



DATE: October 31, 2012
TO: Bellevue Transportation Commission
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SUBJECT: Downtown Transportation Plan Update

INTRODUCTION

The update to the Downtown Transportation Plan will address mobility issues and challenges and support Downtown growth and urban livability looking out to 2030.

On November 8, 2012, staff will review Downtown intersection level of service, design concepts for better integrating wheeled users into the NE 6th Street Pedestrian Corridor, and bicycle and pedestrian facility design concepts for the 112th Avenue NE corridor.

Downtown Intersection Level of Service

Over a number of months staff has built and implemented a traffic operations model - "Dynameq" - for doing dynamic traffic assignment (DTA). We have attended training at PSRC and have hosted two training sessions in City Hall. One training session was for FHWA with attendees from various states and agencies and the other was by the software vendor. This vendor is the same one that provides the EMME model software that we use for the BKR model. Hu Dong of our staff also presented a paper at Transportation Research Board in 2011 titled "Sensitivity Analysis on Dynameq: A View from Practice".

To put it into reference with the BKR Travel Demand Model and VISSIM Model that have been used and presented in earlier city studies, DTA is the mid-level version of the three scales of models – macro, meso, and micro. It is important to note that the BKR model, with the same assumptions, is used as the travel demand forecast base for both DTA and VISSIM modeling. BKR continues to be the foundation of the all of the traffic forecasting we do.

With this background on the approach used to compare 2030 Baseline with a 2030 "Build" Scenario, three sets of side-by-side comparison graphics will be presented. Each series is represented as the traffic modeled in 5 minute increments between 5-6pm. The first series will show the link volume occupancy in more detail than was shown in the EMME link volume and capacity display. Next are the queue length series of displays. These show the node impedance that is calculated in this mid-level model that we can't show from the EMME model. The third set is from the intersection delay that can be used for intersection Level of Service comparison.

What appears to occur is that the level of service decreases as traffic increases from the 2010 base year to the 2030 baseline, aka the “No-Build”. Some measures are shown in Table 1:

Table 1

Downtown	2010 Base Year	2030 No Build	2030 Build
Hourly Volume	82,307	108,661	118,111
Avg Intersection Delay (sec)	27	56	50
LOS	C	E	D
Total Delay Hours in Peak Hour	609	1699	1630

By adding the set of projects listed in the 2030 “Build” scenario there would be some improvement in Downtown traffic level of service, even though most of these projects would be located outside of Downtown. Table 2 has some overall comparisons:

Table 2

Change over 2010	2030 No Build	2030 Build
More Served	132%	144%
Average Delay Increase	211%	186%
Level of Service Change	-2 Grade Levels	-1 Grade Level
Total Delay Hours Increase	279%	268%

More detail and graphics representing the Dynameq intersection level of service results will be presented at the meeting.

2030 “Build” Scenario Project List

The projects listed below are those that have been advanced, both in terms of design and funding, to the point where they can be realistically added to the transportation network that directly and indirectly supports Downtown Bellevue mobility. These 2030 “Build” scenario projects have evolved through planning efforts outside of the Downtown Transportation Plan Update, for instance the Bel-Red Subarea Plan, Bellevue-Redmond-Overlake Transportation Study (BROTS), Mobility & Infrastructure Initiative, East Link, and the I-405 Master Plan. The following projects were added for testing to the 2030 baseline:

- **SR 520: New** ramps to/from east @ 124th Avenue NE to complete the interchange
- **SR 520:** Slip ramp eastbound under 148th Avenue NE to connect to 152nd Avenue NE
- **I-405:** Southbound braid from SR 520 to NE 10th Street

- **I-405:** Add one auxiliary lane (collector/distributor lane) each northbound and southbound, between SE 8th Street and SR 520. Accomplished through restriping not additional widening.
- **NE 2nd Street:** Expand urban arterial to 5-lanes between Bellevue Way and 112th Avenue NE, extend over I-405 to 116th Avenue NE
- **NE 6th Street:** Extend existing HOV facility across I-405 and connect to 120th Ave NE
- **Bellevue Way:** Add one HOV lane southbound from 112th Avenue NE to the South Bellevue Park & Ride

