



DATE: February 6, 2013
TO: Bellevue Transportation Commission
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SUBJECT: Downtown Transportation Plan Update – Transit Capacity

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 February 14, 2013, the Downtown mobility topic will be transit capacity. Staff will review or outline the following:

- BKR travel demand model results for 2030 transit ridership
- Projected transit vehicle and passenger use of the Bellevue Transit Center and Bellevue arterials
- Preliminary ideas to address the identified transit capacity concerns.

Downtown Transit Demand

Downtown Bellevue transit planning is about serving the anticipated jobs, residents and visitors to Downtown. Growth projections identify the significant increase in the numbers of jobs (70,300) and residents (19,000) that will be present in Downtown by 2030. In addition to the numbers, the geographic distribution of jobs and population, and the demographics of the people living and working in Downtown have a bearing on the preferred location and quantity of transit service.

Downtown Transit Scope of Work

Components of Downtown transit service that are being addressed in the Downtown Transportation Plan Update are as follows:

- **Coverage:** Provide short walk distance access to frequent transit service
- **Capacity:** Accommodate buses on Downtown streets and at the Transit Center, and transit passengers on buses and platforms
- **Speed and Reliability:** Move transit vehicles and passengers through Downtown
- **Passenger Access, Comfort and Information:** Support transit passengers between the bus or train and their residences, places of employment and other Downtown destinations

Downtown Transit Coverage

On January 10, 2013 the Commission reviewed the topic of Downtown Bellevue Transit Coverage. Given the 2030 forecast land use pattern, and the assumed transit service, staff analysis identified that over 89% of the residents and employees in Downtown Bellevue would be within a short walk of a transit stop with frequent all day transit service – an improvement from the 86% coverage in 2010. Small areas in the northwest and southwest corners of Downtown and along I-405 would not be well covered in 2030. The Medical Institution District east of I-405 is better covered now than in the 2010 Base Year with RapidRide service and will receive better service with East Link (Hospital Station) and improved frequent transit service on 116th Avenue NE.

Downtown Transit Capacity

The BKR travel demand model provides a forecast for the number of Downtown transit trips expected in 2030. Transit demand analysis provides a look at transit ridership relative to projected transit supply so that measures can be taken to bridge the gap. Table 1 provides a summary of transit demand – the numbers indicate both boardings and alightings that occur in Downtown Bellevue, but not transfers that have a destination outside of Downtown. The model-derived transit trips have been adjusted to account for the short trips within Downtown that are more likely to be on foot than on transit – similar to the walk trip adjustment for auto trips. Note that the model anticipates significant growth in transit ridership in Downtown Bellevue. While a forecasted 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.

Table 1

Transit Trips (rounded to nearest 1,000)	2010	2030	Growth
Total Boardings + Alightings	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 (7 AM – 8 AM)	15,000
		PM Peak (5 PM – 6 PM)	17,000
		All other times	25,000

Transit Capacity - Passengers

As shown by the transit demand numbers in Table 1, there is a substantial estimated increase in the number of people expected to use transit in 2030. Table 2 reveals that large percentage increases in transit use are not unprecedented in Downtown Bellevue. In 1985, according to the CBD Implementation Plan DEIS, 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 as transfers to other buses with a destination 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.

Table 2

Year	Daily Transit Boardings + Alightings
1985	1,447 (actual)
2000	2,400 (actual)
2010	10,000 (modeled, walk trip adjusted)
2012	17,700 (actual)
2030	57,000 (forecast, walk trip adjusted)

Transit Capacity - Buses

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 daily bus trips is projected to increase to 1,750 - an increase of 50% over 2010. In the 2030 PM Peak hour in Downtown, there are expected to be about 210 buses per hour plus East Link, and about 17,000 transit riders. PM Peak ridership is comprised of 3,000 transit passengers destined for Downtown Bellevue, and 14,000 transit passengers 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 - the number of transit trips is 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 50% increase over 2010. The role of the Downtown Transportation Plan is to identify this potential service gap for elected officials and the community, but not to develop a specific plan for how to fill that gap. The DTP identifies the infrastructure needed to accommodate the 2030 bus and passenger trips. Since PM Peak hour is the period in which there is the greatest demand for roadway space and intersection time, we have focused on the 210 buses that will operate during that time on Downtown streets. We have also studied the capacity of the Bellevue Transit Center during this period.

The 210 PM Peak hour buses will be concentrated in the core of Downtown near the Transit Center. 108th Avenue NE and NE 6th Street near the Transit Center are expected to carry the most buses, with about 120 to 150 buses per hour. As buses flow through Downtown they disperse to the street grid, yet some arterials 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 over 200 buses per hour along the 3rd Avenue transit corridor in Downtown Seattle. It is not expected that these roadways would be unable to support this level of bus activity, however some speed and reliability improvements may be needed as bus volumes increase.

At the Bellevue Transit Center (BTC) in 2010 there were about 80 buses per PM Peak hour that access the center platform. Along the BTC platform there are 10 transit bays, plus two bays associated with the BTC located on 108th Avenue NE. In 2030 the number of PM Peak hour 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 transit passengers using and passing through the BTC will grow substantially. The 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, 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 and limits the passenger queuing space. The anticipated bus capacity constraint for the BTC is congestion for buses arriving or trying to leave the transit bays, caused by queuing at intersections. BTC intersections at 108th Avenue NE and 110th Avenue NE will have significantly more buses and pedestrians that will make exiting the BTC more challenging than at present. Traffic signal operations at these intersections will require special attention to ensure the BTC can effectively accommodate anticipated buses and passengers.

Transit Capacity – Preliminary Recommendations

Preliminary recommendations based on the transit capacity findings would articulate policy support and advocacy for sustained and enhanced transit service for Downtown Bellevue. A 50% increase in daily bus transit service would require new funding, the sources of which are not known. 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. Operations of the bus platform staging and signalization at each end of the BTC could streamline bus movement.

NEXT STEPS

At the next scheduled Commission meeting on March 14, 2013 staff will continue the discussion of Downtown transit service. Findings and preliminary recommendations regarding transit speed and reliability, and passenger access, comfort and information will be presented and discussed.