

City of Bellevue
Downtown Circulator Implementation Plan
Final Report

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CHAPTER 1: BACKGROUND

INTRODUCTION

Project Purpose

The purpose of the Bellevue Circulator Implementation Plan is to undertake a technical evaluation of a downtown Bellevue circulator transit service, to be implemented in the short-term (target February 2008) with a five-year service horizon, including:

- Evaluating and developing an implementation approach for a downtown Bellevue circulator service;
- Evaluating alternative concepts to provide intra-downtown circulation options;
- Preparing the analysis to support a Partnership Program proposal for Metro.

A circulator system can be defined as a frequent local transit service, using small buses or vans, to provide access to many collection/distribution points or activity centers, for residents, workers and visitors.

This report provides a summary of the following:

- Transit Service Assessment – An analysis of existing and proposed (2008) transit service in downtown Bellevue to determine areas of coverage, utilization and frequency and gaps in service area;
- Market Assessment – An assessment of the travel demand for a circulator service based on stakeholder interviews.
- Circulator Options and Evaluation – An analysis of six circulator options and needed support facilities within downtown Bellevue;
- Alternatives for Improving Existing Downtown Transit – An assessment of other options for improving transit service, including restructuring of existing routes, and improved wayfinding.

Background

The concept of a circulator service in downtown is not new. In the 1970's and 1980's, the City in partnership with King County Metro offered a circulator service, but the service was discontinued due to low ridership. More recently, a downtown Circulator has been a Council priority, and has been identified as an element of the City's Local Transportation Vision, and the Downtown Implementation Plan (2002).

In 1999, the Council requested that the Transportation Department develop a plan for a transit circulator. Staff presented a draft plan to the Council on January 31, 2000, including potential routing for six small buses to operate a fare-free service during mid-day on 10-minute headways. The cost for this service was estimated at approximately \$500,000 per year for 12,000 annual service hours. Staff recommended that additional analysis be conducted to consider opportunities to integrate the circulator implementation with construction mitigation for the I-405 Access Downtown Project. The Council

directed staff to evaluate potential transit ridership markets, including peak hour commute service.

In response to Council direction, the City undertook a planning process in 2001 to evaluate the feasibility of a downtown circulator. This study was guided by a Citizen's Advisory Committee (comprised of residents, major employers, King County Metro, a representative of the Bellevue Transportation Commission, the Bellevue Downtown Association, and downtown developers). The study included a market assessment of a circulator system, case studies of other circulator systems, assessment of service concepts and technologies, development of a service design, and implementation strategies. The study recommended a circuitous route that served Overlake Hospital to the east, to Old Bellevue to the west. The study determined that the cost for such a system would be approximately up to \$1.5 million per year, generating approximately 10 to 20 riders per hour (1,324 riders per day). The cost per boarding was projected to be \$4 to \$20.

The City Council found the circulator service's annual operating cost was unjustifiable given its anticipated near-term ridership, and adopted the motion advanced by the Citizen Advisory Committee, which included direction to work with transit providers for the implementation of a circulator system in downtown Bellevue at such time that ridership would result in a cost per trip of \$2 to \$3, estimated to occur when the residential population reached 4,000 and employment reached 40,000.

The Downtown Implementation Plan was completed in 2002, and while it did not identify a specific route, it identified the need for it to serve the retail core, office core, Bellevue Transit Center (BTC), and activity centers at the fringe of downtown, such as Overlake Hospital. It recommended that the service operate at 10 minute headways during the peak commute periods and during mid-day. The Plan also recommended that the City undertake a "Park-once" strategy, which allows short-term parking to be used by multiple users, with easy connections to a circulator service.

As part of the "Distributed Services Alternative" of the Bellevue Transit Center project (completed in 2002), the transit routes through downtown were reconfigured to serve areas of the downtown that were previously underserved. As an example, the Route 222 was extended to the Ashwood neighborhood, with a layover at the Bellevue Regional Library. While the route reconfiguration provided service to previously unserved areas, the routing is somewhat circuitous and difficult to understand by many riders.

Since 2002, downtown Bellevue has experienced significant growth, with additional growth expected in the near future. There are currently approximately 5,000 residents and 36,000 employees in downtown. However, there are a large number of commercial and residential developments currently underway, with the potential to increase the residential population by 3,500 and the employee population by 10,000 by 2012.

In addition, a number of transportation related improvements have occurred in downtown over the past decade, including a new, larger transit center, a new direct HOV access ramp at NE 6th Street, extensions of 110th Avenue NE and NE 2nd Street, the widening of

Interstate 405 and accompanying interchange related improvements at NE 8th Street and NE 4th Street (I-405 Access Downtown Project), and the extension of NE 10th Street across I-405 to 116th Avenue NE.

As downtown Bellevue continues to grow, the importance of internal circulation within downtown will increase. Additionally, the recently approved *Transit Now* initiative presents the opportunity to partner with King County Metro on targeted transit investments. These factors contribute to the Bellevue Council's interest in developing a Downtown Circulator Implementation Plan and exploring complementary transit services to provide intra-downtown travel options to residents, employees, and visitors. Council's recent action allocating \$1,000,000 as a resource for a Metro *Transit Now* Partnership Program investment further demonstrates Council's commitment to improving intra-downtown mobility.

As the residential population has exceeded this threshold and the employment population is approaching 40,000, the reevaluation of a downtown circulator is timely.

CHAPTER 2: EXISTING AND NEAR TERM CONDITIONS

EXISTING POPULATION AND GROWTH

Downtown Population

The downtown population is approximately 5,000 residents. These residents live in primarily multi-family residences, dispersed throughout downtown. However, the greatest concentration of residences are located along the fringe areas of downtown, including the Ashwood neighborhood in the northeast quadrant, Old Bellevue in the southwest quadrant, and the Northwest quadrant of downtown. There are two senior residences, including the Pacific Regent Tower and The Gardens, both in the Ashwood neighborhood. While these facilities operate their own shuttle, these residents could benefit from a downtown circulator as it would allow them to reach the various civic, retail, cultural and recreational facilities located beyond short walking distances. The multitude of new housing developments are expected to increase the downtown population by an additional 3,500 residents by the year 2012.

Figure 1 shows the projected 2012 downtown population by Traffic Analysis Zone (TAZ).

Downtown Employment

The downtown employment population is approximately 36,000 employees. These workers are dispersed throughout downtown. The majority of office workers are concentrated along the 108th Avenue NE corridor between NE 2nd Street and NE 10th Street. Retail employment is largely concentrated along Bellevue Way NE, especially at the Bellevue Square shopping center and other major shopping areas nearby. The large increase in commercial and office space currently under development is expected to increase the downtown employment population by an additional 10,000 employees by the year 2012.

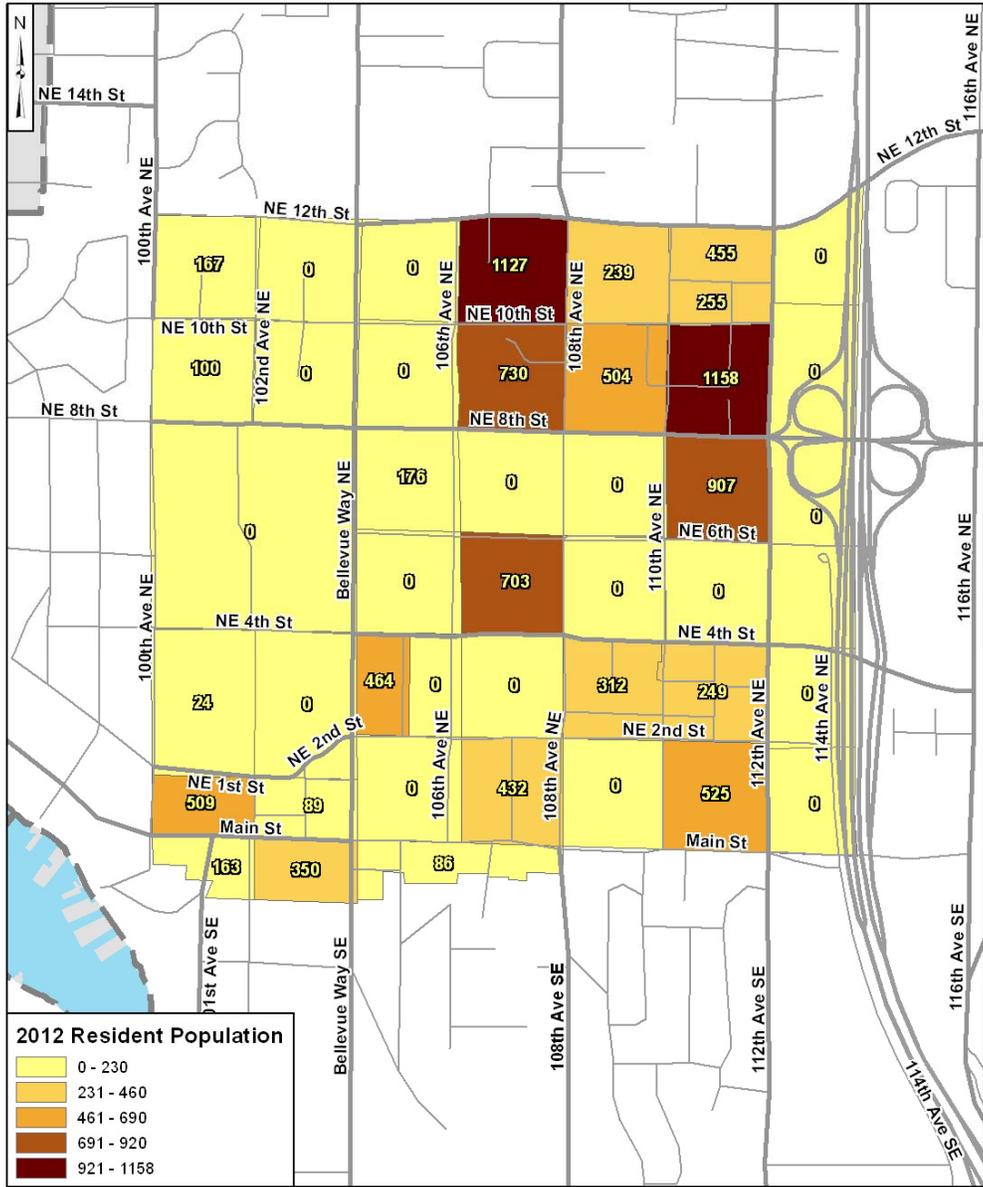
Figure 2 shows the projected 2012 downtown employment by Traffic Analysis Zone (TAZ).

Major Activity Centers

Over the past several decades, downtown Bellevue has evolved from being a primarily auto-oriented commercial area to one that is the regional hub for the greater Eastside. Bellevue, through its Downtown Plan and Comprehensive Plan policies, has focused on making downtown a “great place” that is viable, livable and memorable.¹ These plans envision a vibrant and walkable 24-hour livable community with a mixture of land uses and activities, including commerce, entertainment, office and employment, civic, cultural and recreational uses.

¹ Downtown Implementation Plan, October 2002.

Figure 1: Projected 2012 Downtown Population by TAZ



2012 Resident Population

- 0 - 230
- 231 - 460
- 461 - 690
- 691 - 920
- 921 - 1158

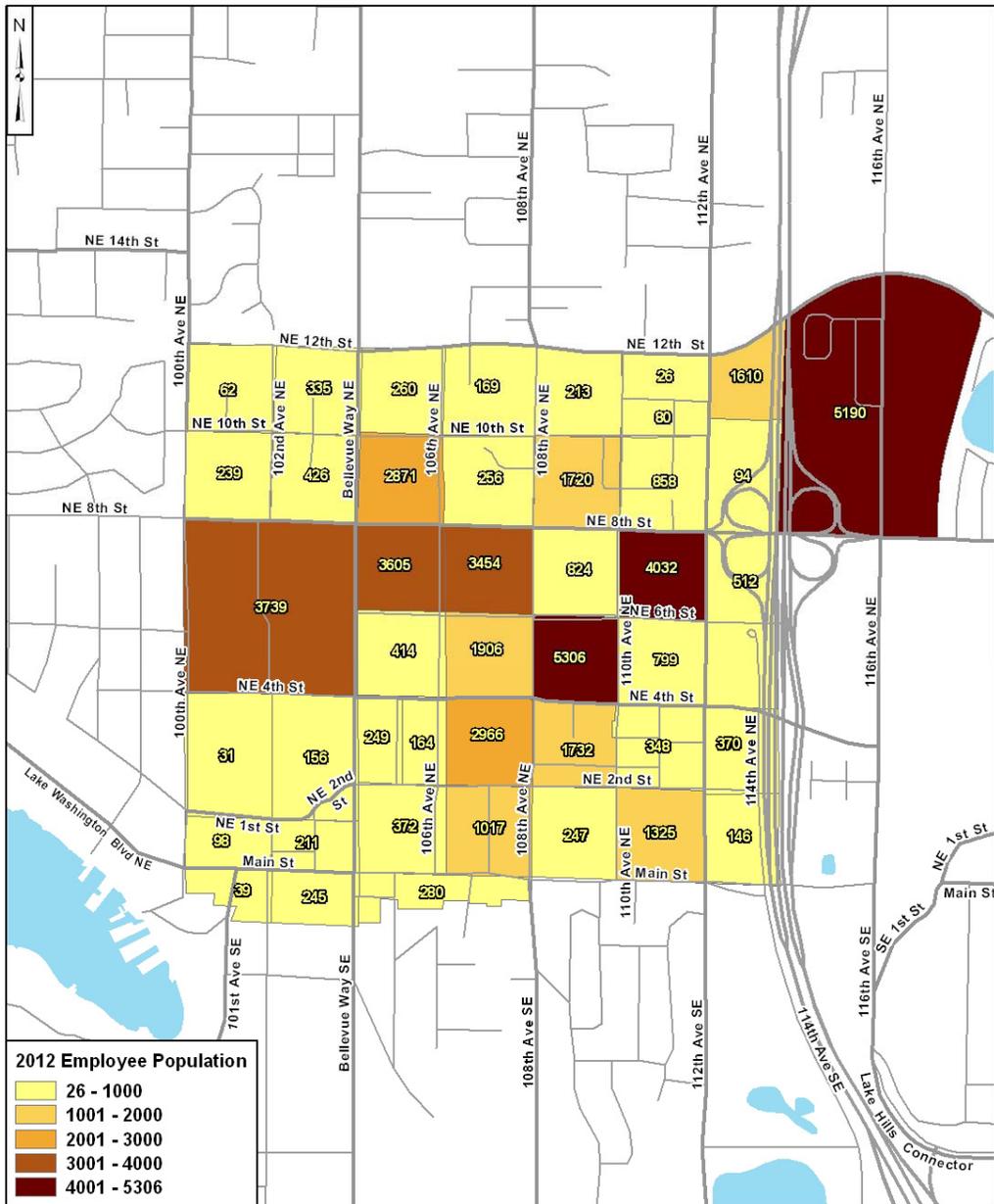


0 500 1,000 Feet

Data Sources: King County

2007 Downtown Bellevue
Circulator Implementation Plan
2012 Resident Population
Figure 1

Figure 2: Projected 2012 Downtown Employment by TAZ



Perteet

0 500 1,000 Feet

Data Sources: King County

**2007 Downtown Bellevue
Circulator Implementation Plan
2012 Employee Population
Figure 2**

The Downtown Plan focuses on the development of districts in downtown, tied together through signature streets. Bellevue Way is envisioned as a grand shopping street that ties the Bellevue Square regional shopping center to other shopping areas including Old Bellevue (on Main Street) and the retail areas of the northwest sector of downtown. Another key activity centers along this street is the Bellevue Arts Museum. Recent retail developments have been completed or are underway along this street, including Lincoln Square and the Avalon Meydenbauer development.

106th Avenue NE is envisioned as an “entertainment” street that keeps residents and workers downtown after work hours. This street currently has some entertainment uses including the Galleria and Compass Plaza (at NE 6th Street). The plan envisions additional entertainment uses along this street, such as restaurants and clubs, connected to the Bellevue Way retail corridor by the 6th Street pedestrian corridor.

The plan envisions 108th Avenue NE as the “commerce” signature street, taking advantage of the many office towers that are focused on this street.

The 6th Street Pedestrian Corridor ties these three signature streets together, and the east end of the corridor acts as the civic and convention area, including the Bellevue City Hall and the Meydenbauer Center.

Beyond these signature areas of downtown, there are several areas that have emerged as identifiable neighborhoods. The northeast quadrant of downtown, known as Ashwood, has grown to have a high concentration of multi-family residences, including two senior housing developments (Pacific Regent, The Gardens), and civic, cultural and recreational uses such as the Bellevue Regional Library, the Museum of Doll Art, and Ashwood Park.

