City of Bellevue

Downtown Transportation Plan

Transportation Commission Recommendation

October 2013

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EXECUTIVE SUMMARY

INTRODUCTION MESSAGE FROM THE BELLEVUE TRANSPORTATION COMMISSION

Through our work on the Downtown Transportation Plan, the Transportation Commission developed a plan for everyone who wants to get around safely and comfortably in Downtown Bellevue, whether that person is driving a car, riding on a bus, pedaling a bicycle or walking or rolling. Our recommended multimodal mobility strategy will provide access for private vehicles and will accommodate the emerging demand for pedestrian, bicycle and transit facilities.

More than a transportation strategy, the Commission's recommendation accommodates anticipated significant increases in Downtown activity with a comprehensive set of improvements to facilities that will enhance Downtown vitality and economic development, improve sustainability, and support livability and public health. The Commission's work is compatible with and is fully integrated into the Downtown Livability Initiative, a companion document addressing land use and urban design.

Backed by data from travel demand forecasts and the resulting vehicular level-of-service at Downtown intersections, the Commission recommends no major new vehicle capacity expansion projects in Downtown. Many roadway and transit projects assumed in the modeling for 2030 are retained in the plan, as these projects will support Downtown land use. Therefore the bulk of the Downtown Transportation Plan focuses on the mobility for people who will not be using a car for all of their Downtown trips. Many of the trips the Plan accommodates are not the commute trips for which PM peak hour level-of-service is measured, but the trips to the store, the restaurant, the park or other destinations within the mixed-use Downtown Urban Center where many destinations require only a short trip.

We presented our Plan to the City Council on October 7, 2013, and in turn, the Council supported Plan implementation in the 2015/2016 budget that funds enhancements throughout Downtown and particularly near the planned light rail stations that serve Downtown.

ACKNOWLEDGMENTS

BELLEVUE CITY COUNCIL — October 7, 2013 Membership

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Jennifer Robertson, Deputy Mayor	John Chelminiak	Kevin Wallace
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BELLEVUE TRANSPORTATION COMMISSION — 2012 - 2013 Membership

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Planning Commission

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Bellevue Downtown Association

Bellevue Chamber of Commerce

Building Owners and Managers Association

Eastside Transportation Association

Top cover photo of Downtown Bellevue at night by Robert Martin

DOWNTOWN TRANSPORTATION PLAN OVERVIEW

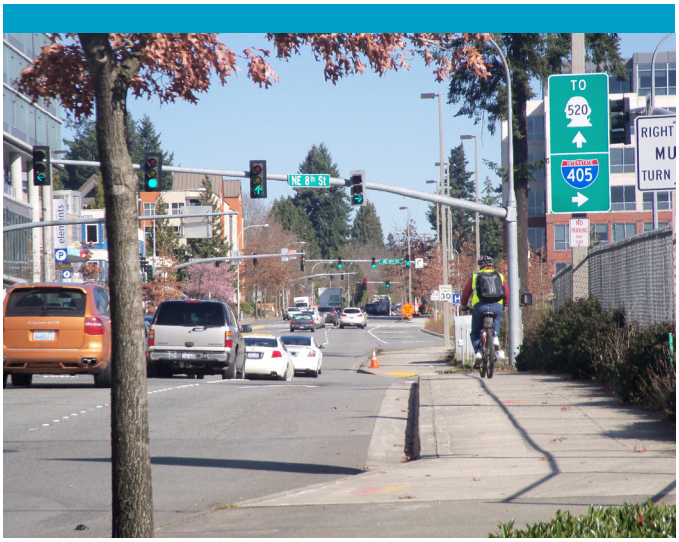
In the 2011-2012 budget, the City Council approved capital and operating funding to support an update to the Downtown Transportation Plan, and directed the Transportation Commission to develop a comprehensive mobility strategy to support Downtown growth to 2030, and beyond. The Commission recommendations for transportation system improvements will accommodate the motorized and non-motorized trips generated by a forecast increase of 28,000 jobs and 12,000 residents—representing approximately 75 percent of the planned employment growth in the city, and over 50 percent of the planned residential growth between 2010 and 2030.

The Commission's task, as the City Council defined it, was to prepare a plan to provide mobility options for people to get around to, from and within Downtown Bellevue. Council provided a set of planning principles to guide the Commission's work and to shape the community expectations. From this perspective the Commission prepared a suite of viable travel options that are compatible with each other and that together will support Downtown vitality and livability. Improvements must be made across all modes. The economic engine of Downtown Bellevue will be strengthened with a transportation strategy that pays focused attention to pedestrians, bicycles and transit while acknowledging that efficient vehicle travel will continue to be critically important. Downtown will become even more attractive and accessible as a place to work, to shop and to call home as well-planned multimodal transportation enhancements are implemented.

Transportation Department staff and the Commission worked closely with the Downtown community to understand the issues and to develop responsive mobility strategies. The Commission met 24 times on the subject and developed a good understanding of the transportation modeling data, as well as the many qualitative measures of mobility, all of which help inform their recommendations.

TRANSPORTATION COMMISSION RECOMMENDATION SUMMARY

The scope of the Transportation Commission recommendation includes four modal components that are embedded in an overall theme of enhancing Downtown mobility options:



PRIVATE MOTOR VEHICLES

Council provided direction to accommodate the forecast vehicular travel demand based on anticipated land use and other available modes, and to analyze opportunities for on-street parking, loading and other curbside uses to support businesses and residents. The assumed 2030 transportation network includes roadway vehicle capacity projects within and outside of Downtown that support Downtown land use and mobility.

TRANSIT

The Downtown Transportation Plan responds to Council direction with recommended policies and projects that provide transit service for the people who live and work in Downtown, the transit capacity to support forecast transit demand, transit speed and reliability enhancements to help bus passengers move throughout Downtown, and transit passenger comfort, access and information to support and improve ridership.

PEDESTRIANS

In a Downtown setting, the pedestrian environment affects mobility, economic development and quality of life. Breaking down the walk trip into its essential components enabled the Transportation Commission to recommend specific enhancements: crosswalks at intersections designed to safely accommodate increasing numbers of pedestrians; mid-block crossings to facilitate pedestrian crossings of arterials between signalized intersections; sidewalks and curbside landscaping that serve as the fundamental pedestrian infrastructure, and through-block connections that provide walkable and accessible corridors through Downtown superblocks.

BICYCLES

Mobility and access for people on bicycles is dependent on a comprehensive network of on-street bicycle facilities and wayfinding plus short-term on-street bicycle parking and long-term, secured commuter parking in garages. For both commuting and recreation, recommended policies and projects will support connectivity within Downtown and connections to neighborhoods and regional facilities such as the I-90 Trail, the SR 520 Trail and the planned Eastside Rail Corridor Trail. Bicycle connections to planned light rail stations will enable riders to make easy transit connections. Shared bicycles may also provide a mobility option.

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1. BACKGROUND & INTRODUCTION

Adopted in 2004 after the comprehensive work on the Downtown Implementation Plan, the Downtown Subarea Plan contains policies that guide the physical development of Downtown Bellevue and identifies transportation projects to accommodate the forecast travel demand through 2020. Transportation policies and projects are collectively known as the Downtown Transportation Plan. This update of the Downtown Transportation Plan acknowledges changed circumstances since 2004, and considers land use and transportation system changes anticipated to 2030. Recommendations for Downtown transportation policies and projects are integrated with the Downtown Livability Initiative—the land use and urban design components of the Downtown Subarea Plan—in a comprehensive package of Subarea Plan amendments due for Council consideration and approval in 2016.

The City Council designated the Transportation Commission to develop a comprehensive slate of transportation policies and projects to address mobility to, from and within Downtown. Downtown mobility is based on the premise that everyone should be able to get around in Downtown Bellevue safely and comfortably, a concept that requires a balancing of the needs of vehicle drivers, transit riders, pedestrians and bicyclists. Reasonably foreseeable roadway capacity projects in and around Downtown will provide an adequate vehicular level-of-service in 2030. Improvements are recommended to better accommodate the diverse needs of an increasing number of people who want to comfortably and safely walk or ride their bicycles in Downtown. Modifications to transit service and facilities will help make riding transit an even more attractive option than it is today.

The multimodal mobility strategy will provide access for private vehicles and will accommodate the emerging demand for pedestrian, bicycle and transit facilities. A multimodal approach to mobility considers both quantitative and qualitative measures that hone in on the types of projects that best match the needs of the community. Transportation system improvements are intended to support mobility for the 70,300 employees and 19,000 residents that are forecast for 2030, plus the visitors who help make Downtown Bellevue a vibrant urban center.

The multimodal strategy is not new, and prior investments have resulted in the vibrant and mobile Downtown Bellevue of today. Yet new policies and projects are needed to help shape the Downtown Bellevue of the future, a future in which walking is the logical option for short trips and people can make longer trips by car, transit or bicycle. Downtown traffic volume is not increasing, even as land continues to develop. People in greater numbers are choosing to walk, bicycle and ride the bus to get around to/from and within Downtown. Mobility options provide choices and help enhance Downtown livability.

COUNCIL PLANNING PRINCIPLES

Planning principles approved by Bellevue City Council February 6, 2012 guided the Transportation Commission's work and established the reasonable expectations in the community for the types of policies and projects that would emerge. These principles are as follows:

1. Plan for multiple modes of travel within and to and from Downtown Bellevue

Develop an innovative multimodal transportation strategy for Downtown Bellevue that updates the existing Downtown Subarea Plan project list. The recommended strategy should consider and incorporate the emerging and anticipated mobility needs of motorists, pedestrians, bicyclists, transit riders, taxi patrons and carpool/vanpool riders, and support the transport, parking and loading needs of employers, residents and businesses.

2. Accommodate the anticipated travel demands from the 2030 land use forecast

Ensure that the planned transportation system will accommodate the 2030 forecast for Downtown residential and employment growth.

3. Advance the adopted vision for Downtown Bellevue

Ensure that the Downtown transportation system advances and supports the land use and urban design vision for Downtown Bellevue - articulated in the Downtown Subarea Plan as a vibrant, livable, accessible, and memorable mixed use Urban Center.

4. Recognize changes in the regional and local transportation and land use environment

Incorporate local and regional transportation projects and plans that have been approved and/or implemented since the Downtown Subarea Plan was adopted in 2004. Transportation system changes include East Link, SR 520 expansion and tolling, improvements to I-90 and I-405, and the Bellevue Mobility and Infrastructure Initiative. Planning changes include the updated Bel-Red Subarea Plan, the Wilburton Subarea Plan and the Eastgate/I-90 Corridor Study.

5. Integrate City Council direction

As potential Downtown transportation projects are identified, incorporate City Council direction on regional transportation facilities, such as the Downtown alignment for East Link and the I-405 Master Plan.

6. Provide for comprehensive public involvement

Ensure that the process to update the Downtown Transportation Plan invites broad and inclusive public involvement that engages the diverse Downtown commercial and residential communities, nearby residential neighborhoods, and other community stakeholders.

7. Minimize traffic impacts on neighborhoods

Consider measures as needed to protect Downtown residents and nearby residential neighborhoods from significant adverse impacts from traffic and commuter parking.

8. Involve regional transportation and planning partners

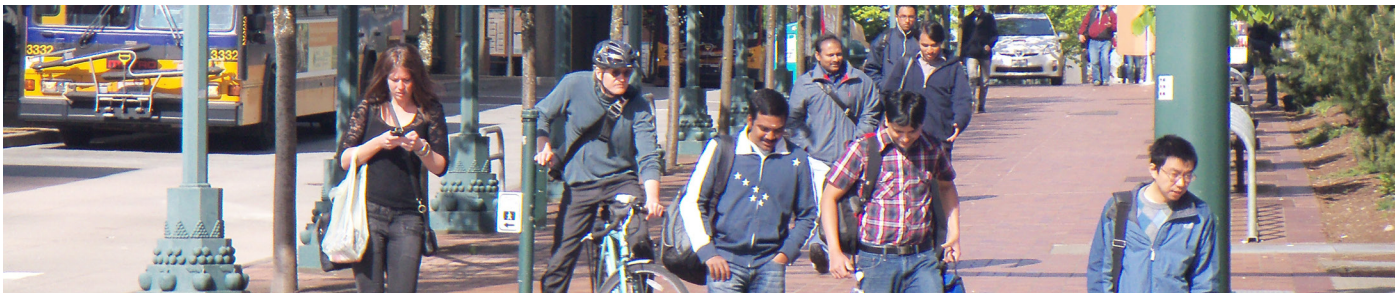
Coordinate planning for the Downtown Bellevue transportation system with regional transportation and planning partners, such as the Puget Sound Regional Council, Washington State Department of Transportation, Sound Transit, and King County Metro, and work to ensure Downtown projects and plans are compatible with each other and are consistent in support of mobility and economic development in Downtown Bellevue.

9. Leverage funding from outside sources to implement projects

Identify transportation system projects that effectively leverage grant funding opportunities. These types of projects will achieve multiple mobility objectives, support economic vitality and residential development, and will sustain Downtown Bellevue's regional status as a Metropolitan City and Urban Center.

10. Utilize measures of effectiveness to evaluate potential projects

Use both quantitative and qualitative measures of effectiveness to evaluate project ideas relative to each other and to community objectives. Consider the cost of a project relative to its benefit to mobility as an important metric, in addition to measures such as improved safety for pedestrians and bicyclists, management of traffic congestion, and the efficient use of the available right-of-way.



IMPLEMENTATION

In the 2015/2016 budget, the City Council allocated $5 million for the period 2015 through 2021 to implement the Downtown Transportation Plan and to provide "exceptional access" to the Downtown Bellevue Light Rail Station, anticipated to open for service in 2023. Project types are identified in the Pedestrian, Bicycle and Transit sections of this report. Downtown Subarea Plan policies provide guidance for investments, standards and programs that address Downtown mobility and support livability.

PUBLIC INVOLVEMENT

Council designated the Transportation Commission to be its advisors for the Downtown Transportation Plan Update. On a monthly basis, the Commission worked with staff on both the big picture of Downtown mobility and on the individual components that make up a comprehensive multimodal mobility strategy. The Commission inquired deeply into the fundamental transportation modeling assumptions and several iterations of model output until they were satisfied that the long-range forecasts provided a good analysis of the expected vehicular level-of-service. For other modes that lacked specific metrics and standards, the Commission methodically reviewed the opportunities to improve the Downtown environment for people who walk, ride a bicycle or ride transit, keeping in mind at all times that a multimodal approach requires balancing, prioritization and trade-offs.

Community Outreach and Engagement Summary

Beginning in the summer of 2011 staff engaged the community in dialogues and activities to understand the issues and opportunities related to Downtown mobility. In addition, staff regularly provided periodic status reports on the Downtown Transportation Plan to community organizations and maintained a project web site (http://www.bellevuewa.gov/downtown-transportation-plan-update.htm). A summary report, "Transportation Issues Scoping Report, January 2012" (http://www.bellevuewa.gov/pdf/Transportation/Scoping_Report(1).pdf) documented the community involvement to date that identified the mobility issues that the Commission addressed. Significant community involvement events are described briefly below:

Downtown Bicycle Mobility Tours

In September of 2011, staff led, with the support of the Bellevue Downtown Association, several bicycle tours of Downtown Bellevue and beyond. A tour targeted toward Downtown residents provided opportunity for dialog on bicycle facilities and parking that would support bicycle mobility within Downtown. Three separate tours focused on bicycle commuters who rode with staff along routes through nearby neighborhoods to the I-90 Trail/Mountains to Sound Greenway and to two access points for the SR 520 Trail. Input from these tours helped inform the Commission's recommendation for Downtown bicycle facilities and solidify the city's long-term support for the bicycle parking program.

Feet First Walking Audits

Later in the Fall of 2011, the Seattle-based pedestrian advocacy organization Feet First worked with staff to lead Downtown walking tours or "audits." Feet First documented public comments, photographed the events, and provided recommendations in a Downtown Bellevue Walking Audit Report that the Commission reviewed and that informed many of the Commission's recommendations for pedestrian facilities. Walking audits were designed keeping in mind the specific needs of Downtown residents and Downtown workers and they covered different routes accordingly. The Feet First report noted that while the sidewalk environment is generally good, the crosswalks at intersections could be improved, mid-block crossings could be added to enhance pedestrian safety and mobility, and through-block connections could be made more visible and accessible.

Community "Open House" Events

An open house on November 1, 2011 highlighted the specific mobility topic areas, Roadways, Transit, Pedestrian, and Bicycle. Community comments directed toward each mode are factored into mobility assessments and are reflected in project and policy recommendations. Downtown mobility was a key topic at the Downtown Livability Initiative open house held on November 29, 2012. At the Spring Transportation EXPO held on April 24, 2013 the Downtown Transportation Plan Update exhibits highlighted preliminary recommendations, and staff answered questions and to gathered additional input.

Downtown Transportation Plan Updates to Stakeholder Organizations

Staff provided updates and fielded questions at meetings of organizations that have a significant interest in Downtown mobility. These include the Bellevue Downtown Association, the Bellevue Chamber of Commerce, the Building Owners and Managers Association, the Eastside Transportation Association, representatives of the hospitals in the Medical District, and individual Downtown businesses.

Community and Professional Organizations

Staff provided information and discussed the Downtown Transportation Plan with the Bellevue Network on Aging and its affiliated community partnership; the Eastside Easy Rider Collaborative. Staff also provided presentations to the American Society of Civil Engineers and the Institute of Transportation Engineers.

City Council

With input from the Transportation Commission, the City Council adopted a set of 11 planning principles on February 6, 2012. Staff provided a management brief in July of 2012 and in March of 2013, and the Transportation Commission transmitted a final recommendation on October 7, 2013. At that time, Council provided direction to implement the Plan recommendations.

Transportation Commission

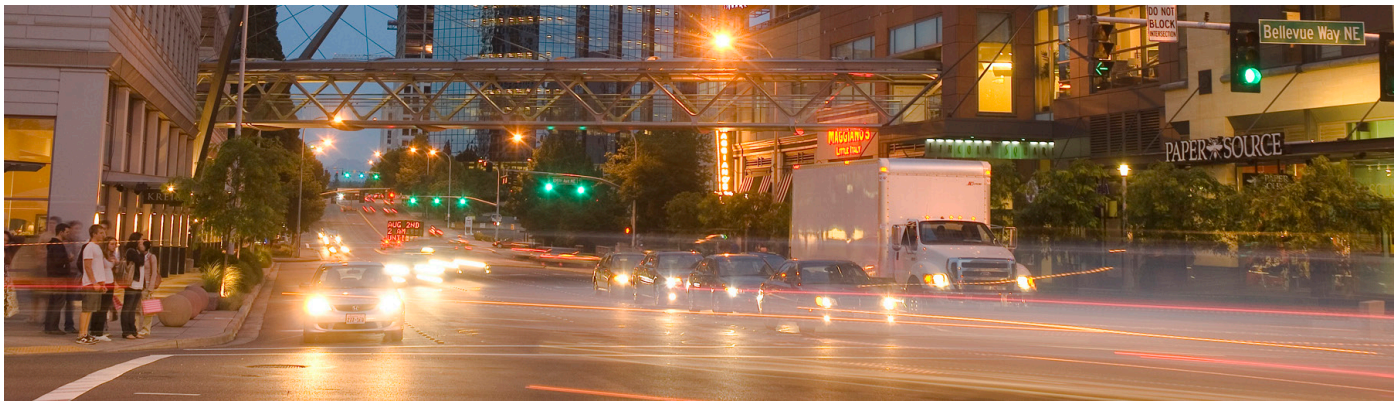
Following direction from Council at the October 7, 2013 meeting, the Transportation Commission reviewed the adopted Downtown Subarea Plan policies and determined whether the policy should be retained, amended or repealed. Conditions for a recommendation to amend or repeal a policy included policy language that was determined to be outdated, redundant, superseded by more recent planning, or the policy had been fully implemented. Recommended Subarea Plan transportation policies will fill gaps identified through the Downtown Transportation Plan update. Transportation policies will be integrated with policies addressing land use and urban design developed through the Downtown Livability Initiative.

SUSTAINABILITY

As a mixed-use, multimodal urban center, Downtown Bellevue has a lot going for it with regard to sustainability. From a purely transportation perspective, this is a setting that lends itself to transit riding for long trips, bicycling for medium trips, and walking for short trips. For those who choose to drive, the environmental impact may be less because shorter trips result in fewer vehicle miles traveled and fewer greenhouse gas emissions. Further analysis may focus on factors such as vehicle miles traveled (VMT), greenhouse gas emissions, VMT and trends in Downtown trips, Downtown livability and personal health implications.

DOWNTOWN MULTIMODAL TRANSPORTATION COMPONENTS

Four ways of getting around in Downtown are at the core of the multimodal mobility strategy: driving on roadways in private vehicles, riding transit, moving about as a pedestrian, and riding bicycles. Staff and the Transportation Commission used projected 2030 land use and travel demand and considered community comments to identify issues and opportunities related to the mobility needs of Downtown residents, workers and visitors, and subsequently developed policy recommendations and project concepts to address them. Through this process the Commission uncovered some significant mobility gaps, some pleasant surprises and some issues that were referred for further analysis to the Downtown Livability Initiative.



2. PRIVATE MOTOR VEHICLES

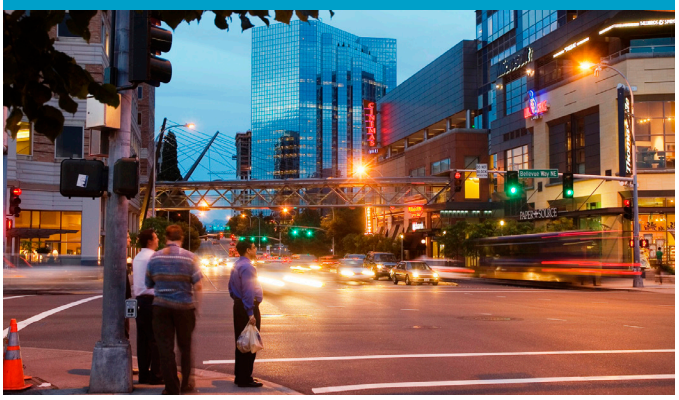
FACILITIES FOR DOWNTOWN DRIVERS

The Downtown Transportation Plan acknowledges the fundamental use of the roadways for people driving vehicles, most of which are private vehicles people use for commuting, shopping, and recreation. Downtown roadways provide access to offices, stores, parks and increasingly, residences. Some people driving in Downtown have no Downtown destination at all and are just moving between neighborhoods or to gain access to the regional freeway system. The capacity of roadway intersections to accommodate vehicles is occasionally exceeded for short periods due to accidents, special events and commuting-related congestion. While it is neither possible nor desirable to build roads to alleviate all congestion, Bellevue has invested heavily in both the infrastructure of the roadways and in the technology to operate the 43 signals that control traffic operations at Downtown intersections. Bellevue uses the Sydney Coordinated Adaptive Traffic System (SCATS) to help ensure that the available roadway and intersection capacity is efficiently utilized. SCATS makes constant adjustments to signal operations in response to the real-time traffic situation, thereby reducing travel delay.

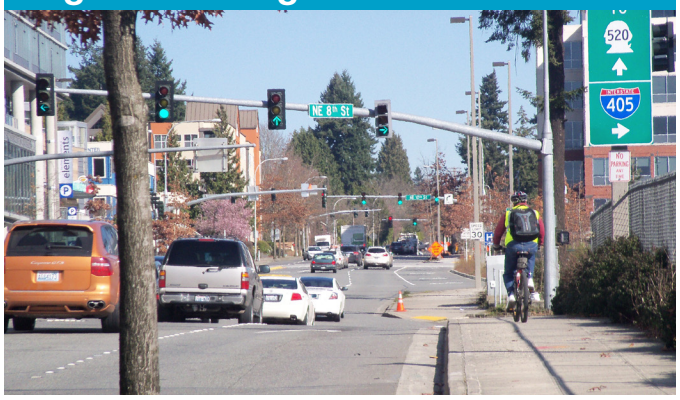
Four components of vehicular roadway mobility are **Downtown Access** (roadway network to get around within Downtown), **Regional & Neighborhood Access** (connections to and from Downtown), **Roadway Capacity** (roadway function in terms of vehicular delay at intersections and travel time), and **Traffic Flow/Efficiency** (using technology to manage traffic flow and add system capacity).

VEHICULAR MOBILITY COMPONENTS

Downtown Access



Regional & Neighborhood Access



Roadway Capacity

Traffic Flow/Efficiency

BELLEVUE
ITS

BELLEVUE
INTELLIGENT TRANSPORTATION SYSTEMS

TRAVEL DEMAND MODELING AND INTERSECTION LEVEL-OF-SERVICE

Analysis of the 2030 travel demand and intersection level-of-service (LOS) examined quantitative metrics that helped identify potential transit and roadway mobility issues and informed the development of policy recommendations and projects. Metrics for private vehicle mobility are related to the average delay at intersections measured in seconds and to the travel time along roadway corridors, both of which are derived from the travel demand modeling and detailed traffic operational modeling. The foundational Bellevue-Kirkland-Redmond (BKR) travel demand model is built upon assumptions for future land use and the roadway network.

