permitted from the HOV lane.

Similar to the analysis of NE 10th St, the impacts of the Main St project were also measured using VISSIM. The VISSIM model used for this analysis is consistent with that described for the NE 10th St; however, unlike the analysis of the NE 10th project, this analysis focused on intersection delay, both from a vehicle perspective and person delay perspective. Since this improvement is limited to the subject intersection only, the analysis focuses primarily on the intersection operations. The impact of the use restriction of the curb lane is reflected in the intersection operations summary, the results of which are shown in Appendix Table 20.

Appendix Table 20 Impacts to vehicle and person delay at Main Street/112th Ave NE resulting from Running Way Project L11.

Main St / 112th Ave NE	Baseline		HOV + TSP	
	LOS	Delay (sec)	LOS	Delay (sec)
Vehicle Delay	E	62.0	D	54.5
Person Delay	E	66.8	D	53.7

Assumed Vehicle Occupancy:

SOV: 1

Buses: 90

Main Street Summary

The analysis shows that the average vehicle delay at the intersection is reduced from 62.0 seconds to 54.5 seconds, and person delay is reduced from 66.8 seconds to 53.7 seconds with the improvement. Although the curb lane is restricted to HOV traffic, the right-turn lane provides additional intersection capacity that results in the improvements in both vehicle and personal delay shown in Appendix Table 20. As part of the next level of analysis, further evaluation of the length of the right turn lane and its impact on the corridor performance should be conducted.

APPENDIX D6: BELLEVUE COLLEGE CONNECTION – 142ND PL SE / SNOQUALMIE RIVER RD MULTIMODAL TRANSPORTATION CORRIDOR

One of the more significant projects included in this report is the Bellevue College Connection Multimodal Transportation Corridor (Running Way Project L27), which is located between the intersection of 142nd Pl SE and SE 36th St on the south end and SE 24th St and Kelsey Creek Rd on the north end. The corridor spans the length of the 142nd Pl SE Bridge from SE 36th St to SE 32nd St, continues north along Snoqualmie River Rd to its intersection with Kelsey Creek Rd, and proceeds north to SE 24th St (see Appendix Figure 16 on page A246). This multimodal corridor as proposed and reflected in the preliminary designs presented here is intended to support pedestrians, bicyclists, and transit users.

This project was previously highlighted in the *Transportation Strategies Report*, part of the *Eastgate/I-90 Lane Use and Transportation Project* completed in 2012 (see Appendix Figure 15). That report outines a vision that will guide public and private actions, investments, and capital project priorities to improve mobility for all travel modes in the Eastgate/I-90 corridor. Potential improvements advanced by the plan are oriented toward finding the best transportation solutions for the area that are affordable, supported by the community, and can be implemented in a reasonable time frame. The list includes projects that would improve traffic flow at critical intersections, enhance the pedestrian/bicycle environment, and increase the attractiveness of transit as a travel option. One of the transit improvements proposed is the development of 142nd Pl SE as a transit emphasis corridor, including upgrading Snoqualmie River Rd to support buses and accessible bus stops. This project has since been adopted into the *2013-2024 Transportation Facilities Plan* (TFP-252).

Transportation Strategies Report

Eastgate/I-90
Land Use & Transportation Project

CITY OF BELLEVUE
January 2012

Department of Transportation
Department of Planning and Community Development

delivery at the direct access ramp and at the intersection with SE 36th Street. At present, these two major transit hubs are less than a half mile apart as the crow flies. Unfortunately, terrain and the road network make this a very difficult connection. Coaches go all the way out to 148th Avenue and turn onto Eastgate Way; this amounts to three signalized left turns in the northbound direction, in addition to a lot of added distance.

To enhance linkages between the Park & Ride and College, the preferred land use and transportation vision incorporates a covered walkway on the 142nd Place SE bridge (much like the Totem Lake I-405 direct access ramp has between the Kingsgate Park & Ride and the flyer stops). At present, the walk is exposed to the elements, which reduces the attractiveness of transferring between local and regional service at this location.

In addition to improving pedestrian comfort with weather protection, bus stops would be placed on the 142nd Place SE bridge immediately adjacent to the I-90 flyer stops to allow for seamless transfers between regional service on I-90 and local service to Factoria, Bellevue College, and points beyond. To realize this location's transfer potential (which will lead to greater ridership), the sidewalk on the bridge would be widened to 8 feet to allow for bus stops on the structure (the sidewalk is only 6 feet wide).

Structural modifications of the bridge structure do not appear necessary to advance these improvements. Visual inspection shows that the travel lanes on the 142nd Place SE bridge are 14 feet wide and the sidewalks are 6 feet wide. It appears possible to narrow the travel lanes to 12 feet and widen the sidewalks to 8 feet, which would be required for a bus stop. Buses would stop in-lane on the bridge, which may delay traffic on the bridge at times.

Figure 29 on the previous page shows the concept of a wider/covered pedestrian walkway across the 142nd Place SE bridge connecting with and contributing to the Mountains to Sound Greenway trail concept on the SE 36th Street frontage road. North of the bridge, improvements would be made on Snoqualmie River Road, which includes upgraded pavement to support buses, sidewalks, accessible bus stops, and the south entrance intersection. This capital investment would allow for the bus routing concept depicted in Figure 30 (source: *Bellevue College Transportation Planning Study*; July 2011).

Developing 142nd Place SE as a "transit emphasis corridor" necessitates a partnership between the City of Bellevue, Bellevue College, Sound Transit, and King County Metro to address the following key challenges: (i) a loss

Figure 30 *Bellevue College Transit Circulation Concept*

Appendix Figure 15 Revised transit routing around Bellevue College along Snoqualmie River Rd, as presented in the *Eastgate/I-90 Transportation Strategies Report*, adopted in January 2012.

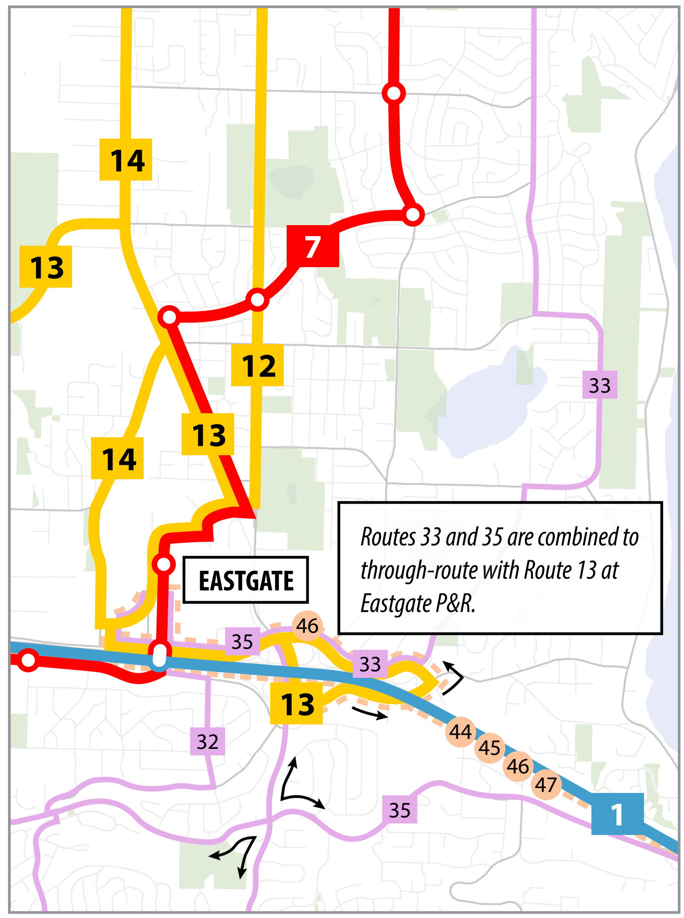
Appendix Figure 16 Full extents of the Bellevue College Connection: 142nd Pl SE / Snoqualmie River Rd Multimodal Transportation Corridor.

This corridor is especially significant to the Transit Master Plan because it improves the efficiency of transit operations to the Eastgate Park-and-Ride while maintaining direct frequent service to the Bellevue College campus. As described in the *Transit Service Vision Report*, the layout of Bellevue College currently presents a major obstacle to efficient service, and it also creates a conflict between the goal of serving the college well and the goal of providing efficient north-south service connecting Crossroads and Overlake to Eastgate and Factoria. The key is to put Bellevue College "on the way" between Eastgate and Crossroads; currently, Bellevue College is a time-consuming cul-de-sac that discourages all north-south ridership across the eastside of Bellevue. Eastgate will continue to grow more important as a regional connection site, so it must be possible to serve both the campus and Eastgate with a minimal amount of deviation.

As shown in Appendix Figure 17, the 2030 Growing Resources scenario envisions three FTN routes operating along the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor: Frequent Rapid Route 7 and Frequent Local Routes 12 and 13. The design of the Bellevue College Connection thus suggests two main types of linear segments along the corridor based on the location of transit, pedestrian, and bicycle traffic flows and the width of travel lanes:

- Snoqualmie River Rd/Kelsey Creek Rd
- 142nd Pl SE Bridge

All three FTN routes traverse the Snoqualmie River Rd/Kelsey Creek Rd segment. At the SE 32nd St intersection, Routes 12FL and 13FL continue southwest to the Eastgate Park-and-Ride, providing connections to Frequent Local Route 14, Coverage Routes 32, 33, and 35, and Peak-Only Route 46. Route 7FR continues south to the Eastgate Freeway Station, providing connections to Frequent Express Route 1, Coverage Route 32, and several Peak-Only routes serving Downtown Seattle and Issaquah (see Appendix Figure 18 on page A249).



WEEKDAY ALL-DAY SERVICE FREQUENCIES (in minutes)

	Peak	Base	Night
Frequent Express	8	10 - 15	30
Frequent Rapid	8	10	15
Frequent Local	8	10	15
Coverage	30	30	30
Peak-Only* (Express & Local)	*Peak frequencies vary by route		

Appendix Figure 17 Routes operating along the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor and in Eastgate and vicinity, as proposed by the 2030 Growing Resources scenario in the *Transit Service Vision Report*.

Snoqualmie River Rd / Kelsey Creek Rd

Pedestrian flow is logically oriented on the north and east sides of Snoqualmie River Rd around campus structures. A sidewalk is recommended to provide direct access to campus, with widths varying from 6-10 feet depending on the volume of pedestrian flow and the locations of the bus zones. To minimize conflict points between pedestrians and driveways, bicycle traffic is moved west of the road to a 10-foot-wide two-way path, with multiple points of access to the college provided. Two 12-foot-wide travel lanes are provided, one for each direction. General purpose vehicular traffic may be restricted along Snoqualmie River Rd to facilitate better transit operation and access for delivery trucks. A sound wall along Snoqualmie River Rd west of the bicycle facility is designed to minimize noise generated by traffic for the neighboring condominium developments.

142nd Pl SE Bridge

The 142nd Pl SE Bridge currently has two 14-foot-wide travel lanes (one for each direction) and 6-foot-wide sidewalks on both sides. No bicycle facility is provided, making riding over the bridge uncomfortable for most riders. There is significant pedestrian traffic on the west side of the 142nd Pl SE Bridge, mainly to/from the Eastgate Park-and-Ride and Eastgate Freeway Station. Due to pedestrian volumes, an 8-foot-wide sidewalk is recommended on the west side of the road. The east side of the road is identified as a suitable location for an independent bicycle facility, providing a direct connection to the Mountains to Sound Greenway at the northeast corner of SE 36th St and 142nd Pl SE. A 10-foot-wide, two-way, elevated bicycle facility is thus recommended on the east side of the road. These non-motorized facilities leave 22 feet for general purpose travel lanes, which at 11-feet per lane satisfies the minimum width criteria to support transit operations.

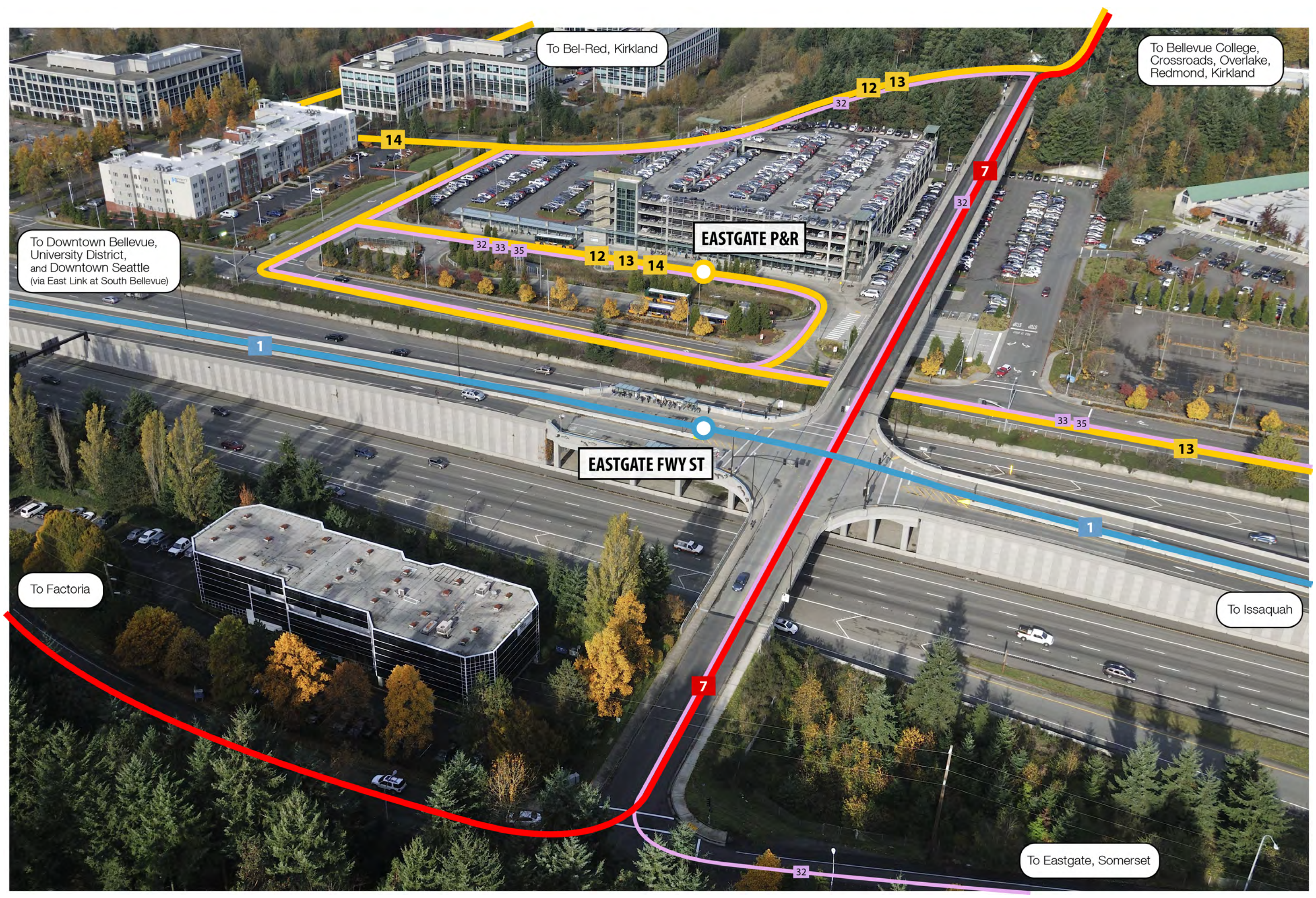
Corridor Sub-segments

Within these two main linear segments, multiple sub-segments warrant specific design consideration:

- **Segment 1:** Kelsey Creek Rd/SE 24th St to Kelsey Creek Rd/Snoqualmie River Rd
- **Segment 2:** Snoqualmie River Rd/Kelsey Creek Rd to Delivery Zone
- **Segment 3:** Delivery Zone to Greenhouse
- **Segment 4:** Bellevue College Transit Center on Snoqualmie River Road
- **Segment 5:** 142nd Pl SE/SE 32nd St
- **Segment 6:** South of 142nd Pl SE/SE 32nd St to 142nd Pl SE north of I-90 Direct Access Ramp
- **Segment 7:** 142nd Pl SE/I-90 Direct Access Ramp to 142nd Pl SE/SE 36th St

Each of these corridor sub-segments is addressed individually on the following pages.

Appendix Figure 18 Transit services at the Eastgate Park-and-Ride and Eastgate Freeway Station in 2030 based on the Growing Resources network. Frequent connections are available to Bellevue College, Crossroads, Downtown Bellevue, Factoria, Issaquah, Overlake, Redmond, and Kirkland.



Segment 1

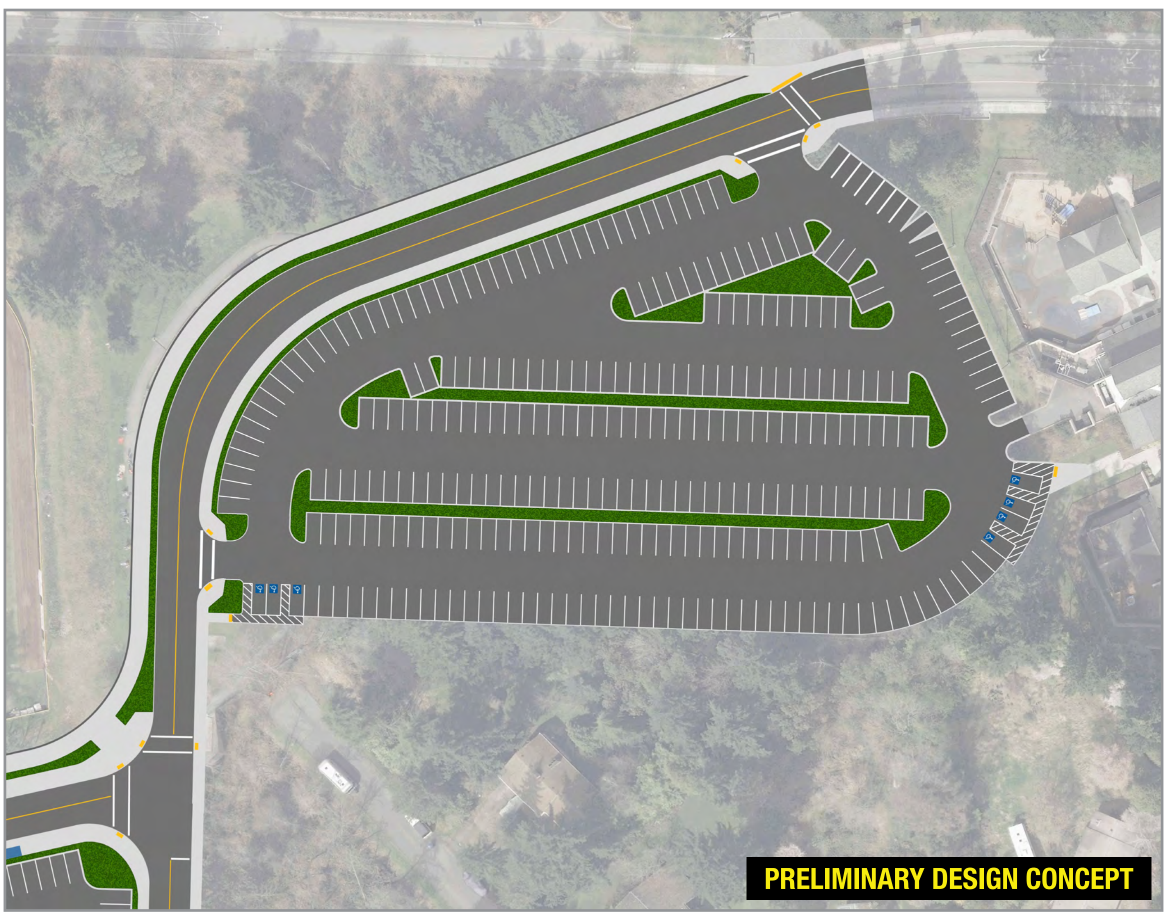
Kelsey Creek Rd/SE 24th St to Kelsey Creek Rd/Snoqualmie River Rd

A 6-foot wide sidewalk is proposed for the south and southeast side of the road. The parking lot is redesigned with only two driveways to reduce the number of the conflict points between pedestrians, transit, and general purpose traffic. The new parking lot design increases the number of stalls by 74, from 227 to 301 stalls (see Appendix Table 21 on page A267).

West of the intersection of Kelsey Creek Rd and SE 24th St, a two-way bicycle facility will be constructed on the north side of the road. East of this intersection, bicycle lanes will be provided in the shoulders of both sides of the road. Bicycle users will transition between these facilities at the SE 24th St intersection, such that bicyclists traveling westbound on SE 24th St would continue directly onto the two-way bicycle facility, while those traveling northeastbound from the campus would cross the street from the new bicycle path and continue along SE 24th St on the south side of the road. Bicyclists also have access to campus at the northwest corner of Snoqualmie River Rd and Kelsey Creek Rd.

Existing:

Proposed:



Segment 2

Snoqualmie River Rd/Kelsey Creek Rd to Delivery Zone

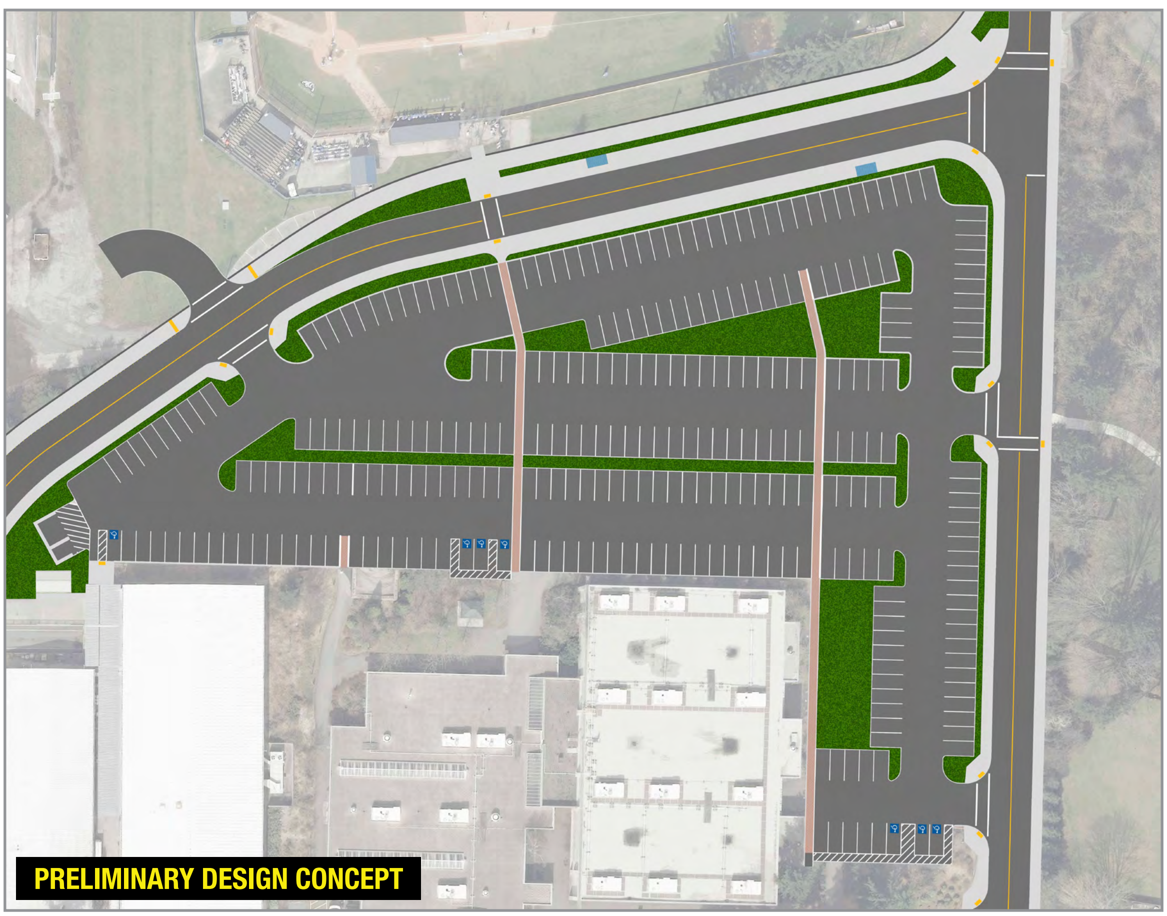
This segment is realigned and shifted north next to the athletic fields to reduce the number of potential conflicts between pedestrians, bicyclists, transit, general purpose traffic, and parking lot users. Parking lot traffic is focused on one side of Kelsey Creek Rd, compared to the current configuration that includes driveways on both sides. This also creates a single parking lot that is larger than the multiple separate existing lots, which allows for a design that maximizes parking capacity. This redesign adds 93 more stalls, increasing the number of stalls in this segment from 203 to 296 (see Appendix Table 21 on page A267).

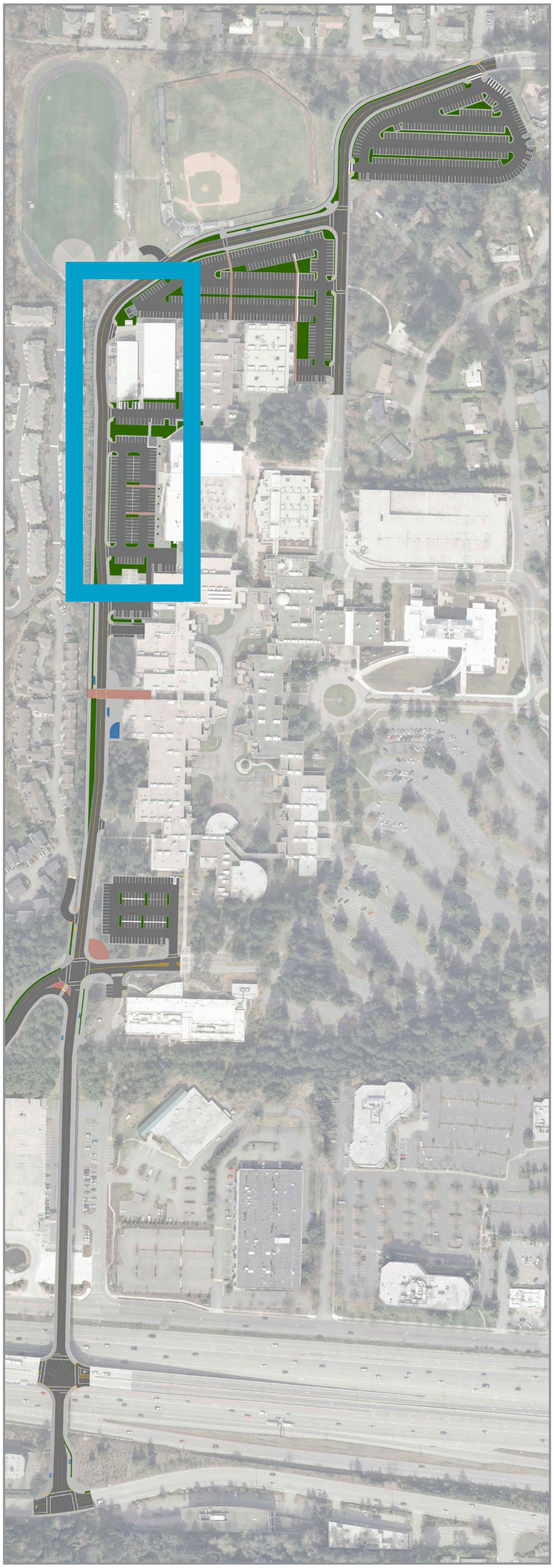
Another advantage of moving the road north is that it increases the turning radius between Snoqualmie River Rd and Kelsey Creek Rd, which will improve transit operations. Bus zones are located between the intersection of Snoqualmie River Rd/Kelsey Creek Rd and the pedestrian crossing to the athletic fields, as this is the longest distance without driveways or pedestrian crossings (about 300 feet). Ten-foot-wide sidewalks are provided on the north and south sides of Snoqualmie River Rd for the westbound (southbound) and eastbound (northbound) bus zones, respectively.