Old Bellevue, centered along Main Street in the southwest quadrant of downtown, also has seen a tremendous growth in multi-family residences. Main Street is being preserved as a “quaint” shopping district with mixed uses. The Downtown Park, located between Old Bellevue and Bellevue Square, is a regional recreational asset that is used year round.

112th Avenue NE/SE had previously been designated (in previous downtown plans) as downtown’s hotel corridor, due to the number of existing hotels located along this street. However, a number of large hotels have been built in other areas of downtown, including the Hyatt (at Bellevue Place), the Westin (at Lincoln Square), and the Courtyard by Marriott (on NE 8th Street).

Other key activity centers located near downtown include Overlake Medical Center (on 116th Avenue NE at NE 12th Street) and Meydenbauer Park (west of downtown on Meydenbauer Bay). Near Overlake Medical Center are a number of other major activity centers, including Whole Foods and the Bellevue Design Center.

Current Planned Developments

A significant number of new developments are currently being developed in locations dispersed throughout downtown. Major new office developments include Lincoln Square (at Bellevue Way/NE 8th Street) which will include nearly 600,000 square feet of office space, the Bravern (adjacent to Meydenbauer Center) which will include nearly 1.6 million square feet of office space, City Center II (adjacent the Bellevue Transit Center) which will include nearly 800,000 square feet of office space, and the Hines Tower 303 (located at NE 4th Street/108th Avenue SE) which will include nearly 400,000 square feet of office space.

There are eight developments currently approved or underway for downtown that will encompass mixed use or residential components, totaling 2,209 new residential units.

These include:

- 1020 Residential Tower (160 units)
- Bellitini (150 units)
- Belcarra (300 units)
- Avalon Meydenbauer (368 units)
- Bellevue Towers (558 units)
- Washington Square (373 units)
- Gateway (130 units)
- Ashwood Commons (170 units)

This recent growth of office, housing and retail in downtown Bellevue will provide a potential market for a future downtown circulator. **Figure 3** shows all existing and planned major activity centers in downtown Bellevue. These activity centers are listed in **Figure 4**.

Figure 3: Major Activity Centers

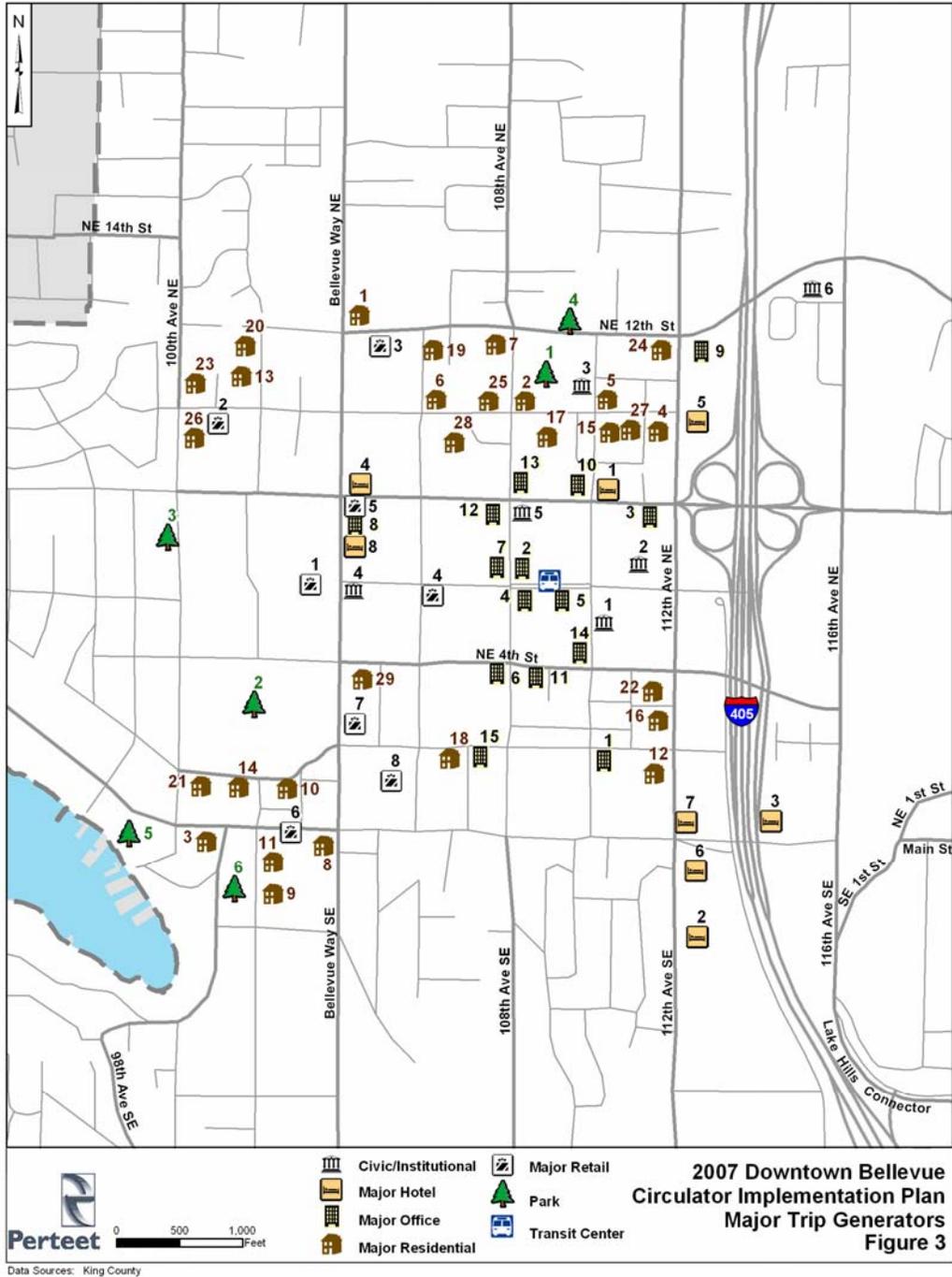


Figure 4: Existing and Approved Major Activity Centers in Downtown Bellevue

Civic

- 1- Bellevue City Hall
- 2- Meydenbauer Center
- 3 – Bellevue Regional Library
- 4 – Bellevue Arts Museum
- 5 – First Congregational Church
- 6 – Overlake Medical Center
- 7 – Museum of Doll Art
- 8 – Post Office
- 9 – Performing Arts Center (Future)

Major Hotel

- 1 - Courtyard by Marriott
- 2 - Double Tree
- 3 - Extended Stay
- 4 - Hyatt
- 5 - Paragon
- 6 - Red Lion
- 7 - Sheraton
- 8 - Westin

Major Office

- 1 - Atrium
- 2 - Bellevue Corporate Plaza
- 3 – Bravern
- 4 - City Center Bellevue
- 5 - City Center East
- 6 - Hines Bellevue
- 7 - Key Center
- 8 - Lincoln Square
- 9 - One Twelfth at Twelfth
- 10 - Plaza Center
- 11 - Summit Office Towers
- 12 - Symetra Financial
- 13 – US Bank Plaza
- 14 – Skyline Tower
- 15 – Pacific Plaza

Major Residential

- 1 - 1200 Bellevue Way
- 2 - 1020 Tower
- 3 - Astoria
- 4 - Ashwood Commons
- 5 - Avalon
- 6 - Belcara

- 7 – Belletini (Senior Housing)
- 8 - Bellevue at Main
- 9 - Bellewood Condos
- 10 - Borgata
- 11 - Courtyard off Main
- 12 - Excalibur
- 13 - LeChateau
- 14 - McKee
- 15 - Oakwood
- 16 - Pacific Inn
- 17 - Pacific Regent (Senior Housing)
- 18 - Pacific Tower
- 19 - Palazzo
- 20 - Polynesia Apts.
- 21 - Seasons
- 22 - Simpson Housing
- 23 - Sumiyoshi
- 24 - Verona
- 25 - VUE/Hanover
- 26 – Bellevue Park Condos
- 27 – The Gardens (Senior Housing)
- 28 – Washington Square
- 29 – Avalon Meydenbauer

Major Retail

- 1 - Bellevue Square
- 2 - Bellevue Village
- 3 - Bellevue North
- 4 - The Galleria
- 5 - Lincoln Square
- 6 - Old Bellevue
- 7 – 200 Plaza
- 8 – Bellevue Plaza
- 9 – Whole Foods
- 10 Niemen Marcus (Future)

Parks

- 1 - Ashwood Park
- 2 - Downtown Park
- 3 - Goddard Park
- 4 - McCormick Park
- 5 - Meydenbauer Park
- 6 - Wildwood Park

CHAPTER 3: TRANSIT SERVICE ASSESSMENT

EXISTING TRANSIT CONDITIONS

The downtown Bellevue core is served by Sound Transit and King County Metro Transit routes. In designing a downtown circulator system for Bellevue, the existing transit network can give valuable cues to areas currently served or un-served, the nature of existing options for downtown Bellevue travel via transit and opportunities for utilizing existing resources for circulator services.

Sound Transit

Existing Sound Transit services in downtown Bellevue provide regional services to the following locations:

- 532 – Bothell, Canyon Park, Ash Way P/R, Everett**
- 535 – Bothell, Canyon Park, Ash Way P/R, Lynnwood**
- 550 – South Bellevue, Mercer Island, Seattle**
- 555 – Issaquah, Factoria, Northgate**
- 556 – Issaquah, University District, Northgate**
- 560 - West Seattle, Burien, Sea-Tac, Renton, South Bellevue, Wilburton**
- 564 – Sumner, Auburn, Kent, Renton, Overlake**
- 565 – Federal Way, Auburn, Kent, Renton, Overlake**

Although the Sound Transit trips circulate through downtown Bellevue, most stop only at the Bellevue Transit Center, with the exception of the route 550 (Downtown Seattle to Downtown Bellevue). The route 550 provides weekday service within downtown between 5 a.m. and midnight, and weekend service between approximately 6 a.m. and midnight. During the weekday, the headways range from 7 minutes (during the pm peak) to 30 minutes. During the weekend, the headways are approximately 30 minutes all day. This route includes stops on Bellevue Way at Main Street, NE 4th Street at 105th Avenue NE, the Bellevue Transit Center, NE 10th Street at 102nd and 108th Avenues NE, and 102nd Avenue NE at NE 8th Street.

The other Sound Transit routes do not provide significant transit service coverage to the Bellevue CBD other than at the Transit Center and offer little potential for improving intra-downtown transit circulation. Under the operating philosophy of Sound Transit, which is to offer limited stop services along much of the route alignment, it is unlikely that any Sound Transit services can be co-opted to improve intra-CBD circulation in Bellevue.

King County Metro Transit

The majority of transit service currently circulating through downtown Bellevue is provided by King County Metro Transit. Metro Transit operates along most street segments in the downtown Bellevue core area. Most of these routes focus on the Bellevue Transit Center, making intra-CBD circulation difficult without transferring at the transit center. Most Metro routes offer at

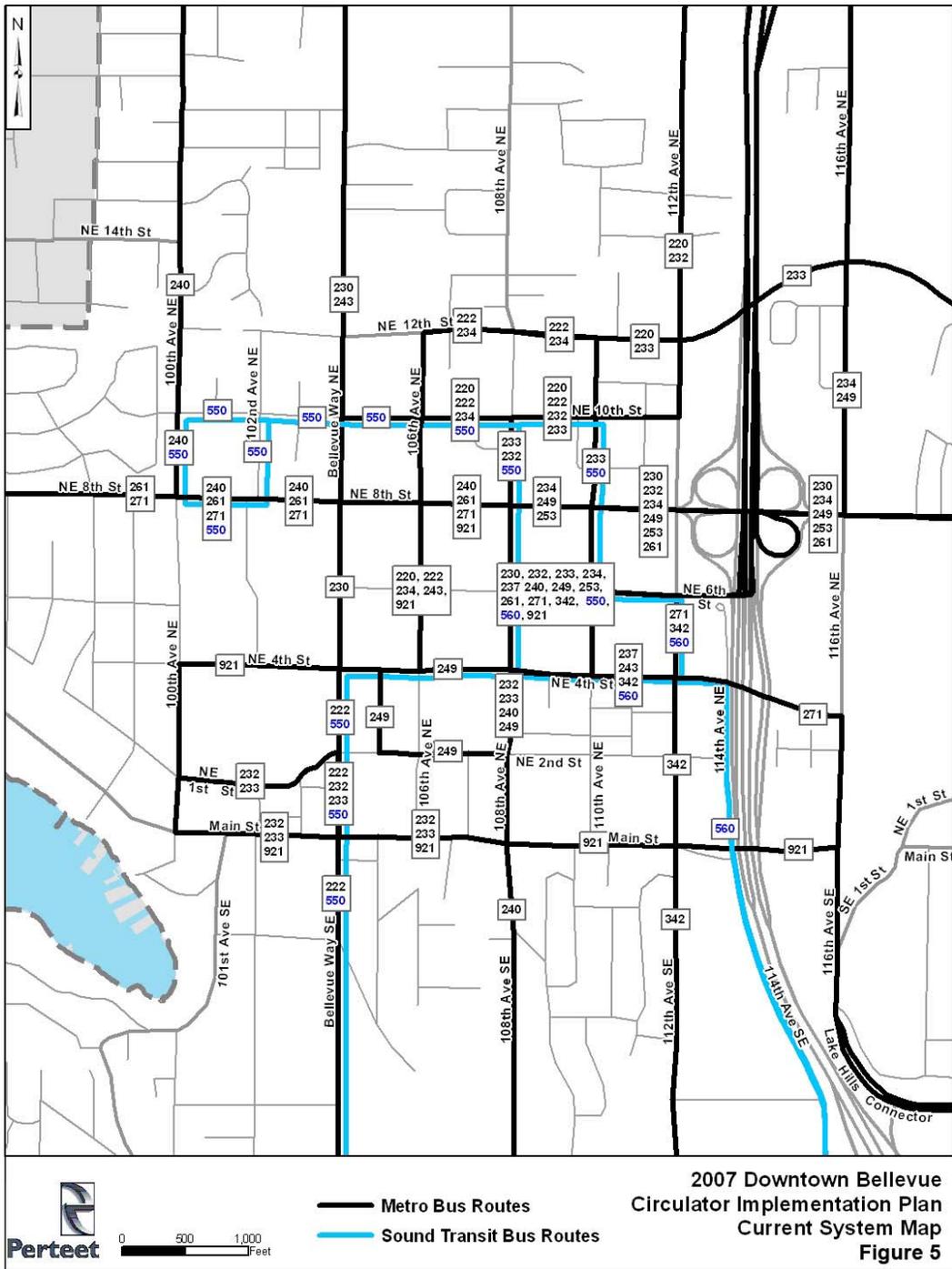
least hourly service, with increased services during peak commuter travel hours. The following is a list of King County Metro transit routes that service downtown Bellevue.