By 2030 Downtown development is projected to provide space for 70,300 jobs and homes for 19,000 residents, an increase of 27,775 jobs and 12,142 residents over the 2010 Base Year, as shown in ***Table 1***. This table also shows a substantial increase in the number of "person trips" generated by this dense mix of land use. A "person trip" occurs Downtown when a person moves across a street—essentially from one block (known in modeling terms as a Transportation Analysis Zone) to another—regardless of mode. The model assumes that people make such trips in a motorized vehicle, and that, for instance, three persons traveling together in one auto make three person trips, and 40 people traveling in one bus are 40 person trips. For short trips in Downtown Bellevue, it is expected that they will take place by walking or bicycling, therefore a walk trip adjustment is made, as described in the Walk Trip Adjustments section below.

Downtown Bellevue	2010 (Base Year)	2030 (Baseline)	Growth
Employment	42,525	70,300	27,775
Population	6,858	19,000	12,142
Person Trips	385,000	665,000	280,000

Table 1. Land Use and Transportation Forecast

Type of Trip (rounded to nearest 1,000)	2010	2030	Growth
Home-Based Work Trips	55,000	104,000	49,000
Home Based Other Trips	188,000	317,000	129,000
Non-Home Based Trips	150,000	244,000	94,000
TOTAL	385,000	665,000	280,000

Table 2. Anticipated Growth Of Person Trip By Type

2030 TRAVEL DEMAND

As Downtown grows, so does overall trip-taking by residents, workers and visitors. The BKR travel demand model projects a 73% increase in the number of daily Downtown "person trips" between 2010 and 2030. A person trip is one that is taken between transportation analysis zones or TAZs, which in Downtown consist of each superblock…a trip taken within a superblock is not counted. ***Table 2*** documents the anticipated growth of each type of person trip taken into, out of and within Downtown Bellevue, regardless of mode (walk, bicycle, transit, private auto). The numbers are based on "trip ends" such that when a person travels from home to work and back again, that is considered two Home-Based Work trips. When a person travels from the office to lunch and back, that is considered two Non-Home Based trips. Home-Based Other trips are those between home and the store, or to school, park, library, etc.

Of the 665,000 daily person trips forecast for 2030, 424,000 have an origin outside of Downtown with a destination within Downtown and 104,000 originate Downtown with a destination elsewhere. All of these trips are considered to be taken by a person in a vehicle—either on transit, in a carpool or in single occupant vehicle. The balance of the trips are the 137,000 internal trips that have both an origin and a destination in Downtown. An important consideration for the short-distance internal Downtown trips is the "walk trip".

WALK TRIP ADJUSTMENTS

In the BKR travel demand model, any trip taken for any purpose between one TAZ and another is considered to taken in a motorized vehicle, even for a short trip between the small TAZs in Downtown Bellevue. A trip within a TAZ is not counted as that person does not enter the transportation system managed by the city. BKR exaggerates the number of vehicle trips made within Downtown because the model does not account for short trips made by pedestrians, and provides a forecast only for vehicle trips (Transit, HOV, SOV). Therefore staff performed a supplemental calculation to approximate the percentage of walk trips in the overall travel demand forecast.

People who arrive Downtown on transit or in a carpool may not have access to a car during the day, so the Non-Home Based trips that they take within Downtown will likely be walk trips. These trips are taken "off the top" of the total travel demand (137,000 internal trips) because there is no car available for these people. For those who arrive Downtown in a car or on transit, many of the trips they take during the day within Downtown are also walk trips. The one simple factor used to determine the likelihood of a person taking a walk trip is the distance between trip origin and destination. Staff developed a distance-based methodology to calculate the percentage of walk trips relative to the total number of trips, shown on the Downtown TAZ base map in ***Figure 1***.

For an example in applying this distance methodology: consider the person-trips taken between Bellevue City Hall and Meydenbauer Center (less than .25 miles); by this calculation at least 70% of the people are likely to walk, whereas 30% of the trips between City Hall and Bellevue Square (0.5 to 0.75 miles) are likely to be walk trips. While other factors play a role in a person's decision to walk or drive—inclement weather, packages to carry, parking availability and cost, hills, time available, etc.—for this purpose, staff applied a deduction for walk trips based only on distance, considered a very conservative approach.

Based on the 2030 forecast of 137,000 daily person trips internal to Downtown, applying the walk trip methodology yields about 76,000 daily Downtown walk trips with a residual of 50,000 daily private vehicle trips. See ***Figure 2*** below for a depiction of the methodology and results.

2030 TRANSPORTATION NETWORK ASSUMPTIONS

The assumed 2030 vehicular transportation network includes many roadway and transit capacity projects that support Downtown mobility. Significant roadway projects outside of Downtown provide a benefit to Downtown by improving overall circulation. Within Downtown, the planned expansion of NE 2nd Street and 110th Avenue NE provide additional vehicular capacity to accommodate anticipated growth in land use and the resulting vehicle trips.

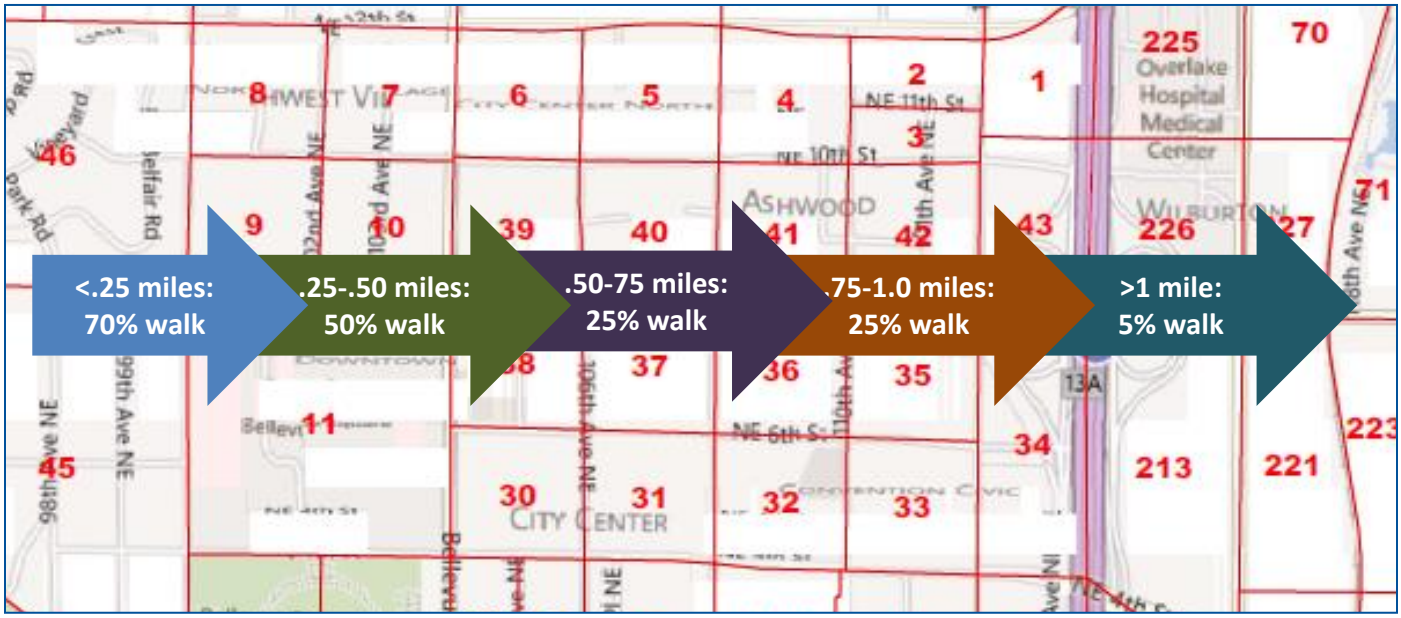
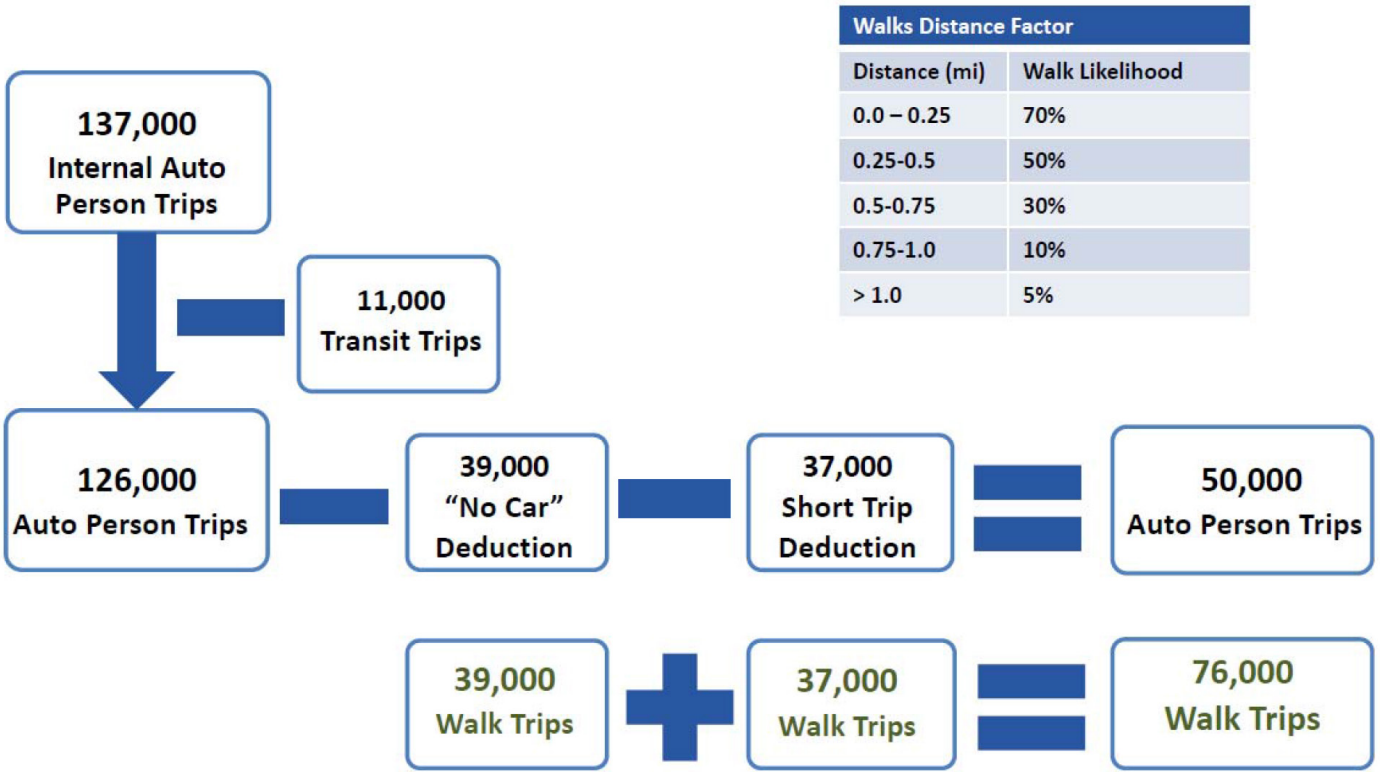


Figure 1. Distance Methodology for Internal Walk Trip Calculation

How Many Daily Walk Trips?



Walks Distance Factor	
Distance (mi)	Walk Likelihood
0.0 – 0.25	70%
0.25-0.5	50%
0.5-0.75	30%
0.75-1.0	10%
> 1.0	5%

Figure 2. 2030 Walk Trip Calculation Methodology

1990-2013 Traffic Volume

Figure 3 shows the average annual weekday traffic volume for specific count locations on Downtown Bellevue arterials. Between 1990 and 2013, the traffic volume has remained relatively constant, while land use Downtown Bellevue has significantly intensified. While this scenario may seem counter-intuitive, it is actually the result of deliberate planning, investments in mobility options, and aggressive transportation demand management. Proximity between destinations and greater intensity of jobs, housing and services promotes walking and bicycling for short trips. Improved transit service, continuous sidewalks, commuter and short-term bicycle parking facilitate non-drive alone trips. Incentives and regulations encourage employees to consider and use modes of travel that do not significantly contribute to congestion. The "all-of-the-above" mobility strategy accommodates private vehicles, but it is noteworthy that the increase in number of vehicles during a typical weekday is not commensurate with growth in land use.

2010 Base Year Roadway Network

The 2010 Base Year modeling platform is the basis for the BKR travel demand model that staff used to determine Downtown Bellevue vehicular travel demand. The 2010 BKR transportation network consists of the regional highway system, roadways and transit in the Bellevue, Kirkland and Redmond area. For the purposes of the Downtown Transportation Plan and the Downtown Livability Initiative, this base year travel demand model is constant in terms of land use and transportation assumptions, in order to retain comparability. In practice, the BKR travel demand model evolves as additional information is known and assumptions are made.

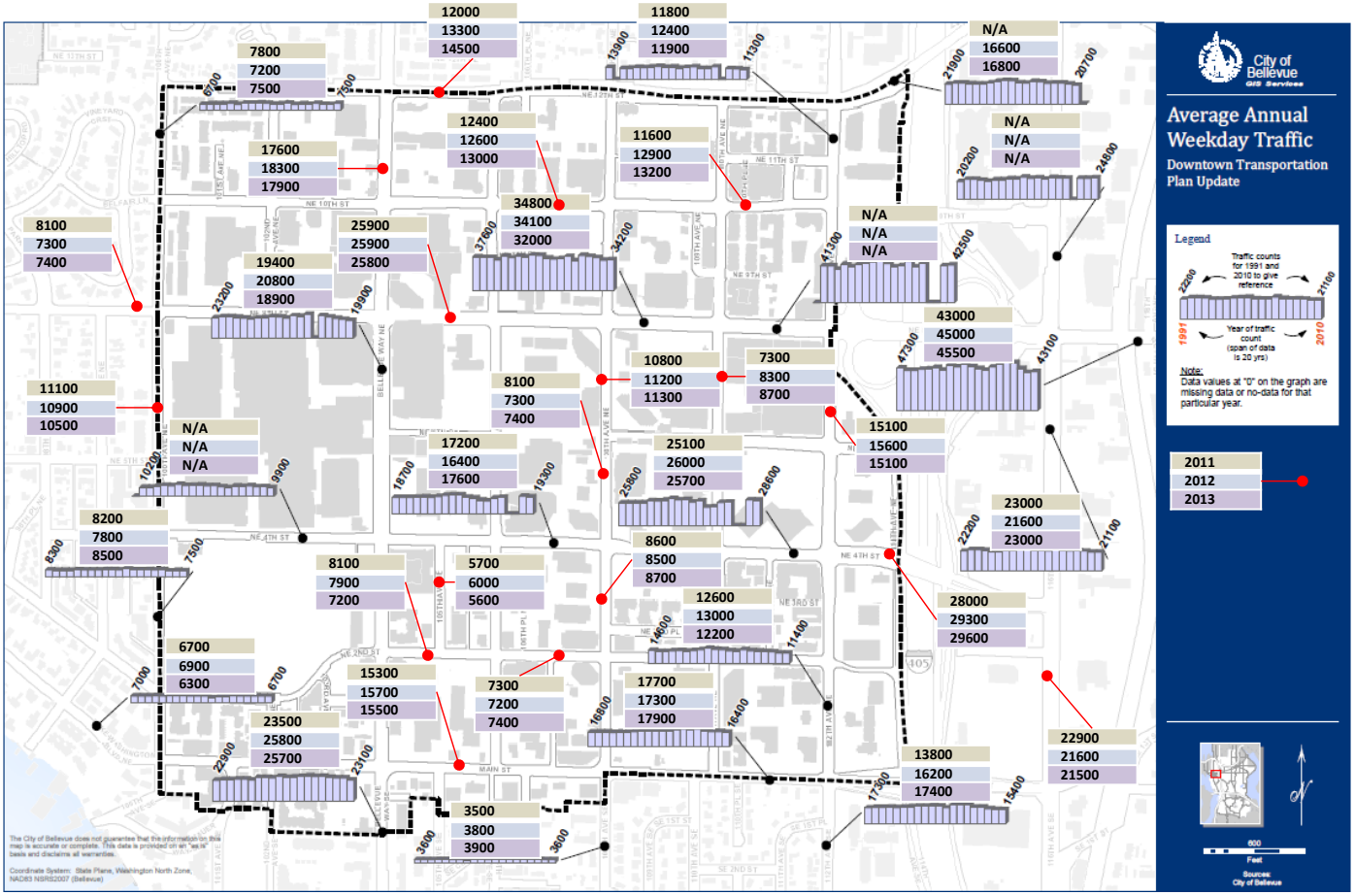


Figure 3. Average Annual Weekday Traffic Volume, 1990-2010 with 2011-2013 Added

2030 Baseline Vehicle and Transit Capacity Projects - "Baseline" Scenario

2030 is the planning "horizon year" for the Downtown Transportation Plan. The 2030 Baseline transportation network assumes new roadway capacity and transit capacity projects in Bellevue, adjacent cities and the greater Central Puget Sound Region. These assumed projects have funding commitments by the State, regional and local agencies, plus other projects that are considered to be "reasonably foreseeable" by 2030. These capacity projects are added to the 2010 Base Year transportation network.

The 2030 "reasonably foreseeable" capacity projects embedded in the travel demand model are the Bellevue 2013-2019 Capital Investment Program (CIP) projects and 2013-2024 Transportation Facility Plan (TFP) projects, plus those funded through Sound Transit 2 (2008) for East Link, Transit Now (2006) for RapidRide, Transportation Nickel Package (2003), Transportation Partnership Account (TPA) package (2005), American Recovery and Reinvestment Act (ARRA) and selected projects in the Puget Sound Regional Council Destination 2040 Plan. Within King County these funding packages support major regional roadway projects such as the Alaskan Way Viaduct and Seawall Replacement Project, SR 520 Bridge Replacement and HOV Project, I-90 Two-Way Transit and HOV Operations, and the I-405 Corridor Program.

Specific Bellevue roadway and transit capacity projects coded in the BKR Baseline scenario model that affect Downtown Bellevue are shown in ***Figure 4*** and include the following:

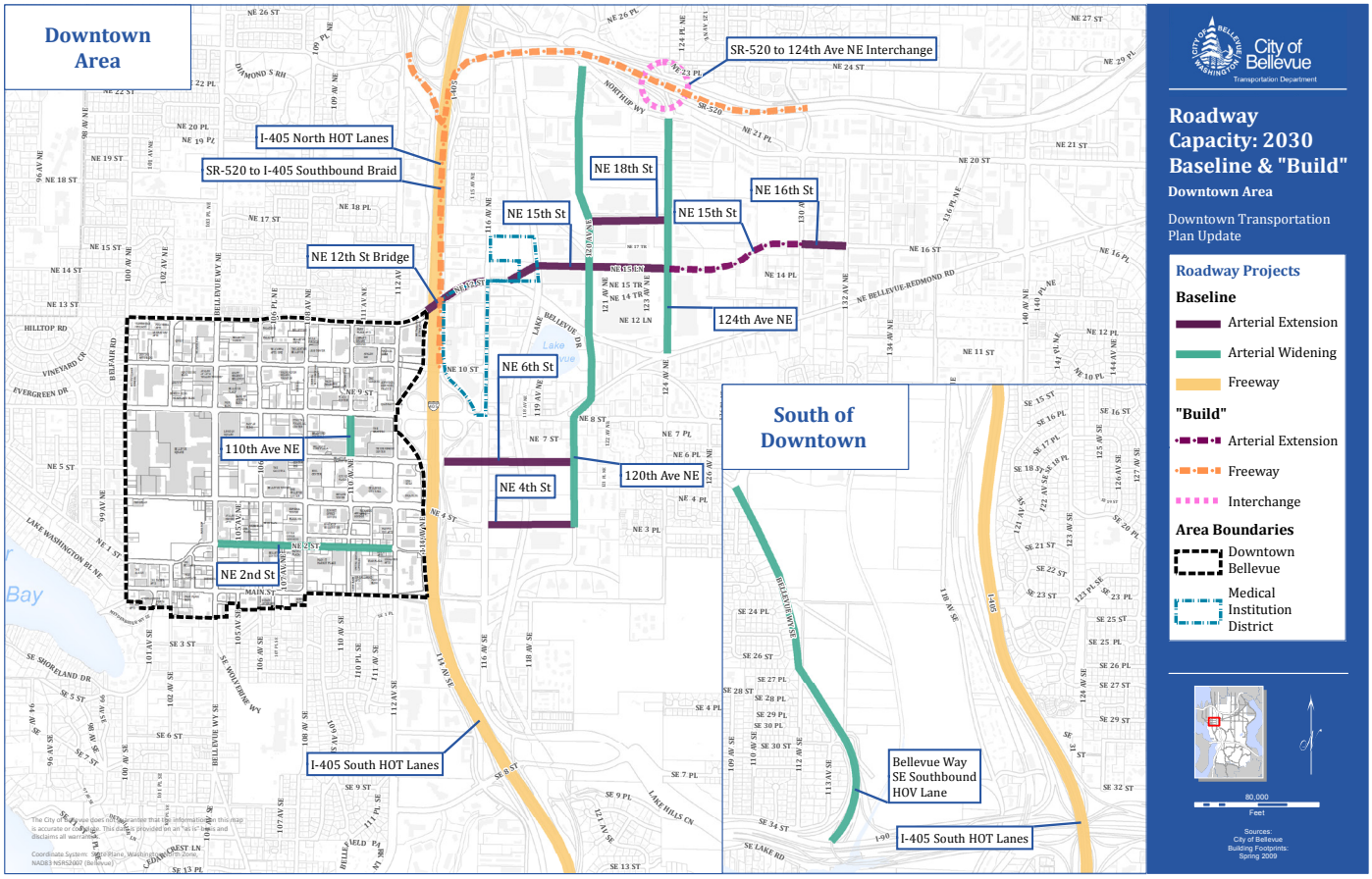


Figure 4. Roadway Capacity: 2030 Baseline and Build Roadway Projects

- East Link Light Rail: Light rail transit between downtown Seattle and Overlake, extending to Downtown Redmond is a subsequent phase
- RapidRide B: Bus rapid transit between Downtown Bellevue and Downtown Redmond, via Crossroads and Overlake
- NE 2nd Street: Widen to 5 lanes between Bellevue Way and 112th Avenue NE
- 110th Avenue NE: Widen to 5 lanes between NE 6th Street and NE 8th Street
- NE 4th Street extension to 120th Avenue NE
- NE 6th Street extension across I-405 to 120th Avenue NE
- 120th Avenue NE: Widen to 5 lanes between NE 4th Street and NE 18th Street
- 124th Avenue NE: Widen between NE 8th Street and NE 15th Street
- NE 15th / 16th Street: New roadway segments in the Bel-Red Subarea
- Bellevue Way SE: One HOV lane southbound from 112th Avenue SE to the South Bellevue Park & Ride to align with the planned southbound HOV lane between the park and ride and I-90

2030 "Build" Scenario Vehicle Capacity Project List

Several vehicle capacity projects have been advanced, both in terms of design and funding commitment, to the point where they can be added in a "Build" scenario to the transportation network that directly and indirectly supports Downtown Bellevue

mobility. These 2030 "Build" scenario vehicle capacity projects have evolved through planning efforts outside of the Downtown Transportation Plan, for instance the Bel-Red Subarea Plan, the Mobility & Infrastructure Initiative, and the I-405 Master Plan. The following vehicle capacity projects, shown in ***Figure 4***, are included in the 2030 "Build" scenario and are added to the 2030 Baseline:

- SR 520: New ramps to/from east @ 124th Avenue NE to complete the interchange
- SR 520: Eastbound slip ramp eastbound under 148th Avenue NE to connect to 152nd Avenue NE and the Overlake Village area in Redmond
- I-405: Southbound braid from SR 520 to NE 10th Street
- I-405: One auxiliary lane (collector/distributor lane) each direction, between SE 8th Street and SR 520. The portion north of Main Street will be accomplished through restriping not additional widening.

INTERSECTION LEVEL-OF-SERVICE

Staff in the Transportation Modeling and Analysis Group led by Judy Clark built and implemented a dynamic traffic assignment forecast—using the software called "Dynameq"—to document existing (2010) intersection level-of-service, shown in ***Figure 5***, and to forecast 2030 level-of-service . The adopted intersection level-of service standard for Downtown Bellevue requires an average intersection level-of-service of E+ that roughly translates to a delay of less than 80 seconds. In 2010, the average delay was 27 seconds

Dynameq uses the macro-level travel demand information from the BKR model to forecast intersection level-of-service in terms of average vehicle delay in the PM peak hour (5pm to 6pm). Unlike a micro-analysis operational model such as "VISSIM", Dynameq does not include data on the potential friction caused to vehicle movement by pedestrians using crosswalks or mid-block crossings. However the Dynameq version employed in this analysis does make adjustments for transit activity—bus volume and in-lane bus stops. The Dynameq analysis does incorporate the adjusted number of internal vehicle trips that result from incorporating the "walk trip" deduction for short trips.