Conclusions from Modeling Regarding Downtown Roadway Capacity

Results from travel demand modeling and operational analysis are one component of the measures of effectiveness evaluation for Downtown Bellevue mobility. Overall long-term mobility will involve providing the right facilities that balance the evolving needs of pedestrians, bicyclists, transit riders (who are also pedestrians and bicyclists at some points in their trip) and automobile drivers and passengers (who, as we have seen, walk in significant numbers in Downtown Bellevue). Using a number of different modeling tools and based on assumptions for 2030 land use and the future transportation network, staff can conclude the following regarding roadway capacity:

- 2030 Baseline congestion within Downtown Bellevue is not gridlock
- 2030 “Build” scenario regional and local projects built outside of Downtown Bellevue will improve accessibility to the regional roadway system (I-405) and connectivity to east Bellevue and Bel-Red.
- 2030 “Build” scenario projects will help reduce congestion within Downtown, especially on east-west arterials
- Additional general purpose vehicular capacity beyond the 2030 “Build “ scenario” projects is not needed within Downtown Bellevue to accommodate 2030 projected growth.
- Certain intersections and links may require additional analysis
- Adaptive signal system technology (ie, SCATS) is optimizing the available capacity in the roadway system
- Many more pedestrians will be present Downtown and will need to be accommodated along and across streets, especially within the core area of Downtown and near light rail stations.

NE 6TH STREET PEDESTRIAN CORRIDOR

During the May 10, 2012 meeting, staff discussed with the Commission general design concepts for the NE 6th Street Pedestrian Corridor and the need to better integrate wheeled users in general and bicyclists in particular. Staff reviewed design components that could be incorporated into the four unique segments of the Pedestrian Corridor as well as a connection to the Downtown Park. One segment in particular – the Garden HillClimb segment – proved to

be a challenge. In this segment between 106th Avenue NE and 108th Avenue NE there is a large change in topography, stairs, and narrow passages. This segment also has lots of pedestrians and bicyclists and many more are expected as Downtown grows and light rail begins operation at the Bellevue Transit Center station.

Design components that could benefit both wheeled users and pedestrians consist of special paving treatments, wayfinding and widening a key pinch point. 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 wheeled users. The same type of paving treatment could be extended through the Transit Central segment of the Pedestrian Corridor to guide bicyclists through this busy area. Figures 1 and 2 show the design concepts for a segment of the Garden HillClimb through Compass Plaza and a segment through Transit Central.

These design concepts could be further refined through the Downtown Livability Initiative.



Figure 2. Compass Plaza route for wheeled users between the Tap House and Café Habits would help with navigation on the slope through the Garden HillClimb.

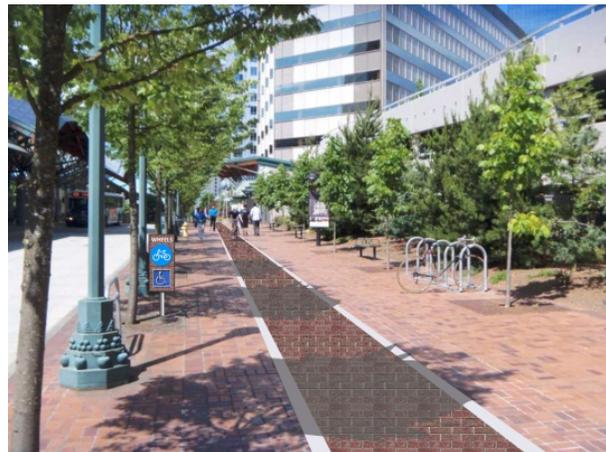


Figure 1. Transit Central route for wheeled users on the north side of the Transit Center would provide a clear path through this busy area, with access to the light rail station.

112TH AVENUE NE BICYCLE AND PEDESTRIAN FACILITIES

During the March 8, 2012 Commission meeting, staff identified the challenges with providing dedicated bicycle facilities within the 112th Avenue NE corridor through Downtown Bellevue. This is an important Downtown commuter route and is a portion of the regional Lake Washington Loop bicycle route. Bicycle lanes on 112th Avenue NE are the adopted facility type, and a high priority in the Pedestrian and Bicycle Transportation Plan. Project # B-126 E/W calls for bicycle lanes on both sides of the street. The task at hand through the Downtown Transportation Plan Update is to develop some design concepts for bicycle access that merit further analysis.