- 220 – Redmond P&R to Downtown Bellevue**
- 222 – Overlake Transit Center, Eastgate, Downtown Bellevue**
- 230 – Kingsgate P&R, Downtown Bellevue, Overlake, Redmond**
- 232 – Downtown Bellevue, Overlake, Redmond, Duvall**
- 233 – Downtown Bellevue, Overlake, Bear Creek P&R**
- 234 – Downtown Bellevue, Kirkland, Kenmore**
- 237 – Downtown Bellevue to Woodinville P&R**
- 240 – Renton, Factoria, Downtown Bellevue, Clyde Hill**
- 243 – Shoreline, UW, Downtown Bellevue, Wilburton P&R**
- 249 – Downtown Bellevue, Overlake, Redmond P&R**
- 253 – Downtown Bellevue to Redmond (Bear Creek)**
- 261 – Downtown Seattle, Downtown Bellevue, Overlake**
- 271 – UW, Downtown Bellevue, Eastgate, Issaquah**
- 342 – Downtown Bellevue to Kingsgate (NE 160th Street)**
- 630 – Downtown Bellevue to Kingsgate P&R**
- 921 – Downtown Bellevue, Eastgate, Somerset, Factoria**

In the study area, only the following short street segments are without King County Metro service (see **Figure 5**):

- NE 2nd Street – Bellevue Way to 105th Avenue NE**
- NE 2nd Street - 108th Avenue NE to 112th Avenue NE**
- NE 12th Street – 100th Avenue NE to 106th Avenue NE**
- 100th Avenue NE – NE 4th Street to NE 8th Street**
- 102nd Avenue NE – NE 10th Street to NE 12th Street**
- 102nd Avenue NE – Main Street to NE 2nd Street**
- 106th Avenue NE – Main Street to NE 4th Street**
- 108th Avenue NE – NE 10th Street to NE 12th Street**
- 112th Avenue NE – NE 6th Street to NE 10th Street**
- 116th Avenue NE – NE 4th Street to NE 8th Street**

Figure 5: Existing Routes in Downtown Bellevue



The sixteen (16) King County Metro routes operating in and through downtown Bellevue include both local Bellevue routes as well as regional and sub-regional services. The Metro Services are summarized in the table below:

Table 1: King County Metro Services in Downtown Bellevue, Spring 2007

Rt.	Service Frequency								Service Span		
	Weekday			Saturday		Sunday			Weekday	Saturday	Sunday
	Peak	Mid	Eve	Base	Eve	Base	Eve				
220	45	60							6:30A - 6:00 P		
222	30	30	60	30	60	60	60		6:00A - 11:00P	8:30A - 11:00P	8:00A - 11:00P
230	30	30	60	30	60	60	60		4:30A - 1:00 A	5:30A - 12:00A	6:30A - 12:00A
232	30								5:30A - 7:00P		
233	30	30	60	60					6:00A - 8:30P	8:00A - 6:30P	
234	30	30	60	60	60				5:30A - 9:30P	7:30A - 8:30P	
237	30								6:00A - 6:00P		
240	30	30	60	30	60	60	60		5:00A - 12:00A	7:00A - 12:30A	8:00A - 12:30A
243	40								6:30A - 6:00P		
249	30	60	60	60	60				6:00A - 7:30P	7:00A - 8:00P	
253	30	30	60	30	60	60	60		5:00A - 12:30A	6:00A - 12:30A	8:00A - 12:30A
261	30								5:30A - 7:00P		
271	15	30	60	30	60	60	60		5:30A - 11:30P	6:30A - 11:30P	7:30A - 11:30P
342	30								5:00A - 6:00P		
630	30								5:00A - 7:00P		
921	45	60							5:00A - 7:00P		

Many of these routes, notably routes 232, 237, 243, 261 and 342 operate only during weekday commuter hours, generally operating only 3-5 trips during the peak period in a single direction. Other routes, such as routes 220 and 921, offer non-standard service frequencies during commuter hours, have relatively infrequent service during the middle of the day, end services quite early and do not operate on weekends. Of the sixteen King County Metro routes operating in downtown Bellevue, only eight (8) offer Saturday service and just five (5) operate Sundays and holidays.

Service Coverage

Figure 6 illustrates the geographic coverage in downtown Bellevue of public transit during the morning (6:30-9 a.m.), midday (9 a.m.-3:30pm) and evening (7-9 p.m.) time periods on weekdays, Saturdays and Sundays. The service coverage area is based on a 1/8 mile distance to the transit route. On weekdays, almost all areas of downtown are serviced by transit. Only during the evening, small sections are not served by transit, including a small section east of 110th Avenue NE near Main Street, and north and south of NE 4th Street west of 102nd Avenue NE.

Saturday a.m. and midday service coverage is similar to weekday evening service. Saturday evening service has larger unserved areas in the Old Bellevue area and near 112th Avenue NE at NE 12th Street. Sunday service coverage is similar to Saturday evening service, with additional unserved areas along 116th Avenue NE north of NE 8th Street. **Figure 7** shows the coverage specifically for the routes 550 and 271 (two routes with good service frequency) during the mid-day, along with areas of poor pedestrian environments.

Figure 6: Service Coverage

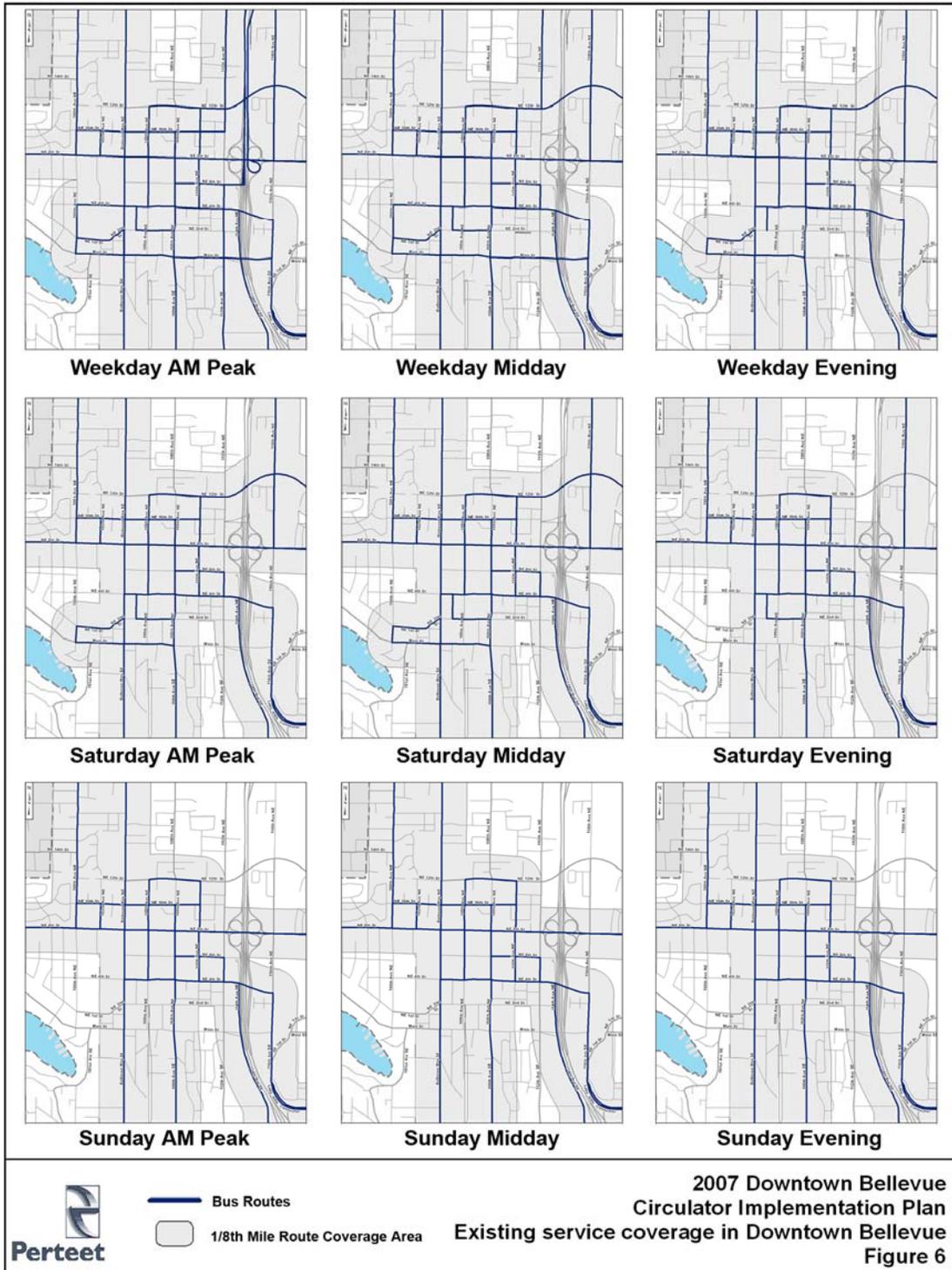
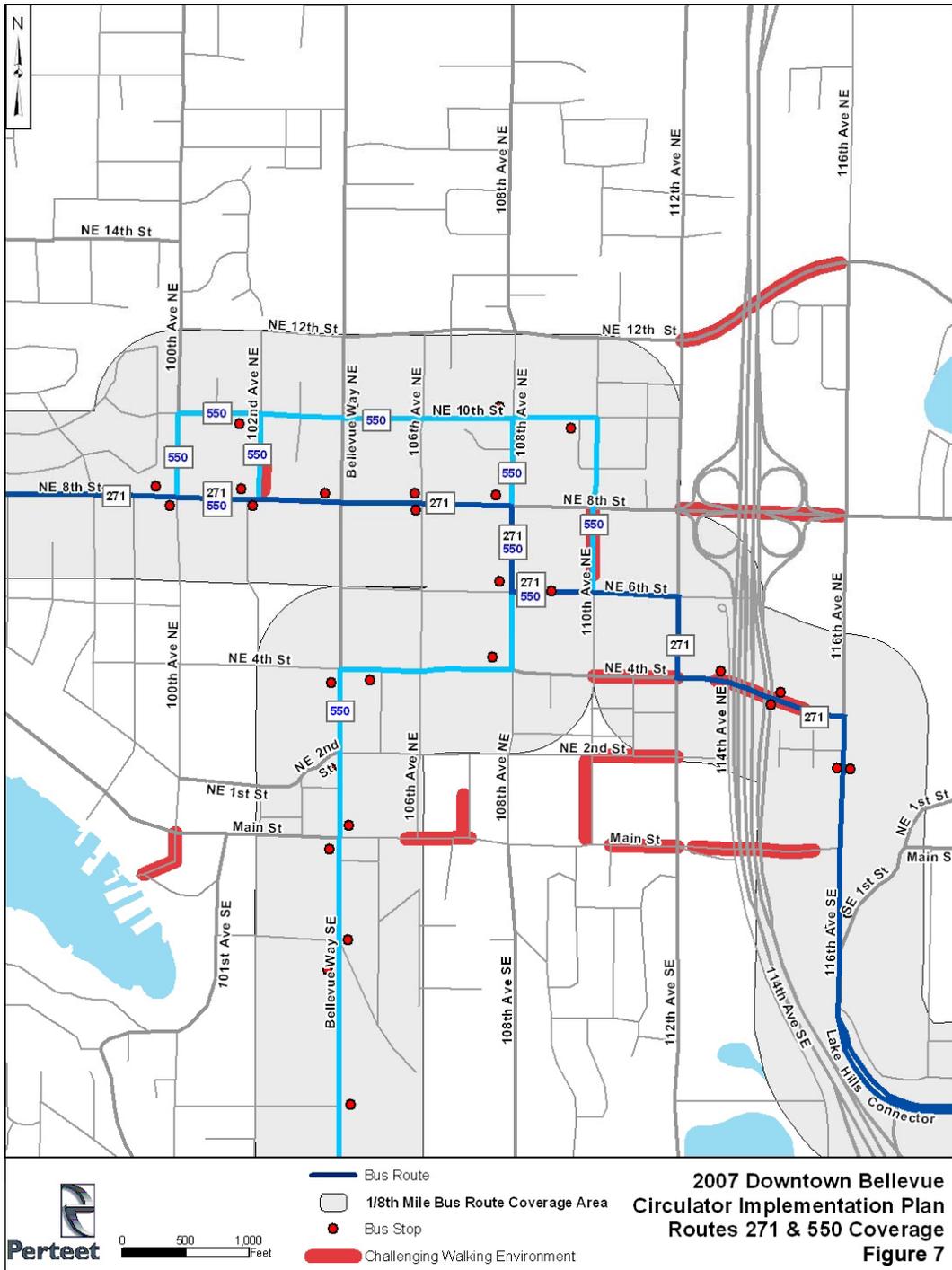


Figure 7: Routes 271/550 Service Coverage



Existing Service Frequency

Service frequencies along downtown Bellevue streets were examined to determine which streets or locations have a higher frequency of trips, vs. those with low frequencies. The frequency was based on the average frequency per hour for all routes, during the mid-day period (9 a.m. to 3:30 p.m.), for both directions. As seen in **Figure 8**, the streets with the greatest frequency (15 or fewer minutes) include 108th Avenue NE between NE 4th Street and NE 8th Street, and at the transit center itself. Streets with a fairly high average frequency (15 to 20 minutes) include NE 4th Street between Bellevue Way and 108th Avenue NE, Bellevue Way south of NE 2nd Street, NE 8th Street between 110th Avenue NE and 116th Avenue NE, and between 100th Avenue NE and 102nd Avenue NE.

Existing Bus Zone Rider Activity

Currently, the majority of transit activity in downtown Bellevue takes place at, or adjacent to, the Bellevue Transit Center. According to King County Metro rider counts, more than 7,000 daily boardings and alightings occurred at the Bellevue Transit Center in 2006. An additional 1,800 daily boardings and alightings occur on 108th Avenue NE adjacent to the Transit Center.

Away from the Transit Center, the highest activity bus zones tend to be concentrated along NE 8th Street, 106th Avenue NE and along Bellevue Way. The major boarding and alighting locations in downtown Bellevue, other than the Bellevue Transit Center, are summarized in **Table 2** and shown in **Figure 9**.

2008 EASTSIDE SERVICE CHANGES

While King County Metro has made numerous proposals to modify transit service on the Eastside during 2008, few of those proposed changes will impact downtown Bellevue to any appreciable extent.

Route 220 – To be discontinued, minor downtown impact

Route 232 – Simplified routing outside Bellevue CBD, no downtown impact

Route 233 – May be interlined with the Route 222

Route 249 – Shortened route alignment away from downtown Bellevue, slightly increased frequency during peak periods, slight downtown impact

Route 921 – Routing changes away from downtown Bellevue, no downtown impact

This information is based on the January 2007 tabloid of proposed changes, and discussions with Metro staff, and does not represent approved modifications. As such, these proposed modifications are likely to change before being adopted. In any event, the impacts of the 2008 service changes on transit service in the Bellevue downtown core will likely be minimal. The proposed changes to the downtown Bellevue route structure as part of the 2008 service changes are shown in **Figure 10**.

Table 2: Major Weekday Downtown Bellevue Transit Activity, excluding BTC (2006)

Dir	On Street	Inter	Cross Street	Total On	Total Off	Total
S	108th Ave NE	FS	NE 8th St	349.7	205.1	554.8
E	NE 4th St	NS	105th Ave NE	27.5	263.0	290.5
E	NE 10th St	NS	102nd Ave NE	110.7	97.5	208.2
W	NE 8th St	FS	102nd Ave NE	93.2	89.5	182.7
E	NE 8th St	FS	102nd Ave NE	50.8	122.6	173.4
E	NE 8th St	NS	106th Ave NE	38.7	124.9	163.6
S	110th Ave NE	FS	NE 12th St	70.0	92.6	162.6
S	Bellevue Way NE	FS	NE 4th St	151.0	7.5	158.5
N	Bellevue Way NE	FS	Main St	26.1	128.0	154.1
W	NE 4th St	FS	108th Ave NE	100.4	25.4	125.8
S	Bellevue Way SE	FS	Main St	104.8	15.5	120.3
S	Bellevue Way SE	FM	SE 3rd St	70.3	34.5	104.8
N	106th Ave NE	FS	NE 6th St	45.9	58.2	104.1
N	Bellevue Way NE	FS	NE 4th St	57.9	37.3	95.2
S	Bellevue Way NE	FS	NE 6th St	32.7	58.8	91.5
E	NE 8th St	FS	116th Ave NE	40.2	48.0	88.2
W	NE 10th St	FS	108th Ave NE	6.9	80.3	87.2
W	NE 8th St	FS	Bellevue Way NE	58.9	27.0	85.9
S	106th Ave NE	FS	NE 6th St	47.2	36.6	83.8
W	NE 8th St	FS	108th Ave NE	35.6	44.9	80.5
W	NE 10th St	NS	Bellevue Way NE	12.7	62.3	75.0
N	106th Ave NE	NS	NE 8th St	36.4	24.0	60.4
E	NE 10th St	NS	109th Ave NE	49.0	6.7	55.7
W	NE 8th St	FS	106th Ave NE	29.8	21.8	51.6
S	Bellevue Way SE	NS	SE 16th St	37.7	8.6	46.3
E	NE 8th St	NS	100th Ave NE	1.5	41.2	42.7
S	Bellevue Way NE	FS	NE 12th St	10.6	30.4	41.0
E	NE 10th St	NS	Bellevue Way NE	35.3	4.2	39.5
S	Bellevue Way SE	NS	SE 6th St	15.0	23.6	38.6
N	Bellevue Way NE	FS	NE 10th St	23.3	15.3	38.6
S	Bellevue Way NE	NS	NE 1st St	26.9	6.7	33.6
E	Main St	NS	106th Ave SE	30.4	1.0	31.4
N	116th Ave NE	NS	1040 ADDRESS	11.1	19.8	30.9
S	Bellevue Way SE	FS	SE 11th St	19.5	10.6	30.1
S	116th Ave NE	FS	1041 ADDRESS OP-1040	13.1	15.4	28.5
N	106th Ave NE	NS	NE 10th St	10.5	17.7	28.2
E	NE 4th St	FS	108th Ave NE	10.0	17.6	27.6
S	116th Ave SE	FM	SE 1st St	3.0	22.9	25.9
N	108th Ave NE	NS	NE 2nd St	6.2	18.2	24.4
N	110th Ave NE	FS	NE 10th St	16.2	7.8	24.0
S	116th Ave NE	FS	NE 12th St	7.7	16.2	23.9
W	NE 8th St	FS	100th Ave NE	20.2	0.8	21.0
S	Bellevue Way SE	FS	108th Ave SE	16.7	3.6	20.3
N	108th Ave NE	FS	NE 2nd PI	2.3	18.0	20.3