With this Dynameq model, staff analyzed the intersection level-of-service for the 2030 Baseline scenario and made a comparison with a 2030 "Build" scenario that includes the additional roadway capacity projects identified above. Current (2010) level-of-service is shown in ***Figure 5,*** and is compared in ***Table 3*** with modeling projections. Note that in 2030, the number of vehicles is forecast to increase, as is the delay for individual vehicles as they make their way through Downtown. The aggregate delay expressed in hours also increases.

In ***Figure 6***, the Dynameq model output shows the forecast level-of-service at each intersection in the 2030 "Baseline" and 2030 "Build" scenarios, expressed as average vehicle delay in seconds. Embedded in this model output is the operation of the transit system on Downtown streets, with in-lane stops for passengers. The effect of regional roadway improvements on Downtown level-of-service is apparent, especially along NE 8th Street from 108th Avenue East to I-405 where LOS F intersections in the "Baseline" scenario operate at LOS E with the "Build" scenario roadway projects.

ACCEPTABLE DELAY

Why is an increase in vehicle delay acceptable and why did the Commission not recommend additional Downtown roadway capacity to reduce this forecast delay?

Downtown	2010 Base Year	2030 Baseline Scenario	2030 "Build" Scenario
PM Peak Hour Vehicle Volume	82,000	112,000	119,000
Average Delay per Vehicle at Intersections (seconds)	27	56	48
Average Level-of-Service (LOS) for All Downtown Intersections	C (LOS C ranges from 20-35 sec)	E (LOS E ranges from 55—80 sec)	D (LOS D ranges from 35—55 sec)
Total Delay (hours) for all Vehicles at Intersections in the PM Peak Hour	600	1,700	1,600

Table 3. 2030 LOS Projections with Baseline and "Build" Scenarios

The complex answer lies in the nature of the mixed land use pattern and density Downtown, the many travel options available, the efficient street grid system, intelligent traffic operation system, and regional transportation capacity factors.

Over 10 years ago, the city dropped the term "Central Business District" (CBD) from the Comprehensive Plan, recognizing that Downtown Bellevue is a mix of neighborhoods in an Urban Center where people work, shop and live. More than semantics, the switch to "Downtown Bellevue" established greater expectations for this to be a place that would be viable, livable and memorable. Different standards for both land use and transportation were embedded in that decision.

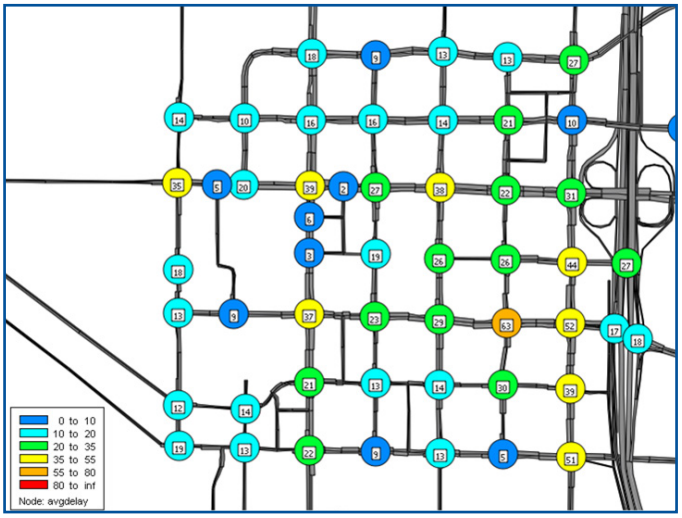


Figure 5. Intersection 2010 Level-of-Service (Delay)

For Downtown Bellevue, a vehicular level-of-service standard for "concurrency" is set at LOS E+ in terms of the traffic volume relative to the capacity of intersections. This level-of-service acknowledges that some driver frustration due to congestion may result. The standard was set at E+ because the City Council recognized that trying to keep ahead of vehicle congestion by building wider roads would be expensive, would be detrimental to quality of life and the environment, and would ultimately fail due to the theory of induced demand—or "if you build it they will drive." In the Commission's work on the Downtown Transportation Plan, the level-of-service calculation was based on average delay in seconds at intersections, and the LOS E (80 seconds delay maximum) was used as guidance.

The street grid in Downtown provides route options for people who choose to drive. With a grid, traffic can disperse and delay can be reduced at some congested intersections. Extending and expanding that street grid east across I-405 with enhanced freeway access eases the delay getting to or across the freeway, especially for transit and high-occupant vehicles.

A robust transit system, plus aggressive transportation demand management programs, supports people who commute Downtown to work. The King County Metro RapidRide B Line provides a high capacity transit service between Downtown

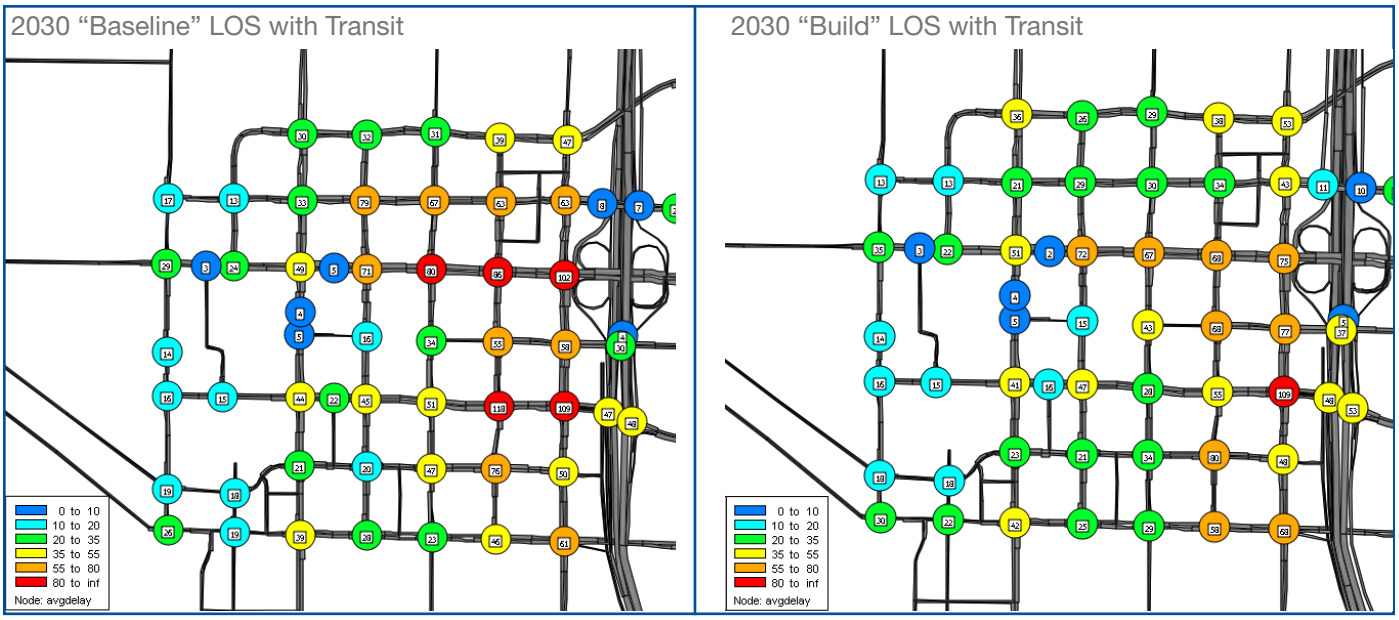


Figure 6. Dynameq Modeling Output - Vehicle Level-of-Service (Delay)

and Redmond, and numerous transit lines like the Metro route 271 and the Sound Transit route 550 provide all day frequent transit service to Seattle. The planned East Link light rail line will dramatically improve transit service with two stations that will be accessible to Downtown residents, workers and visitors when the line opens in 2023.

Regional roadways—I-405, I-90 and SR 520 provide important access to Downtown Bellevue. Peak hour capacity issues and the resulting congestion on these roadways may create delay for vehicles within Downtown. Expansion of freeway infrastructure and improvements to freeway operations will provide for greater mobility for people and freight in these corridors.

Walking and bicycling are increasingly important modes of travel for short trips within Downtown, and for longer trips to nearby neighborhoods and to regional facilities like the I-90 Trail and the SR 520 Trail. The planned Eastside Rail Corridor will provide a connection parallel to I-405. Investments in facilities to serve people walking and bicycling in Downtown will increase the comfort and safety for everyone, and inspire more people to consider non-motorized travel.

MODELING SUMMARY FINDINGS AND CONCLUSIONS

Travel demand modeling results and roadway operational analysis are important metrics to evaluate future Downtown Bellevue mobility. Overall long-term mobility will involve providing the right types of facilities that balance the evolving needs of pedestrians, bicyclists, transit riders (who are also pedestrians or bicyclists at some points in their trip) and automobile drivers and passengers (who also walk in significant numbers in Downtown Bellevue). Using the modeling tools and results, and based on assumptions for 2030 land use and the future transportation network, the Commission concluded the following regarding Downtown roadway capacity:

- 2030 “Baseline” scenario congestion within Downtown Bellevue is within the LOS standard adopted for concurrency for the Downtown mobility management area

Curbside Uses Include Loading Zones, Passenger Pick-up/Drop-off, Taxi Stands and Parklets

- 2030 "Build" scenario of planned regional and local projects built outside of Downtown Bellevue will improve vehicle access to the regional roadway system (I-405) and connectivity to east Bellevue and the Bel-Red Subarea
- 2030 "Build" scenario projects will accommodate more vehicles and help reduce congestion within Downtown, especially on east-west arterials
- Additional general purpose vehicular capacity beyond the 2030 "Build" scenario projects is not shown by the modeling to be needed within Downtown Bellevue to accommodate 2030 projected growth
- Modeling for 2030 does show that some intersections may approach a level of congestion that would require operational or capacity modifications, subject to additional analysis
- Implementation of coordinated and adaptive signal system technology (SCATS) at Downtown intersections is optimizing the available capacity in the roadway system—and also better accommodates the needs of pedestrians and transit

CURBSIDE USES

Council directed that work on the Downtown Transportation Plan consider on-street parking and the related curbside uses of the right of way. Through community outreach efforts for the Downtown Transportation Plan and the Downtown Livability Initiative, the public provided comments related to the use of curbside space.

On-Street Parking

The Downtown On-Street Parking Program began in 1996 with regular enforcement, warnings and monetary penalties beginning in the summer of 1997. The objective of the Downtown On-Street Parking Program is to provide free, short-term on-street parking for Downtown visitors and business customers, supported through enforcement of safety and time zone rules.

On-street parking provides for the convenient, short-term parking needs for business customers and residential visitors. In the Downtown mixed-use urban context, land use and the urban design intent of the streetscape are supported and enhanced by the presence of vehicles parked at the curb and the vitality their passengers bring to the sidewalks and nearby businesses. Parking can be designated as a 24/7 use of that space, or limited to select days of the week or times of day. Cities may implement a metering system for paid use of the on-street parking spaces and use meter revenue to support the parking program and as a resource to invest in the neighborhood.

On-Street Parking Inventory

By a series of Ordinances, the City Council has established on-street parking spaces within Downtown. Specific restrictions for the use of curbside space for parking include:

- No parking anytime
- No parking anytime except Metro transit vehicles
- No parking 7 a.m. to 6 p.m., except Sundays and Holidays
- 2 Hour parking 7 a.m. to 6 p.m., except Sundays and Holidays
- 2 Hour parking 7 a.m. to 6 p.m., except Saturdays, Sundays and Holidays

The total inventory of on-street/curbside parking spaces in Downtown Bellevue in 2010 was about 300 spaces (increasing to 325 in 2015). Parallel parking spaces are typically not individually striped so quantity is variable depending on vehicle type and placement. This compares to a 2010 inventory of 42,274 off-street spaces, average daily occupancy rate of 54.6%; and 42,750 in 2013, average daily occupancy rate of 44.3%. (Puget Sound Regional Council). Most of the on-street/curbside spaces are designated for parallel parking, although angle parking is permitted on a few street segments in Old Bellevue.

The Commission endorsed a set of assessment criteria that were used to evaluate each street corridor and block face in Downtown Bellevue for its potential for additional on-street parking. Criteria were both objective and subjective, recognizing the on-street parking has implications for both mobility and quality of life. A technical report and map that was the outcome of that effort indicated various levels of "opportunity" to expand the supply of on-street parking as follows:

- High Opportunity Locations
  - Score well in all/most categories
  - Easy to implement (with appropriate signage and stall striping)
  - Little to no impact on existing road operations
- Moderate Opportunity Locations
  - Takes a more aggressive approach to on-street parking in that it pushes the notion of status quo
  - May involve using a travel lane for parking - to calm traffic and/or shorten pedestrian crossing distances with bump-outs at intersections
  - Possible opportunity for short-term off-peak parking—curb lane reserved for travel during peak hours and for parking evenings and weekends. Clear signage required with strict tow-away enforcement.

  - May result in a lower off-peak level-of-service at some roadway segments and intersections
  - May increase localized short-term traffic congestion
- Low Opportunity Locations
  - Streets unlikely to support any on-street parking

In all of the high opportunity locations, approximately new 73 new stalls could be created. Moderate opportunity locations would require additional examination but could yield an additional 65 - 125 stalls. This additional parking supply would be implemented after weighing the benefits of additional parking; economic vitality, residential access and calmer streets with the status quo of unrestricted travel lanes. Most of the added parking would be only in the off-peak hours and would require close management and strict enforcement to ensure that travel lanes are available when needed. Additional on-street parking supply, and loading zones, may be created through new street frontage improvements for private-sector development projects.

On-Street Parking—Free or Pay

The concept of paying for on-street parking is new for Downtown Bellevue drivers. City staff has in years past studied converting the 300 time-restricted free on-street parking spaces in Downtown Bellevue to pay parking. The Transportation Commission considered and commented on the concept and value of metered parking, and recommended that a budget proposal be developed to implement such a program. The high cost of "free" parking was one of the factors in the Commission's recommendation. Bellevue currently (2013) pays a contractor $94,038 each year for on-street parking management and enforcement. On average 550 warnings and infraction citations are issued each month. Revenue from parking tickets is lumped in with revenue from other types of tickets and at this time the City does not designate the revenue to any specific purpose other than to contract enforcement.

The following are some factors that may be considered in making the decision to charge for on-street parking:

- Metered parking can increase turnover and improve opportunity for economic activity at nearby businesses.
- Parking meter revenue can support management, enforcement and maintenance of the on-street parking supply—paid for by the users of the parking.
- Parking meter revenue can provide a resource that can be invested in Downtown neighborhood improvements.

Payment Infrastructure and Technology

A pay parking system would consists of electronic pay stations, which have become the standard in cities across the country and worldwide. Pay stations are currently being used in Seattle, Kirkland, and Tacoma. Pay stations accept coins, credit cards, and debit cards. Smart phones may be used to locate available parking and to pay the meter. Pay stations operate on wireless communications—already available in Downtown Bellevue—and are powered with solar trickle-down batteries. Electronic parking guidance system technology can monitor parking space occupancy (for both on-street and off-street parking) and relay that information to drivers through smart phones.

Curbside Parcel/Freight Loading/Unloading

Within Downtown, large-scale loading/unloading typically occurs within on-site locations that are designed and designated for that purpose. Smaller deliveries may occur randomly curbside or from vehicles temporarily parked in the center turn lane. Through development review, the city will work with developers on the design and location of public curbside loading space and on-site loading docks and circulation to help ensure an expeditious loading process for larger deliveries.

Curbside Passenger Pick-Up/Drop-Off

Part of the unscripted urbanism of a vibrant mixed-use urban center is the transfer of pedestrians between vehicles and the sidewalks. While there is no specific “best practice” guidance for managing this activity, active loading or unloading is typically accommodated in designated curbside areas. Through development review, project developers may create new curbside passenger pick-up/drop off areas, or through repurposing permanent curbside parking, pick-up/drop-off space may be designated in a public curbside location.

Taxi Stands

Taxi stands are typically established at major attractions such as hotels, convention and sports venues, shopping/entertainment centers, and transit/light rail stations. Taxi stands work as a first-come, first-served queue, with the taxicab at the front of the line serving the first passenger to arrive, then each taxicab behind it moves ahead. Currently there are no designated taxi stands on public streets in Downtown Bellevue. Off-street taxi stands are incorporated at major hotels. Temporary taxi-stand use of the public curbside space may be desirable during evenings and weekends to support nearby entertainment venues.

Electric Vehicle Charging Stations

Transportation sources contribute significantly to the greenhouse gas (GHG) emissions in Bellevue. Hybrid and electric vehicle technology can reduce GHG emissions. Electric vehicle charging stations are installed within downtown Bellevue buildings for the use of tenants. Public curbside electric vehicle charging stations support the general use of electric vehicles and may be installed in a designated curbside space in a manner similar to an electronic pay station.

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3. TRANSIT

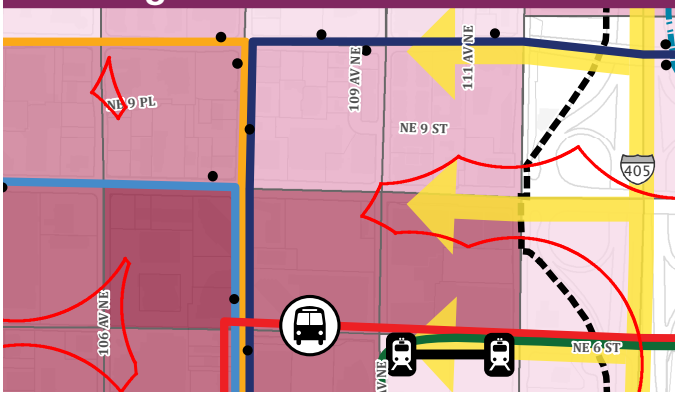
FACILITIES FOR DOWNTOWN TRANSIT RIDERS

Through community outreach, travel demand analysis and conversations with the Transportation Commission, four transit components emerged as topics that are highlighted in the Downtown Transportation Plan: **Transit Coverage**; **Transit Capacity**; **Transit Speed and Reliability**; and **Transit Passenger Comfort, Access and Information**. Each of these components is discussed separately below.

The Bellevue/Kirkland/Redmond (BKR) travel demand model provides a forecast for transit trips that are generated by Downtown growth. Similar to the analysis of roadway capacity, transit demand analysis provides a look at transit demand relative to projected transit supply so that measures can be taken to bridge the gap. ***Table 4*** summarizes transit demand—the numbers indicate both boardings and alightings in Downtown Bellevue, but not transfers that have a destination outside of Downtown. The BKR model results have been adjusted to account for the short trips within Downtown that are more likely to be on foot than on transit. Note that the model anticipates significant growth in transit activity in Downtown Bellevue. While a five-fold increase in total transit trips between 2010 and 2030 is substantial, a breakdown of the actual transit trips makes the numbers more manageable.

TRANSIT COMPONENTS

Coverage



Speed and Reliability

Capacity

Comfort/Access/Information

TRANSIT COVERAGE

Downtown transit coverage is the calculated percentage of residents and employees who have a short walk to a stop or station on the frequent transit network. A couple of definitions are appropriate here. The frequent transit network as defined for the Downtown Transportation Plan is 15-minute or better transit service with a 20-hour span of service—consistent with the King County Metro definition. One or more bus routes may combine to provide frequent transit service along a corridor such that two routes each with 30 minute service provide 15-minute service along the corridor where they operate together. Transit coverage, defined here for DTP purposes only, is the percent of Downtown residents and employees who live or work in a transportation analysis zone (TAZ) that is touched by the 600-foot radius circle from a bus stop with frequent bus transit service or a light rail station. A 600-foot radius was the selected dimension because it is the approximate length of a block (width of a TAZ) in Downtown Bellevue—this is a small scale relative to typical light rail transit planning metrics of ¼ to ½ mile, or 5 to 10-minute walk distance, but it reflects the Downtown walk environment. The 600-foot radius plus the 600-foot

Transit Trips (rounded to nearest 1,000)	2010	2030	Growth
Total Boardings + Alightings (BKR output)	11,000	62,000	51,000
Adjusted Total Boardings + Alightings	10,000	57,000	47,000
2030 Transit Boardings + Alightings by Destination			
Trips Entering Downtown	47,000		
Trips Leaving Downtown	4,000		
Trips Staying Downtown	6,000		
2030 Boardings + Alightings by Purpose			
Home-Based Work		36,000	
Home-Based Other		15,000	
Non-Home Based		6,000	
2030 Boardings + Alightings by Time of Day			
AM Peak			15,000
PM Peak			17,000
All other times			25,000

Table 4. Downtown Transit Ridership Forecast

block length results in a transit coverage calculation within about 1,200 feet (1/4 mile) of a transit stop. To support pedestrian access to transit, particular attention is paid to pedestrian facilities—sidewalks, crosswalks, mid-block crossings, and through-block connections—in the blocks that are touched by the 600-foot radius. A more detailed future analysis may include actual walk distance from bus stops—a walkshed analysis—but the total number of bus stops and the walkshed variability made such an analysis impractical for the DTP.

Forecast population and employment is done by TAZ, so for Downtown we can estimate the location and number of the future residents and employees. Since we can anticipate the location of bus stops and LRT stations, we can relatively easily calculate transit coverage—and the results for Downtown may be surprising. For 2010, using data on population and employment, and the known location and frequency of bus service, the calculated transit coverage is at 86%, (see ***Figure 7***). For 2030 assuming East Link, RapidRide, and some modified frequent transit network routes, the transit coverage factor increases to 97%, (see ***Figure 8***). These figures include only Downtown employees and not those in the Hospital District where in 2010 transit service was not that great, but in 2013 has RapidRide service and in 2030 will be well-served by East Link and a frequent bus route along 116th Avenue NE.

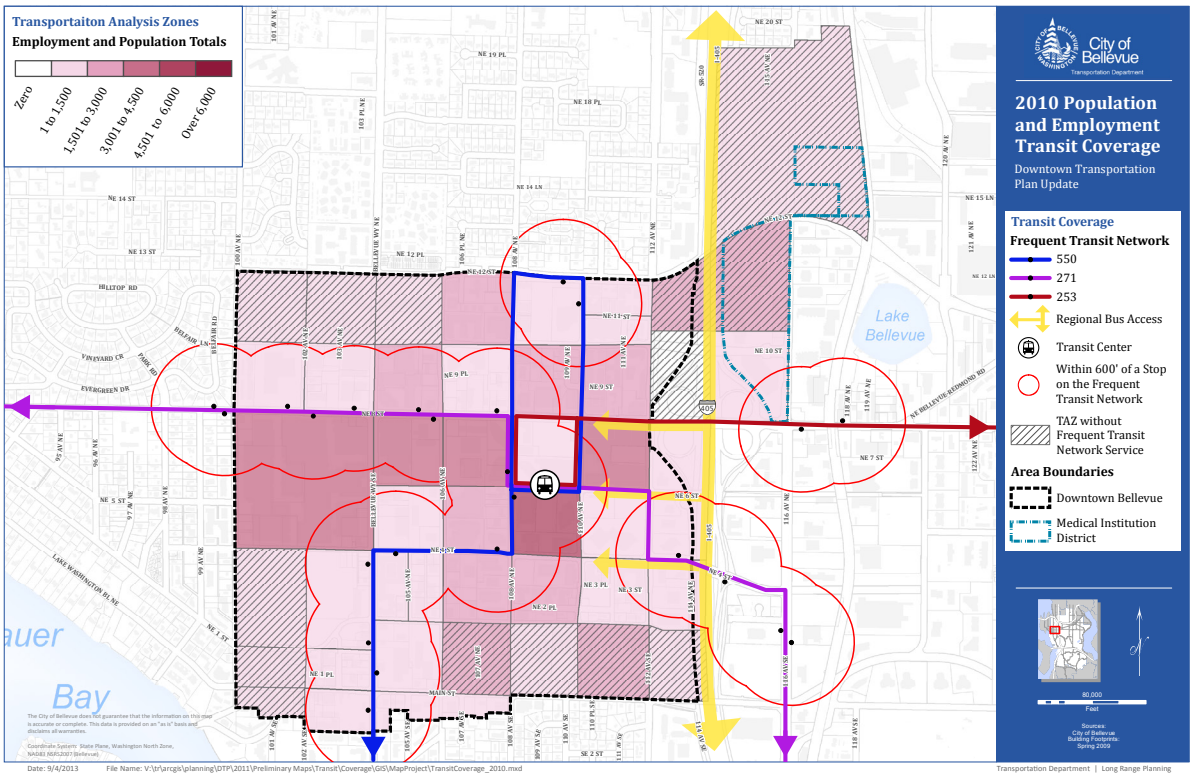


Figure 7. 2010 Downtown Transit Coverage @ 86%

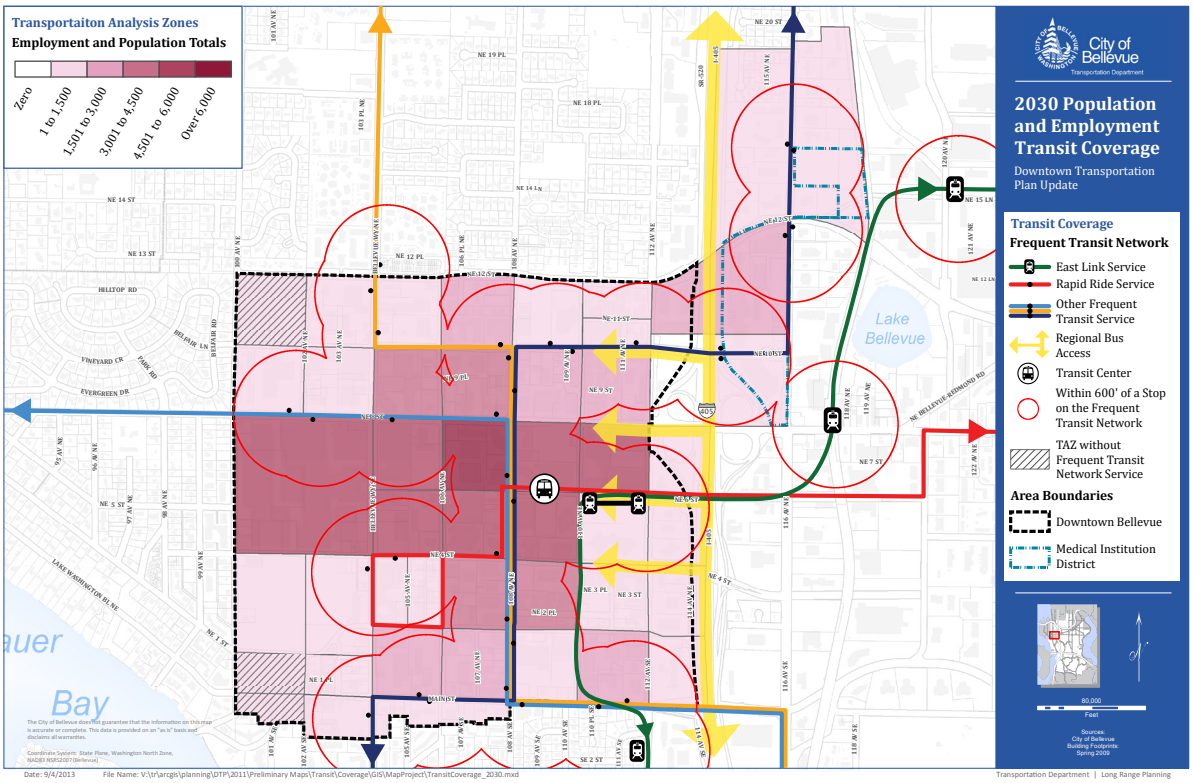


Figure 8. 2030 Projected Downtown Transit Coverage @ 97%

While these transit coverage numbers are impressive, they do not necessarily indicate that a transit passenger would get a one seat ride anywhere in Downtown Bellevue. It simply means that a stop/station on the frequent transit service network is proximate to most people who live and work in Downtown. Some walking is necessary and a transfer may be required, but overall Downtown is now, and is expected to be well served by transit.