Two pedestrian crossing corridors are provided through the parking lot to facilitate pedestrian movement perpendicular to the parking aisles. Pedestrian access from the gymnasium buildings to the baseball fields remains at almost the same place as its current location. Ideally, to minimize the number of conflicts with bicyclists, it would be combined with the athletic fields' driveway, and the driveway would be moved slightly north from its current location. The bicycle facility is separated from the westbound (southbound) bus zone by a 4-foot-wide planter strip to avoid conflicts with pedestrians. Bicyclists have access to campus and to transit at that bus platform.

Existing:

Proposed:





Segment 3

Delivery Zone to Greenhouse

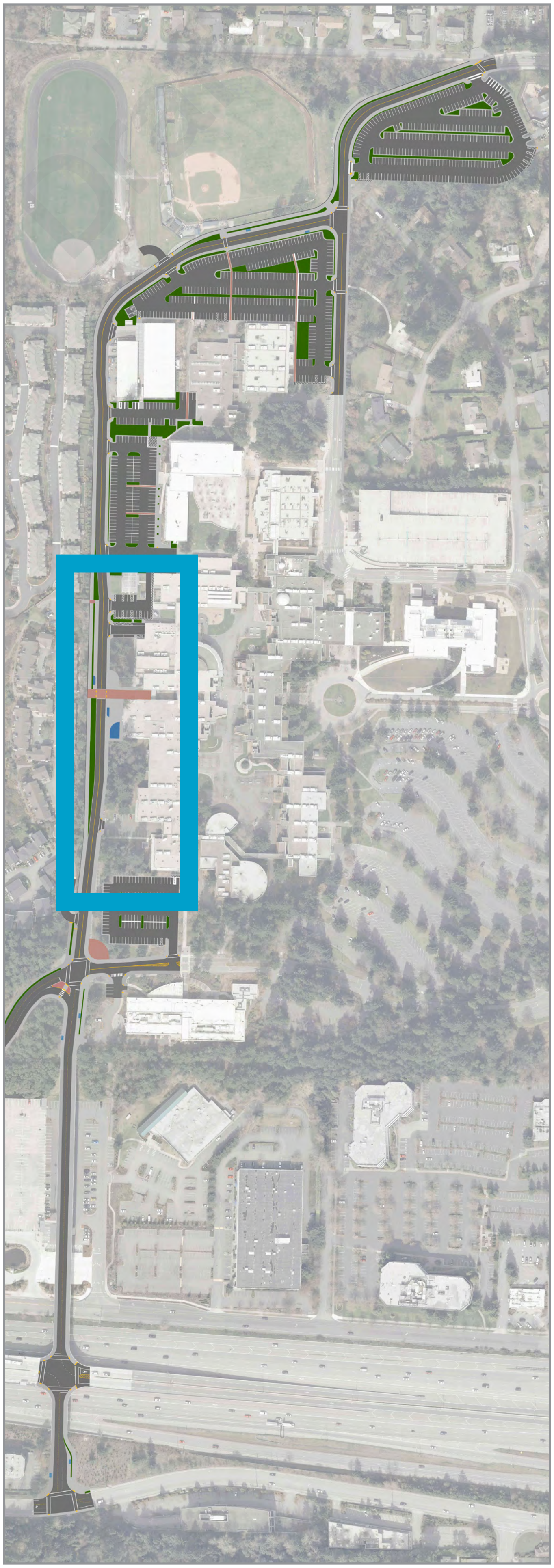
The primary consideration for the Bellevue College delivery zone is preserving the road width to accommodate delivery truck operations. Study of this area resulted in two options for preserving the road width: (1) moving the bicycle facility west of the roadway, or (2) using a mountable curb. While both scenarios have advantages and disadvantages, this design gives preference to the independent bicycle facility west of the roadway. Although this is a more expensive design due to easement and topology, it is much safer and more comfortable for bicyclists, and they would not be required to stop and wait while deliveries take place.

A 6-foot-wide sidewalk provided on the east side of the road, east of the current travel lanes, would be sufficient to support the light pedestrian traffic in this area. Transit vehicles will need to stop and wait for delivery trucks to enter or exit the delivery zone.

With these changes to the roadway and non-motorized facilities, the redesigned parking lot cannot maintain all of the existing stalls in this segment. The number of stalls decreases from 173 to 156, a loss of 17 stalls. However, the parking lot just north of this location (see Segment 2) is close and gains 93 additional stalls, which compensates for the loss realized in this segment (see Appendix Table 21 on page A267).

Existing:

Proposed:



Segment 4

Bellevue College Transit Center on Snoqualmie River Road

This segment includes the primary transit access point to the Bellevue College campus. Bus zones for the Bellevue College Transit Center will be aligned with the campus' main east-west axis, as requested by Bellevue College staff. The pedestrian plaza on the east side of the road may be designed to include a café and magazine kiosk, and a covered area could be provided for tables and chairs.

A 10-foot-wide (minimum requirement) platform area is recommended to accommodate both bus shelters and ADA requirements. Pedestrians cross Snoqualmie River Rd to/from the southbound bus zone at a 24-foot-wide pedestrian crossing area. This design scenario recommends locating bus zones on the near-side of the pedestrian crossing. Although far-side zones would allow buses to leave sooner and reduce dwell times, such a configuration would ultimately encourage unsafe passing, and there are other factors that also support near-side zones. For example, if far-side zones are pursued, two driveways will need to be eliminated—one for the existing handicap parking and one used by delivery trucks. This design preserves the location of the pedestrian access from the neighboring condominium complexes at the north end of the southbound platform. Ideally, it would align with the pedestrian crossing area to reduce the number of conflict points bewteen pedestrians and bicyclists. The bicycle facility west of the southbound zone is separated from the bus platform by a 4-foot-wide planter strip to avoid conflicts with pedestrians. The 24-foot-wide pedestrian crossing extends to the bicycle facility to provide bicyclists access to transit and the campus.

This redesigned roadway eliminates 92 parking stalls along Snoqualmie River Rd (see Appendix Table 21 on page A267). A new parking lot could not be built without significant tree canopy loss.

Existing:

Proposed:

Segment 5

142nd Pl SE/SE 32nd St

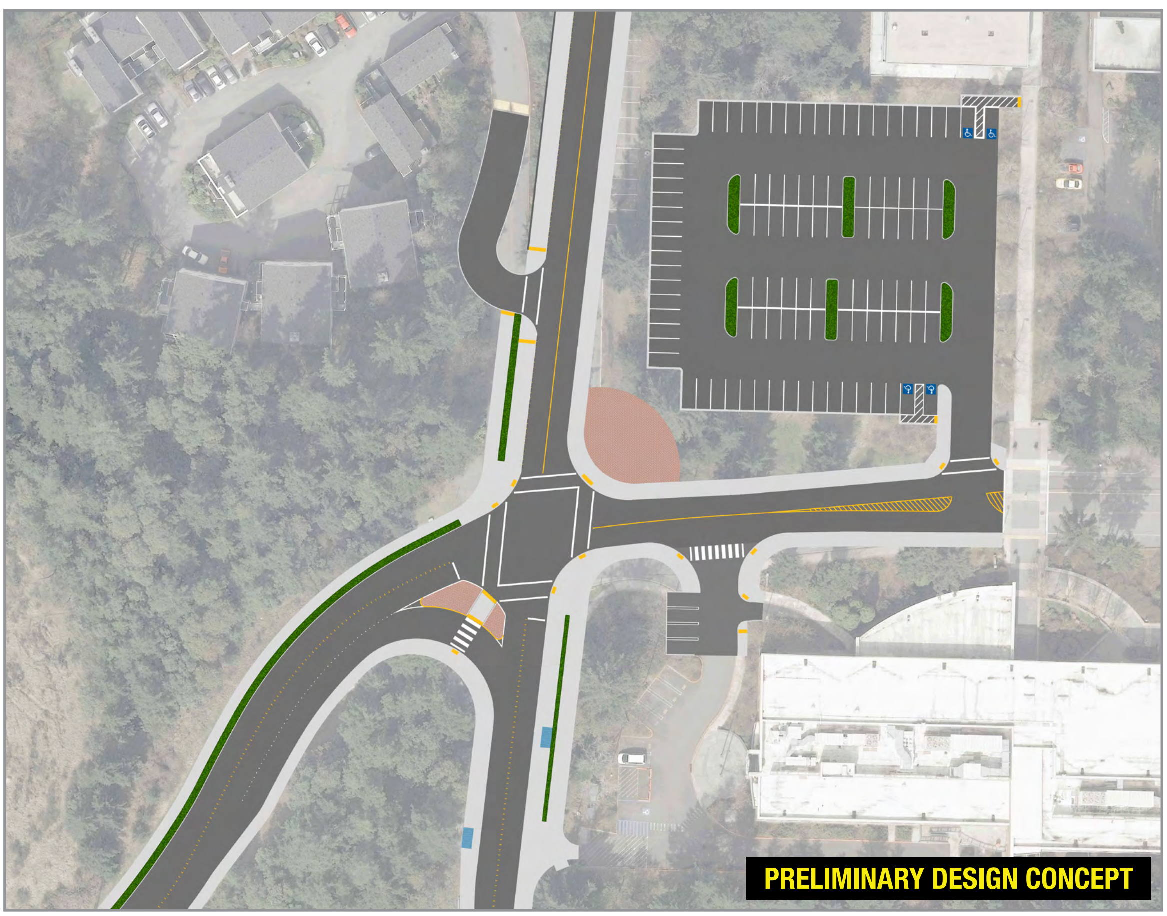
This intersection would undergo significant changes under this preliminary proposed design concept. Currently effectively a five-leg intersection, the realignment of Snoqualmie River Rd would result in a four-leg intersection. Access to the condominium developments along 142nd Pl SE north of SE 32nd St would be provided from Snoqualmie River Rd, instead of directly from the primary intersection. The alignment of Coal Creek Rd would be moved slightly to the north to accommodate a 45-foot turn radius for buses traveling northbound on 142nd Pl SE and continuing westbound on SE 32nd St.

Several bus routes will pass through this intersection, including Routes 7FR, 12FL, and 13FL, and Coverage Route 32. Transit movements will thus consist of north-south travel from 142nd Pl SE to Snoqualmie River Rd (Route 7FR), northbound-to-westbound and eastbound-to-southbound turns between 142nd Pl SE and SE 32nd St (Route 32), and eastbound-to-northbound and southbound-to-westbound turns between SE 32nd St and Snoqualmie River Rd (Routes 12FL and 13FL). The rest of the vehicular traffic consists of private vehicles and delivery trucks to and from the condominium complexes and college campus.

Pedestrian traffic at the intersection comes from Bellevue College (sidewalks on the east side of Snoqualmie River Rd and on the north and south sides of Coal Creek Rd), 142nd Pl SE (sidewalks on the east and west sides of 142nd Pl SE, connecting to the Eastgate Park-and-Ride and northbound bus zone platform), the condominium complex (northwest of the intersection), SE 32nd St, and from the bus zones. Transit shares the road with other traffic west and south of the intersection, but a restriction may be necessary on general purpose traffic along Snoqualmie River Rd north of the condominium complex access road.

Existing:

Proposed:



A pair of bus zones already exists on the south leg of the intersection of 142nd Pl SE and SE 32nd St. To better align with the modified intersection, and to facilitate two-door operation, the northbound zone is moved slightly further north. This eliminates transit conflicts with bicyclists using the bicycle facility on the east side of 142nd Pl SE and pedestrians using the pedestrian trail from the lower elevation.

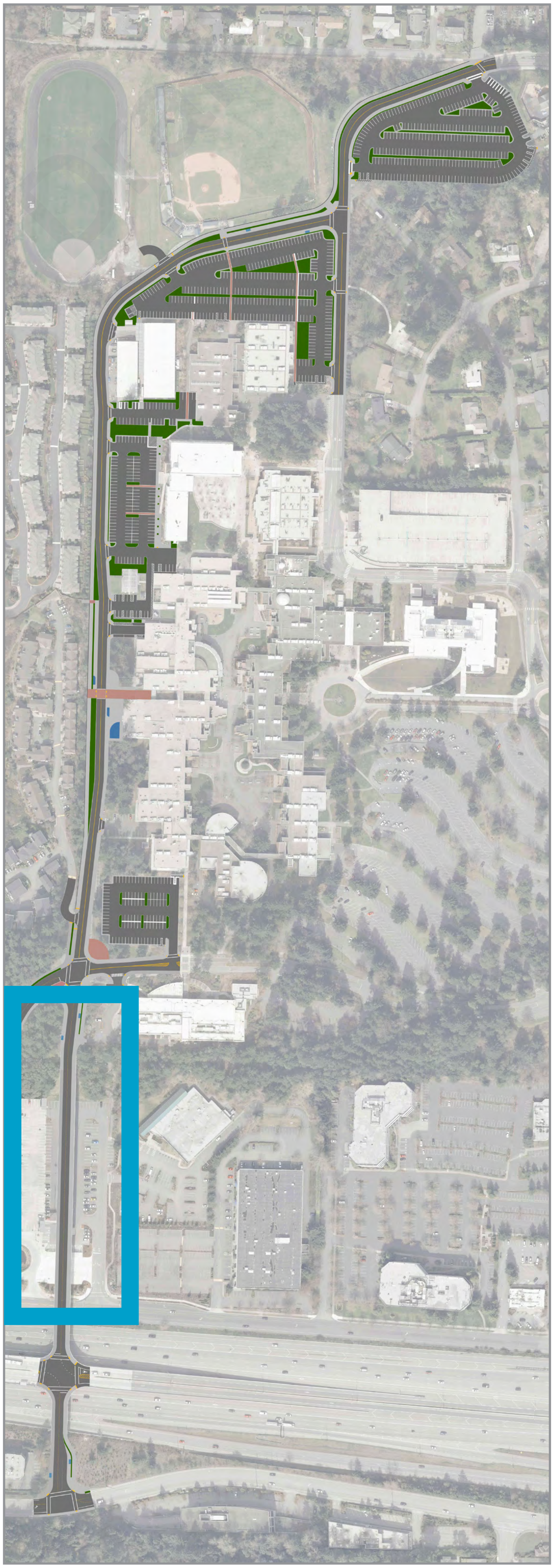
To balance transit access and speed, and to limit the number of potential conflicts between modes, King County Metro recommends only a pair of bus zones on the south leg of the intersection—one for north- and westbound buses and a second for southbound buses. That would mean that buses traveling eastbound on SE 32nd St and continuing northbound on Snoqualmie River Rd (Routes 12FL and 13FL) would not make a stop at the intersection, instead continuing to the Bellevue College Transit Center. Limiting bus zones to only the south leg of the intersection offers more flexibility in addressing access to the condominium complex and the crossing of the bicycle path. The pair of zones on the south leg of 142nd Pl SE can and should remain in-lane stops. Traffic coming from the Bellevue College campus should be minor, as should the LOS for the intersection's west approach. Dwell times are expected to be nominal. King County Metro does not recommend construction of an additional general purpose travel lane. North of the 142nd Pl SE bridge structure, the width of travel lanes would be increased from 11 to 12 feet to facilitate bus operations.