Figure 8: Existing Service Frequency

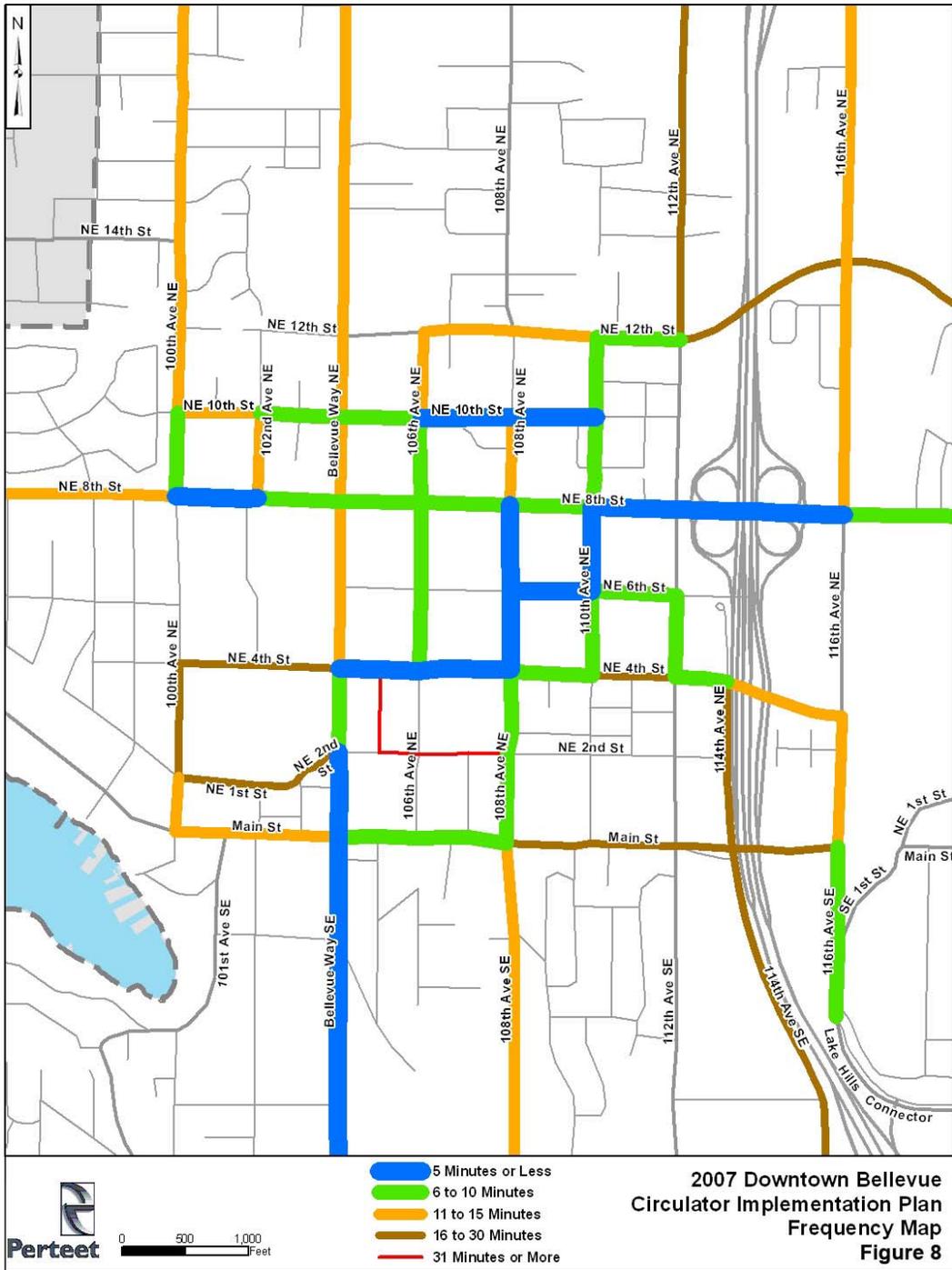


Figure 9: Boardings and Alightings (2006)

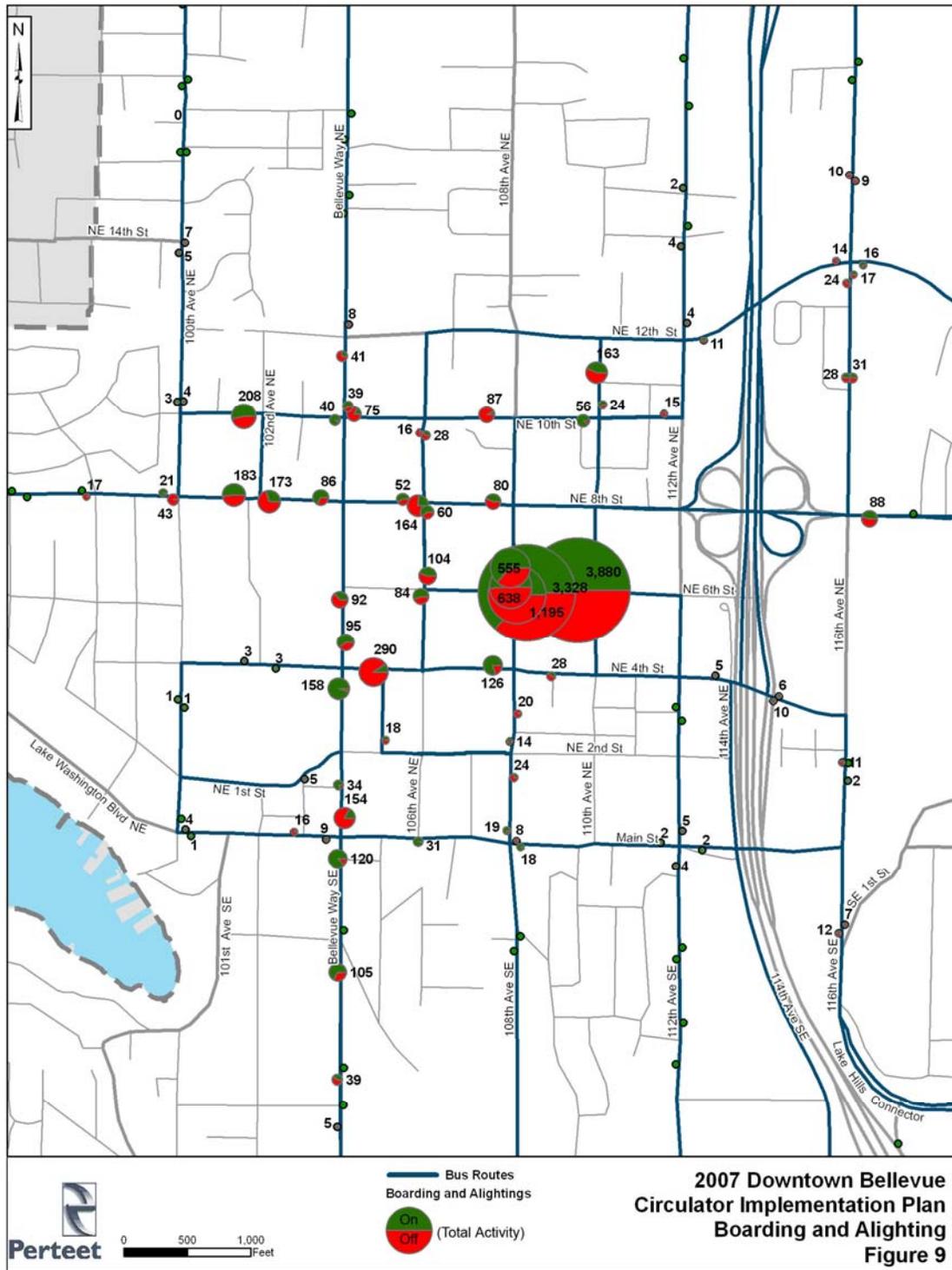
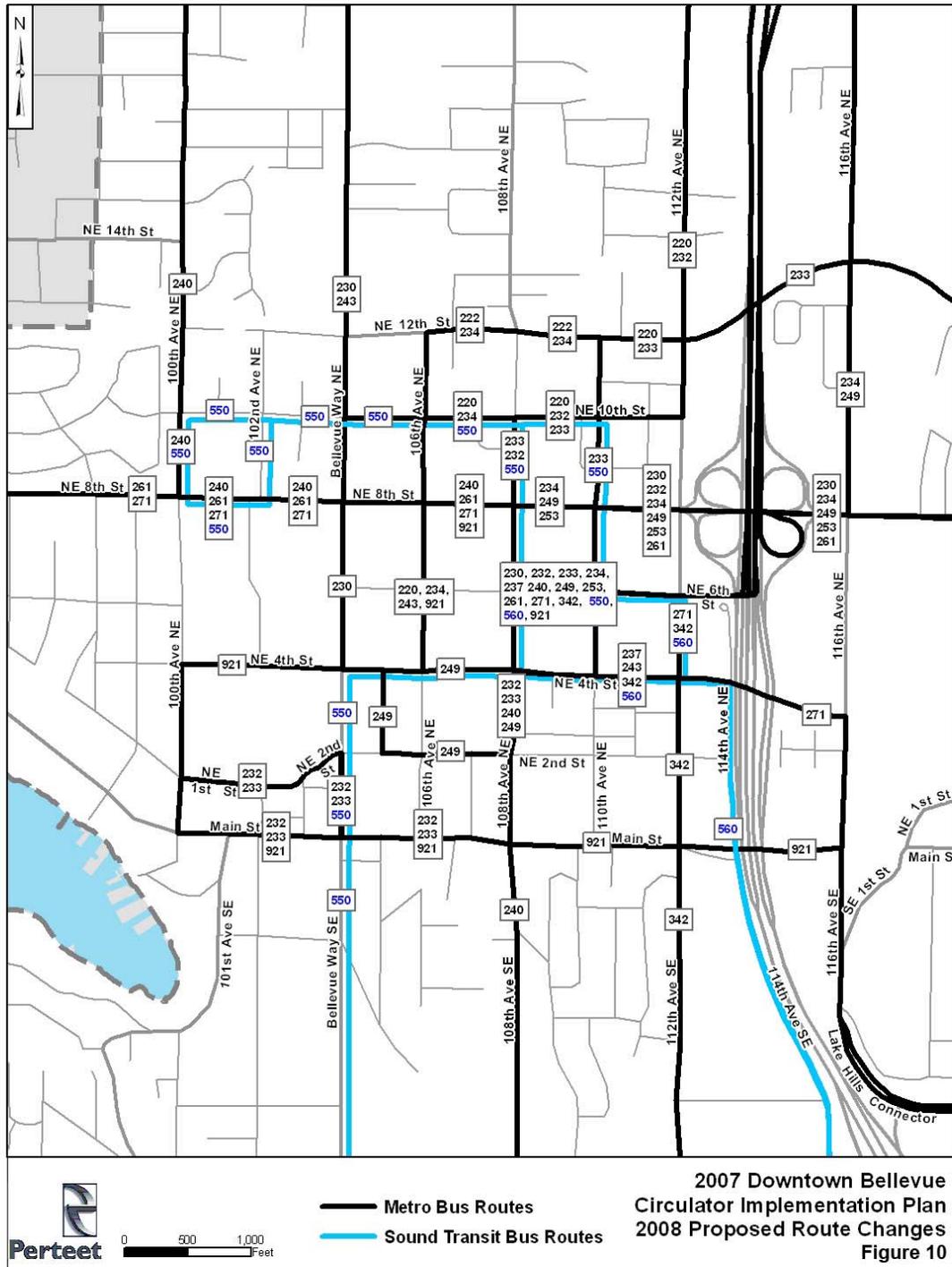


Figure 10: Proposed 2008 Service Changes (As of January 2007)



CHAPTER 4: MARKET ASSESSMENT

Several major stakeholders in Downtown Bellevue were interviewed to obtain input on the need for a downtown circulator, where it should operate, who it should serve and what would contribute to its success. Eight business leaders in the downtown Bellevue area, the Bellevue Downtown Association Land Use Forum, and a group of representatives from the Bellevue Chamber of Commerce were interviewed during the period from March 13 through 29, 2007. Detailed summaries of the interviews are included in **Appendix A**.

SUMMARY OF INTERVIEW RESPONSES

Most of the stakeholders felt that a downtown circulator is needed, however, there was mixed opinion on when it should be implemented, and how it should look or operate. Most believe that a circulator bus will be especially useful to employees. If the circulator provides service from the Transit Center, before and after work times, it will make it possible for more Bellevue employees to ride the bus to work.

The circulator will make it easier for employees, shoppers and residents of downtown to go out to lunch, do shopping and run errands. There was consensus that a circulator will become increasingly attractive and used as more employees and residents fill the downtown core. Some stakeholders felt that the circulator needs to be successful from the beginning, and therefore it might be more feasible to wait until the downtown is more fully developed to support its use. Others felt that even if the Circulator is not a complete success when it begins, the growth of the area will encourage more people to use the system over time.

The Circulator should have a distinctive look and name. It can be a small bus or a van; the criteria for its size should be based upon the passenger loads. Some stakeholders felt that new, “out of the box” types of service should be explored, such as free taxis or jitney type services. Ideally, a circulator should operate every 10 minutes, and most of those interviewed believe it should go in two directions so passengers can choose the direction that will have the shortest travel time to their destinations.

Most feel the circulator should be a free service, and several suggested having a ride-free zone in Downtown Bellevue similar to the one in Seattle – even if the Circulator service is offered.

If the Circulator is to adequately serve employees, it will need to have service begin by 5:30 a.m. for service workers and 6:30 for office workers. Seniors felt that a circulator was especially important during the mid-day. Service will be needed throughout the day and into the evening. Most of those interviewed believe the exact route or routes should be left to the transportation planners, but major activity centers that need to be served include: Overlake Medical Center, Whole Foods, the downtown post office, Bellevue Square, QFC, the Library, and the office and residential areas in the Ashwood neighborhood. One stakeholder suggested that the circulator start out small, providing a link between Overlake Hospital and the Bellevue Transit Center, and that an extension to other parts of downtown be added later as the circulator becomes more successful.

Most of the stakeholders interviewed believe it is very important to have signage, a map showing the route(s), a schedule and/or a GPS-operated sign that announces the arrival time of the next bus, and way-finding information from places throughout downtown. Most do not see a need for special bus shelters.

All of those interviewed say that their agencies or companies will enthusiastically market a downtown circulator system. Some also said they would be willing to provide space for a stop or a shelter, and some might consider paying for a shelter after they receive more information about costs.

TRANSIT CIRCULATOR CASE STUDIES

A review of circulator systems in other cities was conducted to provide an assessment of service characteristics, marketing techniques, successes and lessons learned. The case studies included the following:

- Colorado Springs Downtown Shuttle (Downtown Partnership/Mountain Metro);
- Issaquah Route 200 (King County Metro, King Co., WA);
- DASH (Intercity Transit, Olympia, WA)

Colorado Springs Downtown Shuttle, Route 55 (Mountain Metropolitan Transit)

Beth Kosley, Executive Director, Downtown Partnership

Service Area and Background

The Route 55 is a free downtown shuttle that operates in a north-south direction between Colorado College (at the north end) and Tejon Park & Ride (at the south end). The route is approximately two miles long, and primarily operates on a north-south couplet system, (along Tejon Street and Cascade Avenue, between Platte Avenue to the north and Moreno Avenue to the south), and in both directions on Tejon Street outside of the couplet. At its northern end, the route ends at Colorado College along Cache La Poudre, where it makes a loop. At its southern end, the route ends at the Tejon Park & Ride near Interstate 25. The shuttle route is shown in **Figure 11**.

The service is operated collaboratively between the Downtown Partnership and Mountain Metropolitan Transit (Formerly Springs Transit). The Downtown Partnership is a non-profit organization with the goal of maintaining a vibrant and economically viable downtown. The Partnership serves as the umbrella organization for two additional operating groups (a business improvement district and a historic preservation/arts/housing affiliate) as well as a number of special interest, standing and project-related committees. Committees include Development, Executive, Market Development, Membership, Transportation & Parking, Safe Downtown and others as needs arise.