Preliminary recommendations based on this finding assume a modification of some transit routes to better serve the northwest and southeast quadrants of the Downtown, a successor to the ST 550 route to serve the southwest quadrant, and a frequent route on 116th Avenue NE to serve the hospitals.

TRANSIT CAPACITY

As shown by the transit demand numbers in ***Table 5***, there is a substantial estimated increase in the number of people expected to use transit in 2030. ***Table 5*** and the accompanying ***Figure 9*** reveal that large percentage increases in transit use are not unprecedented in Downtown Bellevue. In 1985, according to the CBD Implementation Plan Draft Environmental Impact Statement, there were 1,447 daily transit trips with a Downtown Bellevue destination, of which 783 were work trips and 664 were non-work trips. At the Bellevue Transit Center in 1986 there were 1,850 boardings and alightings, with 1,075 of those being transfers between buses with destinations elsewhere. The number of Downtown daily transit trips in 2000, according to the Downtown Implementation Plan Update DEIS was 2,400. Each of these documents also forecasts transit demand and states that an increase in transit service will be needed to accommodate the anticipated demand.

Year	Daily Transit Boardings + Alightings
1985	1,447 (actual)
2000	2,400 (actual)
2010	10,000 (modeled & calibrated, walk trip adjusted)
2012	14,000
2030	57,000 (forecast, walk trip adjusted)

Table 5. Historic and Projected Daily Transit Boardings and Alightings.

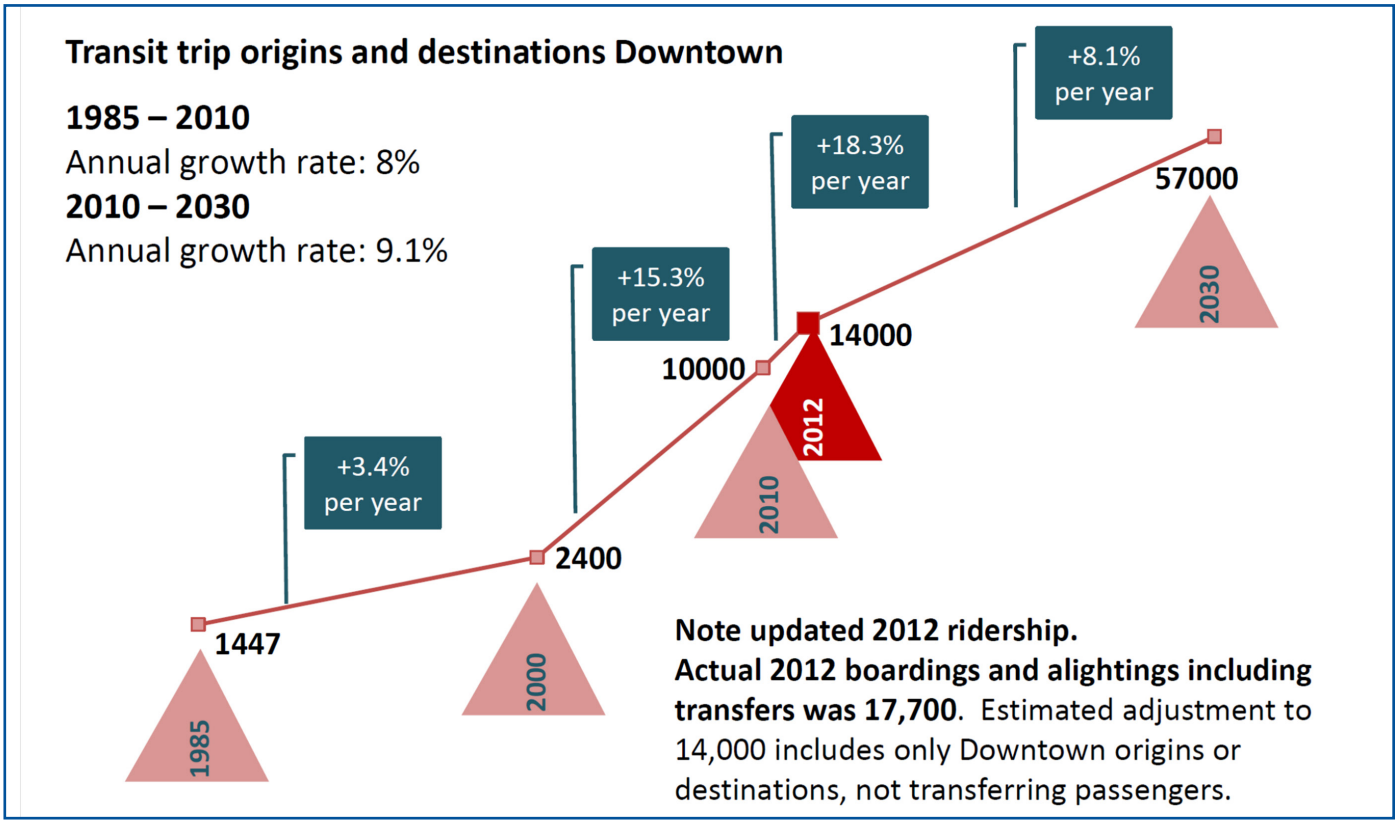


Figure 9 . Downtown Transit Ridership Trend and Projection

In 2010, about 1,150 daily bus trips provided seats (or standing room) for the estimated 10,000 daily transit passengers. By 2030, the number of bus trips is projected to increase to 1,750 each day, an increase of 50% over 2010. In the 2030 PM Peak hour throughout Downtown, there are about 210 buses per hour plus East Link, and about 57,000 transit riders total. PM Peak ridership is comprised of 3,000 transit passenger trips destined for Downtown Bellevue, and 14,000 transit passenger trips outbound from Downtown. The challenge for transit capacity is the larger number of outbound passenger trips and the number of buses required to accommodate those passengers. With that factor in mind the transit service is expected to be provided by transit agencies and the private sector through a variety of service types as follows and as shown in ***Figure 10***—the number of transit trips is

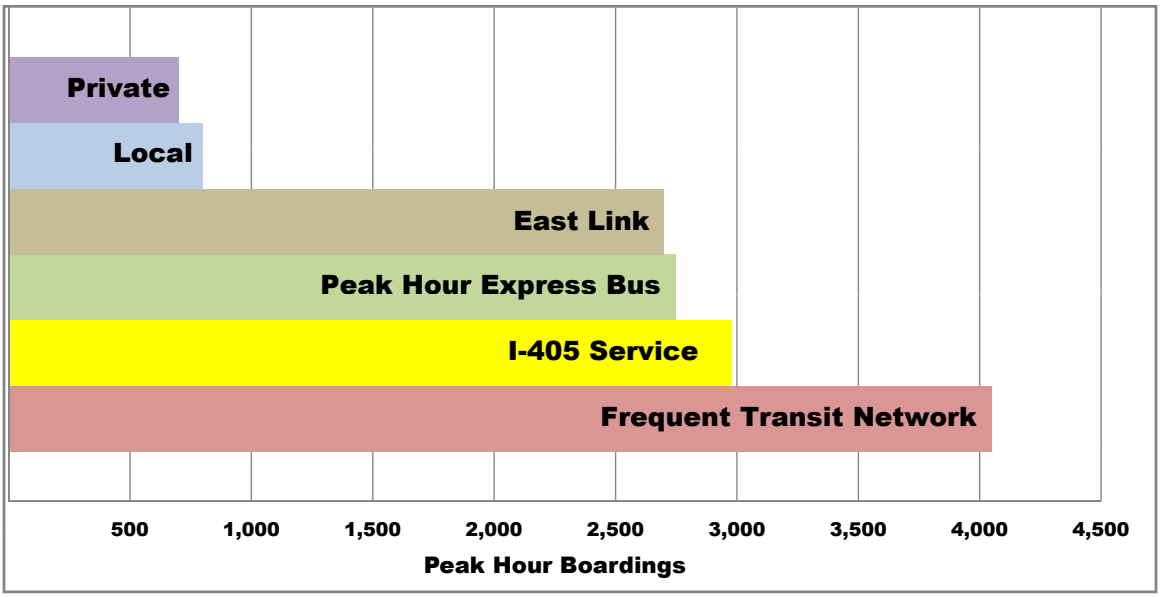


Figure 10. Downtown 2030 Projected PM Peak Hour Transit Boardings by Service Type

outbound from Downtown in the PM peak (14,000 transit trips):

- Local Bus: 16 per hour, 800 transit trips
- Private Service (ie. Microsoft Connect): 14 per hour, 700 transit trips
- I-405 Service: 52 per hour, 3,000 transit trips
- Peak Hour Express: 50 per hour, 2,800 transit trips
- Frequent Transit Network: 75 per hour, 4,000 transit trips
- East Link: 16 per hour, 2,700 transit trips (based on 7.5 minute headway)

Transit capacity factors include the ability of passengers to find seats or standing room on buses and trains, plus the ability of the surface streets to accommodate the anticipated number of buses. As noted above, the amount of daily transit service needed in 2030 is about a 5-fold increase over 2010. The Downtown Transportation Plan identified this potential service gap for elected officials and the community, but did not develop a plan for how to fill that gap—that task being embedded in the Bellevue Transit Master Plan. The DTP identified the infrastructure needs to accommodate the 2030 bus trips. Since PM peak hour is the period in which there is the greatest demand for roadway space and intersection time, the DTP focused on the 210 buses moving on Downtown streets and through the Bellevue Transit Center in the PM peak hour (5PM to 6PM). See ***Figure 11*** for 2010 PM peak hour bus volumes and ***Figure 12*** for projected 2030 volumes.

The 210 PM peak hour buses are concentrated in the core of Downtown. Near the Transit Center, 108th Avenue NE and NE 6th Street are expected to carry the most buses, with about 120 to 150 buses per hour moving in both directions, representing about 8% of all traffic. As buses flow through Downtown they disperse to the street grid, yet some arterials

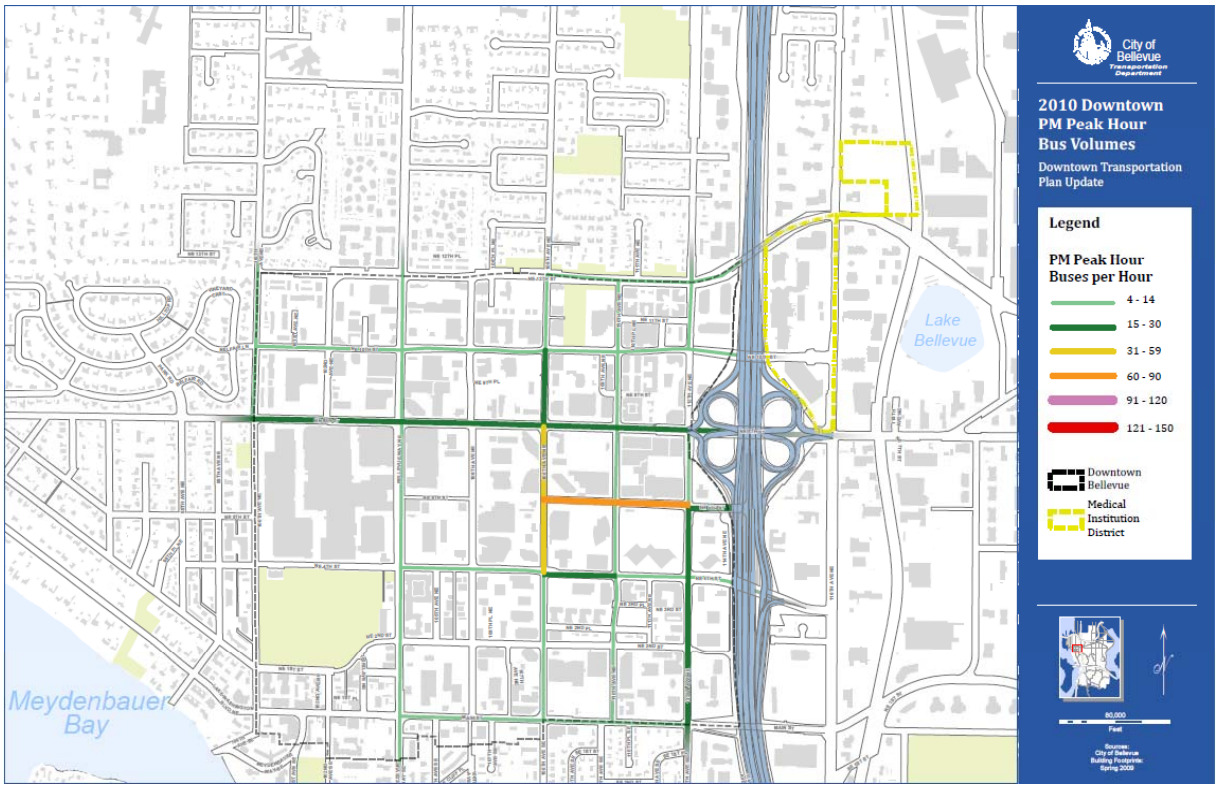


Figure 11. 2010 PM Peak Hour Bus Volume

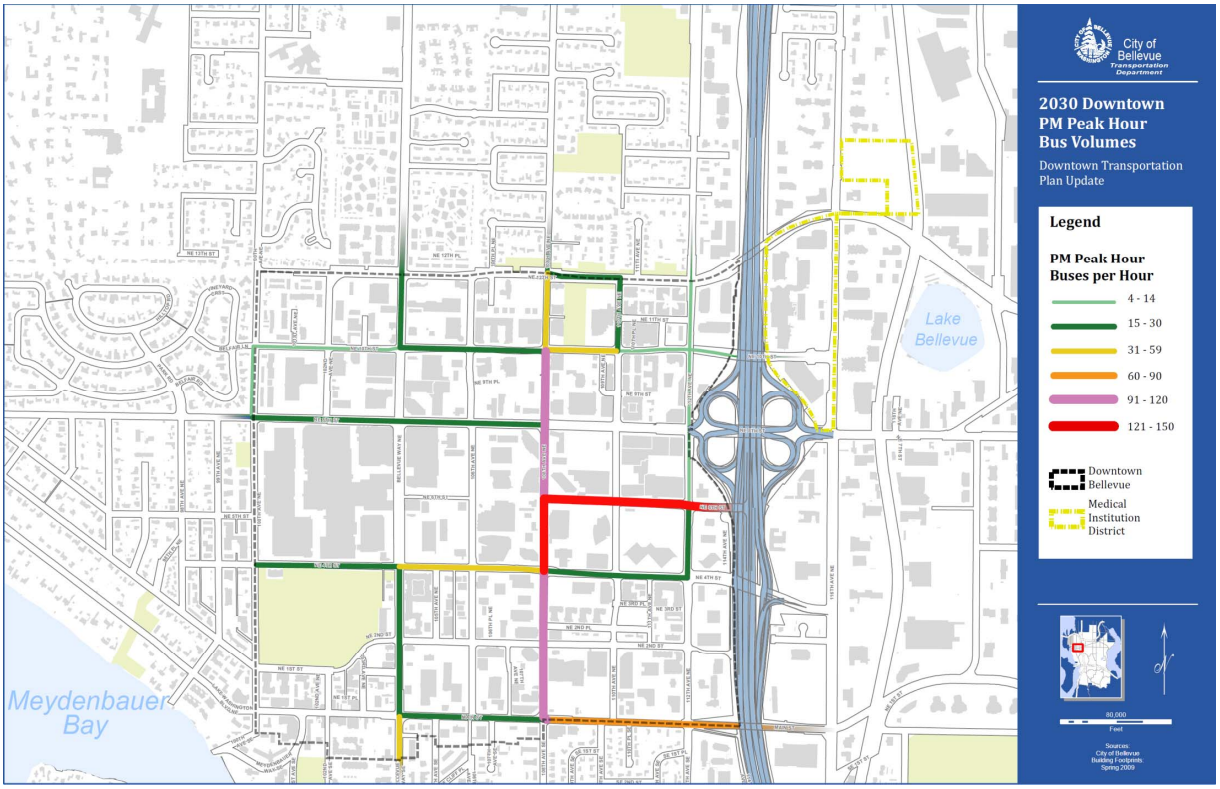


Figure 12. 2030 Projected PM Peak Hour Bus Volume

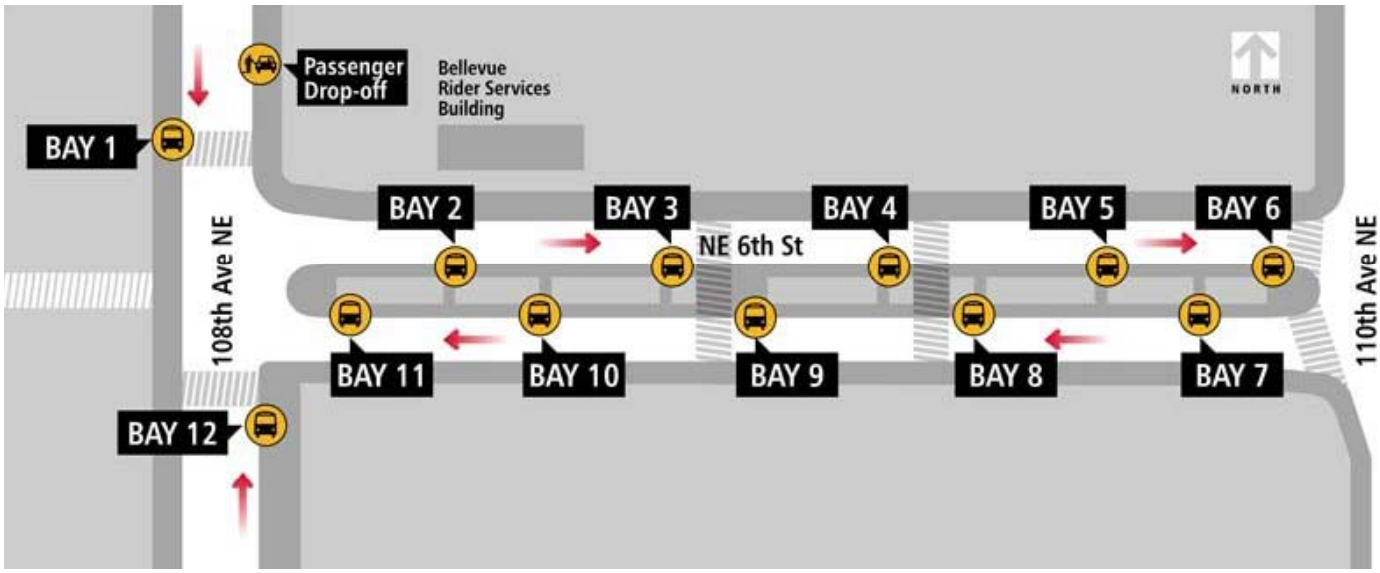


Figure 13. Bellevue Transit Center Bays

will carry substantial bus volumes. Segments of Main Street, for example will have about 60 to 90 buses per hour, parts of NE 4th Street and Bellevue Way will each have about 30-50 buses per hour, NE 8th Street will have about 15 to 30 buses per hour, with lesser volumes on other arterials. That compares with 40-60 buses per hour on 108th Avenue NE today, and, for comparison, over 200 buses per hour along the 3rd Avenue transit corridor in Downtown Seattle.

At the Bellevue Transit Center (BTC) in 2010 there were about 80 buses in the PM Peak hour that access the center platform. Along the BTC platform there are 10 transit bays, plus there are two bays associated with BTC located on 108th Avenue NE (see ***Figure 13***). In 2030 the number of buses using the BTC bays is expected to increase by 55% (with significant added service at the 108th Avenue NE transit bays), and the number of buses and transit passengers using and passing through the BTC will grow substantially (see ***Figure 14***). Transit capacity issues relate to both the number of bus trips and the number of passengers and their movements through the BTC. Based on industry standards (Transit Capacity and Quality of Service Manual), the overall amount of space on the BTC platform appears to be adequate to accommodate the anticipated passenger volume, however the arrangement of space and furniture on the platform restricts the flow of transit transfers, limits the passenger queuing space, and fails to capitalize on the weather-protected space.

Pedestrian level-of-service is based on the amount of platform space (***Figure 15***) and the number of people walking through (***Figure 16***) and waiting for buses. In 2010, the pedestrian density at the BTC was about 30-40 square feet per pedestrian during

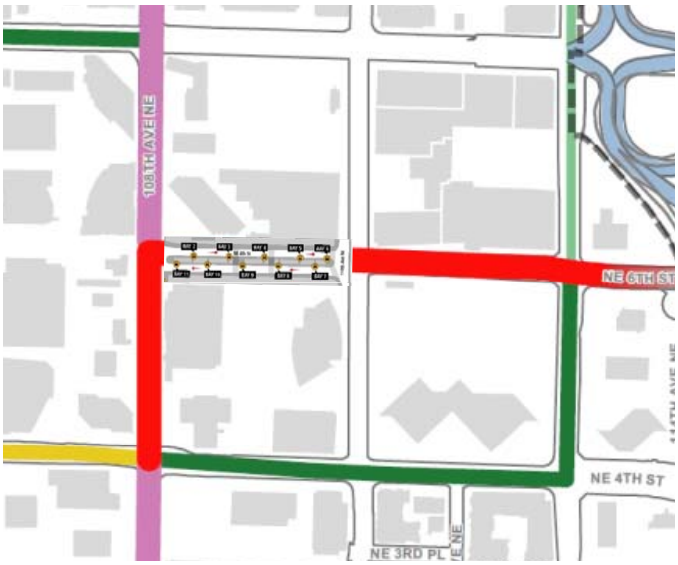


Figure 14. 2030 Projected PM Peak Hour Bus Volume

LOS	Pedestrian Space (ft^2/person)
A	≥ 13
B	10-13
C	7-10
D	3-7
E	2-3
F	< 2

Figure 15. Waiting Area LOS

LOS	Pedestrian Space (ft^2/person)
A	≥ 35
B	25-35
C	15-25
D	10-15
E	5-10
F	< 5

Figure 16. Walkway LOS

PM Peak. This translates to LOS A for waiting areas and to LOS A or LOS B for walkways. By 2030 with no BTC modifications, pedestrian LOS expected to fall to about LOS C for waiting areas and LOS D for walkways. Walkway level-of-service is especially important as the BTC provides a weather-protected route between 108th Avenue NE and 110th Avenue NE, with important connectivity to the planned light rail station.