Pedestrian traffic changes sides at the intersection, from the west side of the road on 142nd Pl SE to the east side of the road on Snoqualmie River Rd. Sidewalks remain 8-feet wide except for at the bus zones, where the sidewalk width increases to 10 feet. A new 8-foot-wide sidewalk is designed on the north side of Coal Creek Rd between the intersection and the pedestrian crossing on Coal Creek Rd, approximately 250 feet east of the intersection.

Pedestrian access to the condominium development consists of an 8-foot-wide sidewalk to the west of and separated from the new bicycle facility by a 4-foot-wide planter strip.

Bicycle traffic also changes sides at the intersection. South of the intersection, it runs along the west side of 142nd Pl SE, has a direct access to the northbound bus zone, and then shifts east of the zone, separated by a 2.5-foot-wide planter strip. A 4-foot-wide planter strip is recommended and may be found to be feasible in later design stages. Bicycle traffic using this intersection will come mainly from the new bicycle facility proposed for the east side of 142nd Pl SE, which connects to the Mountains to Sound Greenway Trail, and from the new bicycle facility proposed for the west side of Snoqualmie River Rd.

The northeast corner of this intersection would be designed as a campus gateway that includes the Bellevue College logo. Landscaping could include a water element and/or a cut-thru crossing, which would benefit pedestrians traveling between Snoqualmie River Rd and Coal Creek Rd. The parking lot northeast of the intersection helps to compensate for the 28 parking stalls lost along Snoqualmie River Rd, increasing the number of stalls in this segment from 77 to 105 (see Appendix Table 21 on page A267).

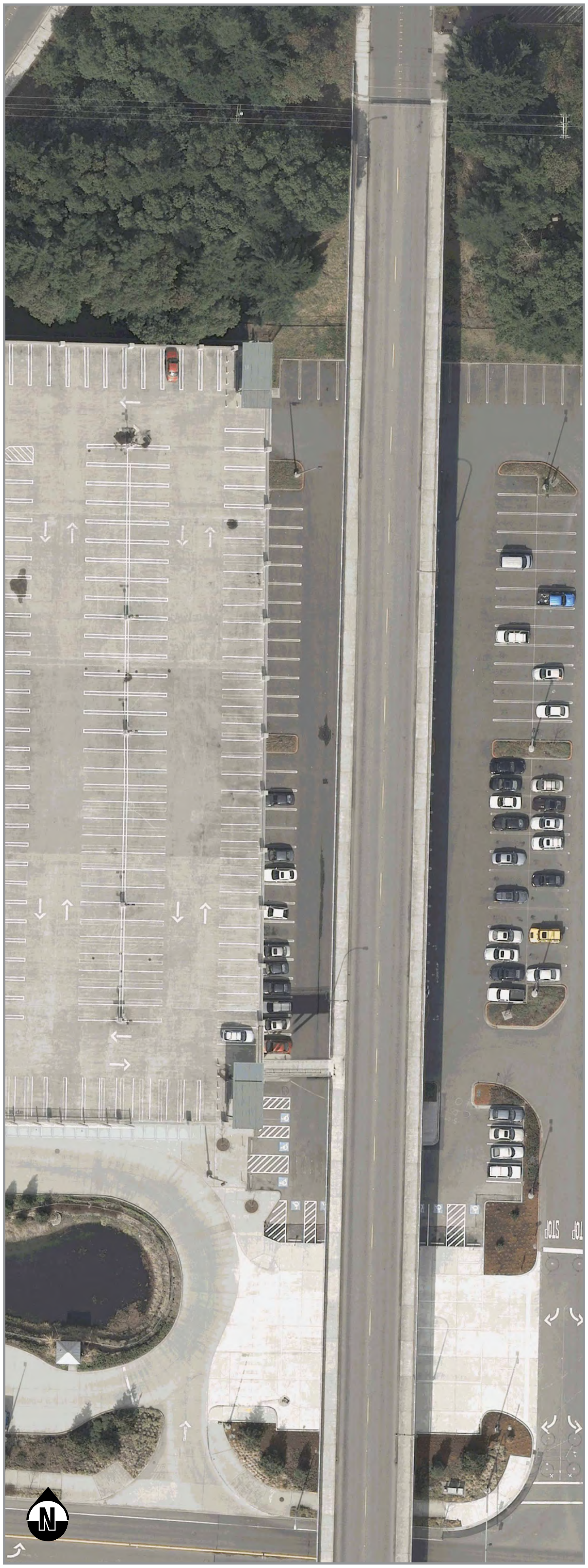


Segment 6

South of 142nd Pl SE/SE 32nd St to North of 142nd Pl SE/I-90 Direct Access Ramp

Consistent with recommendations in the *Eastgate/I-90 Transportation Strategies Report*, this preliminary design concept proposes modifications to the 142nd Pl SE Bridge that would improve the walking and bicycling experience there. There is significant pedestrian traffic on the west side of 142nd Pl SE Bridge, mainly to/from the Eastgate Park-and-Ride and Eastgate Freeway Station. Due to pedestrian volumes, an 8-foot-wide sidewalk is recommended on the west side of the road. The east side of the road is identified as a suitable location for an independent bicycle facility, providing a direct connection to the Mountains to Sound Greenway at the northeast corner of SE 36th St and 142nd Pl SE. A 10-foot-wide, two-way, elevated bicycle facility is thus recommended on the east side of the road. These non-motorized facilities leave 22 feet for general purpose travel lanes, which at 11-feet per lane satisfies the minimum width criteria to support transit operations.

Existing:



Proposed:

Segment 7

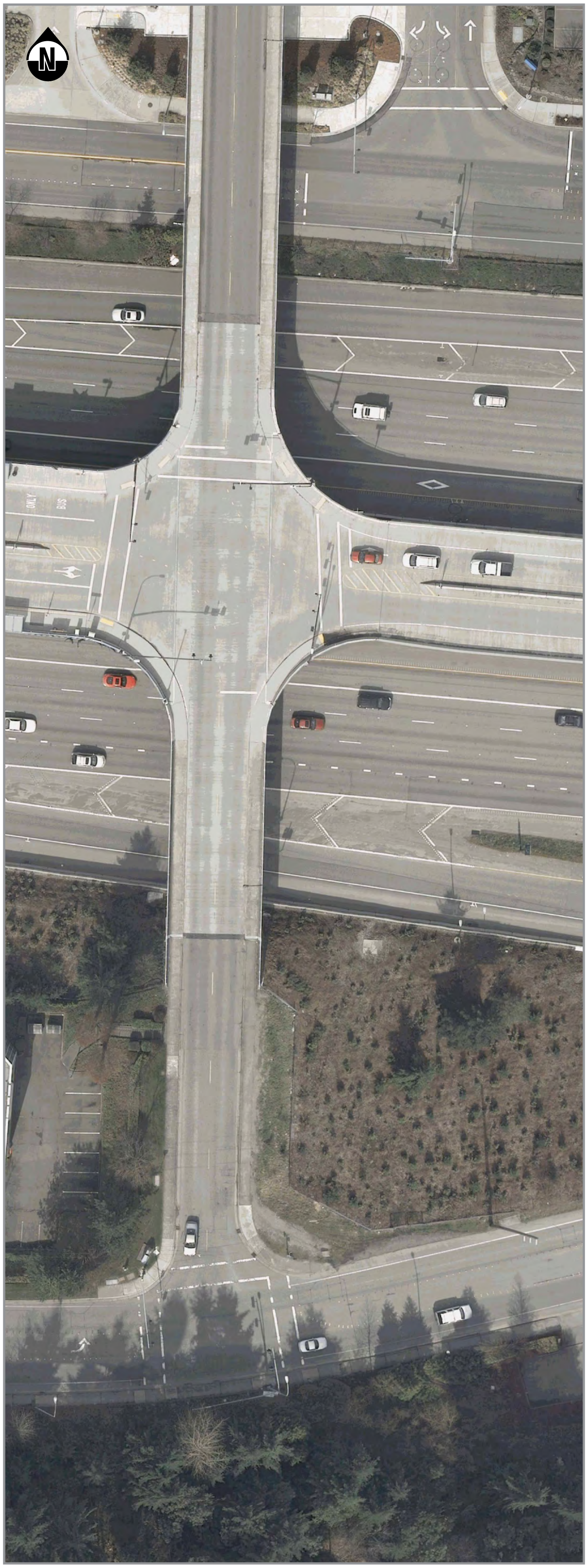
142nd Pl SE/I-90 Direct Access Ramp to 142nd Pl SE/SE 36th St

Users of the 142nd Pl SE/SE 36th St intersection include pedestrians, bicyclists, transit, and general purpose traffic. Bus movements through the intersection include Route 7FR, which travels southbound-to-westbound and eastbound-to-northbound, and Coverage Route 32, which travels southbound-to-eastbound and westbound-to-northbound. South of the 142nd Pl bridge structure, the travel lane width increases from 11 to 12 feet to facilitate bus operations.

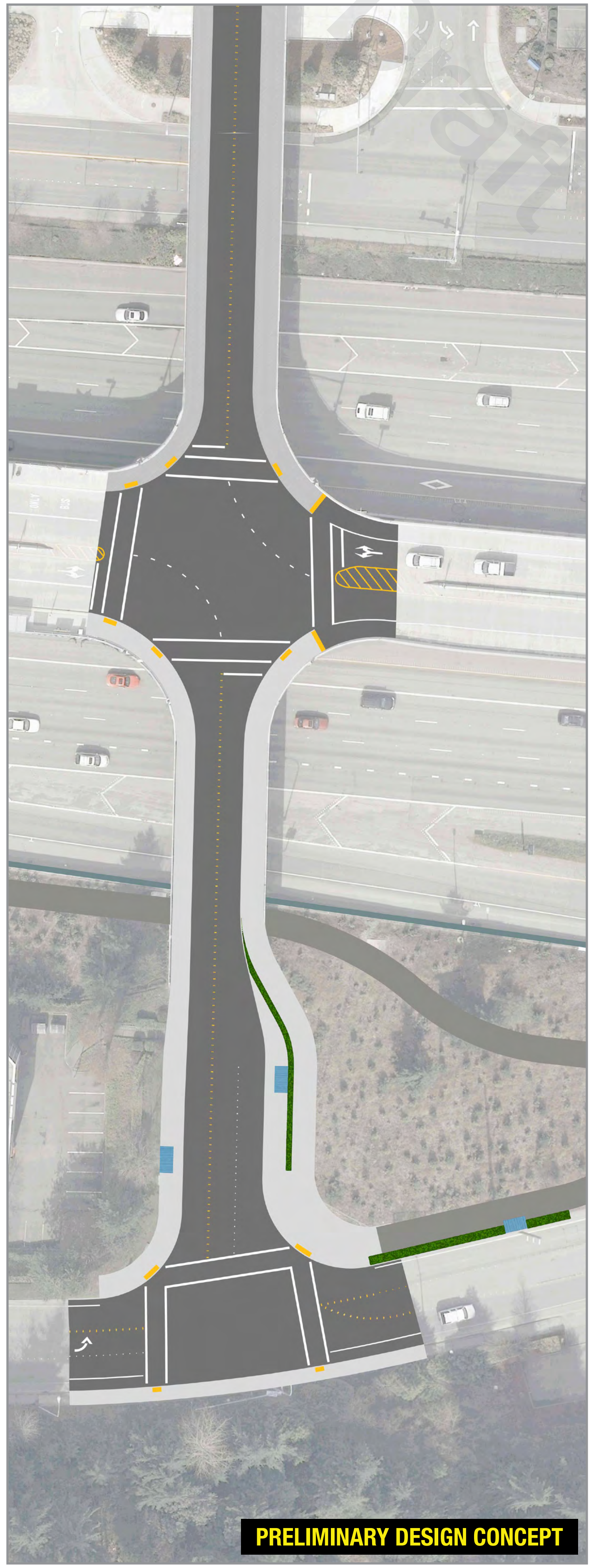
A pair of bus zones is recommended on both sides of 142nd Pl SE just north of SE 36th St—one for northbound and one for southbound buses. These stops serve as a transfer point for transit users connecting from Route 7FR or 32 to routes serving the Eastgate Freeway Station, located 300 feet north of the intersection. The southbound bus zone is in the only southbound lane of travel, so a bus pullout is not practical at this location, as buses turning eastbound onto SE 36th St would not be allowed to make the turn. A pullout lane is designed for the northbound bus zone, allowing other traffic to pass while a bus is stopped at the zone. Additionally, the improved 40-foot turn radius will allow a bus to start from its own lane of travel and finish within the receiving lane without encroaching on opposing traffic.

Because bus zones are located on both sides of 142nd Pl SE just north of SE 36th St, 10-foot-wide sidewalks are provided to comply with criteria for bus zone platform width. Transit users going to the northbound bus zone would cross to the west side of 142nd Pl SE at SE 36th St, not at the I-90 Direct Access Ramp intersection. Pedestrians and bicyclists using the intersection come from the Mountains to Sound Greenway Trail, SE 36th St, 142nd Pl SE, and from the bus zones.

