



DATE: December 5, 2012
TO: Bellevue Transportation Commission
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SUBJECT: Downtown Transportation Plan Update - Traffic

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 December 13, 2012, modeling staff will review Downtown intersection level of service.

Downtown Intersection Level of Service

Over a number of months staff has built and implemented a traffic operations model – using the program “Dynameq” - for doing dynamic traffic assignment (DTA). To put it into context with the BKR Travel Demand Model and the 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 city’s traffic forecasting.

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.

Since this topic was last reported there were some changes to the project lists which contributed to the amended results in these tables. It was decided to include these two additional projects in both the Baseline and the Build scenarios:

NE 2nd Street: Widen to 5-lanes between Bellevue Way and 112th Avenue NE

I-405: HOT lanes extend from NE 6th to Renton at SR 167; one in each direction

The portion of NE 2nd Street crossing over I-405 from 112th Ave NE to 116th Ave NE was not included at this time. The HOT lane extension is viewed as one of the most worthwhile transportation projects in the region.

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	114,697	119,490
Avg Intersection Delay (sec)	27	55	49
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 of the impact of growth on the vehicular traffic system for both the 2030 scenarios:

Table 2

Downtown	Change over 2010	2030 No Build	2030 Build
Hourly Volume	More Served	139%	145%
Avg Intersection Delay (sec)	Average Delay Increase	208%	184%
LOS	Level of Service Change	-2 Grade Levels	-1 Grade Level
Total Delay Hours in Peak Hour	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. The portion north of Main St will be accomplished through restriping not additional widening.
- **NE 6th Street:** Extend existing HOV facility across I-405 and connect to 120th Ave NE
- **Bellevue Way SE:** Add one HOV lane southbound from 112th Avenue SE to the South Bellevue Park & Ride to align with the forthcoming SB HOV lane between there and I-90.

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 transit stops and light rail stations.