The bus capacity constraint for the BTC is the congestion for buses that are arriving or trying to leave the transit bays, caused by bus queuing at intersections. BTC intersections at 108th Avenue NE and 110th Avenue NE will have significantly more buses and pedestrians in 2030, a situation that will make leaving the BTC on a bus more challenging than at present. Traffic signal operations at these intersections and the design of the intersections will require special attention to ensure the BTC can effectively accommodate anticipated buses and passengers.

Recommendations based on the findings related to transit capacity are to articulate policy support and advocacy for sustained and enhanced transit service for Downtown Bellevue, design modifications to improve the function and flow of the passenger platform area of the Bellevue Transit Center, and operational strategies to streamline bus movement. As discussed in the speed and reliability section that follows, Bellevue could provide transit-friendly improvements on transit priority corridors and at select intersections.

TRANSIT SPEED AND RELIABILITY

While Bellevue does not directly provide transit service, the City does manage the right-of-way on which the buses operate and the traffic signals on which efficient transit operations depend. Bellevue may invest in capital improvements or perform traffic operations changes to the benefit of transit passengers and overall mobility.

Transit Priority Corridors

Factors considered in identifying a transit priority corridor include bus volume, passenger numbers, and schedule reliability. Intersection level-of-service may be an additional factor used to determine priority or physical and operational improvements. For purposes of the Downtown Transportation Plan, a hierarchy of transit priority corridors is related to the current or anticipated transit volume are described as follows, compatible with the adopted Bellevue Transit Master Plan, and shown in ***Figure 17***:

- Priority 1 Transit Corridor: Greater than 90 bus trips in PM peak hour
- Priority 2 Transit Corridor: Generally 15 or more bus trips in PM peak hour
- Priority 1 Intersection: An intersection along a Priority 1 Transit Corridor
- Priority 2 Intersection: An intersection along a Priority 2 Transit Corridor

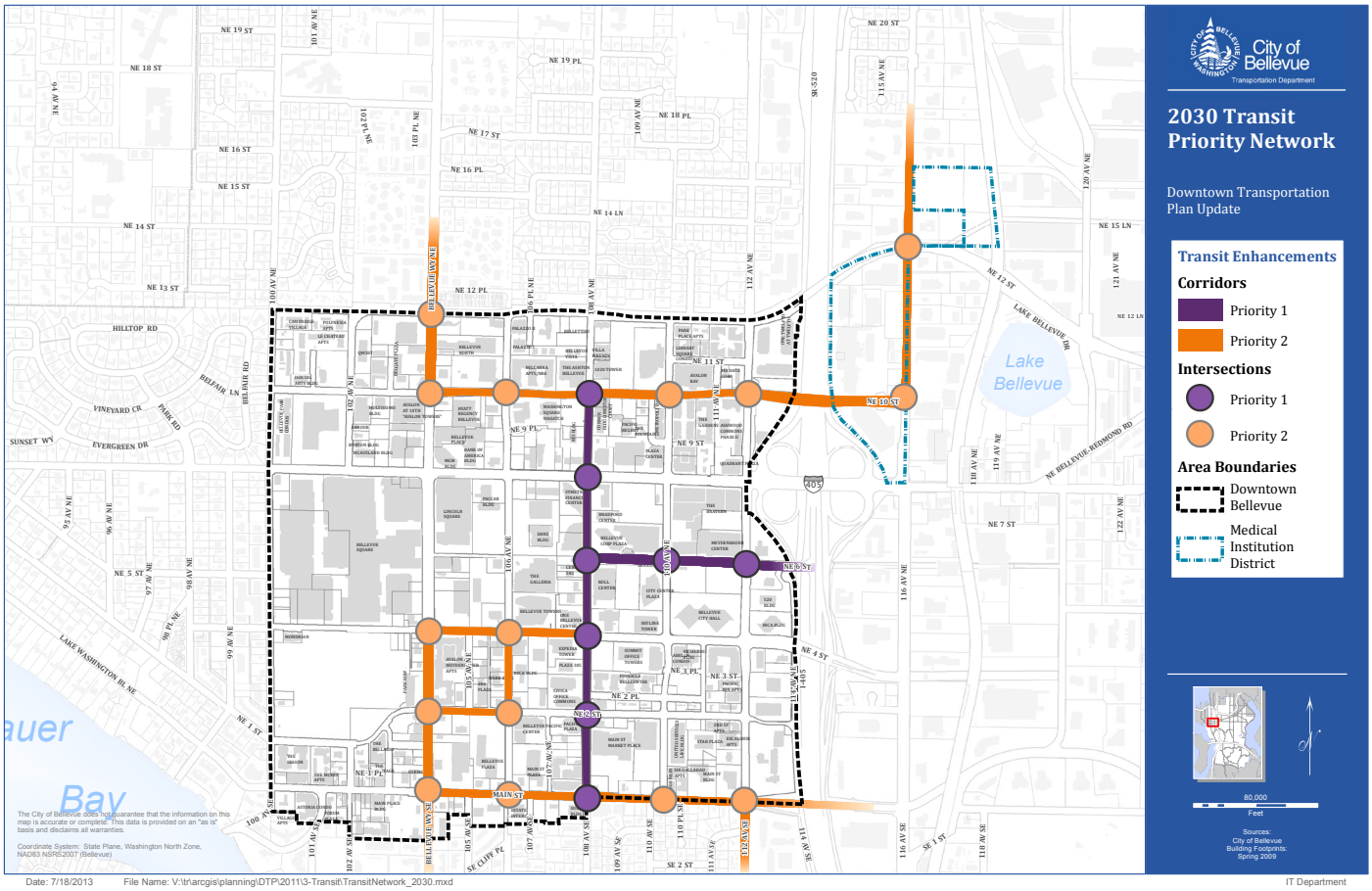


Figure 17. 2030 Planned Downtown Transit Priority Corridors

Corridor and Intersection Implementation Components

Best practices for transit speed and reliability emphasize the application of appropriate tools in the context of the roadway corridor or intersection. Along transit priority corridors, tools include transit priority lanes, peak hour transit-only lanes, bus/bicycle lanes, in-lane bus stops, and business access and transit (BAT) lanes. Other tools include improvements to the pedestrian environment, transit stop consolidation, and off-board fare payment. At signalized intersections, transit signal priority may be implemented—coordinated with the demands of other modes to ensure the greatest efficiency of mobility. Transit signal priority allows a bus and its passengers to arrive and travel through an intersection with little or no delay. Detectors identify and distinguish a bus from other vehicles and modify the signal phase to provide a bus with a green light, typically by extending the green phase or providing an early green by shortening the red phase.

Transit Speed and Reliability Improvements: Implementation and Evaluation

Considerations and decisions to implement transit speed and reliability tools to any transit corridor are related to specific metrics. Data-driven decisions on where and when to implement transit corridor tools or transit signal priority at intersections may be tied to travel time for transit passengers. Infrastructure improvements may be linked to transit service enhancements or pedestrian access, or they may be embedded into programmed roadway or traffic signal operations improvements.

A typical evaluation methodology considers the number of bus passengers carried along a corridor relative to the number of private vehicle passengers. For example, on 108th Avenue NE between NE 4th Street and NE 8th Street, the 2030 PM peak hour vehicle traffic is roughly 2,700 vehicles with 1.4 passengers per vehicle—resulting in 3,800 people transported in private vehicles. On the same segment of 108th Avenue NE over 60 buses per hour are expected, with an average passenger count of 73.5—resulting in 4,400 people transported by bus. Therefore investments that support transit speed and reliability would support mobility for 4,400 bus passengers and potentially the 3,800 private vehicle passengers traveling along the corridor as well. Transit signal priority investments at intersections would be evaluated for all modes in all directions.

Transit Speed and Reliability: Conclusions and Recommendations

Anticipated transit volumes along Downtown Bellevue arterials may trigger the need for some corridor or intersection improvements if passenger delay becomes significant or bus schedule reliability is degraded. Priority 1 and Priority 2 transit corridors and intersections could be designated based on peak hour bus volume. A suite of tools could be applied along corridors or at intersections to maintain or improve transit speed and reliability. Prior to initiating transit corridor enhancements, a corridor or intersection evaluation should consider potential improvements to passenger travel time and transit schedule reliability relative to other mobility demands for the corridor, including private vehicles, freight, pedestrians and bicyclists.

TRANSIT PASSENGER COMFORT, ACCESS AND INFORMATION

The bus stop or the light rail station is the pedestrian's connection to the transit system. Information gleaned from DTP community involvement and discussions at Transportation Commission meetings indicates that there may be a deficit of passenger "amenities" at Downtown transit stops—although these features are clearly "essential" to the quality of the transit passenger's experience and efficiency of the trip. This deficit may result in a person being uncomfortable with or unwilling to take the step to become a transit passenger. Passenger access issues are consolidated into those related to the following:

- Passenger comfort at the transit stop
- Access of transit passengers to and from the neighborhood
- Information available to passengers at the transit stop

Recognizing that all transit stops are not created equal—that each may serve a different purpose or volume of passengers—the Transportation Commission recommends a set of bus stop "typologies" that categorize various types of transit stops and identifies a suite of components that may be integrated to each type of transit stop and the immediate vicinity.

Walk-to-Transit Factors

The perception of walk distance and a person's willingness and ability to walk to transit or to other destinations Downtown is related to the

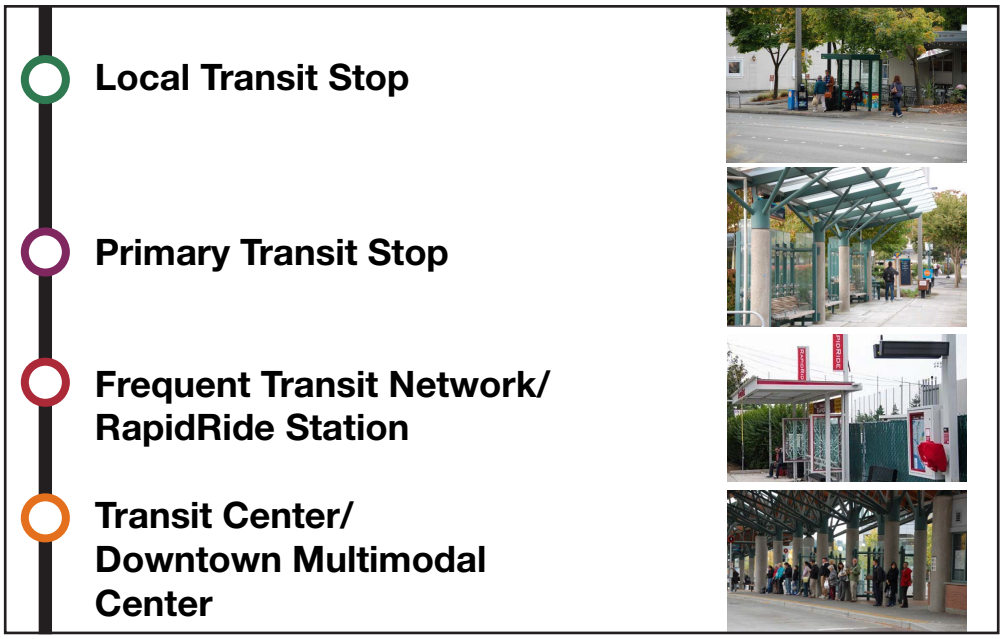


Figure 18. Downtown Transit Stop Typology

quality of the walking environment - the pedestrian infrastructure, roadway traffic speed and volume, intersection design, and the design and use of the adjacent buildings. Community outreach for both the Downtown Transportation Plan and the Downtown Livability Initiative have identified that pedestrian facilities that improve the ability to get around Downtown Bellevue, and the comfort of people walking, can also support transit ridership.

TRANSIT STOP TYPOLOGY

A "best practice" analysis, including a look at the Bellevue Transit Master Plan, transit agency standards, and applications in other urban centers has led to a conclusion that transit stops in Downtown Bellevue can be described in four typologies, the Local Transit Stop, the Primary Transit Stop, the Frequent Transit Network/RapidRide Station and the Transit Center/Multimodal Hub, as shown in ***Figure 18***. The Transportation Commission developed descriptions for transit stops and recommendations for each type as follows:

Local Transit Stop

- Local transit stops are served by a single transit route with generally 30 boardings or less per weekday.
- At a minimum, a Local Transit Stop would provide a pole-mounted bus stop sign, an ADA standard landing pad with access to the sidewalk, and a bench or shelter if boardings warrant.
- There should be access to the nearby neighborhood via standard urban pedestrian and bicycle facilities.

Primary Transit Stop

- Primary transit stops are served by one or more scheduled transit routes with service provided at a combined headway of 30 minutes or better.
- Bus routes may cross at intersections and transfers between routes are routine.
- Average weekday boardings range between 30 and 100 passengers.

- A Primary Transit Stop includes the Local Transit Stop components, plus features that support the level of ridership and transfers, such as: passenger shelter; transit route map and transit transfer wayfinding; real-time information displays; trash receptacle; security lighting; and short-term bicycle parking.
- Pedestrian access should be supported by enhanced crosswalk components, nearby mid-block crossing(s) and neighborhood wayfinding.

Frequent Transit Network/RapidRide Station

- Served primarily by RapidRide B, the station may also be shared with or served only by frequent transit network routes, such as the King County Metro Route #271.
- Average weekday boardings are expected to be in the range of 100 to 1,000 passengers.
- A Frequent Transit Network/RapidRide Station includes Primary Transit Stop facilities, plus a sheltered or enclosed passenger waiting area, an Orca Card vending machine, off-board fare payment, and transit transfer information and wayfinding.
- Pedestrian access may include enhanced or exceptional crosswalk components, plus mid-block crossing(s) and neighborhood wayfinding.

Bellevue Transit Center/Multimodal Hub

- Served by multiple transit routes and transit modes (bus, RapidRide, light rail) with a constant flow of transit vehicles during the day.
- Average weekday boardings will exceed 1,000 passengers.
- A Transit Center/Multimodal Hub includes Frequent Transit Network/RapidRide Station facilities and perhaps also a rest room and “Bike Station” facilities with covered/secure, long-term/commuter bicycle parking.
- Special attention is given to pedestrian flows within the facility as well as access to and from the facility. Effective use of passenger space while providing for passenger comfort, access and information requires specific design treatments common to high volume transit facilities.
- Exceptional crosswalk components provide pedestrian access. On-street bicycle facilities accommodate bicycle access from neighborhoods and regional facilities such as the I-90 Trail and the SR 520 Trail.

IMPLEMENTATION

Several potential implementation strategies may be considered for the development, enhancement and maintenance of transit stops and stations.

- Transit Agency:
  King County Metro is upgrading transit stop components and has introduced a suite of signage types to provide information in a format to complement the design of shelters.

- City of Bellevue:
  Where the city has desired a transit shelter design that is different than the King County Metro standard, it has been the city's responsibility to construct, install and maintain these shelters. Along Factoria Boulevard for example, transit shelter design reflects the former industrial character of the site. Until they were replaced with the RapidRide B shelters, those along NE 8th Street had a unique design that included hand painted tiles that matched those on the nearby noise wall.

- Private Developers:
  Through the Downtown Livability Initiative, a Downtown land use code amendment could give an incentive to a project developer to provide transit stop/station components that would be permanently integrated into the building. Eligibility for the incentive would be contingent on proximity to existing or planned transit stops. The community benefit would be in the form of superior passenger amenities and sidewalks uncluttered by freestanding transit facilities. Potentially eligible components could be enhanced weather protection, seating and wayfinding.

- Maintenance:
  Transit stop maintenance can be supported by sponsorship or advertising or an adopt-a-stop program (this King County Metro Program was curtailed in 2010 but could be revived as resources become available). At South Lake Union Streetcar stations, for example, discrete signage identifies station sponsorship. At Chicago Transit Authority, Portland TriMet, and BART facilities, and in other cities, panel advertisement on shelters provides supplemental resources for maintenance.

- Bellevue Transit Center Reconfiguration:
  The function and flow of the passenger platform area of the Bellevue Transit Center could be improved with the removal and/or rearrangement of minor components such as benches, wind screens, wayfinding, telephone booths and kiosks. An uncluttered and weather-protected corridor between 108th Avenue NE and 110th Avenue NE could provide exceptional access to transit, and in particular, the East Link light rail station.

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4. PEDESTRIANS

FACILITIES FOR DOWNTOWN PEDESTRIANS

Walking is a significant portion of the daily activity of people in Downtown Bellevue, and will be an increasingly important element of economic vitality, Downtown livability and personal health. People need safe and accessible, comfortable and convenient places to walk. The Downtown Transportation Plan enhances the decades of public and private investments to improve the pedestrian environment and make walking the easiest way to get around Downtown.

The Transportation Commission identified four components of the Downtown pedestrian environment that DTP implementation will address: **Crosswalks/Intersections**; **Mid-Block Crossings**; **Sidewalks**; and **Through-Block Connections**. The Pedestrian Corridor is a separate and important component of Downtown pedestrian and bicycle mobility that the Downtown Livability Initiative will address.

Through community outreach, staff and the Transportation Commission gathered information about the Downtown walking experience. Staff also reviewed adopted codes and policies, plus the work compiled in the "Great Streets—Downtown Streetscape Design Guidelines" report from 2010 that took a comprehensive look at ways to improve the quality of the Downtown pedestrian environment. Recommendations for each component of the Downtown pedestrian system follow.

PEDESTRIAN COMPONENTS

Crosswalks/Intersections

Mid-Block Crossings

Sidewalks

Through-Block Connections

CROSSWALKS/INTERSECTIONS

Several features of intersections significantly affect the pedestrian environment: crossing times; crosswalk design, and intersection geometry. With respect to crosswalk design, three types of crosswalk/intersection treatments for Downtown are planned, each intended to fit the urban context: Standard; Enhanced; and Exceptional—shown in example images and described below. See also ***Figure 24*** in Appendix A for a map of intersection types.

Crosswalk/Intersection Elements

Standard Crosswalk/Intersection

In Downtown Bellevue the current standard crosswalk design consists of 2 parallel white bars that are spaced 8-feet between the inside of the stripes. A standard crosswalk/intersection also has a pedestrian actuated signal at the corner that provides both audible and countdown indicators—these are being installed throughout the Downtown as the older signal heads are replaced. There is a comfortable consistency in having this standard at many intersections, as both motorists and pedestrians know what to expect, however the standard intersection treatment may not be sufficient in many Downtown locations.

Pedestrian Actuated Signals

The pedestrian phases of a signal cycle at Bellevue intersections are activated via pedestrian push buttons. The full pedestrian phase consists of three intervals: Walk; Flashing Don't Walk (FDW); and solid Do Not Walk. As a factor of safety, the Do Not Walk interval, usually ends between 4 to 5 seconds prior to releasing any protected conflicting signal phases for vehicles.

Walk intervals usually begin at the start of the vehicular green interval after the pedestrian button is activated. Walk intervals may be initiated partway through a green interval if sufficient green time is available in that cycle to allow a pedestrian to cross. The permitted left turn signal phase for vehicles is skipped when a pedestrian is served as an additional safety measure.

Pedestrian Actuated Signals

Most walk intervals are set at about 5 seconds but may vary between 4 and 30 seconds depending on the push button distance to the curb ramp, nearby land uses, pedestrian volumes and special events.

Two factors determine the length of the FDW interval, the pedestrian crossing distance and the anticipated walking speed. Bellevue typically uses a walk speed of 3.5 feet per second. Pedestrian walking speed is usually reduced to 3.0 feet per second in the vicinity of schools or senior housing.

In general, the adaptive signal system used in Bellevue reduces the cycle length during lighter traffic conditions. Compared to a fixed-time system, the pedestrian actuated system generally provides more opportunities for pedestrians to cross the street. The act of pushing a button may encourage a pedestrian to be more aware of their surroundings and reduce the likelihood for a pedestrian to step off the curb in front of a vehicle, resulting in a safer streets for everyone.

Crosswalk/Intersection Elements (continued)

Enhanced Crosswalk/Intersection

Crosswalks at certain intersections warrant some enhancement beyond the standard. Enhanced crosswalks/intersections are designated for intersections where high numbers of both pedestrians and vehicles are expected, as shown in the accompanying photo, and where an urban design treatment along the street could be carried through the intersection.

The design tools to create an enhanced crosswalk/intersection include: wider than a standard crosswalk to accommodate a large number of pedestrians and provide a buffer from vehicles; wayfinding at corners; weather protection at corners; special paving treatment or striping across the street; and curb bump outs or tighter radius to shorten crossing distance, calm traffic and provide pedestrian queuing areas.

Exceptional Crosswalk/Intersection

The Downtown Bellevue Streetscape Design Guidelines (December 2010) refers to "celebrated intersections" where the pedestrian is provided a very appealing place to walk across the street. For the Downtown Transportation Plan, staff and the Transportation Commission considered additional guidance from adopted code and community input to identify other crosswalk/intersection locations suitable for "exceptional" treatment. Candidate exceptional intersections are those along the Pedestrian Corridor (NE 6th Street at 110th Ave NE, 108th Ave NE, 106th Ave NE and Bellevue Way), and in Old Bellevue across Main Street, and at the 102nd Ave NE @ NE 1st Street entrance to the Downtown Park.

Exceptional intersections may incorporate design components of an Enhanced intersection, and may also include a pedestrian scramble signal phase, raised crossings; and landmark freestanding wayfinding.

MID-BLOCK CROSSINGS

Mid-block crossings help reduce the scale of Downtown Bellevue "superblocks" to be more manageable for pedestrians. Existing Downtown Subarea Plan policy specifically addresses the need for mid-block crossings:

> **Policy S-DT-47.** Reinforce the importance of the pedestrian in Downtown Bellevue with the use of a series of signalized mid-block crossings. Consideration should be given to the design of adjacent superblocks, consideration of traffic flow, and the quality of the pedestrian environment when implementing mid-block crossings.

The Downtown Subarea Plan considers the mid-point of each superblock to be a candidate location for a mid-block crossing. Guidance from policy S-DT-47, plus community input, and current and anticipated demand from land use and light rail stations inform the Commission's recommendations for the location of new mid-block crossings, as shown on the map in ***Figure 25*** in Appendix A.

Existing mid-block crossings exhibit a variety of treatments, including full signalization, rectangular rapidly flashing beacons with supplemental warning signs, median islands, and grade-separated pedestrian bridges. Council has approved of several general locations for future pedestrian bridges across Bellevue Way, NE 4th Street and NE 8th Street. The Transportation Commission identified another potential candidate location for a pedestrian bridge—across NE 6th Street between City Hall Plaza/Metro Site/Light Rail Station and Meydenbauer Center.

Similar to the treatment at an intersection, the design components of a mid-block crossing must work together to provide for a clearly visible and comfortable street crossing and also enhance the streetscape. Further, the location of a mid-block crossing must be logical for all users and must meet engineering standards and warrants.

Mid-Block Crossing Elements

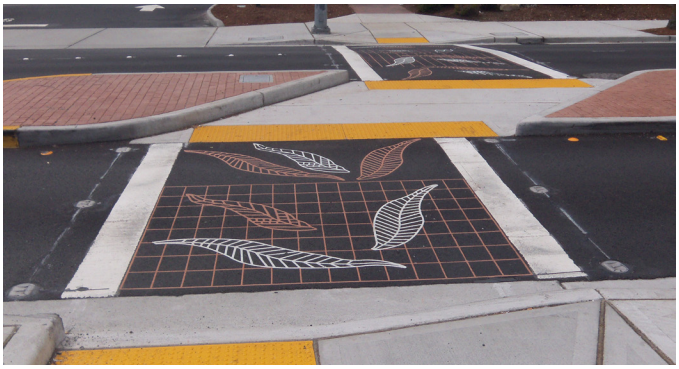
Mid-Block Crossing Locations

While the Downtown Subarea Plan, as adopted in 2004, considers the mid-point of each superblock to be a candidate location for a mid-block crossing, the guidance from policy S-DT-47, plus land use factors inform the high priority locations for installation of mid-block crossings. See ***Figure 25*** in Appendix A for Downtown Transportation Plan recommended mid-block crossing locations.

Signalization/Signage

At all designated mid-block crossing locations, some type of signalization and signage alerts drivers to the presence of a person who wants to cross the street. Standard practice for signalization depends on the roadway width and traffic volume. A rectangular rapidly-flashing beacon is generally used in situations where a pedestrian must cross only one lane of traffic in each direction. Where there is more than one travel line, full signalization is generally provided to notify motorists in all lanes to stop for pedestrians.

Crosswalk Markings



To distinguish the crosswalk from the travel lane and to provide a more interesting and pleasant environment for the pedestrian, special paving is installed in the crosswalk. For added safety the special paving is bracketed by wide and highly visible white lines. The longevity of the pavement design is extended by embedding the decorative pattern into the asphalt so that is it not worn off by vehicle tires

Medians and Planters

To provide a refuge for pedestrians and to calm traffic, landscaped medians are installed where there are no conflicts with driveways or turn lanes. In the Downtown environment, every bit of greenery is important for environmental purposes (cleaner air, reduced urban heat island, improved stormwater runoff) and for livability (enhanced streetscape aesthetics, calmer traffic, pedestrian refuge).