Existing:



Proposed:



A 10-foot-wide two-way bicycle facility begins at the Mountains to Sound Greenway Trail on the east side of 142nd Pl SE, east of the northbound bus zone, separated from the zone by a 2.5-foot-wide planter strip. A 4-foot-wide horizontal separation between the bicycle facility and the bus zone is recommended; however, a wider planter strip would require a wider and thus more expensive bridge structure, especially given the existing slope of the site. Later design stages may consider a wider planter strip or a vertical separation instead. Bicyclists would cross to the west side of 142nd Pl SE at SE 36th St or at the I-90 Direct Access Ramp.

Next Steps

The preliminary design concept for the Bellevue College Connection: 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor presented here represents the result of several months of coordination between the staffs at the City of Bellevue, Bellevue College, and King County Metro. This design was developed to account for the facility dimension requirements for each of the various modes and to comply with ADA requirements, but it should not be construed as a final engineering-level design, nor have the various stakeholders officially endorsed this proposal at the time of this report's publication.

Discussion with Bellevue College is ongoing and will continue, and final design decisions will be made in close coordination with the College in the coming months and years. The *Transit Service Vision Report* assumes the completion of this project prior to 2022, as the mid-term transit networks are designed to utilize this facility. However, the implementation timeline for this project will be determined as the process advances into later design stages.

Appendix Table 21 Impacts of the Multimodal Transportation Corridor preliminary design concept on parking stalls by segment.

	Segment 1 Kelsey Creek Rd/ SE 24th St to Kelsey Creek Rd/Snoqualmie River Rd	Segment 2 Snoqualmie River Rd/ Kelsey Creek Rd to Delivery Zone	Segment 3 Delivery Zone to Greenhouse	Segment 4 Bellevue College Transit Center on Snoqualmie River Road	Segment 5 142nd Pl SE/SE 32nd St	Total
Proposed	301	296	156	16	105	**874**
Current	227	203	173	108	77	**788**
Difference	+74	+93	-17	-92	+28	**+86**

Note: Segments 6 and 7 correspond to the 142nd Pl SE Bridge, which currently does not and will not include any parking.

APPENDIX D7: PROJECTS NO LONGER UNDER CONSIDERATION

Over the course of the Capital Element planning process, several potential projects were eliminated from further consideration due to one or more limitations that render the projects 'fatally flawed'. Appendix Table 22 documents the potential transit running way, queue jump, intersection, roadway, and signalization projects that are no longer being considered for advancement by the Transit Master Plan. The transit signal priority projects that have been eliminated from further consideration are listed in Appendix Table 23 on page A270.

Determining what constitutes a 'fatal flaw' is highly contextual, and there is no single characteristic that uniformly resulted in designation of a potential project as 'fatally flawed'. Generally, the potential projects identified as such are those for which limited right-of-way precludes required roadway expansion, ongoing or planned projects cannot accommodate the proposed changes or any similarly beneficial substitute, or the proposed projects lie entirely outside of Bellevue's jurisdiction. In the case of TSP projects, those eliminated from further consideration were primarily those for which Traffic Engineering staff identified significant conflicts with traffic patterns, signal phasing limitations, or other related issues.

The elimination of these projects from further consideration should not be construed to suggest that the projects are without merit, nor that the needs these projects address are inconsequential. In fact, the composite scores for projects Q4, Q20, and L21 are all in the highest tier, indicating significant LOS and queuing issues. Nevertheless, transit priority projects cannot be accommodated at these locations. It is therefore all the more important that other transit priority projects are implemented so that transit

Appendix Figure 19 Running Way Improvement Project L10: A shoulder transit-only bypass lane would eliminate signal and queuing delay for northwest-bound buses on this segment of Lake Hills Connector. It is no longer being considered because adjacent wetland easements limit the available right-of-way. Also pictured is Spot Improvement Project Q11, a queue jump lane that would assist southeast-bound buses. The latter project is still being considered and would require a new lane to be constructed if implemented as shown, but all existing general purpose travel lanes would be maintained.

Appendix Table 22 Potential transit running way, queue jump, intersection, roadway, and signalization projects eliminated from further consideration.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need	Reason for Project Elimination
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
Deleted HOV, BAT or General Purpose Lanes									
L10	Lake Hills Connector Tee Intersection Bypass	Lane Construction	13	8 / 10 / 15	Construct westbound transit bypass lanes at T-intersections with Richards Rd.	12–14	14–16	Addresses 2030 intersection LOS of E and queuing issues.	Wetland easements surround the intersection of Lake Hills Connector and Richards Rd, limiting the available space for construction of additional lanes. A sidewalk currently exists on the north side of the roadway, and a 10-14 foot-wide off-street path (O-123-N) is planned for this location as part of the Lake to Lake Trail priority bicycle corridor (EW-3). Construction of the proposed bypass lane would require removal of the existing pedestrian facility and preclude construction of the planned facility.
L15	Northup Way BAT Lane	Lane Restrictions	5, 14	4 / 5 / ~8	Implement BAT on Northup Way from 108th Ave NE to N 33rd Pl and add protected turn phase to improve LOS for turn.	16	24	Addresses current and future LOS issues (E and F, respectively) and queuing issues. Very frequent service on corridor.	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. That WSDOT project includes reconstruction of the intersection of Northup Way and 108th Ave NE, and the channelization being implemented was established based on the needs projected by WSDOT models of travel demand. Barring a substantial shift in mode split in favor of transit compared to the conditions projected by WSDOT, it is therefore considered highly unlikely that sufficient capacity will exist to convert a general purpose travel lane into a BAT lane without significant negative impacts to intersection LOS and queue lengths.
L16	Bellevue Way HOV Lane	Lane Construction	1	8 / 10-15 / 30	Construct northbound HOV lane for SR-520 westbound on-ramp to allow HOV traffic to bypass ramp meter and traffic queue.	7–9	12–15	Allows buses/HOV to bypass ramp queues.	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. Modifications to highway on-ramps and overpasses were therefore deemed to be highly unlikely if not impossible during the TMP planning horizon.
L21	148th Ave NE BAT Lane	Lane Construction	12	8 / 10 / 15	Construct northbound BAT lane on 148th Ave NE from approximately NE 40th St to NE 51st St.	21–23	21	Addresses current queuing issues as well as future LOS of F and very long queue.	Project extents lie entirely outside of Bellevue, in the jurisdiction of the City of Redmond.
Deleted Queue Jumps									
Q1	Bellevue Way to SR-520 Westbound HOV	Queue Jump	1	8 / 10-15 / 30	Construct HOV queue jump lane for transit and HOV to bypass general purpose traffic at onramp meter.	7-9	12-15	Allows buses/HOV to bypass ramp queues.	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. Modifications to highway on-ramps and overpasses were therefore deemed to be highly unlikely if not impossible during the TMP planning horizon.
Q4	108th Ave NE and Northup Way Northbound	Queue Jump	4, 5, 14	~3 / 3-4 / 5-6	Add queue jump to northbound right turn lane.	30	23	Addresses operator comments, existing and future LOS and queuing issue, and very high bus volumes	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. That WSDOT project includes reconstruction of the intersection of Northup Way and 108th Ave NE, which includes the addition of one general purpose travel lane to southbound 108th Ave NE and the inclusion of a bicycle lane in the northbound direction. Given the design of the intersection being implemented, it would not be possible to incorporate a queue jump lane in the northbound right turn lane.
Q11	Lake Hills Connector and Richards Rd - Eastbound	Queue Jump	13	8 / 10 / 15	Add queue jump to eastbound approach partially in of right turn lane and partially in new queue jump lane.	14	16	Addresses future intersection LOS of E and significant queuing.	Wetland easements surround the intersection of Lake Hills Connector and Richards Rd, limiting the available space for construction of additional lanes.
Q20	148th Ave NE and NE 51st St - Northbound	Queue Jump	7, 12	4 / 5 / ~8	Add queue jump to northbound approach in new right turn only lane.	21	21	Addresses existing queuing and future LOS of F and significant queuing	Project extents lie entirely outside of Bellevue, in the jurisdiction of the City of Redmond.

Note: These projects are conceptual and the final details of design would be developed if the projects were reconsidered and advanced further along in the implementation process.

Appendix Table 23 Potential transit signal priority (TSP) projects eliminated from further consideration.

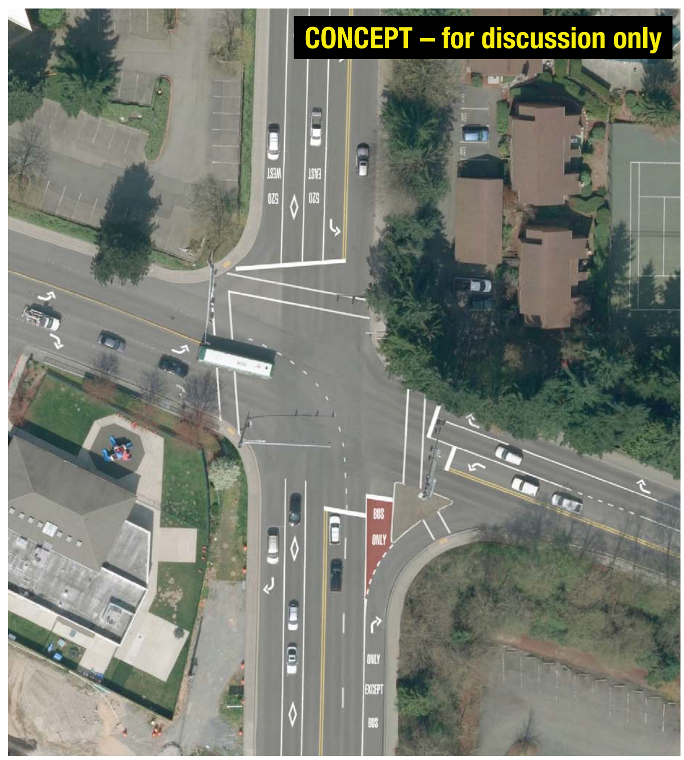
Intersection ID	Cross Streets	Direction(s)	Approach Composite Scores Short-Term	Approach Composite Scores Long-Term	FTN Route(s)	Reason for Project Elimination
8	Bellevue Way NE and NE 4th St	Northbound, Westbound	15–21	15–17	3, 6	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
9	Main St and Bellevue Way	Northbound, Southbound, Westbound	16–24	15–18	3, 11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
47	148th Ave NE and NE 20th St	Northbound, Southbound	11	15	12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
51	Lake Hills Blvd and 148th Ave SE	Northbound, Southbound, Westbound, Eastbound	3–15	9–13	7, 12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
61	156th Ave NE and NE 24th St	Northbound, Southbound	12–16	17–18	7	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
81	148th Ave NE and NE 24th St	Northbound, Westbound	13	18	12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
86	SE Eastgate Way and 156th Ave SE	Westbound, Eastbound	15–21	15–17	3, 6	Intersection no longer included on the most recent revision of the TSP project list submitted by consultant. No explanation was provided for its elimination.
90	SE Eastgate Way and 158th Ave SE	Westbound, Eastbound	15–21	15–17	3, 6	Intersection no longer included on the most recent revision of the TSP project list submitted by consultant. No explanation was provided for its elimination.
101	SE Eastgate Way and 150th Ave SE	Northbound, Westbound, Eastbound	14–26	12–14	13	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
204	Factoria Blvd and SE 36th St	Northbound, Westbound, Eastbound	20–23	11–20	7, 11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
222	Factoria Blvd and SE 38th St	Northbound, Southbound	20–22	22–24	7, 11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
223	Coal Creek Pkwy SE and 119th Ave SE	Northbound, Westbound	13–17	19–20	11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
NA_10	NE 8th St and 148th Ave NE	Northbound, Southbound, Westbound, Eastbound	19–24	14–19	6, 12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
NA_11	148th Ave NE and Bel-Red Rd	Northbound, Southbound	11–20	15–19	12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.

Note: These projects are conceptual and the final details of design would be developed if the projects were reconsidered and advanced further along in the implementation process.

services can travel quickly and efficiently, with minimal delay due to congestion, along other portions of the Frequent Transit Network to compensate for these locations where reduced speed and reliability is likely.

Running Way Improvement Project L10 and Spot Improvement Project Q4 provide representative examples of the kinds of projects no longer being considered because of 'fatal flaws' identified during the Capital Element planning process. Project L10 is a transit-only bypass lane that would be constructed in the shoulder on the north side of Lake Hills Connector. This lane would bypass long queuing delay and lengthy queues for northwest-bound buses on this segment, which in the 2030 PM peak are projected to average over 2 minutes and stretch nearly 1,000 feet. The intersection being bypassed is also projected to have an LOS of E in 2030. However, the project is no longer being considered because adjacent wetland easements limit the right-of-way available for construction of an additional lane, and a 10-14 foot-wide off-street path (O-123-N) planned for this location as part of the Lake to Lake Trail priority bicycle corridor (EW-3) precludes the bypass lane.

Project Q4 would have restructured the south approach of 108th Ave NE at Northup Way to incorporate the queue jump into a modified right turn lane. This would address 2030 average queuing delays of 4 minutes, average queue lengths of nearly 500 feet, and an LOS of F—all issues that are compounded by very high bus volumes of 675 daily trips. The project is no longer being considered because it cannot be accommodated by the WSDOT plans that are currently being implemented as part of the SR-520 Bridge Replacement and HOV Program. However, because the intersection configuration currently being constructed by WSDOT includes a northbound curbside bicycle lane, it would not be possible to modify the right turn lane as proposed without putting buses and bicycles in direct conflict with one another.



Appendix Figure 20 Spot Improvement Project Q4: Queue jump lane on 108th Ave NE for northbound buses at Northup Way. This project is no longer being considered because it cannot be accommodated by WSDOT plans currently being implemented. Also pictured is Running Way Improvement Project L17 along 108th Ave NE, a southbound HOV lane between South Kirkland Park-and-Ride and SR-520. Aerial images depict roadway striping before and after lane reconfiguration. Running Way Improvement Project L15, a BAT lane on Northup Way, is not pictured.