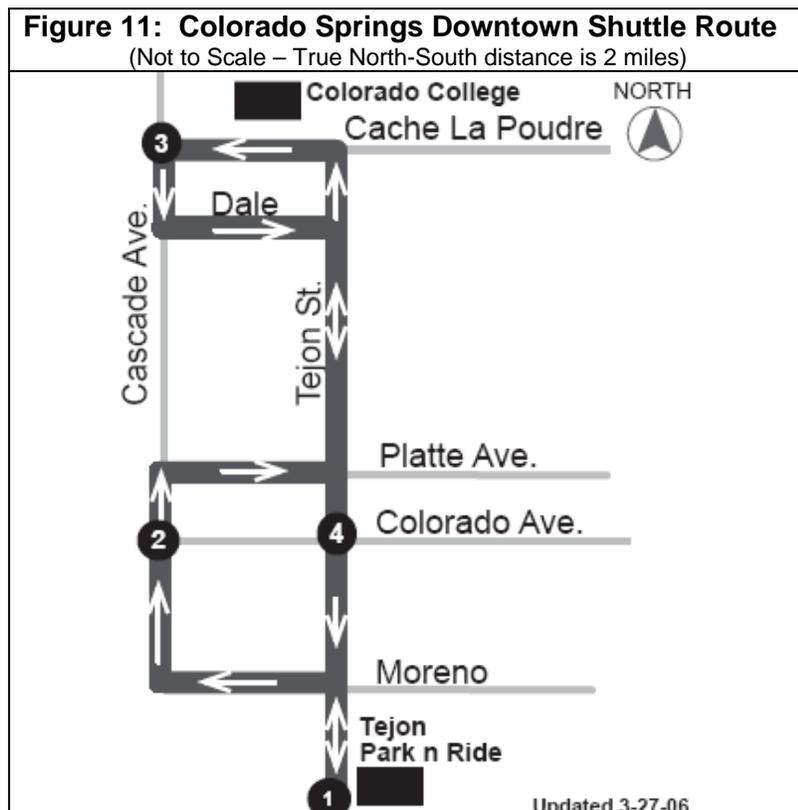
The shuttle service has been in operation since 2004, and was made possible with a Congestion Mitigation Air Quality (CMAQ) grant through the Pikes Peak Area Council of Governments (PPACG).

In early 2003, the PPACG awarded CMAQ funds to the Greater Downtown Business Improvement District, Downtown Partnership, Colorado College and the Transit Services

Division to implement the Free Downtown Shuttle as a three-year demonstration project. The total grant award for the three-year project is \$2,116,940, which includes funding from the PPACG, the Federal Transit Authority and matching funds provided by the Greater Downtown Business Improvement District (BID), the Downtown Partnership and Colorado College. The BID partnered with the Transit Division to purchase the buses, and the Downtown Partnership provides an ongoing match.

The grant ends at the end of 2007, and the Downtown Partnership is working with Mountain Metro to analyze the feasibility of having Mountain Metro continue the service in the future. The Downtown Partnership may be able to use its \$80,000 annual set-aside for transportation and parking services that could go toward the purchase of new buses. Because Mountain Metro is a regional transit authority, the case will need to be made that the shuttle service serves the needs of the region.

If the service continues in the future, the Downtown Partnership would like to have analysis conducted to change the routing from a couplet system to using only Tejon Street. This would require the City converting Tejon Street to a two-way operation. The Partnership believes that most of the foot traffic is on Tejon Street, while Cascade Street is more corporate. Keeping the buses on one street would provide greater visibility of the buses, could improve travel time and headways, and serve more users.



Service Hours and Frequency

Service operates weekdays between 6:20 a.m. and 8 p.m. Headways vary during the time of day. During the midday (11:10 a.m.-3:20 p.m.), headways are every 10 minutes, and every 13 minutes until approximately 5 p.m. During the early morning (6:20-9:50 a.m.), headways are 35 minutes, and 20 minutes between 9:50 a.m. and 11:10 a.m. During the evening, headways are 20 minutes between 5:04 p.m. and 5:43 p.m., and 35 minutes between 5:43 p.m. and 8 p.m. On Fridays, service is extended to 1 a.m., with approximately 30-35 minute headways.

On Saturdays, service operates between 9:15 a.m. and 1:00 p.m. Headways during the mid-day (11 a.m. to 4 p.m.) are 13 minutes, and 15 minutes between 4 p.m. and 4:30 p.m. During the morning (9:15-11 a.m.), service operates at 35 minute headways, and during the evening (4:30-11:30 p.m.), service operates at 35 minute headways. The late evening service (11:30 p.m. to 1 a.m.) operates on 30 minute headways. The late night service is targeted at the college students, who frequent the downtown entertainment uses.

Users

The Downtown Partnership estimates that approximately 60 percent of the users are comprised of college students, high school students (there is a downtown high school), tourists (the convention center is along the route) and commuters. Most of the commuters access the shuttle from the Park & Ride lot, however some live along the route. Approximately 40 percent of the riders are estimated to be homeless transients. The Partnership feels that the large homeless population that uses the shuttle is attracted to it because of the free fares, and because the current route serves a soup kitchen and shelter.

Marketing

The CMAQ funds that were awarded had some funding for marketing the service. When the service was launched, the Partnership conducted a marketing campaign that included advertisements in newspapers and other media, ads on college radio stations, and printed brochures that were available at shops and other major activity centers such as libraries.

The Partnership also develops a free map that is targeted at tourists and new residents. The map shows major activity centers and businesses but also includes the shuttle route and schedule. The map is updated annually and available at hotels.

All of the buses are colored in a yellow and green checkerboard pattern, with a unique retro style to them to make them more visible and unique. The word “FREE” is also spelled in large letters on the side of the bus. If the service is continued, the Partnership and Mountain Metro may look into adding new elements to the branding of buses, such as different color patterns and logos.

One of the initial goals for the project was to ensure that the drivers provide as much information to riders as possible, such as pointing out activity centers and handing out maps. The Downtown Partnership indicated that this effort has not been as successful as they initially envisioned.

Stop Characteristics

None of the stops include shelters, but they all include a transit sign and a carousel attached to a lamp pole that includes a printed bus schedule. The yellow and green checkerboard pattern is incorporated into the stops as much as possible.

Vehicles

During the peak period, a total of five 30-foot buses are used to operate the shuttle service. When the service was initially launched, electric buses were purchased. The public was very enthusiastic with the electric buses because of the environmental benefits and lower noise. However, the Partnership and Mountain Metro was disappointed because the buses had numerous operating failures, some of them due to the higher altitude of the city. Because of the numerous mechanical problems, the electric buses were retired, and replaced with clean diesel buses. The Partnership is not happy with these buses either, because they are less

Figure 12: Colorado Springs Downtown Shuttle Vehicle



environmentally friendly, noisier, and the physical design is less exciting than the electric buses. If the service is continued in the future, the Partnership will be looking at other vehicle options.

Ridership

A boarding and alighting study was conducted in October 2005. Counts were done on both a Wednesday and a Friday. The total number of boardings was 689 on Wednesday, and 535 boardings on Friday as shown in **Table 3**. For the Wednesday counts, there was an average of 43 riders per hour (both directions). For Friday, there was an average of 28 riders per hour (both directions). For both days, the highest ridership tended to occur during the pm peak (between 3 and 6pm), however, on Friday, there was also an equivalent peak during the lunch period (between 11 a.m. and 1 p.m.).

The locations with the highest boardings occurred in the downtown core, while other areas that had significant numbers of boardings were at Colorado College and the Tejon Park & Ride. The study estimated that a minimum of approximately 20 percent of the riders were transients, but also indicated this number may be low.

Successes and Lessons Learned

The shuttle service is successful in that it is linking the two ends of a very linear downtown, which was one of the project's primary goals. The college is now better connected to the downtown core, and the college, which contributes financially, is very supportive of the service.

The Partnership indicated that they should have started out with a more proven technology for the buses, and it was an embarrassment to the partners to have to change the bus technology shortly after the service began.

Table 3: Colorado Springs Downtown Shuttle Boardings

Daily Boardings by Time Period				
Time Period	Wednesday		Friday	
	Boardings	% of Boardings	Boardings	% of Boardings
Prior to 7 a.m.	14	2%	16	3%
7 - 9 a.m.	68	10%	33	6%
9 - 11 a.m.	91	13%	47	9%
11 a.m. - 1pm	116	17%	101	19%
1 - 3pm	117	17%	87	16%
3 - 6pm	215	31%	102	19%
6 - 8pm	45	7%	85	16%
8 - 10pm	23	3%	53	10%
After 10pm	-		11	2%
Total	689		535	

Source: LSC, 2006

In addition, the Partnership should re-think the concept of a free service and consider a nominal fee (such as a quarter) to try to deter the transient population from taking advantage of the service, which has had some effect on attracting other riders.

Links

<http://www.lscs.com/projects/shuttle/index.htm>

<http://www.downtowncs.com/>

Issaquah Route 200 (King County Metro)

Jim Arrowsmith, King County Transit Planner

Service Area and Background

The Route 200 is a fare-free, two-way transit route operated by King County Metro. The City of Issaquah pays a portion of the fare costs to King County (See Fare Structure). The route operates between the Fred Meyer located at SE 62nd Street/SE Black Nugget Road (to the north of Interstate 90) and the Issaquah Community Center, located near downtown Issaquah at 2nd Avenue SE/SE Darst Street.

A number of major activity centers are located along or near the route as shown in **Figure 13**, including Siemens Medical Systems (one of Issaquah’s larger employers), Issaquah Commons, Pickering Place (office and retail center), the Issaquah Park & Ride, Gilman Village shopping center, downtown Issaquah, and Issaquah High School.

The route began operating in the mid 1990’s, after a citizen’s transportation advisory committee recommended additional transit service internal to the city of Issaquah, to help people get around the City.

Figure 13: Issaquah Route 200 Routing



Around the time that the service was recommended, a private developer was constructing the Issaquah Commons commercial development (located on Maple Street at Gilman Boulevard), and an agreement was made between the developer and City to fund a portion of the operating cost for a shuttle route for two years as part of their mitigation costs. The developer paid the cost to the City, and the City forwarded the funds to King County Metro to operate the service. After the two-year agreement expired, the City negotiated with King County Metro to continue the service, but with a higher level of service and longer route. Most recently, the route was restructured to connect as many attractors as possible within the limits of resources. This latest restructuring allowed the route to reach the Fred Meyer department store.

The City of Issaquah has considered extending the route to the Issaquah Highlands area, however, Sound Transit has a route that goes from the Highlands to downtown Issaquah, and the current Route 200 is already somewhat lengthy. A longer route would likely result in less reliable service.

Service Hours and Frequency

The service is operated on weekdays between 6 a.m. and 7pm. The route headways are approximately 30 minutes all day.

Fare Structure

The service on the route 200 has been free to users since its inception. The City pays King County the amount that is estimated to have come from the farebox had a fare been in place.

Users

King County was not aware of any route surveys that have been done to identify the users, but stated there is likely a wide cross-section of users, given the variety of attractors along the route. Riders may include high school students (Issaquah High School is along the route), senior citizens accessing the Senior Center, shoppers, users of the community center and library.

Marketing

The vehicles currently used for Route 200 are standard Metro styled vehicles, with no special or unique look to them. However, the City of Issaquah negotiated with King County (Marketing group) to allow the vehicles to have a special destination sign that says “Route 200 Freeby”. In addition, the City has stated an interest in using vintage trolleys in the future. The City would need to continue to negotiate with King County to operate this type of vehicle. Metro usually does not assign a specific vehicle to a specific route. When this has been done in the past, it has resulted in a more complicated maintenance system and additional oversight to ensure that the particular vehicle is assigned to the route. This can become especially cumbersome when a vehicle needs replacement due to it being in the maintenance shop.

Stop Characteristics

The stops along the route are general Metro stops, most consisting of a transit pad and sign. There are limited shelters along the route, due to the low average of daily boardings at most stops. Two standard Metro shelters were built at the Issaquah Commons commercial site when the service was initiated. The City has discussed the need for additional improvements at some stops, but nothing has been implemented. Any new shelters built in areas that don't meet the 25+

daily boarding rate would need to be funded through another source, such as advertising. Approximately 10 years ago, King County Metro explored the potential for shelter advertising, and at that time, the City of Issaquah was not interested in having advertising on its shelters.

Vehicles

King County Metro currently uses a 30' long cut-away type van for this route, but is in the process of purchasing replacement vehicles. The new vehicles to serve the route will likely be a small 30' bus. Metro states that the small buses are more optimal in that they require less time and effort to strap in wheelchairs (the vans require the driver to get out of the bus to assist the wheelchair user in).

Ridership

The latest statistics from King County Metro indicate that on average, the Route 200 has approximately 300 riders per day (both directions). The route operates a total of 49 one-way trips per day, which equates to approximately 6 riders per trip, and 13-15 riders per revenue hour. The most productive portions of the route are within downtown Issaquah, and near the Issaquah Park & Ride lot, where daily ridership ranges from 70 to 80 riders per day in each area.

Successes and Lessons Learned

Issaquah experiences heavy congestion on many of its arterials due to the limited number of arterials that serve the City. Approximately 12 routes currently serve the City of Issaquah. Prior to the Route 200 implementation, most of the routes that served Issaquah experienced delay due to roadway congestion. After the Route 200 was implemented, King County was able to truncate some of the other routes to minimize duplication of service. This resulted in the removal of larger buses from the City's streets, and has helped to improve congestion. In addition, the costs for operating the Route 200 have been somewhat offset by cost savings associated with the reconfiguration of other routes.

One of the lessons learned is that there is a need for considerable discussion and willingness among all of the parties involved to reach an agreement on something that works and makes sense. If all of the parties are willing to take time to work out issues, there can be successes.

Another lesson is that sometimes, it's better not to try and connect all of the dots. The more you try to please everyone, and provide service to all of the attractors (the more you are trying to be all things to all people), there will probably be less success. It is important to identify which are the most important needs, and identify those that have conflicting issues.

Links

www.metrokc.gov

DASH (Intercity Transit, Olympia, WA)

Dennis Bloom, Intercity Transit Planning Manager

Service Area and Background

The DASH shuttle began in early 2006. The service is operated by Intercity Transit. The service was initiated to help enhance access to and from downtown Olympia and the Capital Campus, while easing the demand for limited parking, especially during the Legislative session. There has been a perception among the visitors and legislators that there is a lack of parking at the Capital (although the parking garage is not fully used), leading to persons parking within the South Capital neighborhood. The initiation of the DASH shuttle was in response to solving some of the neighborhood parking issues, as well as helping to spur activity in the downtown area.

The DASH service provides high frequency connections for visitors, employees and shoppers. It travels past eight satellite parking lots. The parking on campus is especially saturated during the Legislative session. The DASH service provides an option for people to park in other areas and ride the free shuttle to the Capital Campus.

The 2.2 mile route operates between the Capital Visitors parking lot (Jefferson at Wheeler), through the Capital Campus, and to the Farmers Market via Capital Way as shown in **Figure 14**. In addition to the DASH service, three other routes operate along Capital Way.

Service Hours and Frequency

DASH service is operated on weekdays between 6:45 a.m. and 7:15 p.m., and operates on approximately 12 minute headways. Saturday service operates between April and December, when the Farmers Market is open. Service on Saturdays operates on 15 minute headways. The Saturday service only operates between the West Campus and the Farmers Market.

Fare Structure

The DASH service is free to users. Users can also park for free for the first two hours at either the Capital Visitors lot or the Farmers Market. After the first two hours, parking is 50 cents per hour. At the Wheeler lot, stalls can be leased on a month to month basis, while visitors can park for 2 hours. The Farmers Market lot is only available for parking from January through March, when the market is closed.

In addition, all State employees have a Starpass, which allows them to ride all Intercity Transit routes for free.

Service and Capital Costs

Transit officials estimate the service operating cost at approximately \$620,780 annually. The cost is approximately \$72 per hour. The service is fully operated and funded by Intercity Transit. The buses were purchased as part of Intercity's fleet expansion, which is funded through a local sales tax. Shelters are part of the overall program, however, shelters on the Capital Campus are funded and owned by the State as part of its Commute Trip Reduction (CTR) program.

Users

The DASH service is used by legislators, tourists, employees that work at the State Capital, and shoppers. The service has its highest ridership during the legislative season. During this period, many legislators and employees ride DASH to access shopping and eating establishments in downtown Olympia. In addition, the Downtown Business Association encourages employees to

park at the peripheral lots or outside of the downtown core, and use the DASH service. Service is frequented throughout the day, but the highest demand tends to be between 11 a.m. and 2 p.m.