Staff and the consultant team sought to identify the constraints and opportunities of introducing dedicated bicycle facilities onto this corridor and looked at a range of options. As previously discussed with the Commission, the key constraint to bicycle mobility is the intersection of 112th Avenue NE with NE 8th Street. It is particularly problematic for bicyclists traveling in the northbound direction because there is no crosswalk on the east leg of the intersection, and the grade is uphill. Staff has identified some design options that focus on ways to accommodate bicycles and pedestrians along the corridor and across this intersection.

112th Avenue NE Bicycle Facility Design Options

Each of the following design options would improve the 112th Avenue NE corridor for bicyclists and could be carried forward for further analysis for feasibility, effectiveness, traffic impacts and costs:

At-Grade

Pedestrian and Bicycle Transportation Plan project B-126 E/W calls for 5-foot wide on-street bicycle lanes on both sides of 112th Avenue NE north of NE 6th Street. Two means to accomplish this are to increase the roadway width by 10 feet to accommodate the bicycle lanes, or to implement a “road diet” that would repurpose 10 feet from existing vehicle travel lanes for the two bicycle lanes. A shared-lane marking or “sharrow” option was considered and was discarded due to the volume and speed of traffic. Three concepts for at-grade facilities along 112th Avenue NE and across NE 8th Street and two concepts for grade-separated bicycle facilities east of the intersection have been developed for consideration:

- **Bicycle Lanes - Widen the road by 10 feet for bicycle lanes, with crosswalks at NE 8th Street**
The curb line along much of the west side of 112th Avenue NE is fixed due to existing buildings – Meydenbauer Center, Bravern, Elements Too, etc. On the east side, buildings are generally set back from the sidewalk, but there is limited public right-of-way in which to widen the road by 10-feet to accommodate bicycle lanes. This concept would require right-of-way acquisition and striping for bicycle lanes and crosswalks through the NE 8th Street intersection where currently on the east side there is no pedestrian crossing.
- **Bicycle Lanes - Road diet with bicycle lanes and crosswalks at NE 8th Street**
A very preliminary look at the future traffic volume on 112th Ave NE shows that a road diet – the removal of a travel lane - may be feasible and a reasonable level of service could be maintained. This concept would repurpose the existing curb-to-curb roadway width by removing a northbound travel lane and restriping to include bicycle lanes on each side. This concept would also require bicycle lane and crosswalk striping at NE 8th Street.
- **Bicycle Lane Northbound Only – Restriping with one NB bicycle lane and crosswalks at NE 8th Street**

For most bicyclists, the biggest challenge to riding along the corridor is in the northbound/uphill direction. Southbound, bicyclists are generally more comfortable with sharing the outside lane with traffic, especially since there is a crosswalk at NE 8th Street. The concept of restriping the roadway to provide for a single bicycle lane in the northbound direction may be a reasonable and cost-effective solution.

Grade-Separation

The intersection of 112th Avenue NE and NE 8th Street is one of the biggest challenges to non-motorized users of this corridor. A grade separated crossing on the east leg of the 112th Avenue NE/NE 8th Street intersection would provide a safe and convenient crossing while retaining the roadway vehicular capacity of 112th Avenue NE and NE 8th Street. Both grade-separated options would be located east of 112th Ave NE and would extend the existing off-street path north from its terminus south of NE 8th Street to NE 10th Street. Costs for each would be similar, in the \$10M range.

- Underpass

Very preliminary analysis shows that a 12-foot wide underpass would be feasible, but that it would need to be relatively deep due to underground utilities (about 23 feet deep compared to 2 similar underpasses on the Burke-Gilman Trail in Lake Forest Park that are about 12 feet deep). Construction impacts to NE 8th Street would also need to be considered.

- Overpass

The off-street path from 114th Ave NE could be extended to cross over NE 8th Street. Analysis shows that an overpass would be feasible and that there may be less construction risk than the underpass where utilities are located. An architecturally significant overpass may have added value as a gateway feature.

Commission Direction

Staff will provide some graphics to show each of the design concepts. However, within the scope and budget of the Downtown Transportation Plan, resources are not available to conduct a more thorough corridor design study for 112th Avenue NE between NE 6th Street and NE 12th Street. Adoption of the Plan would trigger a series of “early implementation” projects, one of which could be this corridor study. Should all design options be carried forward for further analysis? Does the Commission have any recommendations for revisions or refinements to the design concepts discussed thus far?

NEXT STEPS

At the next scheduled Commission meeting on December 13, 2012 staff will introduce concepts for improving Downtown transit service.