APPENDIX D8: POTENTIAL LONG-TERM TSP LOCATIONS

As noted in the section about transit signal priority projects (see page 159), potential TSP projects have been organized into three groups: near-term projects, deleted projects, and long-term projects. Appendix Table 24 lists all intersection approaches served by the 2030 Frequent Transit Network (FTN) that are not among the near-term or deleted projects. This should not be construed as a list of all long-term projects; rather, these are all of the signals that have not yet been eliminated from further consideration. King County Metro is expected to provide guidance by 2018 about its anticipated capacity to expand its TSP capabilities. The City will then consider that information when reviewing this list of intersection approaches to determine which should have long-term TSP projects pursued between 2020–2030.

If transit efficiency and reliability were the only two considerations necessary in determining where TSP should be deployed—that is, if cost were no object, impacts to other travel modes were deemed insignificant, and no technical limitations existed on where TSP could be deployed—then TSP might reasonably be pursued at all or most of these signals. However, this is of course not the case, as all of these other factors are also critical considerations in determining where transit priority can and should be implemented. Therefore, the specific projects that may be included in this group will not be identified until after 2020 when more information is available.

Appendix Table 24 Intersection approaches potentially eligible for long-term transit signal priority (TSP) projects.

Intersection ID	Cross Streets	Direction (Approach)	Long-Term Approach Composite Scores	FTN Route(s)	Previous TSP Priority	Related TMP Project	Related TFP Project
10	Bellevue Way SE & SE Wolverine Way	Northbound, Southbound	18	3, 11			
11	Bellevue Way SE & SE 8th St	Northbound, Southbound	18	3, 11			
12	Bellevue Way SE & SE 10th St	Northbound, Southbound	16–18	3, 11			
13	Bellevue Way SE & 108th Ave SE	Eastbound, Westbound, Northbound, Southbound	16–22	3, 11	X	X	
14	Bellevue Way SE & 112th Ave SE	Eastbound, Westbound, Northbound, Southbound	19–23	1, 3, 11	X	X	X
17	NE 4th St & 106th Ave NE	Eastbound, Westbound	17–19	3, 5, 6			
19	Main St & 106th Ave	Eastbound, Westbound	17–18	11			
22	NE 4th St & 108th Ave NE	Eastbound, Northbound, Southbound	18–19	1, 3, 5, 6, 11, 13		X	X
23	108th Ave NE & NE 2nd St	Northbound, Southbound	18–19	1, 2, 3, 5, 6, 11, 13		X	X
24	Main St & 108th Ave	Eastbound, Westbound, Southbound	18–24	1, 11, 13		X	X
29	116th Ave NE & NE 12th St	Northbound, Southbound, Westbound	16–24	5, 14			
31	Bellevue Way NE & NE 2nd St	Eastbound, Westbound, Northbound, Southbound	6–18	3. 5, 6	X	X	X
36	Main St & 112th Ave	Eastbound, Westbound, Northbound	18–24	1, 13		X	
37	Bel-Red Rd & 130th Ave NE	Eastbound, Westbound	10–15	14			
38	Bel-Red Rd & 132th Ave NE	Eastbound, Westbound	8–10	14			
40	Bel-Red Rd & 140th Ave NE	Northbound, Westbound	11–16	14		X	
50	Main St & 148th Ave	Northbound, Southbound	9–14	12			
52	148th Ave SE & SE 16th St	Northbound, Southbound	20	12			
53	148th Ave SE & SE 22nd St	Northbound, Southbound	8	12		X	
55	148th Ave SE & SE 24th St	Eastbound, Southbound	15	12		X	
60	156th Ave NE & Bel-Red Rd	Northbound, Southbound	16–18	7		X	
65	148th Ave SE & SE 8th St	Northbound, Southbound	6–10	12			
78	Northup Way & 108th Ave NE	Eastbound, Northbound, Southbound	23–24	4, 5, 14		X	
83	Main St & 156th Ave	Northbound, Southbound	8–12	7			
84	Lake Hills Blvd & 156th Ave SE	Eastbound, Southbound	9–13	7			
89	112th Ave SE & SE 8th St	Northbound, Southbound	12	1			
105	SE Eastgate Way & Richards Rd	Northbound	19	11			
108	Bellevue Way SE & Bellevue P&R Entrance	Eastbound, Westbound, Northbound, Southbound	14–22	1, 3, 11	X	X	X
114	Northup Way & NE 116th Ave	Eastbound, Northbound	24	5, 14		X	
135	Bellevue Way SE & SE 16th St	Northbound, Southbound	16	3, 11			
157	Main St & 110th Ave	Eastbound, Westbound	19–24	13		X	
165	NE 10th St & 116th Ave NE	Eastbound, Southbound	11–13	5		X	
171	SE 36th St & 142nd Pl SE	Eastbound, Westbound, Southbound	13–19	7		X	
175	Bel-Red Rd & 134th Ave NE	Eastbound, Westbound	8–11	14			
180	116th Ave SE & Overlake Hospital	Northbound, Southbound	11–17	5		X	
191	NE 6th St & I-405 Direct Access Ramp	Eastbound, Westbound, Northbound, Southbound	15–23	2, 6		X	X
202	Factoria Blvd & SE Newport Way	Northbound, Southbound	15–18	7, 11			
203	Coal Creek Pkwy & Factoria Blvd	Eastbound, Southbound	17–18	7, 11			
214	108th Ave NE & SR-520 Direct Access Ramp	Eastbound, Westbound, Southbound	23	4, 5, 14		X	
234	NE 10th St & 112th Ave NE	Eastbound, Westbound	15–17	5		X	
259	NE 10th St & I-405 on-ramp	Eastbound, Westbound	13–15	5			
263	156th Ave NE & NE 28th St	Northbound, Southbound	16–18	7		X	

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

Appendix Table 15 continued.

Intersection ID	Cross Streets	Direction (Approach)	Long-Term Approach Composite Scores	FTN Route(s)	Previous TSP Priority	Related TMP Project	Related TFP Project
268	148th Ave NE & NE 22nd St	Northbound, Southbound	19	12		X	X
280	Kamber Rd & 139th Ave SE	Northbound, Southwestbound	7–10	14			
282	Factoria Blvd & SE 41st St	Eastbound, Northbound, Southbound	5–14	7, 11			
284	Coal Creek Pkwy & 124th Ave SE	Eastbound, Westbound, Southbound	9–20	7			
285	Factoria Blvd & 3600 Block	Northbound, Southbound	19–20	7, 11		X	
291	SE 36th St & 132nd Ave SE	Westbound, Eastbound	6–20	7			
298	112th Ave SE & SE 6th St	Northbound, Southbound	12–20	1			
301	Factoria Blvd & Newport High School Entrance	Northbound, Southbound	13–15	7, 11			
304	148th Ave SE & Lake Hills Greenbelt Trail Crosswalk	Northbound, Southbound	16	12			
305	SE 36th St & 136th Pl SE	Eastbound, Westbound	6–13	7			
318	Factoria Blvd & SE 40th Ln	Northbound, Southbound	14–22	7, 11			
332	NE 10th St & Bellevue Library Crosswalk	Eastbound, Westbound	15–17	5		X	
332	NE 10th St & 110th Ave NE	Eastbound, Westbound	17–23	5		X	
NA_5	Bel-Red Rd & 124th Ave NE	Northbound, Southbound	14–15	14		X	X
NA_6	148th Ave NE & NE 36th St	Southbound, Westbound	16–18	12			
NA_7	NE 15th st & 120th Ave NE	Eastbound, Westbound	16	14			
NA_8	NE 15th st & 124th Ave NE	Eastbound, Northbound	14–15	14			
NA_9	NE 6th St & 120th Ave NE	Eastbound, Southbound	14–15	6		X	X

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

APPENDIX D9: VALUE OF TRAVEL TIME SAVINGS

To better understand the value of the projected improvements to travel speed realized by implementing all of the proposed HOV and BAT lane projects, an analysis was conducted to determine the aggregate number of revenue and passenger hours saved and the monetized value of these travel time savings to both transit users and operators. This appendix explains how the figures presented in the Potential Outcomes section (see page 168) were calculated .

Data from two separate travel demand models was used to complete this analysis, both of which assessed PM peak conditions based on the 2030 Growing Resources scenario. The first was Dynameq model D30R1.0.3, which was used to obtain transit travel speeds with and without implementation of all proposed HOV and BAT lane projects, as described on page 165 (see Table 23 on page 166 for results). Travel speeds were aggregated by FTN service type (i.e. FX, FR, and FL), and these were multiplied by the total annualized PM peak revenue miles operated by the routes in each category to obtain the estimated number of PM peak revenue hours operated. The number of hours operated in the HOV/BAT Lane Scenario was subtracted from the Baseline hours to obtain the estimated number of PM peak revenue hours saved, as shown in Appendix Table 25 below.

Appendix Table 25 2030 projected difference in PM peak speed and travel time by FTN service type - Baseline vs. HOV/BAT Scenarios.

FTN Service Type	PM Peak Rev Miles	PM Peak Avg Speed (mph)		Est. PM Peak Rev Hours		Est. PM Peak Rev Hours Saved		PM Peak Pass Hr / Rev Hr	Annualized PM Peak Pass Hours Saved
		Baseline	HOV/BAT	Est. Baseline	Est. HOV/BAT	Baseline - HOV/BAT	% Diff		
Data Source:	Planned	Dynameq Model		Calculated		Calculated		BKR Model	Calculated
FX	816,446	18.1	19.1	45,008	42,657	2,352	5.2%	63.2	148,592
FR	290,891	12.4	12.6	23,535	23,014	521	2.2%	33.4	17,414
FL	474,491	12.1	13.1	39,117	36,248	2,869	7.3%	34.8	99,779
								Annual Total:	**265,786**

Appendix Table 26 2030 projected value of PM peak travel time savings for passengers from proposed HOV/BAT projects by service type.

FTN Service Type	Annualized PM Peak Pass Hours Saved	Mean Hourly Wage (Seattle-Bellevue-Everett)	Travel Time Value (Relative to Wage)			Value of Time ($/person hr)			Value of Pass Hrs Saved		
			Low: LOS A-C (Seated) / Urban Peak	Medium: LOS A-C (Standing)	High: LOS D (Seating/ Standing Average)	Low	Medium	High	Low	Medium	High
Data Source:	Calculated	Bureau of Labor Statistics	Victoria Transport Policy Institute			Calculated			Calculated		
FX	148,592								$1,439,564	$2,056,519	$2,344,432
FR	17,414	$27.68	35%	50%	57%	$9.69	$13.84	$15.78	$168,711	$241,016	$274,759
FL	99,779								$966,655	$1,380,936	$1,574,267
								Annual Total:	**$2,574,930**	**$3,678,471**	**$4,193,457**

Notes: Value of travel time savings based on the May 2012 mean hourly wage for Seattle-Everett-Bellevue of $27.68, obtained from the US Department of Labor Bureau of Labor Statistics. Low, Medium, and High estimates are based on the percentage of that wage considered when valuing transit passenger time, reflecting 35%, 50%, and 57%, respectively. Higher rates of time valuation relative to the mean hourly wage correspond to reduced perceived convenience due to lower intersection LOS (e.g. High corresponds to LOS 'D') and/or standing rather than sitting.

The second model that provided data for this analysis was the BKR travel demand model (EMME version MP30R6.2), which was used to project ridership by route. These ridership figures were multiplied by three (to convert from the single-hour projection to the full length of the PM peak period), then multiplied by 255 to provide an annualized weekday total. These were divided by the number of revenue hours planned for each route to estimate the number of passengers per revenue hour, which were then averaged by FTN service type, as shown in the second to last column in Appendix Table 25. Estimated PM peak revenue hours saved were multiplied by the number of passenger hours per revenue hour to obtain the total number of passenger hours saved by FTN service type, which when summed equals 265,786 hours annually. This figure is an estimate of the passenger-weighted hours saved during the PM peak period—that is, an aggregation of the couple of minutes each passenger would save each day during their evening commute over the course of a year.

A literature review was conducted to determine how to most appropriately value passenger travel time when monetizing these figures, and different sources provided different recommendations. Ultimately, figures recommended by the Victoria Transport Policy Institute (VTPI) were selected for this analysis, both because they are provided in the form of rates, which allow results to be calibrated to reflect the local average wage, and because different rates are provided for different travel modes, each with adjustments to reflect qualitative factors like comfort, convenience, and reliability (see Appendix Table 27). In Appendix Table 26, the Low, Medium, and High rates are 35%, 50%, and 57%, respectively. The Low rate is consistent with both that for seated transit passengers in LOS A-C conditions, and also with that cited by the VTPI for transit passengers under urban peak conditions (see VTPI 2009 page 5.2-20).

Appendix Table 27 Recommended travel time values relative to prevailing wages by travel mode and level-of-service (LOS).

Travel Mode	LOS A-C	LOS D	LOS E	LOS F
Personal Vehicle Driver	50%	67%	84%	100%
Adult Car Passenger	35%	47%	58%	70%
Adult Transit Passenger – Seated	35%	47%	58%	70%
Adult Transit Passenger – Standing	50%	67%	83%	100%
Pedestrians and Bicyclists	50%	67%	84%	100%

Adapted from "Transportation Cost and Benefit Analysis: Techniques, Estimates and Implications, Second Edition" by VTPI (2009), page 5.2-10.

The Medium rate is consistent with that for standing transit passengers in LOS A-C conditions, and the High rate reflects the average of the rates for seated and standing passengers in LOS D conditions. Given that the citywide average LOS is projected to be LOS D in 2030 whether or not HOV/BAT lane projects are implemented (see Table 24 on page 168), the High rate may be the most appropriate to consider, but a range is nevertheless provided to reflect the uncertainty inherent in such an analysis.

The wage by which all travel time valuation calculations are multipied in this analysis is $27.68. This is consistent with the May 2012 mean hourly wage estimate for the Seattle-Bellevue-Everett Metropolitan Division, as published by the US Bureau of Labor Statistics. Multiplying this wage by each of the rates noted above provides a range for the value of time per person hour, by which the total PM peak passenger hours saved were then multiplied for each FTN service type. This assessment suggests that transit passengers in Bellevue in 2030 will save between $2.5–$4.2 million worth of travel time annually in the PM peak period alone if the proposed HOV/BAT lanes are implemented.