SIDEWALKS

Sidewalks in Downtown Bellevue provide the fundamental infrastructure for pedestrian mobility and incorporate urban design features that enhance livability. The Downtown Land Use Code prescribes the width of sidewalks and the landscaping treatment adjacent to the street. Both the private sector and public sector must incorporate the Code provisions in new buildings and infrastructure projects.

The Transportation Commission forwarded a recommendation to the Downtown Livability Initiative Steering Committee to amend the Land Use Code to increase the required sidewalk width along certain heavily traveled street segments such as along 106th Avenue NE where 12-16 foot wide sidewalks would accommodate lots of pedestrians, window shoppers and café seating on this designated "Entertainment" avenue. Along some streets where there is no on-street parking and where a buffer is needed from traffic, the Commission recommended substituting a continuous landscape planter along the outside edge of the sidewalk instead of street trees in tree grates. This type of treatment is popular with pedestrians along portions of Bellevue Way and NE 4th Street.

Sidewalk Elements

Geometry

Materials

Lighting

Landscaping

Street Furnishing

THROUGH-BLOCK CONNECTIONS

(REFERRAL TO DOWNTOWN LIVABILITY INITIATIVE)

Similar in purpose to mid-block crossings, through-block connections help to break up the Downtown superblocks into more manageable sizes for pedestrians. The Land Use Code requires that through-block connections be incorporated in new development; design guidelines are provided and basic wayfinding is required. In many situations, the best pedestrian route to plazas between buildings is on a through-block connection. However, the design of existing through-block connections is so variable, that people are uncertain as to whether they are welcome, and wayfinding does not let a person know where the through-block connection will lead.

Through-block connections are great shortcuts through superblocks that make it easier to get around on foot in Downtown. To make them even better, the Transportation Commission recommends that some design refinements be considered in the Downtown Livability Initiative. Design refinements could create standard public access wayfinding; commonly recognizable paving material or inlays; and universal accessibility according to ADA standards.

Through-Block Connection Elements

Design

Signage/Wayfinding

Pedestrian Environment

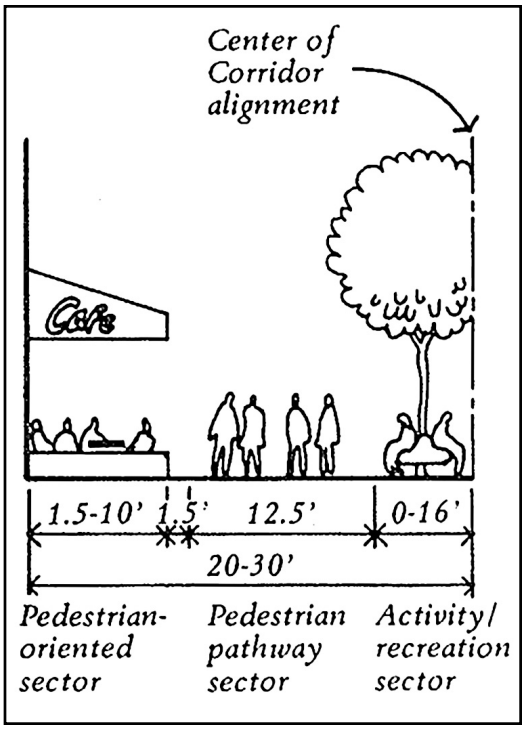


Figure 19. Building the Pedestrian Corridor by Halves

PEDESTRIAN CORRIDOR

(REFERRAL TO DOWNTOWN LIVABILITY INITIATIVE)

Through DTP community outreach the Commission learned that the NE 6th Street Pedestrian Corridor is a high priority route for both walking and bicycling, yet the design doesn't meet the mobility needs of many users, both pedestrians and bicyclists. There are also urban design issues that are addressed within the purview of the Downtown Livability Initiative. The Pedestrian Corridor will be increasingly important as new development occurs along the corridor and light rail becomes an anchor destination on the east end. It is part of a "Grand Connection" that will extend from Meydenbauer Bay, through Downtown and to the Wilburton neighborhood east of I-405. From a mobility perspective, some sections of the corridor are difficult for everyone to navigate due to narrow passages, steep slopes, tight turns and poor sightlines.

As a "referral" to the Downtown Livability Initiative, the Downtown Transportation Plan has developed a concept design that is intended to, using words that paraphrase a community comment, "welcome bicyclists but don't scare the pedestrians". By incorporating designs that indicate the preferred route for bicyclists and incorporate traffic-calming techniques to keep bicyclists at a speed appropriate for a busy pedestrian route, the corridor can be more accommodating to all users. Design components could consist of special paving treatments, wayfinding and widening. At Compass Plaza, a winding route could be made more visible and accessible by integrating special paving into the existing brick plaza and installing wayfinding signage designed specifically for bicyclists and others who are on wheels or pushing strollers. Through the Bellevue Transit Center, similar paving and wayfinding could direct bicyclists to a preferred route on the north side. Pedestrian Corridor design guidance could be refined through the Downtown Livability Initiative and design concepts could be implemented as development occurs or as a city projects.

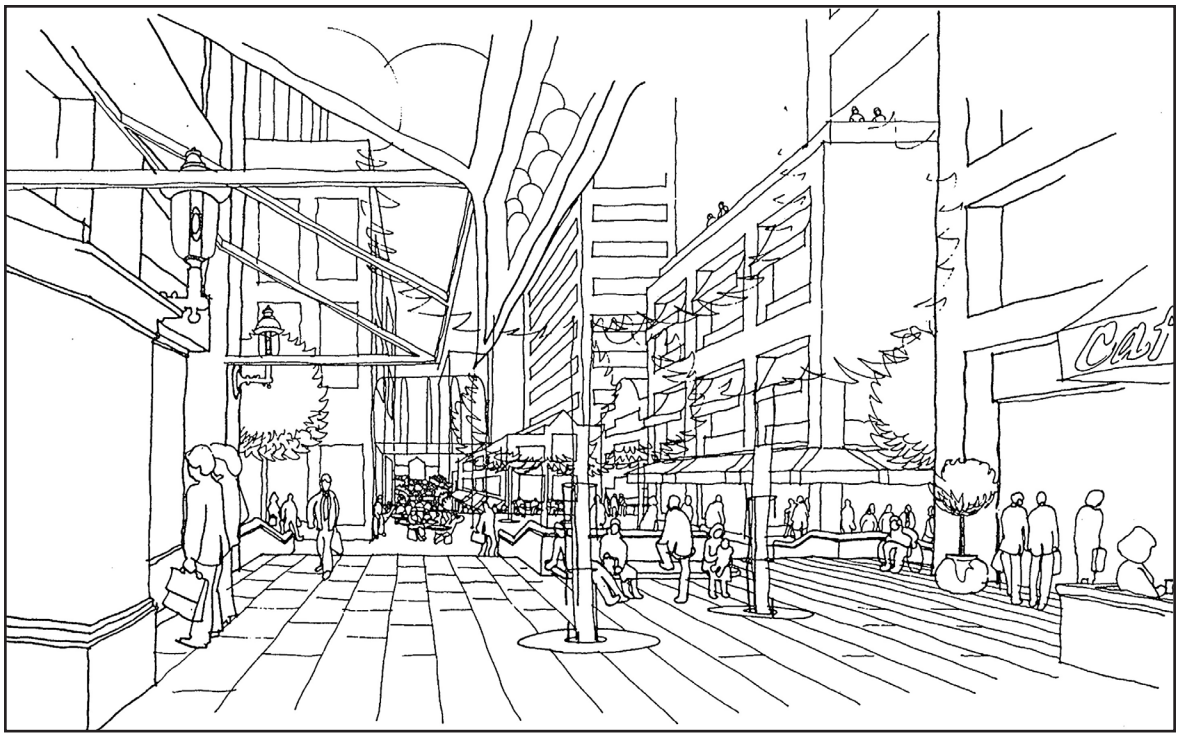


Figure 20. Illustrative Design Concept for the Pedestrian Corridor

Pedestrian Corridor History

In 1981, Council adopted a CBD (Downtown) Land Use Code that included significant changes to the intensity of development that could be built, and also addressed "quality of life" issues, recognizing that a high quality pedestrian environment was an important component of a vibrant downtown. Amendments to the Land Use Code for the CBD included the concept of the "Pedestrian Corridor"—a 60-foot wide corridor along the alignment of NE 6th Street between Bellevue Way and 108th Avenue NE, and wrapping around the Transit Center. Design guidelines adopted later that year provide concepts and illustrations to assist developers of properties along the Corridor to incorporate the functional and aesthetic intent.

Pedestrian amenities are described in the design guidelines "to ensure that the corridor emphasizes pedestrian use." Features such as seating, lighting, wayfinding, landscaping, etc. can accomplish the intent. The guidelines provide a template for creation of the corridor one-half at a time, as development occurs on one side or the other, as shown in ***Figure 19***.

When one walks along the Pedestrian Corridor today, one observes and experiences the finished portions that have been installed by adjacent development, and anticipates the completion of the corridor as new development occurs. ***Figure 20*** is an illustration of the design concept for the corridor, as envisioned in 1981.

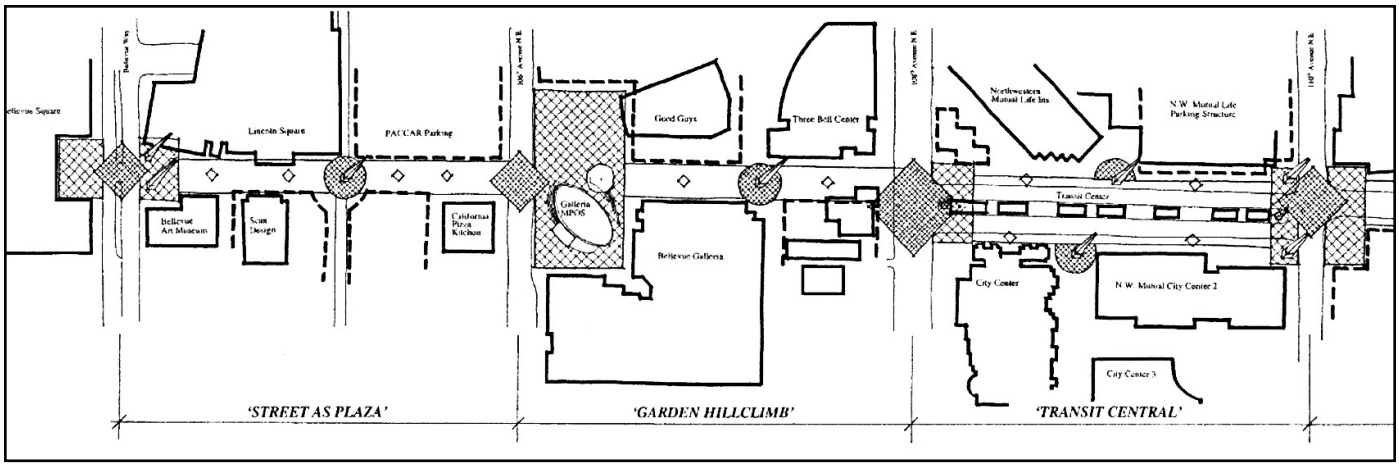


Figure 21. Pedestrian Corridor Blocks

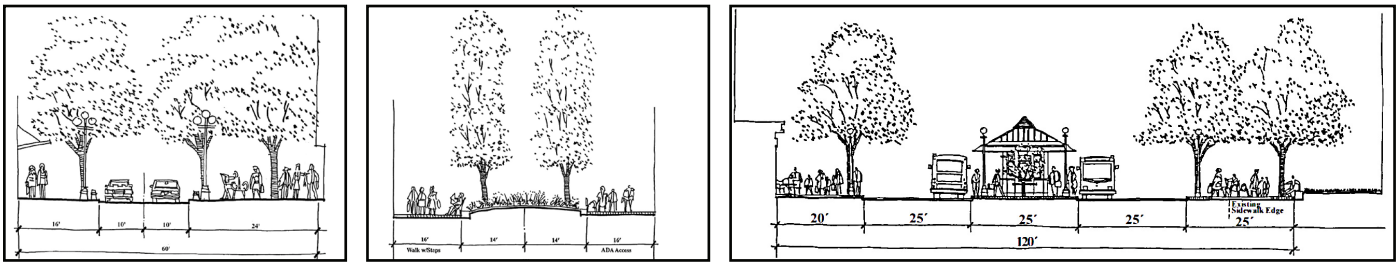


Figure 22. Sections for "Street as Plaza", "Garden Hillclimb", and "Transit Central"

Beginning with the Downtown Implementation Plan (DIP) work in the early 2000s, the concept of integrating bicycles to the Pedestrian Corridor began to materialize. This was in recognition of the fact that bicyclists had been using the corridor for years as part of a commute, for recreation, or to deliver parcels and now sandwiches to customers in nearby businesses, and spurred by two factors: many more people were living Downtown and using bicycles to get around, and bicycle commuting in association with the Transit Center was becoming more feasible and popular. Further, the parallel streets, NE 4th Street and NE 8th Street were not seen as being bicycle-friendly streets. On maps included in the final DIP report, facilities for bicyclists were officially introduced to the NE 6th Street Pedestrian Corridor. No design guidance was provided within that document to describe how to improve the corridor to better accommodate bicyclists.

Pedestrian Corridor "Blocks"

Revisions to the design guidelines were initiated in 1998 to allow for the integration of motorized traffic in the block between Bellevue Way and 106th Avenue NE. That action also created the concept of integrating distinct character to the other blocks along the Corridor. In the revised guidelines…"the Corridor as a whole is seen as a unit, (and) each block is envisioned to have its own distinguishable and unique character." This concept is illustrated in ***Figures 21*** and ***22***. The "Street as Plaza" block between Bellevue Way and 106th Avenue NE provides the pedestrian-friendly character of an urban plaza while allowing for slow-speed, low-volume vehicular traffic. Along the "Garden Hillclimb, vehicle travel is not allowed and a terraced lushly landscaped corridor is taking shape, perhaps in the future to include more intimate garden rooms appropriate for a coffee break or lunch. Transit

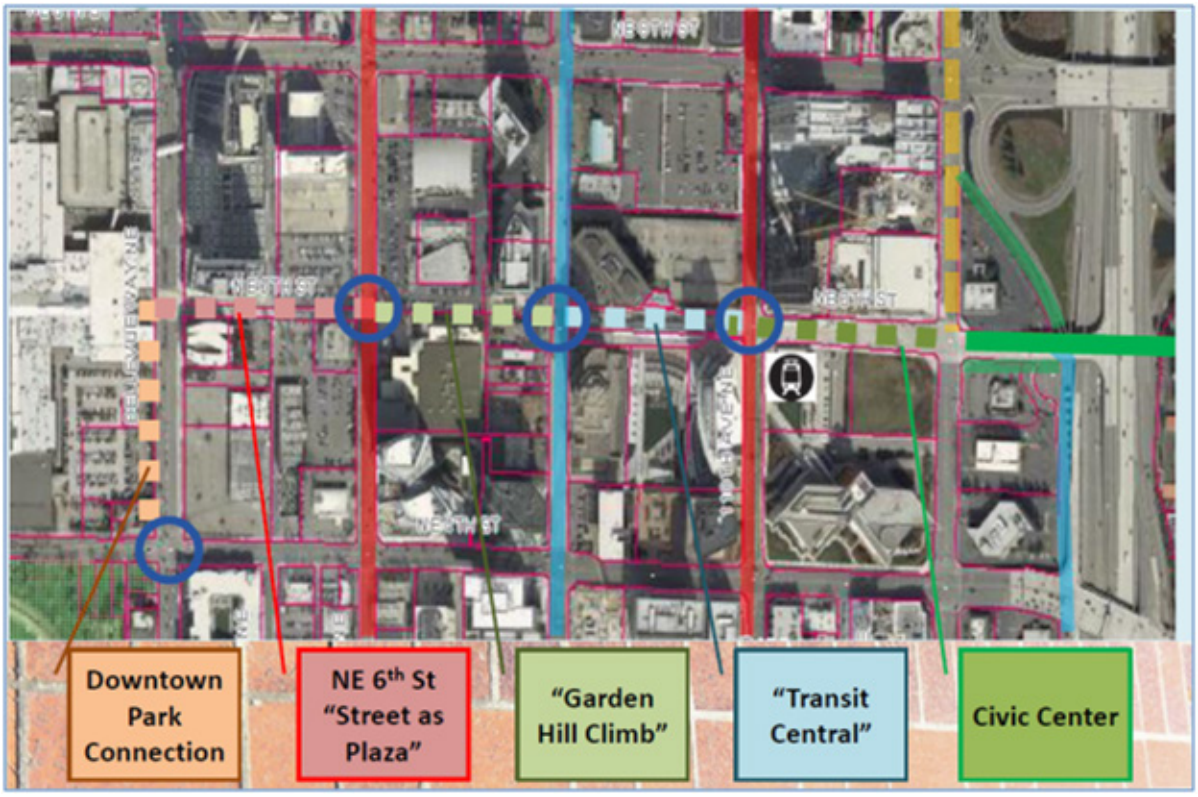


Figure 23. Pedestrian Corridor "Blocks"

Central provides for both transit connections and through passage. This is by design a very active block, yet it also provides space and amenities for pedestrians to find relief from the hustle and bustle.

Integrating Design Components for Bicyclists

Outreach conducted for the Downtown Transportation Plan Update in the Summer and Fall of 2011 provided some insights into the needs of bicyclists along this corridor. There is a clear desire to have a network of routes and facility types that will allow a wider range of riders to feel comfortable getting around in Downtown Bellevue on a bicycle. For a number of reasons, the NE 6th Street Pedestrian Corridor is a high priority for bicycling, including: little or no traffic, parallel streets are wide and busy, good integration with north/south routes and the Lake Washington Loop route, Transit Center attracts lots of bicyclists and the future light rail station will attract even more, and destinations along the way are attractive to both pedestrians and bicyclists. Currently the corridor is difficult for a bicyclist to navigate due to narrow passages, steep sections, tight turns and poor sightlines. The intent is to use designs that incorporate traffic-calming techniques for bicyclists. ***Figure 23*** shows the NE 6th Street Pedestrian Corridor and calls out each of the "blocks" that will have unique design components that may accommodate bicycle riders differently depending on the situation.

5. BICYCLES

FACILITIES FOR DOWNTOWN BICYCLE RIDERS

Downtown Transportation Plan recommendations for bicycle facility types revised and refined project descriptions from the citywide 2009 Pedestrian and Bicycle Transportation Plan. The 2009 Ped/Bike Plan also identifies citywide priority bicycle corridors, four of which include routes on Downtown streets.

During the late Summer and Fall of 2011, staff worked through various public outreach events and meetings with the Transportation Commission to gather input on the challenges to bicycle mobility in Downtown Bellevue and to explore opportunities to improve infrastructure for bicyclists. Downtown bicycle riders identified some significant issues, including a lack of on-street bicycle facilities, challenges to east/west bicycle access through Downtown, bicycle access to planned light rail stations, access across I-405 to east Bellevue neighborhoods, access to regional bicycle facilities (I-90 Trail and the SR 520 Trail), wayfinding, and bicycle parking. In addition to requesting bicycle facilities in general and more of the popular bike racks within Downtown in particular, the community expressed support for developing the Eastside Rail Corridor and providing bicycle facility connections to that planned regional trail.

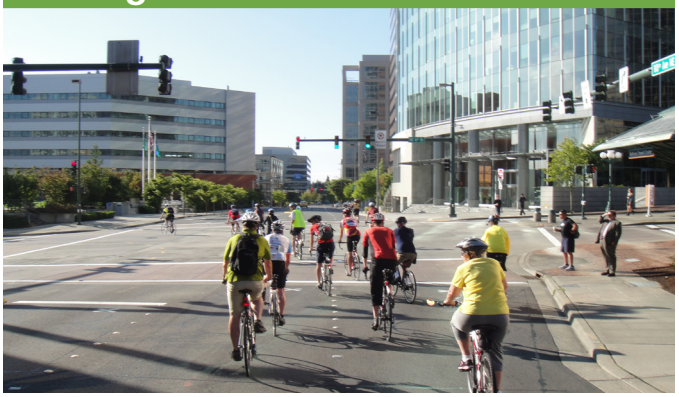
The Transportation Commission generally placed the issues to address in the Downtown Transportation

BICYCLE COMPONENTS

Local Connections

Regional Connections

Getting Around Downtown



Bicycle Parking

Commuting

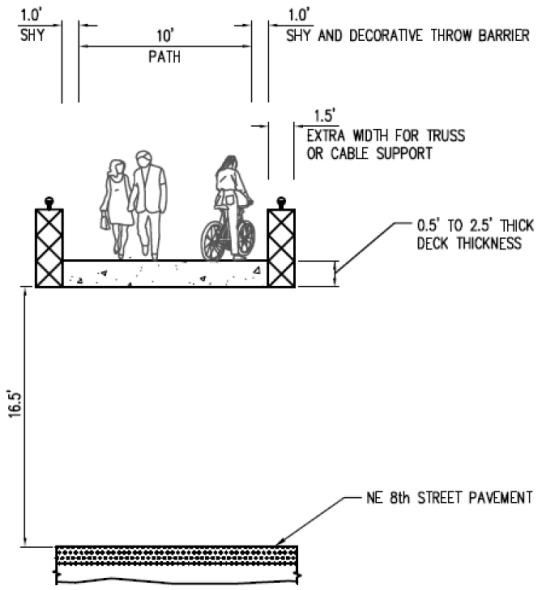
Plan into one of five component categories: **Local Connections** to areas within and nearby to Downtown; **Regional Connections** to destinations such as the I-90 Trail and the SR 520 Trail; bicycling through and **Getting Around Downtown** as part of the Lake Washington Loop route or the Lake-to-Lake Trail route; the need for both short-term and long term **Bicycle Parking**; and other **Commuting Facilities** that would make it easier to commute by bicycle**.**

Recommendations are responsive to community input and are realistically achievable giving the intense competition for limited Downtown right-of-way with cars, buses, and pedestrians. Recommended bicycle routes between Downtown and several nearby neighborhoods and regional bicycle facilities are described and mapped, as shown in ***Figure 27*** in Appendix A.

The Commission recommends the Downtown Transportation Plan bicycle facility network implement new tools and provide a robust bicycle wayfinding system to supplement pedestrian wayfinding. Bicycle facility project recommendations include east-west corridor improvements on Main Street and NE 12th Street, and north-south corridor improvements on 100th Avenue NE and 108th Avenue NE. Considerations for a shared bicycle/transit corridor are incorporated in the Commission's recommendation for 108th Avenue NE which is an increasingly important transit corridor and a route for neighborhood and regional bicycle access.

A corridor analysis for Main Street, 106th Avenue NE and 108th Avenue NE will sort out the facility types that are needed for all users to safely and

Bicycle Detector Marking at Signalized Intersection



Typical Pedestrian/Bicycle Overpass Cross Section

comfortably share these roadways. Bicycle facilities along 112th Avenue NE would support the Lake Washington Loop bicycle route and improve an important Downtown bicycle commuter route as well. A new ramp from the 114th Avenue NE bicycle route and an interim bicycle lane in the northbound direction will be installed where a dedicated bicycle facility is most needed due to the uphill grade and the busy intersection with NE 8th Street. In the long-term, the Commission recommends a pedestrian and bicycle overpass across of NE 8th Street.

Improving facilities for all bicyclists along portions of the NE 6th Street Pedestrian Corridor will help with access to the Downtown light rail station, employment and retail destinations, and housing.

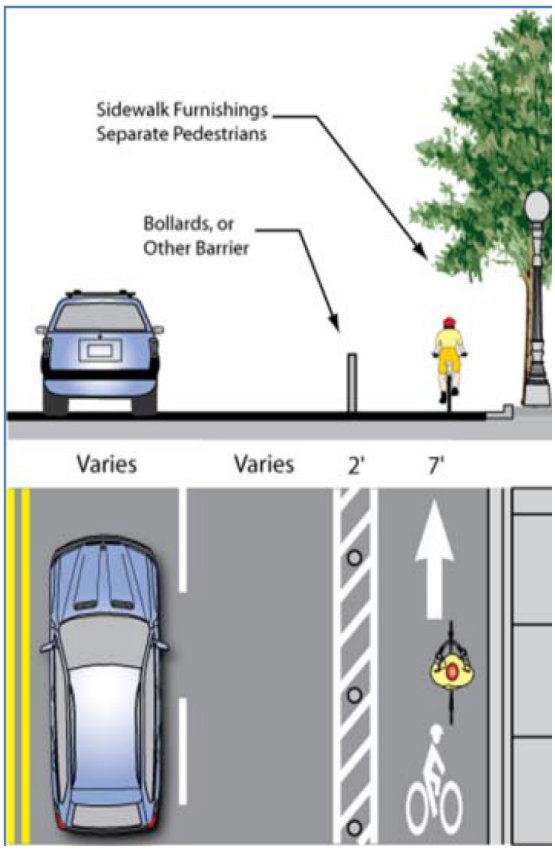
Lastly, bicycle connections to planned light rail stations will enable riders to make easy transit connections. Shared bicycles may also provide a mobility option.