Marketing

Intercity Transit provides a brochure/flyer for DASH service. The flyer also includes discount coupons for area businesses. In addition, a number of local organizations help to support and promote the DASH service, including the Washington State Department of General Administration, the Port of Olympia, the Downtown Business Association, Washington State

Legislature, the City of Olympia, the Port of Olympia-Thurston County Visitor and Convention Bureau. The Business Association, Port and Visitors bureau share in the cost of the marketing, and also prepare individual brochures and have information on their websites.

The service is also promoted at area events (through advertising), such as the Arts Walk which is held twice per year.

The DASH buses are painted bright colors with an attractive vehicle graphic design to provide a unique look. There are four buses, each a different color (purple, green, orange and yellow).

Stop Characteristics

Most of the stops include a shelter, and all of the stops have unique signage displaying the DASH logo as shown in **Figure 16**. Stops are located approximately every two blocks. The stops do not include real-time information, due to the high frequencies. However, Intercity Transit does have real time information for other routes at the downtown transit center.

Shelters include route maps, and a way-finding map of downtown Olympia with major activity centers and current events. The way-finding map is funded as part of a City of Olympia way-finding project.

Vehicles

The DASH service uses a total of four (4) - 30' low-floor, biodiesel Gillig buses. At any one time, there are a maximum of three buses operating, with one spare vehicle.

Ridership

In its first year of operation (2006), the shuttle carried more than 82,000 rides, and averaged more than 2,600 riders per week during the legislative session. In 2006, there was an average of approximately 14 boardings per hour during the legislative session. Thus far in 2007, there has been an average of 19 boardings per hour.

Successes and Lessons Learned

One of the key successes of the DASH service has been that congestion in the downtown area has decreased, especially near the Capital Campus and the South Capital neighborhood. The service, combined with the State's CTR program, has been successful in getting more people, especially employees, to try transit. Intercity Transit has also seen growth in ridership from residents of the South Capital neighborhood. The ridership to date for 2007 has also been successful.

Figure 15: DASH Bus



Figure 16: DASH Stop



To be successful, a shuttle service needs to have origins and destinations that will attract people, such as a major employment center like the State Capital. The ability to connect between a retail area and major employment site is the biggest draw for the service. In addition, having a short route and frequent service has been an advantage, and a key to success.

Finally, a successful operation requires participation and coordination among partners. Intercity's ability to partner with other key agencies, especially related to marketing, has been a major driver in the success of the service.

Links

www.intercitytransit.com

CHAPTER 5 – CIRCULATOR OPTIONS AND EVALUATION

CIRCULATOR OPTIONS

A number of fixed route circulator options were developed based on feedback from stakeholder interviews, a meeting with the Bellevue Chamber of Commerce, and meetings with city staff. The routes range from a simple configuration that only serves the core of downtown, to one that serves the peripheral areas of both the Overlake Hospital area and the Old Bellevue area. All of the routes serve the Bellevue Transit Center. It was recommended that this study also compare the route options with the route that was recommended in the 2001 circulator study.

Option A – Core Downtown

This route option, referred to as the “Core Downtown” route, is a simple route in a rectangular form that operates in a one-directional movement. The route would begin along 110th Avenue NE at the Bellevue Transit Center, moving in a southbound (clockwise) direction. A new stop would need to be added on the west side of 110th Avenue NE in the vicinity of the transit center, either north or south of NE 6th Street. Moving southward, the route would turn west onto Main Street, then traverse north along Bellevue Way. At NE 10th Street, the route would turn east, and then turn south at 110th Avenue NE, and head back to its origination at the transit center.

The purpose of this route is to offer a simple, easy to understand route structure that serves some of the key major activity centers in the downtown core, including areas along the northern and southern peripheries of downtown.

This route would require new bus stops on the east side of Bellevue Way, on the south side of NE 10th Street, and on the west side of 110th Avenue NE. In addition, if it were determined that the route should operate as a two-directional route, new bus stops would be required on the opposite sides of those streets, as shown in **Figure 17**.

Option B – Old Bellevue

This route option, referred to as the “Old Bellevue” route, extends from the core to serve the Old Bellevue neighborhood as shown in **Figure 18**. The route continues west on Main Street through Old Bellevue, and then north on 100th Avenue NE. It then turns east on NE 1st/NE 2nd Street, and turns north again at Bellevue Way. This route also provides access to close proximity of Meydenbauer Park/Marina, and better access to the western portions of Downtown Park, and a number of residential sites within Old Bellevue. While this route could operate as a one-way, clockwise directional route, the added distance and thus travel time, may warrant this as a two-directional route.

Figure 17: Route Option A



**2007 Downtown Bellevue
Circulator Implementation Plan
Option A - Core Downtown
Figure 17**

Perteeet
0 500 1,000 Feet
Data Sources: King County

Figure 18: Route Option B



Perteeet
0 500 1,000 Feet

Data Sources: King County

**2007 Downtown Bellevue
Circulator Implementation Plan
Option B - Old Bellevue
Figure 18**

In addition to the bus stops that are identified under Option A, this route option includes new stops on NE 1st Street in the Old Bellevue area, to serve the Downtown Park and multi-family residences along NE 1st Street.

Option C – Overlake Hospital Area

This route option extends from the core to serve the Overlake Hospital area, as shown in **Figure 19**. This route option was identified due to the expression for the need to serve this area from the stakeholder input process. By the year 2012, it is projected that there will be 5,190 employees within the TAZ that is bordered by NE 12th Street, I-405, NE 8th Street and the BN Railway line. This employment largely comprises Overlake Hospital, with additional employment from Whole Foods, the Bellevue Design Center, and the Group Health facility currently under construction. From NE 10th Street, the route would turn north onto 112th Avenue NE, and east onto NE 12th/Bel-Red Road. It would then turn south on 116th Avenue NE where it would serve the Overlake Medical Center and other activity areas such as the Bellevue Design Center and Whole Foods. It would then turn west onto NE 8th Street, and then pick up the core route at 110th Avenue NE, where it would turn south. Once the NE 10th Street extension is completed, this route could traverse east along this roadway rather than NE 8th Street, to avoid congestion. While this route could operate as a one-way, clockwise directional route, the fairly long distance and thus travel time would most likely warrant it as a two-directional route.

In addition to the bus stops identified in Option A, this route also includes new stops on 112th Avenue NE (to serve the One Twelfth at Twelfth office building), new stops on 116th Avenue NE near NE 8th Street (to serve Whole Foods and the future Group Health building), and new stops on NE 8th Street (to serve the Bravern development).

Option D – Hybrid

This route option as shown in **Figure 20**, combines the Core Route, Old Bellevue route, and Overlake Hospital route to form a large route that serves the core plus peripheral areas of downtown. While this route could operate as a one-way loop, the significant travel time and more circuitous routing would likely warrant that the route operate in two-directions.

The Hybrid route includes the same bus stops that are included in Options B and C.

Option E – Northeast Quadrant

One of the concerns heard through the stakeholder process was that there was a strong need to link the Overlake hospital area to the transit center and downtown core, but that any additional routing through downtown be phased in later. It was felt that people in the core of downtown can easily walk to other areas, such as Bellevue Square or Old Bellevue. The Northeast Quadrant route only provides this smaller loop to link the hospital area to the transit center and Ashwood neighborhoods as shown in **Figure 21**. This route begins at the transit center, and traverses north on 108th Avenue NE, east on

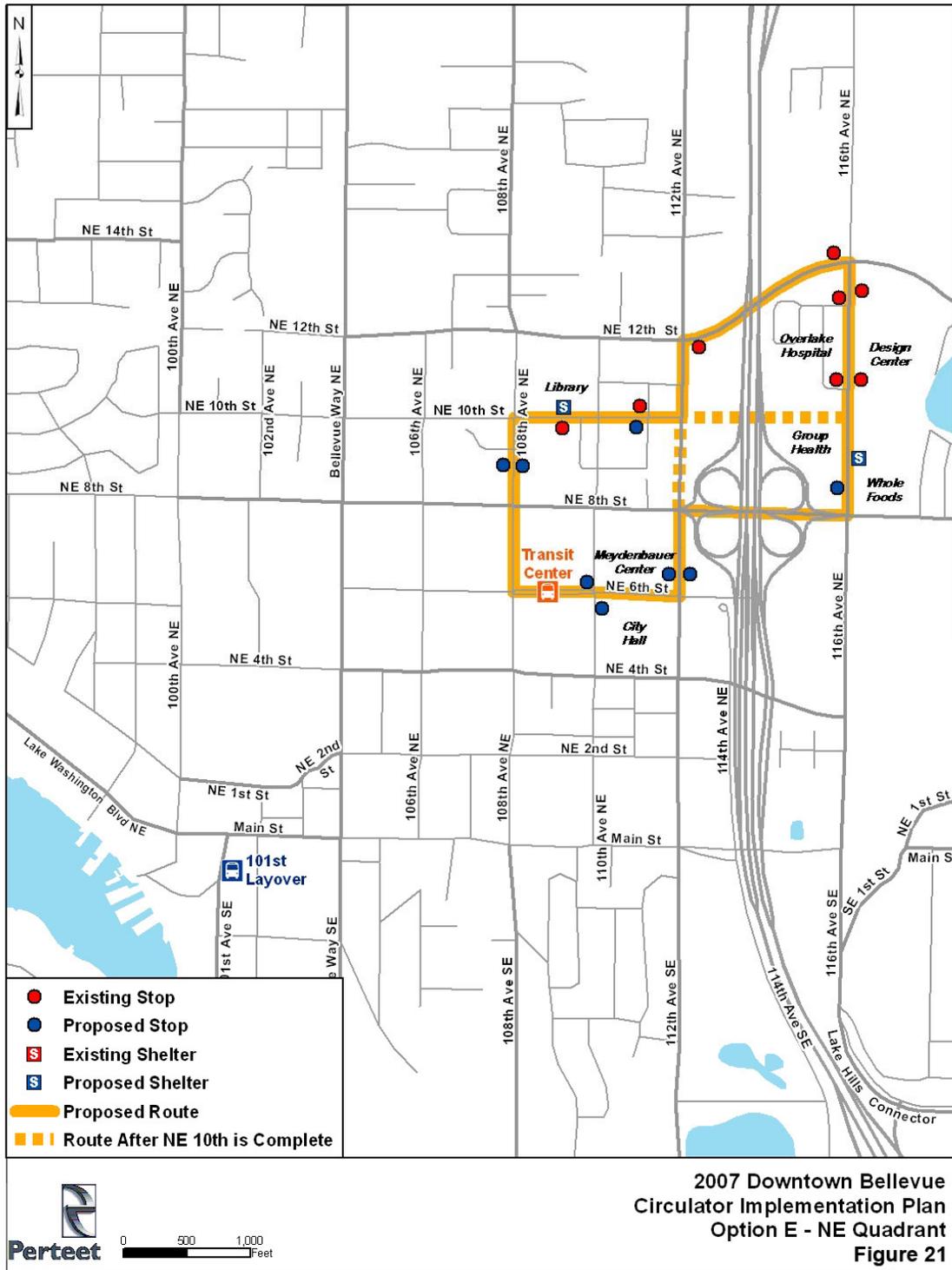
Figure 19: Route Option C



Figure 20: Route Option D



Figure 21: Route Option E



NE 10th Street to serve Ashwood, north on 112th Avenue NE to serve the 112th at 12th office complex, east on NE 12th Street/Bel-Red Road, south on 116th Avenue NE to serve Overlake Hospital, the Design Center and Whole Foods, and west on NE 8th Street. It would then turn south on 112th Avenue NE before turning west on NE 6th Street to end at the transit center. This route is short enough that it could run in a one-directional loop.

New bus stops are recommended on 108th Avenue NE, north of NE 8th Street, on NE 10th Street to serve the Ashwood neighborhood, 116th Avenue NE near NE 8th Street to serve Whole Foods and Group Health, and on 112th Avenue NE near NE 6th Street to serve the Bravern development, Meydenbauer Center and other office buildings located on 112th Avenue NE. If the route were to operate in two directions, new stops are recommended on the west side of 108th Avenue NE north of NE 8th Street, on the north side of NE 10th Street to serve the library, on the east side of 112th Avenue NE near NE 6th Street to serve Bravern and Meydenbauer Center, and on the east side of 116th Avenue NE to serve Whole Foods and Group Health.

Option F – 2001 Recommended Route

It was requested that a comparison be made to the recommended circulator route that was identified in the 2001 Downtown Circulator Final Report. This route is fairly circuitous, and is not a full loop, but rather has short loops on each end as shown in **Figure 22**. The route begins from its layover at 105th Avenue NE. It turns west on NE 4th Street, south on Bellevue Way, east on NE 2nd Street, south on 110th Avenue NE, east on Main Street, north on 116th Avenue NE (where it serves the Overlake Hospital area), west on NE 12th Street, south on 110th Avenue NE, west into the Bellevue Transit Center, north on 108th Avenue NE, west on NE 8th Street, south on Bellevue Way, west on NE 4th Street, south on 100th Avenue NE, east on NE 1st Street and then loops south onto 101st Avenue NE and west onto Main Street before turning north again on 100th Avenue NE. This route as originally planned in the previous study was envisioned as a two-directional route.

Figure 22 only shows the existing bus stops that are located along the roads that serve this route, as the previous study did not identify specific recommended stops.

Other Potential Types of Service

Share Taxi

A share taxi is a type of service that falls between private transport and conventional bus service, with a fixed route, but the convenience of stopping anywhere to pick or drop passengers. Unlike a regular taxi service, the Share taxi allows multiple riders to share the ride. Share taxis often have unfixed time schedules. A fare is usually collected at the beginning of the ride, and often the fares are controlled by the government. Once the share taxi leaves its origin (usually a terminal), it proceeds along its route. Drivers generally stop to drop passengers wherever they want to alight and to pick up those who flag down the vehicle from the side of the road. Usually the vehicle continues along its route even if it is not always full.

Figure 22: Route Option F



Another type of share taxi has no fixed route. In many countries, especially developing countries, share taxis are the main system of public transport. While they are an important form of mobility, they are often poorly understood, and not well integrated into the overall transportation system. This is because they are usually privately owned, and are not subject to as much regulation or control. A number of types of vehicles are used for this service, including minibuses, vans, and pickup trucks.²

The benefit of a share taxi is that they average better ridership than a private vehicle, and can be less costly to operate than a bus. The drawback is that they offer less reliability and predictability to riders. The other drawback is that this type of service is not as usable to disabled persons.

Jitneys

A jitney, similar to a share taxi, refers to a vehicle intermediate between a taxi and a bus. It is generally a small capacity vehicle that follows a rough service route, but can go slightly out of its way to pick up and drop off passengers. In many US cities, such as Pittsburgh and Detroit, the term jitney refers to an unlicensed taxi cab.

Jitneys have reappeared in some areas of the US, particularly inner city areas once served by streetcars and private buses. (An increase in bus fares usually leads to a significant rise in jitney usage.) While jitneys are often seen as a more "market-friendly" alternative to public transportation, there are concerns over fares, insurance liabilities, and passenger safety that have kept legislative support for jitneys decidedly tepid. In New York, jitneys (known as "dollar vans" because of their original price) are regulated and remain popular.³ Similar to share taxis, this type of service offers less predictability to riders, and are not as usable to disabled persons.

Public Light Bus (Minibus Service)

This type of service runs in Hong Kong, and is also known as minibus or maxicab. The service operates in areas where standard bus lines cannot or do not reach as frequently, quickly or directly. The minibus carries a maximum of 16 seated passengers. They are typically faster and more efficient due to their small size and limited carrying capacity. This service is popular in Hong Kong because of its high density, which requires an extensive network of minibus routes.

Passengers hail the minibus from the street curb similar to a taxi, and can generally be hailed from any point along the route, subject to traffic regulations. Some stops are marked. The passenger tells the driver where they would like to be dropped off along the route.

There are two types of minibus service in Hong Kong. Green minibuses operate on a scheduled service with fixed routes and fares. The exact fare must be tendered, or can be made through a smart card. On some routes, passengers only pay a portion of the full fare if they are only traveling a section of the route. Red minibuses operate on a non-scheduled service, and can operate anywhere where there are no prohibitions over routes and fares. The service operates according to the market demand. Unlike the green minibuses that accept a smart card, red minibuses usually only accept cash, but change is also given. The red minibus fares and

² Wikipedia.org

³ Wikipedia.org

timetables are not regulated by the government, and can be more expensive than the green minibus.⁴

King County Metro discourages the use of “flagstops” (areas where customers can wave down a bus) within its system, especially in urban areas. In rural areas, this type of service is more accepted. In urban areas, drivers are only supposed to stop at designated stops, to ensure both passenger and traffic safety. In fact, King County Metro works with jurisdictions to identify the most feasible location for a transit stop that is best for both passenger safety and traffic safety. Therefore, a flagstop type of operation would probably not be allowed by Metro in downtown Bellevue.