As noted in the Potential Outcomes section, assessing the value of travel time savings for transit operators is somewhat more complicated. This is both because the ability to remove a bus from a schedule while maintaining the same headways depends on multiple factors that could not be reflected by this analysis, and because the travel demand models

Appendix Table 28 2030 projected value of PM peak travel time savings for transit operators from proposed HOV/BAT projects by FTN service type.

FTN Service Type	PM Peak Rev Miles	PM Peak Avg Speed (mph)		Est. PM Peak Rev Hours		Operating Cost per Hour		Annualized PM Peak Pass Hours Saved	
		Baseline	HOV/BAT	Est. Baseline	Est. HOV/BAT	Low[1]	High[2]	Low[1]	High[2]
Data Source:	Planned	Dynameq Model		Calculated		King County Metro		Calculated	
FX	816,446	18.1	19.1	2,352	5.2%			$209,285	$319,054
FR	290,891	12.4	12.6	521	2.2%	$89.00	$135.68	$46,399	$70,736
FL	474,491	12.1	13.1	2,869	7.3%			$255,322	$389,238
							Annual Total:	**$511,007**	**$779,027**

1. Low estimate based on King County Metro's 2010 marginal hourly operating cost of $89.
2. High estimate based on King County Metro's 2012 'Transit Operating Cost per Vehicle Hour', as reported on the agency's website at: http://metro.kingcounty.gov/am/reports/annual-measures/financial.html#cost-per-hour

used here to assess transit travel speed use the service frequencies defined by the 2030 Growing Resources scenario as model inputs, but operating these frequencies will only be possible if transit travel speeds meet or exceed the targets established in the *Service Vision Report*. Even so, it remains instructive to estimate the operating cost savings attributable to implementing these HOV and BAT lane projects, even if these savings are effectively reinvested in prodiving service at the frequencies being proposed.

As shown in Appendix Table 28, two values are considered in this analysis for operating cost per hour. The Low estimate ($89) is based on King County Metro's 2010 marginal hourly operating cost, while the High estimate ($135.68) is based on King County Metro's 2012 transit operating cost per vehicle hour, as reported on the agency's website. Both values are considered here because each represents a different way of assessing the cost of operating service. The marginal hourly operating cost (Low estimate) is the rate that is typically used when estimating the cost of revising existing services (e.g. adding or removing trips to an existing route), whereas the operating cost per vehicle hour (High estimate) is a more holistic cost estimate that also considers the planning, implementation, marketing, and other costs associated with operating transit service (e.g. the costs of fuel, operator wages). Multiplying the total travel time savings realized by HOV/BAT lane implementation by these operating costs per hour suggests that transit service providers would save between about $510,000–$780,000 annually in the PM peak period alone.

APPENDIX D10:
2030 CITYWIDE LEVEL OF SERVICE (LOS)

Appendix Table 29 Dynameq model output for 2030 citywide level of service (LOS) for FTN-served intersections.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour
1	981	100th Ave/Main Street	1,637	25	C	11	1,883	24	C	13	1,726	24	C	12
2	5455	102nd Ave/Main Street	1,619	20	C	9	1,417	19	B	8	1,360	19	B	7
3	979	100th Ave NE/NE 8th Street	1,799	33	C	17	2,077	26	C	15	2,040	23	C	13
4	5097	102nd Ave NE/NE 8th Street	1,900	25	C	13	1,893	22	C	12	1,938	23	C	12
5	1750	Bellevue Way NE/NE 12th Street	3,159	32	C	28	3,526	34	C	33	3,134	33	C	28
6	5017	Bellevue Way NE/NE 10th Street	3,535	23	C	22	3,491	23	C	22	3,032	26	C	22
7	1738	Bellevue Way NE/NE 8th Street	4,463	55	D	68	4,236	52	D	61	4,335	51	D	61
8	2640	Bellevue Way NE/NE 4th Street	3,589	37	D	37	3,467	40	D	39	3,328	39	D	36
9	1736	Bellevue Way/Main Street	2,577	66	E	48	2,572	37	D	26	2,407	39	D	26
11	5105	Bellevue Way SE/SE 8th Street	3,827	44	D	47	3,609	30	C	30	3,338	24	C	22
12	5106	Bellevue Way SE/SE 10th Street	3,106	10	A	8	2,939	4	A	4	2,840	5	A	4
13	1717	108th Ave SE/Bellevue Way SE	3,634	62	E	62	2,954	65	E	53	2,905	18	B	15
14	1716	112th Ave SE/Bellevue Way SE	4,260	119	F	141	3,531	78	E	77	3,588	36	D	35
15	5020	106th Ave NE/NE 12th Street	2,621	26	C	19	2,622	28	C	21	2,472	32	C	22
16	5021	106th Ave NE/NE 8th Street	4,466	61	E	76	4,360	66	E	80	4,348	69	E	83
17	5022	106th Ave NE/NE 4th Street	3,713	46	D	47	3,582	49	D	49	3,534	61	E	60
18	5025	106th Ave NE/NE 2nd Street	3,097	27	C	23	3,059	25	C	21	2,684	63	E	47
19	1735	106th Ave/Main Street	2,184	24	C	14	2,196	38	D	23	2,028	85	F	48
20	1749	108th Ave NE/NE 12th Street	3,563	17	B	17	3,499	21	C	21	3,400	43	D	41
21	1739	108th Ave NE/NE 8th Street	4,988	69	E	95	4,786	64	E	85	4,208	76	E	88
22	2641	108th Ave NE/NE 4th Street	2,659	34	C	25	2,653	29	C	21	2,944	47	D	38
23	5027	108th Ave NE/NE 2nd Street	1,565	68	E	30	1,621	46	D	21	1,829	73	E	37
24	1734	108th Ave/Main Street	2,856	24	C	19	2,624	53	D	39	2,764	91	F	70
25	1748	112th Ave NE/NE 12th Street	5,129	51	D	73	4,709	50	D	65	4,570	59	E	75
26	1740	112th Ave NE/NE 8th Street	7,310	71	E	145	7,571	71	E	150	6,853	91	F	174
27	5031	110th Ave NE/NE 8th Street	5,684	65	E	102	5,636	75	E	118	4,832	96	F	129
28	5018	Bellevue Way NE/NE 6th Street	2,469	5	A	3	2,160	4	A	3	1,898	4	A	2
29	1747	116th Ave NE/NE 12th Street	5,507	68	E	104	5,506	56	E	85	5,283	58	E	84
30	1741	116th Ave NE/NE 8th Street	7,375	55	E	113	7,452	53	D	110	6,657	58	E	108
31	5019	Bellevue Way NE/NE 2nd Street	3,261	32	C	29	3,111	22	C	19	2,803	23	C	18
32	5509	120th Ave NE/NE 12th Street	3,876	39	D	42	4,124	36	D	41	4,254	35	D	41
34	1745	124th Ave NE/Bellevue-Redmond Rd	3,174	51	D	45	3,260	55	D	50	3,338	53	D	49
35	1743	124th Ave NE/NE 8th Street	4,907	43	D	59	4,790	51	D	67	4,650	40	D	52
36	1733	112th Ave/Main Street	5,177	67	E	96	5,049	90	F	127	5,182	66	E	95
37	5036	130th Ave NE/Bellevue-Redmond Rd	2,026	13	B	7	2,047	13	B	7	2,118	14	B	9
38	5037	132nd Ave NE/Bellevue-Redmond Rd	2,388	18	B	12	2,375	16	B	11	2,439	17	B	12
39	1754	140th Ave NE/NE 20th Street	4,471	34	C	42	4,346	34	C	41	4,338	36	D	43
40	1755	140th Ave NE/Bellevue-Redmond Rd	4,165	41	D	48	4,047	44	D	50	3,959	48	D	53
41	1731	140th Ave NE/NE 8th Street	4,140	93	F	107	4,031	80	F	90	4,004	55	E	62

Appendix Table 19 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour
42	5073	140th Ave/Main Street	2,032	14	B	8	1,944	14	B	7	1,862	14	B	7
43	1721	140th Ave SE/SE 8th Street	2,549	46	D	33	2,385	39	D	26	2,326	37	D	24
44	5078	145th Place SE/Lake Hills Blvd	1,647	31	C	14	1,451	13	B	5	1,450	10	B	4
45	1715	145th Place SE/SE 16th Street	2,301	50	D	32	2,052	45	D	26	1,976	40	D	22
47	1763	148th Ave NE/NE 20th Street	5,042	103	F	144	4,959	104	F	143	5,723	83	F	132
48	1756	148th Ave NE/Bellevue-Redmond Rd	5,371	75	E	112	5,195	83	F	119	5,497	59	E	89
49	1730	148th Ave NE/NE 8th Street	5,485	42	D	64	4,987	45	D	62	4,874	45	D	60
50	5074	148th Ave/Main Street	3,737	29	C	30	3,350	28	C	26	3,333	27	C	25
51	1714	148th Ave SE/Lake Hills Blvd	3,081	30	C	26	2,885	32	C	25	2,902	31	C	25
52	1713	148th Ave SE/SE 16th Street	3,372	41	D	38	3,166	33	C	29	3,181	40	D	36
53	1700	148th Ave SE/SE 22nd Street	2,686	44	D	33	2,532	25	C	18	2,679	21	C	16
54	6122	145th Place SE/SE 24th Street	1,132	18	B	6	957	12	B	3	1,006	12	B	3
55	6123	148th Ave SE/SE 24th Street	2,770	36	D	28	2,460	22	C	15	2,464	17	B	12
57	6166	148th Ave SE/SE 28th Street	3,990	135	F	150	3,684	130	F	133	3,710	118	F	122
58	1757	Bellevue-Redmond Rd/NE 20th Street	4,491	44	D	55	4,588	46	D	58	4,764	41	D	54
59	1762	Bellevue-Redmond Rd/NE 24th Street	4,219	53	D	62	4,095	46	D	53	4,055	51	D	57
60	5099	156th Ave NE/Bellevue-Redmond Rd	4,171	93	F	108	4,171	85	F	98	4,635	50	D	64
61	1761	156th Ave NE/NE 24th Street	4,008	62	E	69	3,930	59	E	65	4,517	46	D	58
62	1758	156th Ave NE/Northup Way	4,383	85	F	103	4,460	62	E	77	4,576	65	E	83
63	1729	156th Ave NE/NE 8th Street	3,285	39	D	35	3,157	38	D	34	2,786	40	D	31
64	1765	140th Ave NE/NE 24th Street	3,385	78	E	74	3,368	98	F	92	3,151	73	E	64
65	1722	148th Ave SE/SE 8th Street	2,869	6	A	4	2,642	5	A	3	2,657	6	A	5
67	6131	156th Ave NE/NE 10th Street	2,083	22	C	13	1,901	23	C	12	1,751	21	C	10
68	1753	130th Ave NE/NE 20th Street	2,803	35	C	27	2,854	28	C	22	2,863	33	C	27
69	5003	Bellevue Way NE/NE 24th Street	2,440	30	C	20	2,738	29	C	22	2,562	32	C	23
70	5551	156th Ave NE/NE 13th Street	2,547	22	C	15	2,461	25	C	17	2,504	25	C	17
71	1719	Lk Hills Connector/SE 8th St/7th Pl	3,552	112	F	110	3,491	72	E	69	3,252	79	E	72
72	2642	112th Ave NE/NE 4th Street	4,500	135	F	169	4,540	105	F	132	4,845	102	F	138
73	1732	116th Ave/Main Street	3,628	34	C	34	3,409	32	C	31	3,463	38	D	37
74	1769	Bellevue Way NE/Northup Way NE	2,404	90	F	60	2,621	71	E	52	2,603	110	F	79
75	5057	164th Ave NE/NE 24th Street	2,732	35	D	27	2,528	49	D	34	2,443	33	C	23
76	1637	164th Ave NE/Northup Way	3,274	32	C	29	3,176	23	C	21	3,080	25	C	22
77	5066	130th Ave NE/NE 24th Street	2,201	38	D	23	2,175	39	D	24	2,293	56	E	35
78	1768	108th Ave NE/Northup Way NE	3,137	122	F	106	3,300	125	F	114	3,221	116	F	103
79	5058	148th Ave NE/NE 40th Street	3,093	71	E	61	2,663	152	F	112	2,908	59	E	48
81	1764	148th Ave NE/NE 24th Street	4,890	92	F	125	4,736	85	F	112	4,666	78	E	101
82	1698	Richards Rd/Kamber Rd	2,960	54	D	45	2,956	49	D	40	2,751	36	D	28
83	5075	156th Ave/Main Street	2,064	15	B	9	1,916	16	B	9	1,771	16	B	8
84	1724	156th Ave SE/Lake Hills Blvd	1,946	24	C	13	1,797	23	C	12	1,697	21	C	10
85	6054	Richards Rd/SE 32nd Street	2,626	69	E	50	2,600	52	D	37	2,569	37	D	27
86	1770	156th Ave SE/SE Eastgate Way	2,925	44	D	36	2,758	49	D	38	2,572	43	D	30
87	1728	164th Ave NE/NE 8th Street	2,832	45	D	36	2,780	32	C	25	2,689	34	C	26
88	1766	124th Ave NE/Northup Way NE	2,798	86	F	67	2,927	64	E	52	3,005	107	F	90
89	1718	112th Ave SE/SE 8th Street	1,532	26	C	11	1,237	18	B	6	1,148	23	C	7
90	6124	158th Ave SE/SE Eastgate Way	1,390	15	B	6	1,287	15	B	5	1,205	14	B	5