NEW BICYCLE FACILITY TOOLS AVAILABLE FOR THE DOWNTOWN TRANSPORTATION PLAN

The unique circumstances of each roadway segment and the intended facilities for bicycle riders require a big box of tools to help make riding a bicycle an activity available to people of all ages and abilities. The 2009 Pedestrian and Bicycle Transportation Plan included a number of tools available at the time to allocate or share what in most cases is a limited amount of roadway surface. Recently, new tools have become available, including from the NACTO Urban Bikeway Design Guide, to more precisely define the intended use of the roadway space and to protect the safety of the person riding a bicycle. For the Downtown Transportation Plan, the set of tools available includes those adopted in the Pedestrian and Bicycle Transportation Plan, plus a few others that have become accepted practice.

On-Street Facilities

Wayfinding



Protected Bike Lane Details

- Shared Lane Marking (Sharrow):
  A bicycle + chevron symbol painted in the travel lane of a roadway to indicate the presence of bicycles, to provide wayfinding guidance, and often to mark the suggested position of the bicyclist in the lane.
- Protected Bicycle Lane:
  A one-way (as shown) or two-way bicycle lane physically separated from moving traffic by a painted buffer or physical barrier.
- Green Bicycle Lane:
  A bicycle lane that is painted green along its full length or at potential traffic conflict points such as driveways and intersections.
- Green Bike Box:
  A location at an intersection that is painted green to indicate the preferred location where bicyclists should wait for a signal change to better position bicyclists to continue through the intersection or to make a left turn.

Public Bicycle Parking on Sidewalk

Private Off-Street Bike Parking Facilities

BICYCLE PARKING

Sidewalk Bicycle Racks

Sidewalk bicycle racks are important for short-term bicycle parking. However since there is no requirement for bicycle parking in new structures, many potential bicycle commuters do not have a convenient and secure place to park their bicycles during the day.

Through the Pedestrian and Bicycle Access Improvements Program, the Transportation Department installs and maintains bicycle racks on the public right-of-way and easements in Downtown. New bicycle rack locations are typically based on demand - identifying popular destinations that lack proximate short-term bicycle parking, sometimes indicated by people who lock their bicycles to trees, sign posts, or other street furniture. The city installs and maintains bike racks free of charge at the request of businesses, residents, and bicyclists.

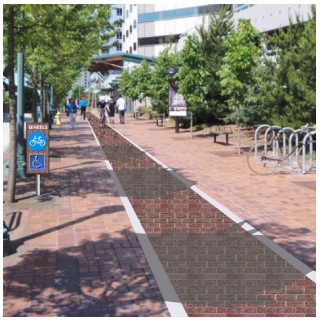
Off-Street Bicycle Parking

Secure parking for those who ride their bicycles to work, or for Downtown residents is an important factor to support commuters and recreational riders. Such “end-of-ride” facilities include sidewalk bike racks, bike corrals, and secure bike parking in buildings and transit stations. Participants in Downtown bicycle tours expressed support for end of ride facilities. Lincoln Square, the Skyline Tower, Bellevue City Hall and other Downtown buildings have installed secure bicycle parking to meet the demand of employees. A recommended Land Use Code amendment referred for consideration to Downtown Livability Initiative would require secure on-site bicycle parking, lockers and showers in new development. Bicycle parking for commuters would be developed on-site through development review.

BICYCLE WAYFINDING

Wayfinding for bicycle riders helps them to navigate within Downtown and along routes to regional bicycle facilities and to nearby neighborhoods. Typical wayfinding includes signage at decision points that identifies the direction and distance to specific destinations, and confirmation signage after the turn to point the bicycle rider in the right direction.

BICYCLE ACCESS TO PLANNED LIGHT RAIL STATIONS



The 2009 Pedestrian and Bicycle Transportation Plan did not consider bicycle (or pedestrian) access to East Link light rail stations because station locations had not all been identified. Sound Transit has planned six light rail stations in Bellevue, two of which are within the scope of the Downtown Transportation Plan, the Bellevue Transit Center Station and the East Main Station. Special pavers and signage would make bicycle access to the Transit Center light rail station more intuitive and comfortable. Access to the East Main Street station from Downtown would be facilitated by a wide sidewalk and a series of paths on the south side of Main Street, plus improved pedestrian crossings at Main Street intersections at 110th Avenue NE and 112th Avenue NE.

BIKE SHARE FOR DOWNTOWN

Puget Sound Bike Share launched Phase 1 of the Pronto-branded system in Downtown Seattle and the University District in October of 2014. As a "last mile" mode to improve access to transit, or as a means to facilitate short trips, a bike share program shows promise for Downtown Bellevue. A feasibility analysis and business plan, including sponsorships, would precede bike share implementation.

APPENDIX A: MAPS

- ***Figure 24.*** Intersection Types
- ***Figure 25.*** Existing and Planned Mid-Block Crossings
- ***Figure 26.*** Planned Sidewalk Width and Landscape Type
- ***Figure 27.*** Planned Bicycle Facilities Network

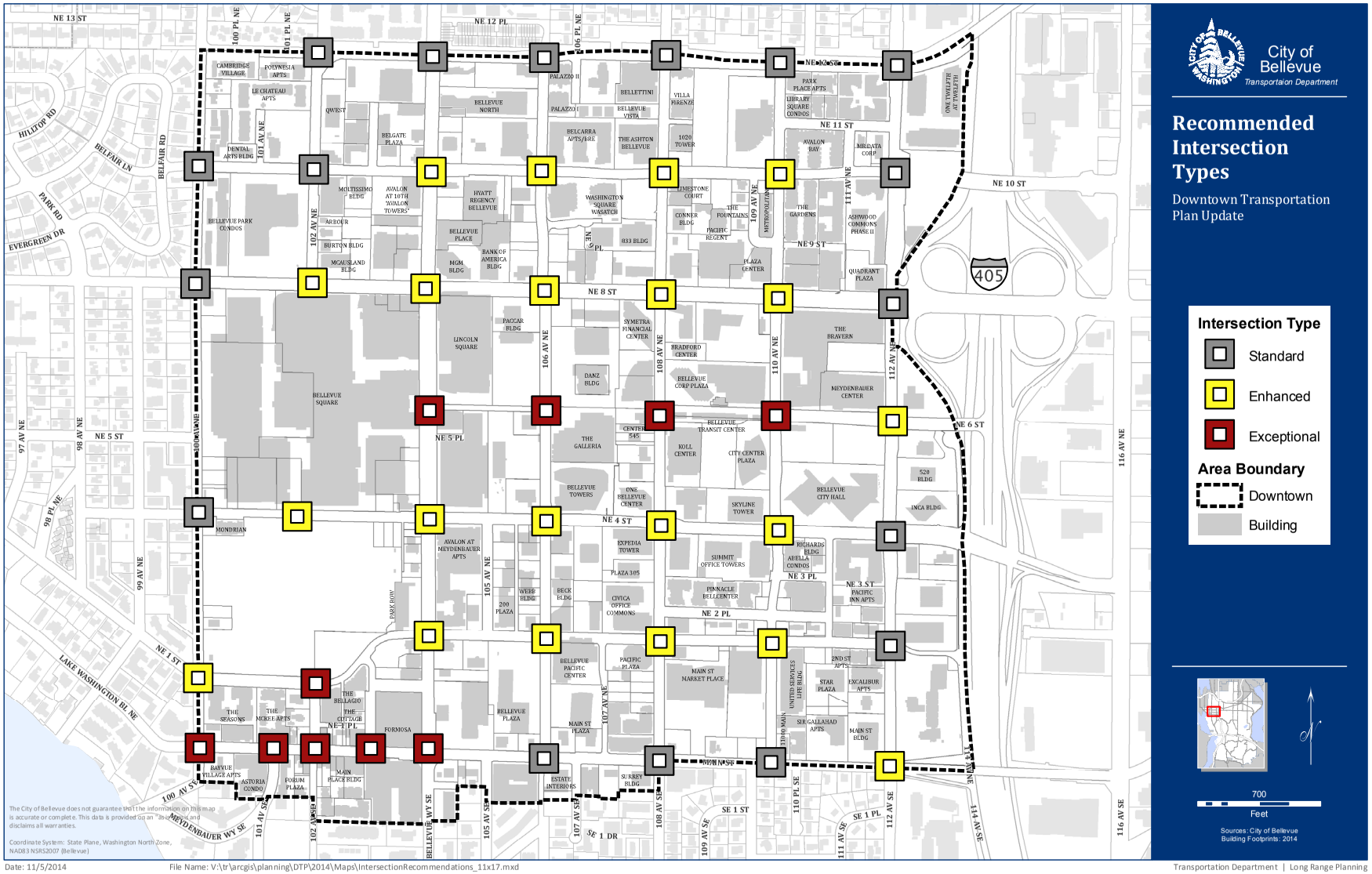
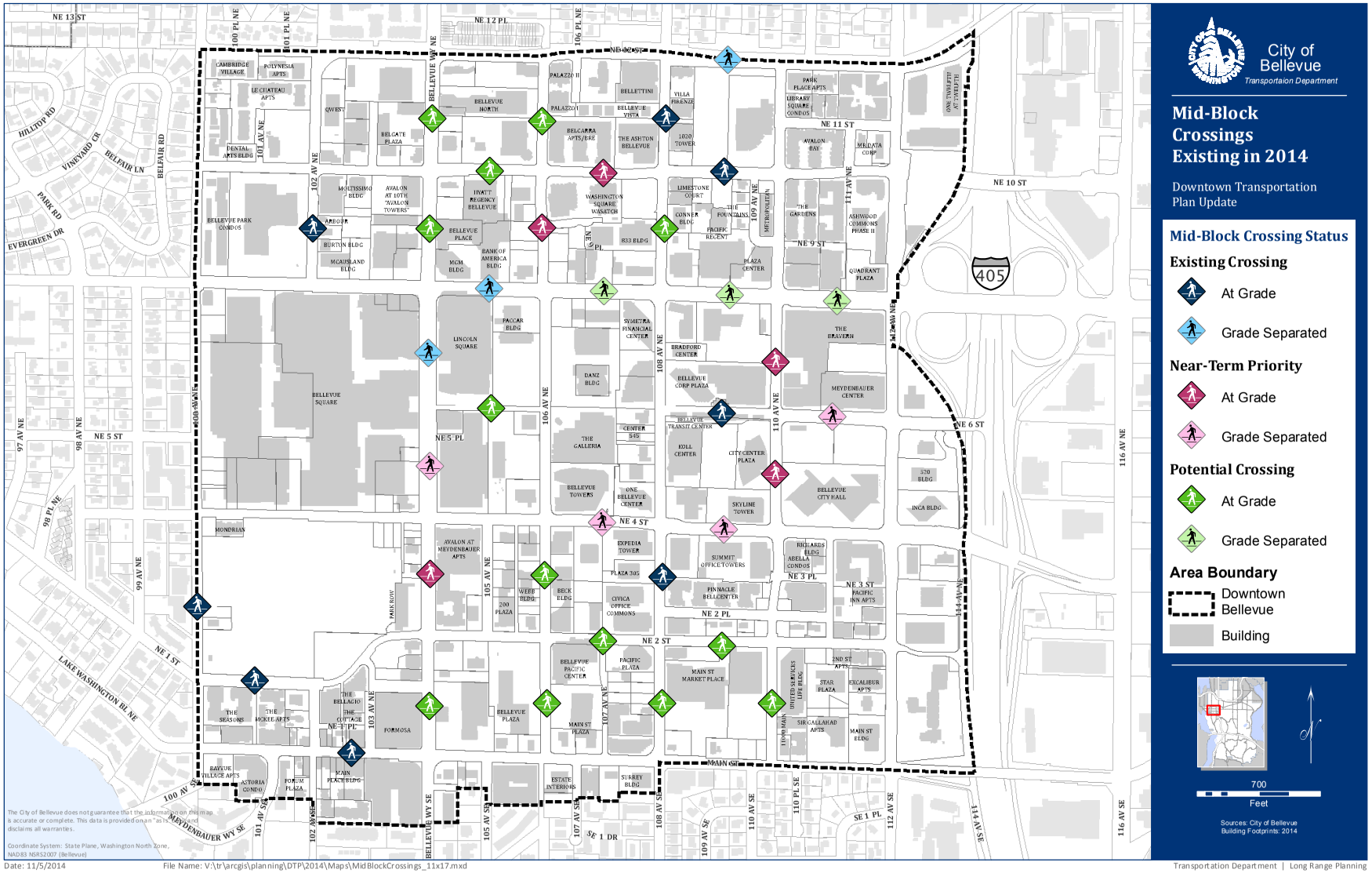


Figure 24. Intersection Types



Date: 11/5/2014 File Name: V:\tr\arcgis\planning\DTP\2014\Maps\MidBlockCrossings_11x17.mxd Transportation Department | Long Range Planning

Figure 25. Existing and Planned Mid-Block Crossings

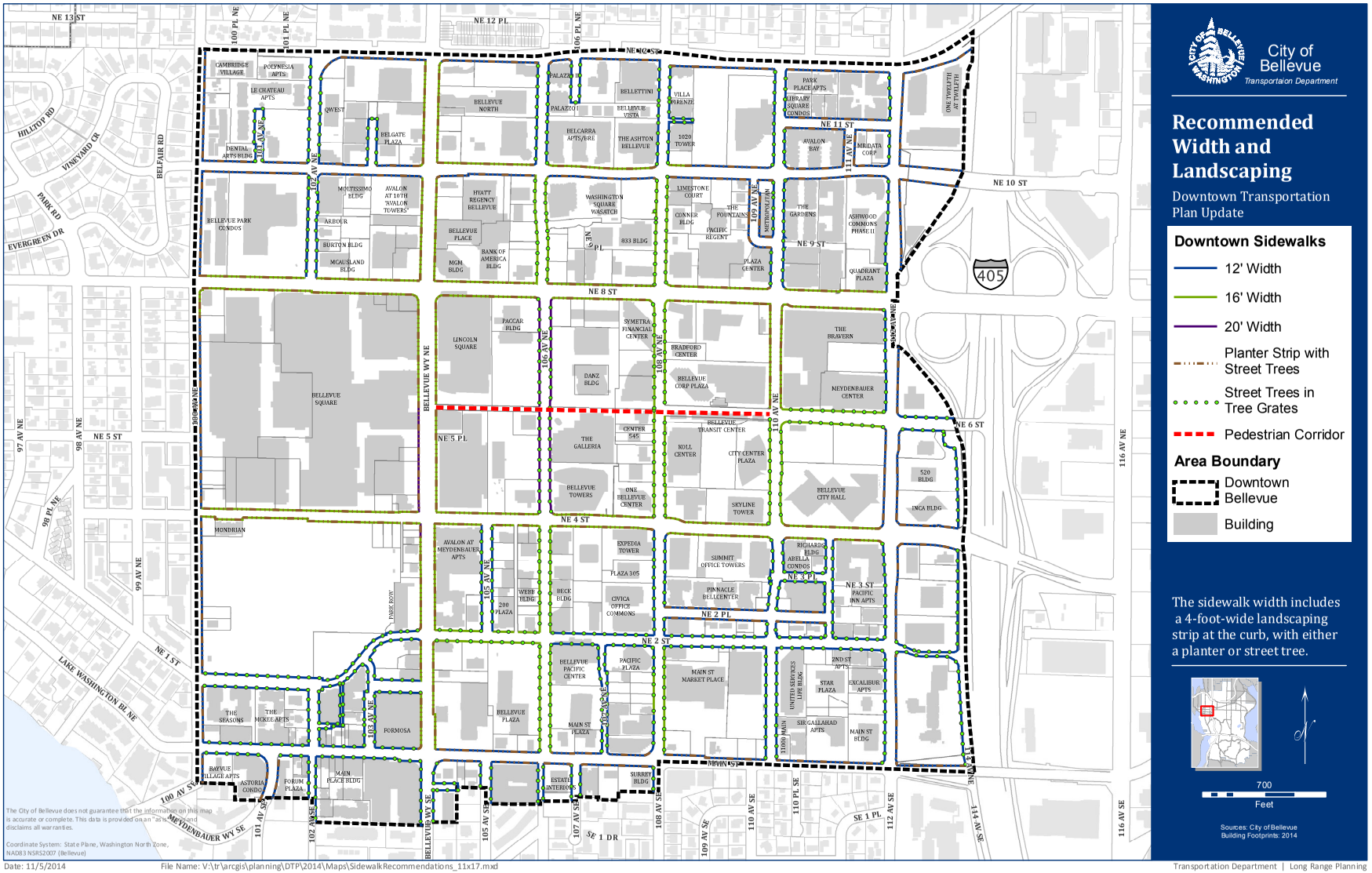


Figure 26. Planned Sidewalk Width and Landscape Type

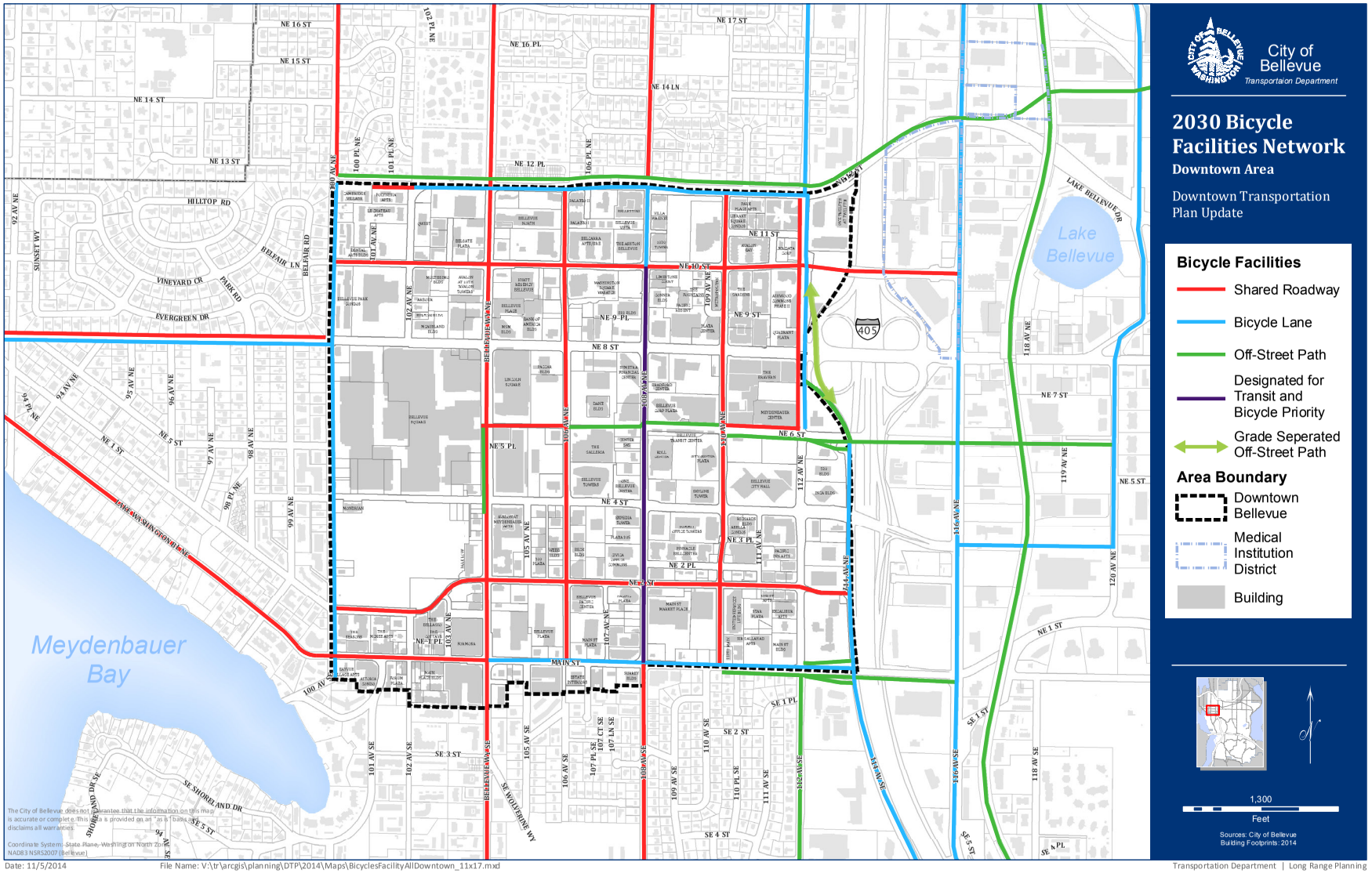


Figure 27. Planned Bicycle Facilities Network

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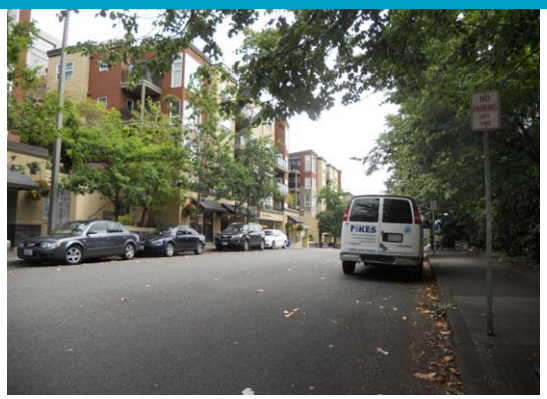
APPENDIX B: MOBILITY COMPONENT TOOLBOX

On the following pages are shown are typical recommended components of the various mobility options for the Downtown Transportation Plan, shown as a suite of photographs or “vignettes”. It is the implementation of these details that provide for and enhance Downtown mobility options, and improve Downtown livability and vitality. Some of these mobility options and their associated components are referred to the Downtown Livability Initiative because they are related to the Downtown Land Use Code and are implemented largely through the private sector.

Vignettes

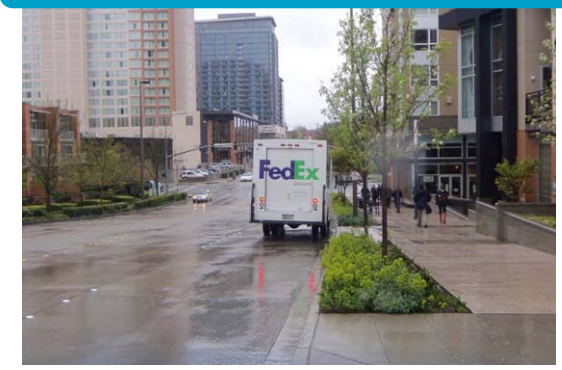
- On-Street Parking
- Miscellaneous Curbside Uses (referred in part to the Downtown Livability Initiative)
- Local Transit Stop
- Primary Transit Stop
- Frequent Transit Network/RapidRide Station
- Transit Center/MultiModal Hub
- Standard Crosswalk
- Enhanced Crosswalk
- Exceptional Crosswalk
- Mid-Block Crossing
- Through-Block Connection (referred to the Downtown Livability Initiative)
- Sidewalks and Landscaping (referred to the Downtown Livability Initiative)
- Bicycle Facilities

Permanent Parking



Pay for Parking

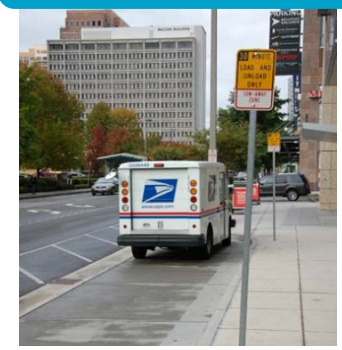
Off-Peak Parking



ON-STREET PARKING

On-street parking supports and provides access to nearby commercial establishments and residences. The approximately 300 existing on-street parking spaces would be supplemented with several dozen new permanent on-street spaces plus potentially some temporary off-peak spaces where the curb lane could be used for parking during evenings and weekends. A pay for parking program, governed by a set of program principles, would use parking revenue to pay for the management and enforcement of the program and for Downtown streetscape improvements.

Loading Zone



Electric Vehicle Charging Stations

Park(ing) Day

Taxi Stands

Passenger Pick-up/Drop-Off

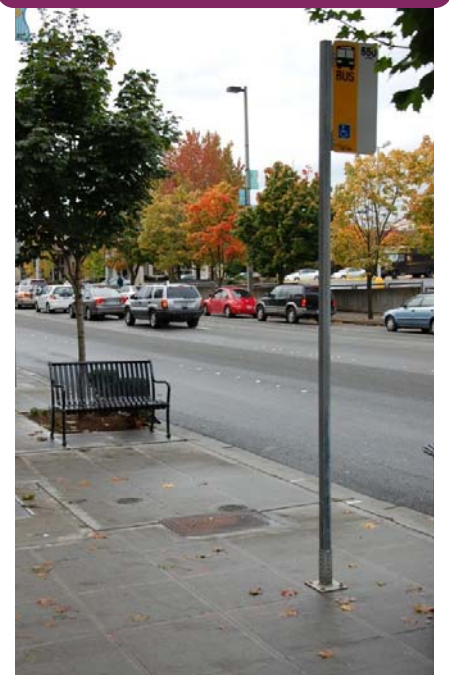
MISCELLANEOUS CURBSIDE USES

Part of the vibrant urbanism of a mixed-use urban center is the transfer of pedestrians and goods to and from vehicles. Often this activity takes place spontaneously at curbside, even if driveways and off-street loading facilities are available. Accommodations for this activity to occur curbside can be integrated in to the frontage improvements of new private-sector development projects through development review, and the City may invest in public infrastructure to support Downtown economic development.