The other drawback for a flagstop type of operation is that it can slow down service. If customers are allowed to flag the vehicle anywhere outside of designated stops, the travel time decreases, thereby impacting headways. An important element of a circulator system is customer understanding, and reliability. The transit stop itself, can be a form of marketing for the service.

Figure 23: Green Minibus in Hong Kong



LAYOVER NEEDS

The following section describes the existing and potential layover options that could be used for the downtown circulator. King County requires the vehicles to have a five-minute layover at the end of a run. If the run is less than 15 minutes, the layover can be less than five minutes. The drawback of providing a layover that requires the bus to deviate from the route is that the travel time for the individual run becomes longer for riders. Therefore, in the case of the downtown circulator, it would be more feasible from a rider standpoint to have the layover at or near the transit center to allow the rider to get off and access other routes if needed. Optimally, the best

⁴ Wikipedia.org

location for a layover would be located on the route adjacent to the transit center (but not within the transit center, as this would require added travel time to make a loop to get back on the route), such as on 110th Avenue NE. This would minimize the amount of time it takes for the bus to make circuitous movements to reach the layover.

Layovers, if they are off of the transit route, can also add significant travel times to the route itself, and therefore, impact the schedule and headways, at least on an hourly basis. Therefore, it is generally beneficial for the layover to be on the route, or as close to the route as possible without requiring circuitous travel to reach the layover or get back to the route. This helps to minimize any added travel time, and therefore improve route productivity. If the agency wishes to maintain a regular headway during the layover period, another bus would be required during the headway period.

Another option for providing the driver layover is to have a rollback, or “extraboard”, which is essentially another driver that is available to relieve the driver requiring a layover. When driver A is required a break, the driver stops at a designated stop, such as near the transit center, where another driver is waiting to relieve driver A. For a one-directional route that normally requires two buses to make the headway, a third “extraboard” driver would be required to provide the layover relief. This system allows buses to stay on their scheduled headway, resulting in a more reliable service to riders and negating the need for an extra bus.

Potential Layover Zones

The following section describes potential layover locations that might be available for a downtown circulator. The following locations are layover locations that are preferred by Metro, in the order of their preference.

101st Avenue SE

The City of Bellevue has adopted a future layover space for a future downtown circulator, which is located on the east side (northbound) of 101st Avenue SE, adjacent to Wildwood Park. This layover location can accommodate two vans. This layover location is currently unused, and the City’s parking ordinance would need to be updated to allow for layovers in this location.

This location is the preferred location as stated by King County Metro for any shuttle service that serves downtown. The drawback for this site is that it requires out-of-direction travel, does not front a destination, and riders on this particular run would need to sit on the bus while it lays over, thereby making the route less reliable. This layover location would likely add costs and reduce ridership for the circulator.

106th Avenue NE

When layover spaces were being identified and approved by the City of Bellevue during the implementation of the “Distributed Services” alternative in the late 1990’s, a layover site on east side of 106th Avenue NE, just north of NE 6th Street was considered. This site includes a transit stop that was developed as part of the Bellevue Transit Center expansion. There is room within the designated transit area for a layover space. However, at the time that the layovers were being considered by Council, there was a preference not to have buses or vans lying over at this site, as

it is considered as a gateway to the NE 6th Street Pedestrian Corridor. None of the circulator alternatives are slated to use 106th Avenue NE, and thus would add operating costs if this layover were used.

100th Avenue NE

There is currently a layover space on the east side of 100th Avenue NE, between Main Street and NE 1st Street. This space is currently used, however, as part of the 2008 Metro service changes, this space may become available. The space is large enough to hold one 40-foot coach, or possibly two vans.

Bellevue Transit Center, Bay 7

Bay 7 at the Bellevue Transit Center is located in the westbound direction, directly west of 110th Avenue NE. This space is large enough for two vans. The space is currently reserved for paratransit vehicles that deliver or pick up riders from the other transit routes. A policy decision would need to be made by King County Metro to allow this space to be used as a circulator layover. Most of the circulator alternatives do not directly serve the segment of the BTC that Bay 7 is on, and therefore operating costs would increase if this layover were used.

Other Potential Layover Sites Identified by City

The City of Bellevue had identified a number of other potential curb-side locations in downtown that are considered feasible and desirable for future layover needs. These locations do not currently serve as layovers, and would need to be approved by the City and King County Metro. They include the following:

- NE 4th Street (South side) between 108th Avenue SE and 110th Avenue NE.
- 106th Avenue NE (East side) north of NE 10th Street and NE 8th Street – This is adjacent to the Belcarra Apartments currently under construction, and may no longer be feasible. In addition, it may affect existing on-street parking.
- 108th Avenue NE (West side) between NE 10th Street and NE 12th Street – This is adjacent to two residential developments currently under construction (VUE/Hanover and Belletini), and may no longer be feasible. In addition, it may affect existing on-street parking in this area.
- NE 10th Street (South side) between 106th Avenue NE and 108th Avenue NE – This is adjacent to the Washington Square residential development currently under construction, and may no longer be feasible.

Existing or Potential Layovers as they relate to Route Options

Each of the route options were looked at in terms of how close they are to the adopted layover near Wildwood Park, as well as other potential locations.

Option A – Core Route

101st Avenue SE - The Core Route would require circulator vehicles to traverse approximately .65 miles off of the route at an average speed of 8 mph to reach the layover adjacent to Wildwood Park. Vehicles would likely continue west on Main Street, and turn south onto 102nd Avenue SE, west on SE 3rd Street, and north on 101st Avenue SE. From its layover, the vehicle

would turn right onto Main Street and left onto Bellevue Way to continue its routing. The additional routing to reach the layover, along with a five minute break, would take approximately ten minutes.

100th Avenue NE - Another layover location that would be feasible for this route include the layover at 100th Avenue NE. Vehicles would continue west on Main Street, and turn north on 110th Avenue NE. After the layover, the vehicles would loop onto NE 1st Street, then south on 102nd Avenue NE, and east on Main Street before turning northbound on Bellevue Way. The additional routing to reach the layover, along with a five minute break, would take approximately ten minutes for this .62 mile diversion.

NE 4th Street - Another potential layover location is the site along NE 4th Street. This would require the vehicle to divert off of its route, using NE 2nd Street, 108th Avenue NE, and NE 4th Street. The .37 mile diversion would take approximately eight minutes, including the five minute layover period. As mentioned earlier, this is not an approved layover zone.

NE 10th Street - The most optimal location for a layover for this route is along NE 10th Street between 106th Avenue NE and 108th Avenue NE, because it is along the route. However, this location is not currently designated as a layover, and may be infeasible due to the current adjacent development under construction.

106th Avenue NE/ NE 6th Street - The potential layover on 106th Avenue NE north of NE 6th Street would require significant diversions. A vehicle traveling northbound on Bellevue Way would need to turn east on NE 6th Street and north onto 106th Avenue NE. After the layover, the vehicle would need to turn east onto NE 8th Street, south on 108th Avenue NE, and west on NE 4th Street before reaching Bellevue Way again. This total diversion of approximately one mile would add over seven minutes of travel time, plus an additional five minute layover for a total of 12.5 minutes.

106th Avenue NE/NE 10th Street – This potential layover site would require vehicles to turn north onto 106th Avenue NE. After its layover, the vehicle would turn west on NE 12th Street, south on Bellevue Way, and then east again on NE 10th Street. The total diversion time for this .50 mile diversion, including the layover, is approximately 9 minutes.

108th Avenue NE – This potential layover site would require vehicles to turn north on 110th Avenue NE, west on NE 12th Street, and south of 108th Avenue NE to reach the layover. After the layover, the vehicle would turn east on NE 10th Street again. The total diversion time for this .63 mile diversion, including layover, is approximately ten minutes.

Bellevue Transit Center – This potential layover would require vehicles to turn west into the transit center from 110th Avenue NE. After the layover, the vehicle would turn north onto 108th Avenue NE, east onto NE 8th Street, and south onto 110th Avenue NE. The total .50 mile diversion, including layover, is approximately 9 minutes. If a van is used, the van could make a turn within the transit center at 108th Avenue NE to return to 110th Avenue NE. The travel diversion with a layover using a van would be approximately 7 minutes. The benefit of a layover at the transit center is it allows passengers to disembark during the layover.

Option B – Old Bellevue

All of the layovers identified in Option A would be similar for Option B, with the exception of the Wildwood Park site, and the 100th Avenue NE site.

101st Avenue SE - The Old Bellevue Route would require circulator vehicles to traverse approximately .36 miles off of the route to reach the 101st Avenue SE site. Vehicles would already be on Main Street in the Old Bellevue area, and would only need to turn south onto 102nd Avenue SE, west on SE 3rd Street, and north on 101st Avenue SE. From its layover, the vehicle would turn left onto Main Street to continue its routing. The additional routing to reach the layover, along with a five minute break, would take approximately seven minutes.

100th Avenue NE – For this layover, vehicles would already be traversing north on 110th Avenue NE, so there would not be any extra time needed to reach this layover.

Option C – Overlake Hospital Area

Under Option C, all of the layovers, and associated travel times would be similar to Option A.

Option D – Hybrid

Under Option D, all of the layovers, and associated travel times would be similar to Option B.

Option E – Northeast Quadrant

101st Avenue SE - The Northeast Quadrant Route would require circulator vehicles to traverse approximately 1.9 miles off of the route to reach the layover adjacent to Wildwood Park. Vehicles would likely turn south onto 108th Avenue NE, then west on Main Street, and turn south onto 102nd Avenue SE, west on SE 3rd Street, and north on 101st Avenue SE. From its layover, the vehicle would turn right onto Main Street and left onto 108th Avenue NE to continue its routing. The additional routing to reach the layover, along with a five minute break, would take approximately 19 minutes.

100th Avenue NE – For this layover site, vehicles would turn south onto 108th Avenue NE, turn west on Main Street, and turn north on 110th Avenue NE. After the layover, the vehicles would turn east onto NE 1st Street/NE 2nd Street, then turn north onto 108th Avenue NE, where it would continue its route. The additional routing to reach the layover, along with a five minute break, would take approximately 18 minutes (including layover) for this 1.67 mile diversion.

NE 4th Street – This potential layover location would require the vehicle to turn south onto 108th Avenue NE from the transit center. The vehicle would turn east onto NE 4th Street for its layover. After the layover, it would turn north onto 110th Avenue NE, then west into the transit center again, where it could then continue north onto 108th Avenue NE. The .50 mile diversion would take approximately nine minutes, including the five minute layover period.

NE 10th Street – This layover would require the vehicle to continue north on 108th Avenue NE past NE 10th Street, then turn west onto NE 12th Street, south on 106th Avenue NE, and east on NE 10th Street for the layover. After the layover, it would continue on its route east on NE 10th

Street. The .50 mile diversion would take approximately nine minutes, including the five minute layover period.

106th Avenue NE/NE 6th Street - The potential layover on 106th Avenue NE north of NE 6th Street would require significant diversions. The vehicle would turn south onto 108th Avenue NE, west on NE 4th Street, and north on 106th Avenue NE. After the layover, it would need to turn east onto NE 8th Street, south on 110th Avenue NE, and west into the transit center before continuing the route north on 108th Avenue NE. This total diversion of approximately one mile would add over seven minutes of travel time, plus an additional five minute layover for a total of 12.5 minutes.

106th Avenue NE/NE 10th Street – This potential layover site would require vehicles to turn west on NE 10th Street (from 108th Avenue NE) and north onto 106th Avenue NE. After its layover, the vehicle would turn west on NE 12th Street, south on Bellevue Way, and then east again on NE 10th Street. The total diversion time for this .78 mile diversion, including the layover, is approximately 11 minutes.

108th Avenue NE – This potential layover site would require vehicles to turn west on NE 10th Street, north on 106th Avenue NE, east on NE 12th Street, and south on 108th Avenue NE. After the layover, the vehicle would turn east on NE 10th Street again. The total diversion time for this .50 mile diversion, including layover, is approximately nine minutes.

Bellevue Transit Center – This route goes through the BTC as part of its routing, and therefore, the only time associated with the layover is the layover itself, which would be approximately five minutes.

Option F – 2001 Recommended Route

The route that was recommended in the 2001 Circulator study assumed that a layover would be located along 105th Avenue NE, between NE 2nd Street and NE 4th Street. This is an existing layover zone that is used by other King County Metro routes. If this layover were not available for use, the other potential layovers could be used. However, because the previous route was not a full loop route, many of the identified potential layover locations would not be feasible, as they are not near the end of the route. Only those layovers in the Old Bellevue area would be feasible, or near the existing proposed layover.

101st Avenue SE – The 2001 recommended route makes a loop in the Old Bellevue area. If it were to layover adjacent to Wildwood Park, the vehicle would continue south on 102nd Avenue SE, turn west on SE 3rd Street, and north on 101st Avenue SE. From its layover, the vehicle would turn west onto Main Street to continue its routing. The .38 mile diversion to reach the layover, along with a five minute break, would take approximately eight minutes.

100th Avenue NE – For this layover site, vehicles on this route are already traversing north on 100th Avenue NE from Main Street. There would not be any additional travel time to reach the layover site.

NE 4th Street – If this route were to use the layover at NE 4th Street, it would not need to make a loop onto 106th Avenue NE as currently designed for its layover at that location. Instead, the route would likely be reconfigured so that it continues east on NE 4th Street and lays over at the NE 4th Street site. After the layover, the route could turn south onto 110th Avenue NE, north on 108th Avenue NE, and west on NE 4th Street. This reconfigured route of approximately a mile to make the layover, would take approximately 12.5 minutes for the total layover time.

Table 4: Layover Travel Times (including Layover) for Options

Layover Site	Layover Travel and waiting time					
	Option A	Option B	Option C	Option D	Option E	Option F
101 st Avenue SE	10 mins	8 mins.	10 mins.	8 mins.	19 mins.	8 mins.
100th Avenue NE	10 mins.	5 mins.	10 mins.	5 mins.	18 mins.	5 mins.
NE 4th Street	8 mins.	8 mins.	8 mins.	8 mins.	9 mins.	13 mins.
NE 10th Street	5 mins.	5 mins.	5 mins.	5 mins.	9 mins.	NA
106th Ave NE/NE 6th St	13 mins	13 mins.	13 mins.	13 mins.	13 mins.	NA
106th Ave NE/NE 10th St.	9 mins.	9 mins.	9 mins.	9 mins.	11 mins.	NA
108th Avenue NE	10 mins.	10 mins.	10 mins.	10 mins.	9 mins.	NA
BTC	7 - 9 mins.	7 - 9 mins.	7 - 9 mins.	7 - 9 mins.	5 mins.	NA

It is highly unlikely that choice circulator riders would regularly endure regular deviations and wait times of 5 or more minutes. Waiting more than 5 minutes is a severe disincentive to attracting choice riders.

CIRCULATOR OPTION EVALUATION

The six circulator route options were evaluated and ranked based on established evaluation criteria. The criteria included:

- Ability to serve underserved areas
- Population served
- Employment population served
- Activity Centers served
- Travel time of route
- Ease of routing
- Distance to established layover area

The summary of the evaluations are shown in **Table 4**, and the evaluation criteria are further explained in **Appendix B**.

Option A – Core Downtown

Underserved Areas

The majority of Route Option A is along roadways that are already served by other existing transit routes. The only portion that does not currently have an existing route on it is along 110th Avenue NE, between NE 4th Street and Main Street. However, a field visit indicated that while the portion of 110th Avenue NE, north of NE 4th Street has routes that operate along it, there were

no bus stops that would allow access to those routes. Therefore, for this evaluation, it was determined that the entire portion of 110th Avenue NE between NE 10th Street and Main Street (a total of .64 miles) is not currently served by transit.

Population Served

The total residential population (projected for the year 2012) within a 1/8 mile radius of this route option is 8,058 persons. The greatest concentration of residents are located to the north end of downtown and Ashwood neighborhoods, especially due to the number of new residential developments currently under construction in those areas.

Employment Served

The total employment population (projected for the year 2012) within a 1/8 mile radius of this route option is 32,034 persons. The greatest concentration of employees are located near the transit center on 110th Avenue NE. Many of these are projected with the future Bravern and City Center II developments.

Activity Centers Served

Approximately 29 major activity centers are directly adjacent to this route. Some of the more important activity centers include Bellevue City Hall, the City Center office towers, the east edge of the Old Main area, Downtown Park, Bellevue Square, Lincoln Square, major residential buildings along the northern edge of downtown, the Bellevue Regional Library and Ashwood Park.