Appendix Table 19 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersection Delay (sec)	LOS	Total Delay Hours in Peak Hour
91	1776	160th Ave SE/SE Eastgate Way	1,188	19	B	6	1,179	20	B	6	1,190	20	C	7
92	5101	161st Ave SE/SE Eastgate Way	1,770	37	D	18	1,697	40	D	19	1,624	34	C	15
93	6156	Lk Washington Blvd/NE 1st/NE 10th St	679	32	C	6	1,488	32	C	13	1,404	32	C	13
94	1737	92nd Ave NE/NE 8th Street	1,432	16	B	6	1,548	27	C	12	1,510	27	C	11
96	980	100th Ave NE/NE 4th Street	1,711	18	B	9	1,580	16	B	7	1,494	16	B	6
97	5080	156th Ave SE/SE 24th St/22nd Pl	1,796	60	E	30	1,599	67	E	30	1,570	56	E	25
98	5104	Coal Creek Parkway/Forest Drive	3,362	37	D	34	3,357	40	D	37	3,447	29	C	28
99	5895	Somerset Blvd/SE Newport Way	844	21	C	5	687	24	C	4	692	20	C	4
100	2540	92nd Ave NE/Lk Washington Blvd	893	11	B	3	1,537	37	D	16	1,513	53	D	22
101	5331	150th Ave SE/SE Eastgate Way	3,378	35	D	33	3,169	33	C	29	3,132	32	C	28
102	5087	118th Ave SE/SE 8th Street	2,742	95	F	72	2,747	60	E	45	2,641	75	E	55
104	6125	SE Allen Rd/SE Newport Way	1,203	22	C	7	969	17	B	5	907	19	B	5
105	5083	Richards Rd/SE Eastgate Way	3,453	83	F	80	3,569	48	D	48	3,717	85	F	88
106	2900	121st Ave SE/SE 8th Street	2,277	29	C	19	2,152	40	D	24	2,036	22	C	12
107	5033	112th Ave NE/NE 6th Street	3,251	87	F	79	3,525	66	E	64	3,627	62	E	63
108	5109	Bellevue Way SE/P&R/112th Ave SE	4,890	158	F	214	4,028	185	F	207	3,957	147	F	162
111	1726	Northup Way/NE 8th Street	1,536	40	D	17	1,609	49	D	22	1,656	56	E	26
114	1767	116th Ave NE/Northup Way NE	1,821	86	F	44	1,810	108	F	54	1,457	81	F	33
116	6210	115th Place NE/Northup Way	2,133	91	F	54	2,389	83	F	55	2,381	56	E	37
117	5510	120th Ave NE/NE 20th Street	1,373	28	C	11	1,811	31	C	16	2,058	54	D	31
118	5067	Northup Way/NE 24th Street	1,836	48	D	25	2,363	36	D	23	2,619	42	D	31
119	5004	108th Ave NE/NE 24th Street	1,082	18	B	5	1,110	19	B	6	1,068	22	C	6
123	5059	140th Ave NE/NE 40th Street	1,940	101	F	54	1,836	108	F	55	1,880	102	F	53
124	5030	110th Ave NE/NE 6th Street	1,779	41	D	20	1,851	41	D	21	1,717	61	E	29
126	5026	108th Ave NE/NE 6th Street	1,161	36	D	12	870	47	D	11	999	29	C	8
128	5032	112th Ave NE/NE 2nd Street	3,425	62	E	59	3,426	54	D	51	3,154	60	E	52
129	5096	102nd Ave NE/NE 10th Street	1,908	15	B	8	2,056	15	B	8	1,793	15	B	8
130	5012	100th Ave NE/NE 10th Street	1,106	11	B	3	1,248	14	B	5	1,205	13	B	4
131	5086	116th Ave SE/SE 1st Street	2,813	46	D	36	2,585	36	D	26	2,273	31	C	19
132	2901	Richards Rd/SE 30th Street	2,061	48	D	27	2,081	24	C	14	1,964	16	B	9
133	1692	150th Ave SE/SE Newport Way	2,690	37	D	27	2,818	47	D	37	2,795	39	D	30
134	1720	Richards Rd/Lk Hills Connector	1,818	69	E	35	1,765	57	E	28	1,794	47	D	24
135	5107	Bellevue Way SE/SE 16th Street	3,335	43	D	40	3,004	61	E	51	3,190	27	C	24
136	5604	Bellevue Way NE/NE 30th Street	2,184	21	C	13	2,538	38	D	27	2,317	52	D	34
138	5053	Bellevue-Redmond Rd/NE 40th Street	2,977	37	D	31	2,829	42	D	33	3,015	29	C	24
139	5506	116th Ave NE/NE 4th Street	3,989	81	F	90	3,637	71	E	72	3,716	52	D	53
141	5010	100th Ave NE/NE 1st Street	2,253	22	C	13	2,176	21	C	12	2,012	16	B	9
143	5894	Coal Creek Parkway/SE 60th Street	2,943	28	C	23	2,810	24	C	19	2,910	23	C	18
144	5463	102nd Ave NE/NE 1st Street	1,385	18	B	7	1,306	20	C	7	1,235	19	B	6
145	5426	102nd Ave NE/NE 4th Street	1,849	14	B	7	1,733	12	B	6	1,646	14	B	6
146	5326	SE Eastgate Way/SE 35th Place	1,406	19	B	7	1,373	21	C	8	1,290	18	B	6
152	5436	105th Ave NE/NE 4th Street	2,194	19	B	12	2,128	15	B	9	2,123	19	B	11
153	3387	114th Ave SE/SE 8th St (Bellfield Office	1,135	30	C	9	1,130	17	B	5	1,082	16	B	5
154	5023	106th Ave NE/NE 10th Street	3,137	33	C	29	3,193	36	D	32	2,663	58	E	43
157	5028	110th Ave/Main Street	2,325	24	C	16	2,289	70	E	44	2,835	34	C	27

Appendix Table 19 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
158	5029	110th Ave NE/NE 2nd Street	2,036	95	F	54	2,136	100	F	59	2,238	95	F	59
159	5641	110th Ave NE/NE 4th Street	3,428	116	F	110	3,437	63	E	60	3,780	108	F	114
162	5401	110th Ave NE/NE 12th Street	3,738	22	C	23	3,633	24	C	25	3,484	37	D	36
164	5708	OHCM Internal Rd/NE 10th St Extension	2,338	29	C	19	2,248	25	C	16	2,218	31	C	19
165	5505	116th Ave NE/NE 10th St Extension	3,716	22	C	23	3,746	18	B	19	3,465	37	D	35
171	5088	142nd PL SE/SE 36th Street	1,674	47	D	22	1,576	57	E	25	1,626	43	D	20
173	1712	156th Ave SE/SE 16th Street	2,233	6	A	3	2,095	5	A	3	2,069	5	A	3
174	5595	150th Ave SE/SE 38th Street	3,123	70	E	61	3,122	66	E	58	3,128	72	E	62
175	6252	134th Ave NE/Bellevue-Redmond Rd	2,916	17	B	14	2,938	20	B	16	2,971	19	B	16
179	5024	106th Ave NE/NE 6th Street	2,312	15	B	10	2,199	14	B	9	2,112	20	C	12
180	7077	116th Ave NE/OHMC Entrance	2,180	14	B	8	2,264	14	B	9	1,995	20	C	11
181	5046	SE 1st St/120th Ave/Main Street	1,610	29	C	13	1,468	19	B	8	1,394	21	C	8
185	6032	136th Place NE/Northup Way	2,651	22	C	16	2,532	21	C	15	2,637	21	C	15
186	3109	120th Ave NE/NE 6th Street	2,673	23	C	17	2,273	23	C	15	2,149	20	C	12
188	6006	148th Ave NE/NE 29th Place	3,494	103	F	100	3,400	107	F	101	3,383	72	E	68
189	5803	NE 29th Place/NE 24th Street	2,009	14	B	8	1,847	20	B	10	1,683	11	B	5
190	6200	108th Ave NE/NE 10th Street	2,839	39	D	31	2,964	45	D	37	2,677	58	E	43
195	2321	148th Ave NE/NE 36th Street	2,777	36	D	28	2,584	62	E	45	2,754	34	C	26
198	5050	W Lk Sammamish Parkway/NE 40th Street	1,119	12	B	4	1,013	11	B	3	959	10	B	3
202	1693	128th Ave SE/Newport/SE Newport Way	2,406	29	C	19	2,325	16	B	10	2,274	16	B	10
203	1694	Factoria BLVD/Coal Creek Pkwy	3,075	81	F	69	3,162	52	D	45	3,159	44	D	39
204	5084	128th Ave SE/SE 36th Street	4,075	41	D	46	4,102	33	C	38	4,275	35	C	41
219	5286	I-405 NB Ramps/SE 8th Street	2,450	48	D	33	2,249	54	D	34	2,354	48	D	32
220	6110	I-405 NB Ramps/Coal Creek Parkway	3,572	55	E	55	3,718	38	D	39	3,705	42	D	43
221	6114	I-405 SB Ramps/Coal Creek Parkway	2,220	169	F	104	2,249	168	F	105	2,088	171	F	99
222	6065	128th Ave SE/SE 38th Place	3,077	78	E	66	2,936	88	F	72	3,020	82	F	69
223	6109	119th Ave SE/Coal Creek Parkway	3,667	103	F	105	3,702	81	F	84	3,725	69	E	71
224	5652	I-405 SB Ramps/NE 4th Street	3,712	48	D	50	3,689	48	D	49	3,942	48	D	53
225	5653	I-405 NB Ramps/NE 4th Street	3,182	59	E	52	3,367	56	E	52	3,324	42	D	39
226	5277	I-405 SB Ramps/SE 8th Street	1,221	51	D	17	1,068	28	C	8	1,378	37	D	14
227	2902	150th Ave SE/I-90 EB Off-Ramp/SE 36th St	3,026	80	E	67	3,024	92	F	77	3,037	75	E	64
228	1690	Lakemont Blvd (SR-901)/SE Newport Way	3,023	59	E	50	3,132	46	D	40	3,152	46	D	40
233	5091	120th Ave NE/NE 8th Street	5,303	53	D	78	5,001	46	D	63	4,792	42	D	56
234	5393	112th Ave NE/NE 10th Street	4,379	56	E	68	4,271	55	E	66	4,170	54	D	62
235	6201	110th Ave NE/NE 10th Street	2,919	49	D	40	2,913	50	D	40	2,760	31	C	24
238	1682	Coal Creek Parkway/SE 72nd Place	3,000	24	C	20	2,831	23	C	18	2,958	26	C	21
239	5098	156th Ave NE/NE 40th Street	5,165	72	E	103	4,903	62	E	84	4,873	51	D	69
245	6104	119th Ave SE/SE 60th Street	1,695	8	A	4	1,360	3	A	1	1,375	3	A	1
248	6078	148th Ave SE/SE 46th Street	1,490	3	A	1	1,531	4	A	2	1,518	4	A	2
249	2214	148th Ave NE/NE 51st Street	3,765	107	F	112	3,599	125	F	125	3,626	123	F	124
250	5383	SR-520 SB Ramps/NE 51st Street	2,610	29	C	21	2,585	28	C	20	2,549	29	C	20
251	5387	SR-520 NB Ramps/NE 51st Street	2,501	57	E	39	2,422	45	D	30	2,351	48	D	31
252	5038	132nd Ave NE/NE 20th Street	2,339	31	C	20	2,400	31	C	21	2,429	28	C	19
255	5229	156th Ave NE/NE 51st Street	3,573	111	F	110	3,429	111	F	105	3,508	95	F	92
260	6220	I-90 EB On-Ramp/SE Newport Way	1,739	5	A	2	1,906	5	A	2	1,920	4	A	2

Appendix Table 19 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
262	7766	W Lk Sammamish Parkway/SR-520 EB Off-Ramp	3,356	65	E	60	3,286	70	E	64	3,375	67	E	63
263	6016	156th Ave NE/NE 28th Street	2,580	57	E	41	2,672	37	D	28	2,996	41	D	34
264	6132	156th Ave NE/NE 31st Street	2,838	38	D	30	3,094	34	C	29	3,037	48	D	40
265	5061	148th Ave NE/Old Redmond Road	4,326	42	D	51	4,189	46	D	54	4,204	52	D	61
266	6170	151st Ave NE/NE 24th Street	2,047	39	D	22	1,922	45	D	24	2,021	20	C	11
267	6018	152st Ave NE/NE 24th Street	3,446	61	E	58	3,154	74	E	65	3,498	52	D	51
268	5539	148th Ave NE/NE 22nd Street (Sears)	2,967	23	C	19	2,956	26	C	21	3,349	25	C	24
269	5516	132th Ave NE/NE 16th Street	1,725	21	C	10	1,453	19	B	8	1,700	21	C	10
270	6039	140th Ave NE/NE 18th St (Evergreen Mall)	2,017	3	A	2	1,829	3	A	2	1,565	4	A	2
272	5573	139th Ave SE/SE Eastgate Way	1,497	14	B	6	1,542	14	B	6	1,573	14	B	6
275	2215	W Lk Sammamish Parkway/NE 51st Street	3,356	46	D	43	3,251	58	E	52	3,319	65	E	60
276	1760	Bellevue-Redmond Rd/W Lk Sammamish Parkway	2,634	69	E	51	2,609	70	E	51	2,743	53	D	41
277	7078	156th Ave NE/NE 36th Street	3,558	34	C	34	3,554	31	C	31	3,650	31	C	32
279	5247	148th Ave NE/SR-520 EB Off-Ramp	4,095	15	B	18	4,044	15	B	17	3,917	16	B	18
280	5578	139th Ave SE/Kamber Road	2,005	41	D	23	2,100	30	C	17	1,993	21	C	12
282	1141	128th Ave SE/SE 41st Street	2,120	15	B	9	1,934	18	B	10	1,922	21	C	11
284	6068	124th Ave SE/Coal Creek Parkway	3,108	57	E	49	3,190	53	D	47	3,184	50	D	44
285	6064	128th Ave SE/3600 Block	3,421	44	D	42	3,417	44	D	42	3,530	40	D	39
294	5508	124th Ave NE/NE 16th Street	2,016	29	C	16	1,727	31	C	15	1,849	34	C	17
295	1121	120th Ave NE/NE 4th Street	2,815	12	B	9	2,109	11	B	7	2,161	11	B	7
300	7671	W Lk Sammamish Parkway/Marymoor Park	2,993	64	E	53	2,889	83	F	67	2,963	78	E	64
		Subtotal	565,672			8,141	552,955			7,665	548,186			7,350
		Citywide Average Vehicle Delay (sec)	51.8				49.9				48.3			
		Citywide Total Delay Hours	8,141				7,665				7,350			
		Citywide Average LOS	D				D				D			

Note: The 'Citywide' totals above reflect all intersections citywide through which FTN services operate.