Bus Passenger Shelter

Passenger Seating

Paved Landing Pad



Pedestrian Scale Lighting

Pole-Mounted Sign

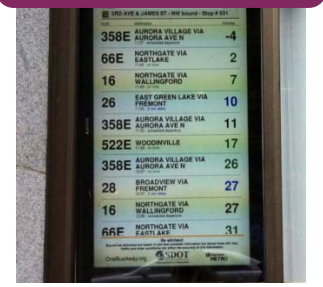
LOCAL TRANSIT STOP

A Local Transit Stop is served by a single transit route with generally 30 boardings or less per weekday. At a minimum, a Local Transit Stop would provide a pole-mounted bus stop sign, an ADA standard paved landing pad with access to the sidewalk, a bench, pedestrian scale lighting, and a shelter if boardings warrant. Access to the neighborhood is provided via typical urban standard pedestrian and bicycle facilities.

Short-Term Bicycle Parking

Transit System Wayfinding

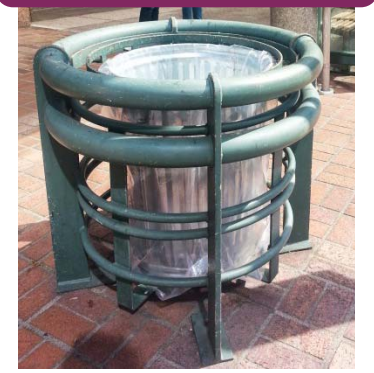
Real Time Bus Arrival Information



Local Wayfinding

Transit Route Map

Trash Receptacle



Enhanced Crosswalk

Mid-Block Crossing

PRIMARY TRANSIT STOP

A Primary Transit Stop is served by one or more transit routes with service provided at a combined headway of 30 minutes, or better. Weekday boardings run between 30 and 100 passengers. Bus routes may cross at nearby intersections, and transfers between routes are common. Components of a Primary Transit Stop would include the Local Transit Stop components plus features that support boardings and transfers, such as: passenger shelter; transit route map and transit transfer wayfinding; real time information displays; trash receptacle; and short-term bicycle parking.

Orca Card Vending Machine

Shelter or Enclosed Waiting Area

Off-Board Fare Payment

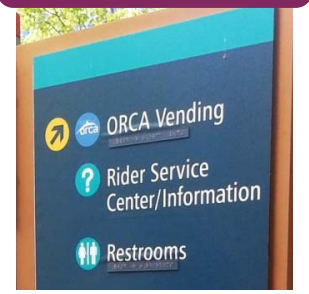
Exceptional Crosswalk

Mid-Block Crossing

FREQUENT TRANSIT NETWORK/ RAPIDRIDE STATION COMPONENTS

A Frequent Transit Network Stop or RapidRide Station is served primarily by RapidRide B and the station/stop may also serve local or regional frequent transit network routes, e.g. King County Metro Route #271. Weekday boardings average in the range of 100 to 1,000 passengers. A Frequent Transit Network/RapidRide Station would include Primary Transit Stop facilities, plus a sheltered or enclosed passenger waiting area; an Orca Card vending machine, off-board fare payment, and transit transfer.

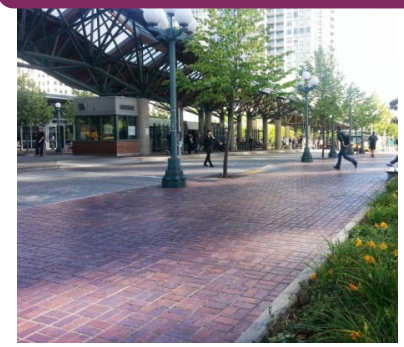
Public Restrooms



Downtown Wayfinding

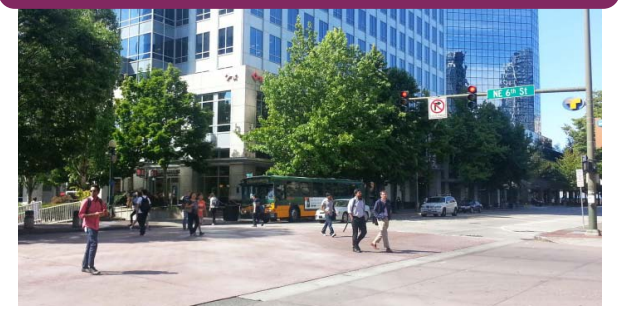
Commuter Bicycle Parking Bike Station

Generous Sidewalk Width



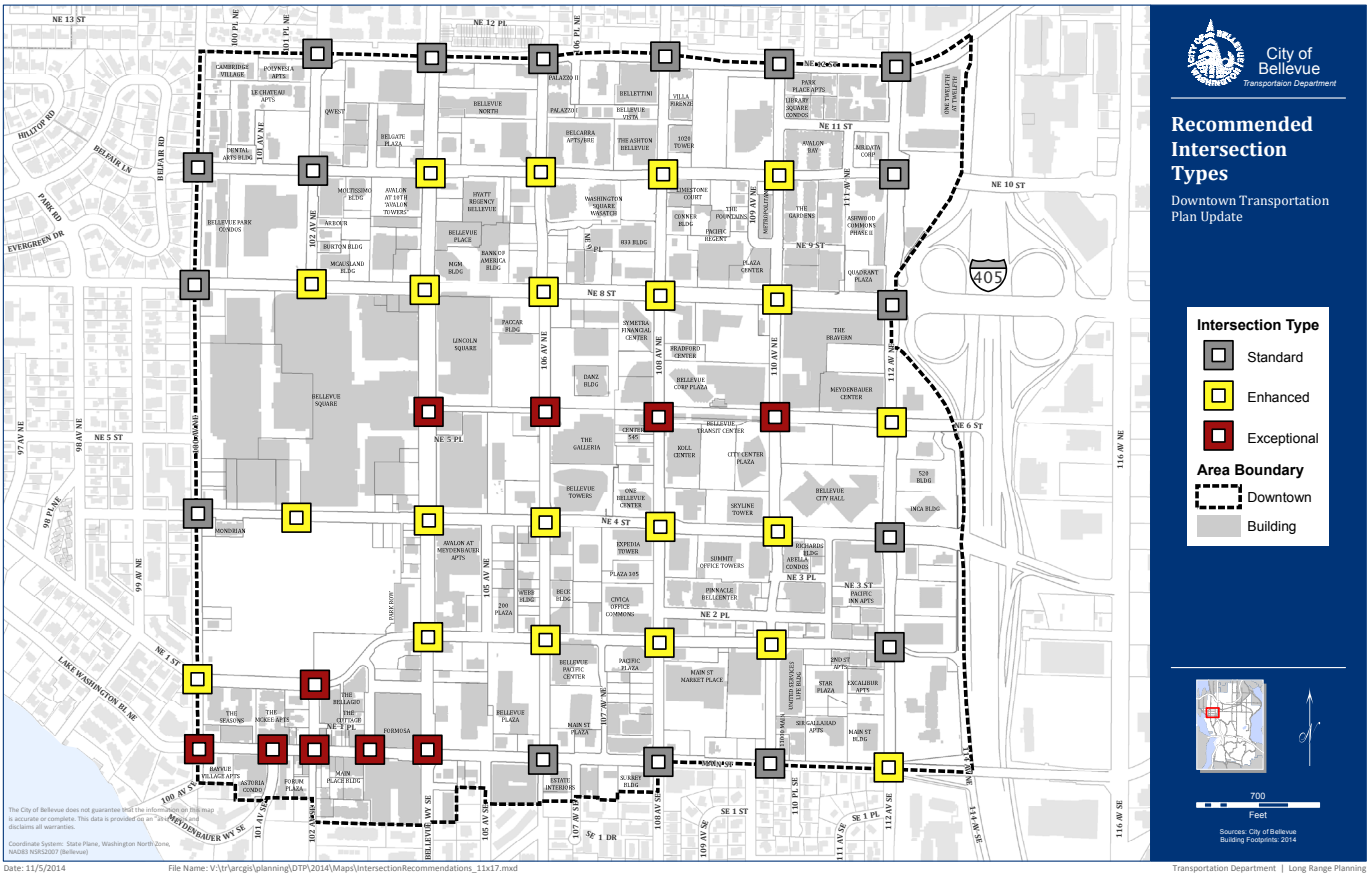
Bicycle Access

Exceptional Crosswalk / Intersection



TRANSIT CENTER/MULTIMODAL HUB

A Transit Center/MultiModal Hub is served by multiple transit routes and transit modes (bus, RapidRide, East Link light rail) with a constant flow of transit vehicles and passengers during the day. Weekday boardings exceed 1,000 passengers. A Transit Center/Multimodal Hub would include Frequent Transit Network/RapidRide Station facilities, perhaps also a public rest room and “Bike Station” facilities with covered/secure, and long-term (commuter) bicycle parking.



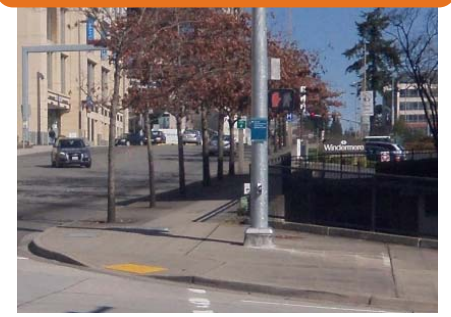
CROSSWALK/INTERSECTION COMPONENTS

The following three pages of components correspond to the icons marked on the above map for various types of recommended intersections in the City of Bellevue.

Two Curb Ramps Per Corner

Two Parallel White Bars

Urban-Scale Turning Radius



Visual & Audible Countdown Signal

Accessible Pedestrian Signal Actuation

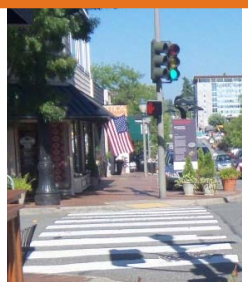
Vehicle Stop Bar

Adequate Crossing Time

STANDARD CROSSWALK/ INTERSECTION

A standard crosswalk/intersection has provided a comfortable consistency at intersections in Downtown Bellevue. Both motorist and pedestrians know what to expect and how to interact with one another. However, due to factors of pedestrian volume, traffic conditions, and/or urban design considerations, a standard crosswalk/intersection may not be desired or adequate at all intersections. Standard crosswalk/intersection components are well suited to perimeter areas of Downtown where pedestrian volumes tend to be lower and less growth is expected than in the core.

Alternative Striping



Minor/Local Wayfinding

Generous Crossing Time

Wider than Standard

Weather Protection

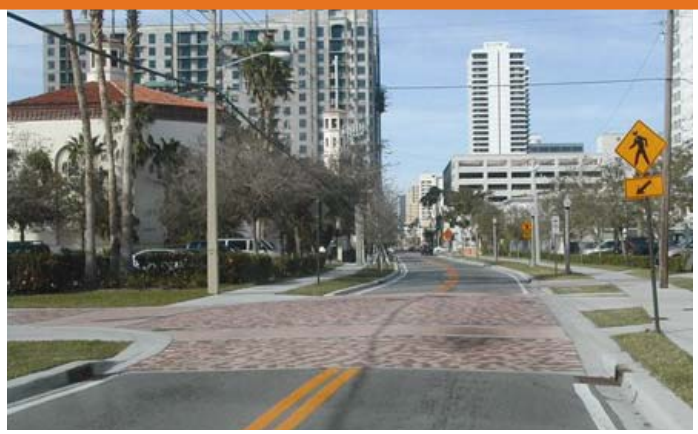
Special Paving Treatment

Curb Bump-Out

ENHANCED CROSSWALK/ INTERSECTION

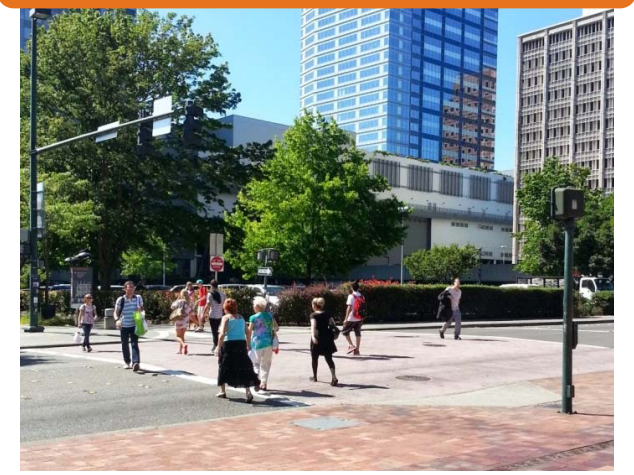
Enhanced crosswalks/intersections are located at intersections where high numbers of pedestrians and vehicles are expected, and where the urban design treatment along the street would be continued through the intersection. The design tools that create an enhanced crosswalk/intersection provide more space and visibility for pedestrians, integrate features for pedestrian comfort and information, and apply contextual design components. Enhanced crosswalks/intersections are appropriate throughout much of the Downtown core where office, retail and residential development is most intense.

Raised Crosswalk

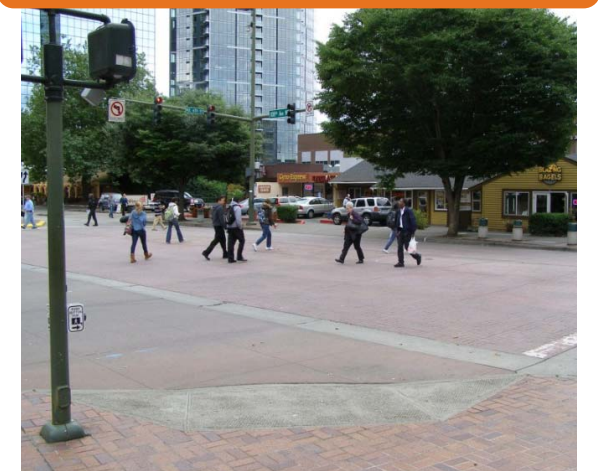


Downtown Wayfinding

Whole Intersection Crosswalk

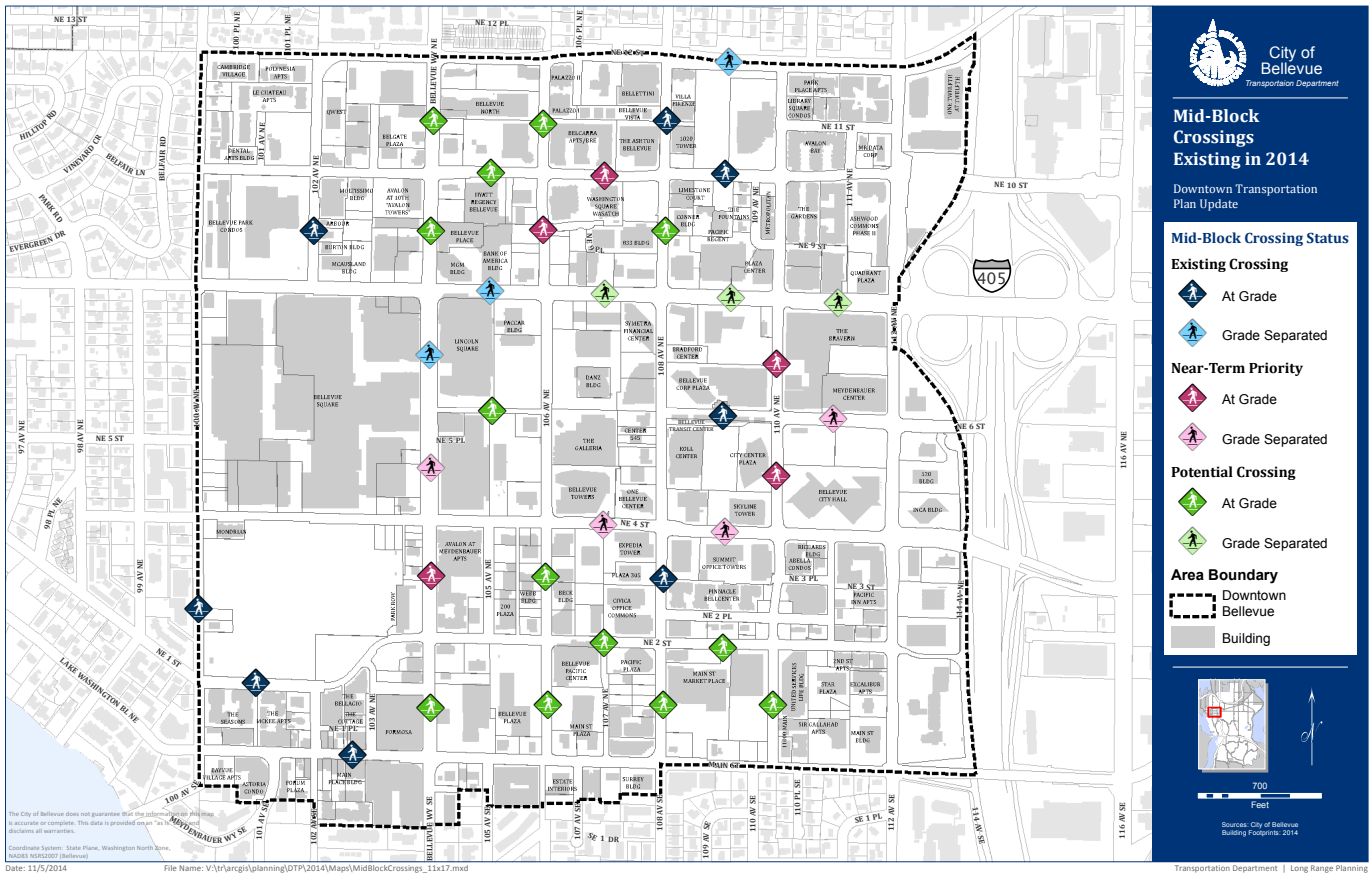


All-Walk Signal Phase



EXCEPTIONAL CROSSWALK/ INTERSECTION

The Downtown Bellevue Streetscape Design Guidelines (December 2010) refers to "celebrated intersections" where the pedestrian is provided a very appealing place to walk across the street. For the Downtown Transportation Plan, these types of crossings are called "Exceptional Crosswalks/ Intersections" and they are related to rights-of-way that have an "A" designation in the "Building/ Sidewalk Relationships Design Guidelines." These are crosswalk/intersection locations along the NE 6th Street Pedestrian Corridor, in Old Bellevue across Main Street, and at NE 1st St. and 102nd Ave.

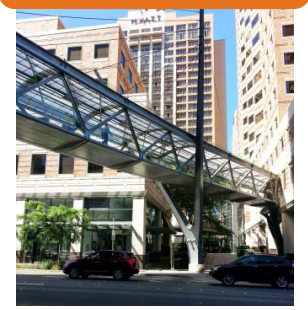


MID-BLOCK CROSSING COMPONENTS

The following page has components that are used in the various types of existing mid-block crossings in the City of Bellevue.

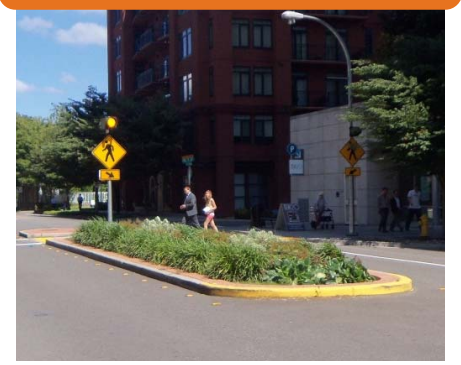
Rapidly Flashing Beacon

Grade Separation



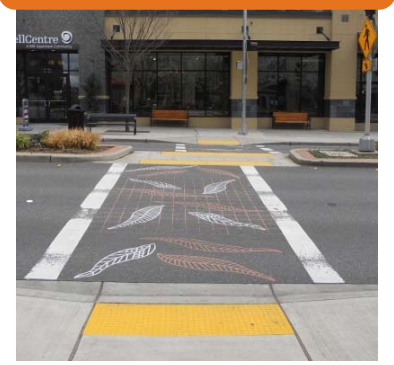
Hard Surface Median

Landscaped Median



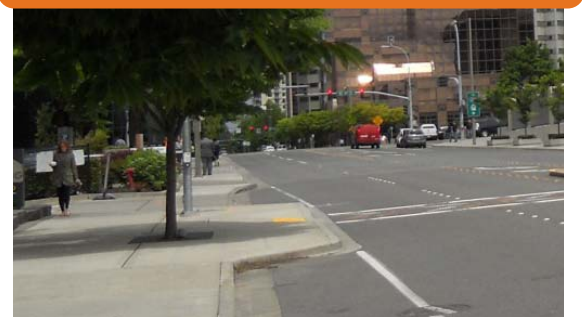
Amber Warning Lights

Special Paving Treatment



Full Signalization

Curb Bump-Out



MID-BLOCK CROSSING

Mid-block crossings help reduce the scale of Downtown Bellevue "superblocks" to be more manageable for pedestrians by creating better access. Mid-block crossings may exhibit a variety of design components that are selected considering the number of travel lanes, the traffic speed and volume, the number of pedestrians and their destinations. Components can include various types of signalization, landscaped or hard surfaced medians, curb bump-outs, special paving and in select locations, grade-separated pedestrian bridges.

Street Trees in Tree Grates

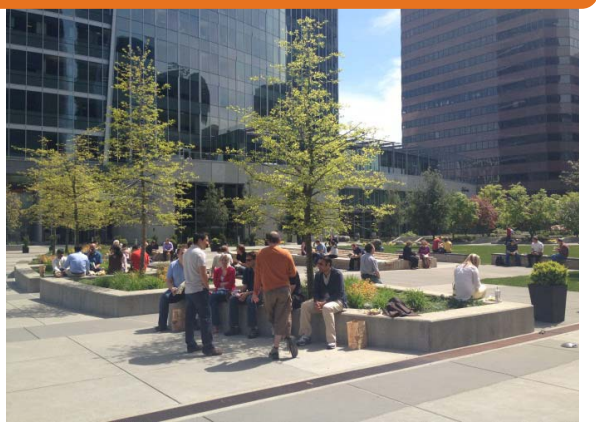
Street Trees with Plantings in Landscape Strip

SIDEWALKS AND LANDSCAPING

Downtown Bellevue sidewalks provide a non-motorized mobility option and are urban design features that enhance livability. The Downtown Land Use Code—being updated through the Downtown Livability Initiative—prescribes the width of sidewalks and the landscaping treatment adjacent to the street. Both the private sector and public sector must incorporate the Code provisions in buildings and infrastructure projects. Curbside landscaping may include a continuous landscape planter with street trees along the outside edge of the sidewalk or the traditional street trees in tree grates.

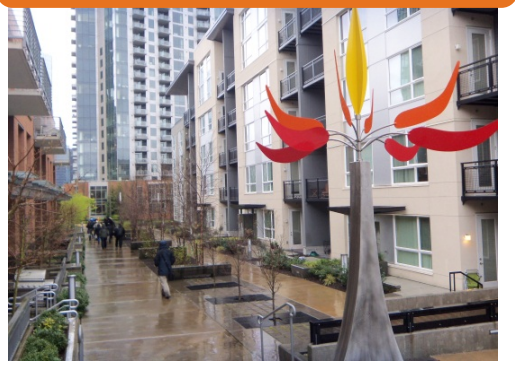
Public Access Wayfinding

Pathways and Plazas Recognized as Public Space



Distinct Paving Materials or Inlays

ADA Accessibility



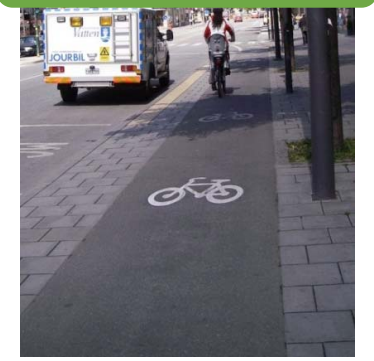
THROUGH-BLOCK CONNECTIONS

Similar in function to mid-block crossings, through-block connections help improve access by breaking up the Downtown superblocks into more manageable sizes for pedestrians. Recommended design considerations would provide a greater degree of accessibility and legibility to indicate that these pathways—and the plazas that they connect—are open to the public. Standard public access wayfinding is recommended to include destinations. Commonly recognizable paving material or inlays would indicate public access; and universal accessibility would be provided according to ADA standards.

Bicycle Lane

Shared Lane Markings

CycleTrack



Short-Term Bicycle Parking

Local & Regional Wayfinding

Bicycle Signal Actuation

Bicycle Traffic Signal

BICYCLE FACILITIES

The unique circumstances of each Downtown roadway segment and the intended accommodations for bicyclists require a big box of bicycle facility tools to get the job done. Facilities for bicycle mobility within Downtown Bellevue and to adjacent neighborhoods and regional connections can comfortably accommodate many types of riders.

Sidewalk bicycle racks are important for short-term bicycle parking. Also bicycle commuters need a convenient and secure place to park their bicycles during the day—this is a bicycle facility referred to the Downtown Livability Initiative.

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