Travel Time and Vehicle Needs

This route is approximately 2 miles long in one-direction. Using an assumption of a vehicle operating at eight miles per hour (which would include time for stops), the travel time for the vehicle to complete the full route is approximately 15 minutes. Vehicle needs would depend on the headway that is ultimately preferred. However, if an assumption were made that a 10-minute headway is required during the peak operating period, this route option would require two vehicles to operate along the route during that period, and another vehicle as a spare.

Ease of Routing

Because this route operates in a one-way, clockwise direction, all of the turning movements would be right turns, improving the ease of movement. An analysis for all of the options considered any intersections that are projected to operate at a Level of Service E or F by the year 2012, based on the City's 2006 Concurrency Update report. The only intersection that is projected to operate at a LOS F is at NE 8th Street at 112th Avenue NE. This route option is not affected by that intersection.

Layover Facilities

In order to be consistent based on the approved layover site for the circulator, all of the route options considered the distance from the route to the 101st Avenue SE layover (adjacent Wildwood Park), based on the most feasible routing to reach the layover site. The distance for Option A to the layover site is .65 miles.

Table 5: Circulator Options Analysis

Evaluation Criteria	Option	Rank	Issues
Underserved Areas	A	2	.64 miles w/out bus service (bus stops)
	B	1	.90 miles w/out bus service (bus stops)
	C	2	.64 miles w/out bus service (bus stops)
	D	1	.90 miles w/out bus service (bus stops)
	E	4	.13 miles w/out bus service (bus stops)
	F	3	.59 miles w/out bus service (bus stops)
Employment	A	3	32,034 w/in 1/8 mile of route
	B	3	32,202 w/in 1/8 mile of route
	C	2	39,173 w/in 1/8 mile of route
	D	2	39,341 w/in 1/8 mile of route
	E	4	27,049 w/in 1/8 mile of route
	F	1	47,651 w/in 1/8 mile of route
Population	A	3	8,058 w/in 1/8 mile of route
	B	2	8,754 w/in 1/8 mile of route
	C	3	8,058 w/in 1/8 mile of route
	D	2	8,754 w/in 1/8 mile of route
	E	4	6,078 w/in 1/8 mile of route
	F	1	9,371 + w/in 1/8 mile of route
Activity Centers	A	5	29 Major activity sites adjacent route
	B	4	36 Major activity sites adjacent route
	C	3	37 Major activity sites adjacent route
	D	2	43 Major activity sites adjacent route
	E	6	25 Major activity sites adjacent route
	F	1	44 Major activity sites adjacent route
Travel Time	A	2	15.10 minutes travel time (8mph)
	B	3	18.67 minutes travel time
	C	4	23.70 minutes travel time
	D	5	27.30 minutes travel time
	E	1	14.32 minutes travel time
	F	6	35.47 minutes travel time

Table 5 (contd.): Circulator Options Analysis

Measure of Effectiveness	Option	Rank	Issues
Ease of Routing	A	1	0 LOS E/F intersection; 0 left turns
	B	2	0 LOS E/F intersections; 1 left turn
	C	3	1 LOS E/F intersection; 2 left turns
	D	4	1 LOS E/F intersection; 3 left turns
	E	3	1 LOS E/F intersection; 2 left turns
	F	5	0 LOS E/F intersections; 4-11 left turns
Vehicle Needs (Assume 10 min headway at peak period)	A	1	1 - way, 3 vehicles (incl 1 spare)
	B	1	1 - way, 3 vehicles (incl 1 spare)
	C	2	1 - way, 4 vehicles (incl 1 spare)
	D	3	1 - way, 4 vehicles (incl 1 spare)
	E	1	1 - way, 3 vehicles (incl 1 spare)
	F	3	1 - way, 5 vehicles (incl 1 spare)
Layovers	A	3	Addtl. .65 miles to 101st Ave SE layover
	B	1	Addtl. .36 miles to 101st Ave SE layover
	C	3	Addtl. .65 miles to 101st Ave SE layover
	D	1	Addtl. .36 miles to 101st Ave SE layover
	E	4	Addtl. 1.9 miles to 101st Ave SE layover
	F	2	Addtl. .38 miles to 101st Ave SE layover

Final Ranking

Option	Ranked Score	Rank
Option A - Core Route	20	3
Option B - Old Bellevue	17	1
Option C - Overlake Hospital	22	4
Option D - Hybrid	19	2
Option E - Northeast Quadrant	27	5
Option F - 2001 Route	22	4

Option B – Old Bellevue

Underserved Areas

Similar to Route Option A, the majority of this route is along roadways that are already served by other existing transit routes. The primary portion that is currently not served by transit is 110th Avenue NE, just as in Option A (a total of .64 miles). In addition, this route traverses on NE 1st / NE 2nd Street in the Old Bellevue area. While this road currently has two routes that traverse it, there were no bus stops that were observed from a field survey. It is assumed that this option would provide at least one to two stops along this road to better serve the park and residential areas. The total unserved area for this option is .90 miles.

Population Served

The total residential population (projected for the year 2012) within a 1/8 mile radius of this route option is 8,754 persons. Like Option A, the greatest concentration of residents are located in the north downtown and Ashwood neighborhoods. However, there are a significant number of residents in the Old Bellevue neighborhood, which results in the greater overall population served when compared with Option A.

Employment Served

The total employment population (projected for the year 2012) within a 1/8 mile radius of this route option is 32,202 persons. Like Option A, the greatest concentration of employees are located near the transit center on 110th Avenue NE. The extension to the Old Bellevue neighborhood results in a minor increase to employment served.

Activity Centers Served

Approximately 36 major activity centers are directly adjacent to this route. This route serves the same activity centers as Option A, but also serves large multi-family residences in Old Bellevue, and is within proximity to Meydenbauer Park/Marina.

Travel Time and Vehicle Needs

This route is approximately 2.5 miles long in one-direction. Using an assumption of a vehicle operating at eight miles per hour (which would include time for stops), the travel time for the vehicle to complete the full route is approximately 19 minutes (based on an average speed of 8 mph). However, congestion frequently occurs on Main Street in Old Bellevue, and could result in a longer travel time, especially for vehicles trying to cross Bellevue Way on NE Main Street. Vehicle needs would depend on the headway that is ultimately preferred. However, if an assumption were made that a ten-minute headway is required during the peak operating period, this route option would require two vehicles to operate along the route during that period, and another vehicle as a spare.

Ease of Routing

Because this route operates in a one-way, clockwise direction, most of the turning movements would be right turns. The only left turn is at NE 2nd/Bellevue Way. An analysis for all of the options considered any intersections that are projected to operate at a Level of Service E or F by the year 2012, based on the City's 2006 Concurrency Update report. The only intersection that is

projected to operate at a LOS F is at NE 8th Street at 112th Avenue NE. This route option is not affected by that intersection. The tight turns and small street segments in Old Bellevue could potentially make routing more difficult in this area, depending on the type of vehicle used.

Layover Facilities

The distance from the route to the 101st Avenue SE layover (adjacent Wildwood Park) is .36 miles.

Option C – Overlake Hospital Area

Underserved Areas

Similar to Route Option A, the majority of this route is along roadways that are already served by other existing transit routes. The primary portion that is currently not served by transit is 110th Avenue NE, just as in Option A (a total of .64 miles).

Population Served

The total residential population (projected for the year 2012) within a 1/8 mile radius of this route option is 8,058 persons (The same as Option A). There are no significant residential populations in the Overlake Hospital area, and therefore, there is no change.

Employment Served

The total employment population (projected for the year 2012) within a 1/8 mile radius of this route option is 39,173 persons. The greatest concentration of employees are located near the transit center on 110th Avenue NE, and in the Overlake Hospital area.

Activity Centers Served

Approximately 37 major activity centers are directly adjacent to this route. This route serves the same activity centers as Option A, but also serves the major activity areas near Overlake Hospital, including the hospital itself, the Bellevue Design Center and Whole Foods.

Travel Time and Vehicle Needs

This route is approximately 3.16 miles long in one-direction. Using an assumption of a vehicle operating at eight miles per hour (which would include time for stops), the travel time for the vehicle to complete the full route is approximately 24 minutes. Vehicle needs would depend on the headway that is ultimately preferred. However, if an assumption were made that a ten-minute headway is required during the peak operating period, this route option would require a minimum of three vehicles to operate along the route (in a one-way direction) during that period, and another vehicle as a spare. With layovers, a third vehicle could potentially be needed to operate along the route.

Ease of Routing

Assuming that the route operates in a one-way, clockwise direction, most of the turning movements would be right turns. The route makes two left turns, and is affected by the intersection of NE 8th Street at 112th Avenue NE, which currently operates at a LOS F, and will continue to operate at this LOS in 2012. A counter-clockwise movement would require six left

turns. The tight turns and small street segments in Old Bellevue could potentially make routing more difficult in this area, depending on the type of vehicle used.

Layover Facilities

Similar to Option A, the distance from the route to the 101st Avenue SE layover (adjacent Wildwood Park) is .65 miles.

Option D – Hybrid

Underserved Areas

Similar to Route Option B, the total unserved area for this option is .90 miles.

Population Served

The total residential population (projected for the year 2012) within a 1/8 mile radius of this route option is 8,754 persons (The same as Option B).

Employment Served

The total employment population (projected for the year 2012) within a 1/8 mile radius of this route option is 39,341 persons. This is similar to Option C, but adds a minor increase with the Old Bellevue area. The greatest concentration of employees are located near the transit center on 110th Avenue NE, and at the Overlake Hospital area.

Activity Centers Served

Approximately 43 major activity centers are directly adjacent to this route, as it includes both the Old Bellevue area and the Overlake Hospital area.

Travel Time and Vehicle Needs

This route is approximately 3.64 miles long in one-direction. Using an assumption of a vehicle operating at eight miles per hour (which would include time for stops), the travel time for the vehicle to complete the full route is approximately 28 minutes. With the longer travel time, reliability decreases. Vehicle needs would depend on the headway that is ultimately preferred. However, if an assumption were made that a ten-minute headway is required during the peak operating period, this route option would require a minimum of three vehicles to operate along the route (in a one-way direction) during that period, and another vehicle as a spare.

Ease of Routing

Assuming that the route operates in a one-way, clockwise direction, most of the turning movements would be right turns. The route makes three left turns, and is affected by the intersection of NE 8th Street at 112th Avenue NE, which currently operates at a LOS F, and will continue to operate at this LOS in 2012. The tight turns and small street segments in Old Bellevue could potentially make routing more difficult in this area, depending on the type of vehicle used.

Layover Facilities

Similar to Option B, the distance from the route to the 101st Avenue SE layover (adjacent Wildwood Park) is .36 miles.

Option E – Northeast Quadrant

Underserved Areas

The total unserved area for this option is .13 miles (along 112th Avenue NE between NE 6th Street and NE 8th Street).

Population Served

The total residential population (projected for the year 2012) within a 1/8 mile radius of this route option is 6,078 persons, the lowest of all options evaluated. Most of these residents are within the Ashwood neighborhood.

Employment Served

The total employment population (projected for the year 2012) within a 1/8 mile radius of this route option is 27,049 persons. The greatest concentration of employees are located near the transit center on 110th Avenue NE, and at the Overlake Hospital area. This option does not capture the large employment areas to the west near Bellevue Square and Lincoln Square as the other options do.

Activity Centers Served

Approximately 25 major activity centers are directly adjacent to this route due to its smaller geographic area that is served. The primary major activity centers are some major office towers near the core and transit center, multi-family residences in the Ashwood area, the Overlake Hospital area activity centers, the convention center and City Hall.

Travel Time and Vehicle Needs

This route is approximately 1.91 miles long in one-direction. Using an assumption of a vehicle operating at eight miles per hour (which would include time for stops), the travel time for the vehicle to complete the full route is approximately 14 minutes. Vehicle needs would depend on the headway that is ultimately preferred. However, if an assumption were made that a ten-minute headway is required during the peak operating period, this route option would require a two vehicles to operate along the route during that period, and another vehicle as a spare.

Ease of Routing

Assuming that the route operates in a one-way, clockwise direction, most of the turning movements would be right turns. The route makes two left turns, and is affected by the intersection of NE 8th Street at 112th Avenue NE, which currently operates at a LOS F, and will continue to operate at this LOS in 2012.

Layover Facilities

This route option is far from the approved layover site at 101st Avenue SE. The distance between the route and the layover is 1.9 miles.

Option F – 2001 Recommended Route

Underserved Areas

This route operates on a number of street segments currently not served by transit, including portions of 110th Avenue NE, and portions of NE 2nd Street. The total unserved area for this option is .59 miles.

Population Served

The total residential population (projected for the year 2012) within a 1/8 mile radius of this route option is 9,371+ persons. This option serves the greatest number of residents, primarily because it traverses near the future Bellevue Towers (projected to have 703 residents), and it also serves a greater number of residents west of 100th Avenue NE north of the Old Bellevue area.

Employment Served

The total employment population (projected for the year 2012) within a 1/8 mile radius of this route option is 47,651 persons. Because of the extent of this route, and its circuitous routing throughout the downtown, it captures nearly all of the major employment areas, with the exception of the northwest quadrant of downtown.

Activity Centers Served

Approximately 44 major activity centers are directly adjacent to this route due to its significant routing throughout the downtown area. While it does not capture some of the activity centers in the northwest quadrant of downtown, it serves additional activity centers east of I-405 including the Extended Stay Hotel.

Travel Time and Vehicle Needs

This route is approximately 4.73 miles long in one-direction. Using an assumption of a vehicle operating at eight miles per hour (which would include time for stops), the travel time for the vehicle to complete the full route is approximately 35 minutes. Vehicle needs would depend on the headway that is ultimately preferred. If an assumption were made that a ten-minute headway is required during the peak operating period, this route option would require a minimum of four vehicles to operate along the route during that period, and another vehicle as a spare, in a one-directional movement. However, because the route is two directional, it would likely require double the amount of vehicles.

Ease of Routing

Moving in a clockwise direction, this route makes four left turns. Moving in a counter-clockwise direction, the route makes 11 left turns. It is not affected by the intersection of NE 8th Street at 112th Avenue NE.

Layover Facilities

If the route were restructured, it is .38 miles from the approved layover site at 101st Avenue SE. Otherwise, this route assumed that its layover would be located on the east side of 105th Avenue NE, north of NE 2nd Street.

SUPPORT FACILITIES

Vehicle Types

Circulator service vehicle technologies can range from a subsidized taxi service in the form of a voucher system being provided to customers to dedicated rail lines providing circulator service that run on rail and provide 5 to 7 minute frequencies. In the middle is rubber tire technology that uses existing street infrastructure either on dedicated lanes or in general purpose lanes to provide circulation.

As far as rubber tire technology, there are many different types of vehicles that are used, from a car (taxi) or van type (minibus) vehicle to larger buses (30 to 40 ft. standard bus). With each of these vehicle types come capital costs, lifespan of vehicle, and overall operations and maintenance costs.

Taxi or small van (1 to 8 passengers)

There are many different types of taxis and small vehicles as seen in **Figures 24 and 25** that are used for circulation type operations around the country. They are usually subsidized by the city or transit agency and are meant for areas that have ridership demand, but not the demand to constitute a larger vehicle.

Capital costs of the vehicles range between \$20,000 to \$50,000 (4 passenger car or 8 passenger van). The lifespan of these vehicles is between 3 to 5 years depending on annual usage. O&M costs are high considering these vehicles are usually dealership serviced, much more frequent service is required for upkeep and fuel costs are high for ridership numbers (unless using alternative fuel source).

Figure 24: Taxi vehicle



Figure 25: Passenger van (ADA approved)



Minibus or Small Van (cutaways, 10 to 19 passengers)

Minibuses or cutaway vans (**Figure 26**) are widely used for many different purposes, including airport shuttles, school buses, tour groups and so on. These vehicles are also used for circulator services that have a target ridership market and demand that exceeds a taxi or smaller van type vehicle, but that does not carry the loads of a larger bus. These vehicles also allow more flexibility for routing than a larger vehicle. Averaging around 21ft in length, these vehicles are comparable to larger SUV's and therefore can easily serve areas with smaller turning radii and other obstacles.

Capital costs of these vehicles range between \$75,000 and \$200,000 depending on specifications and accessories. For an in-service vehicle for transit use, the cost is approximately \$125,000. The life span of these vehicles is usually 5 to 7 years and operations and maintenance costs are usually contracted out with the service provider. The O&M costs are higher than a taxi or small van, but ridership capacity is also higher.

Figure 26: Examples of minibus and cutaway vans



Small Buses (20 to 30 passengers)

There are many different manufacturer's of small buses, usually referred to as a 30-footer. Some of these companies are Newflyer, Econoline, and Gillig. Two examples of a small bus are pictured below in **Figure 27**. These buses usually range between 25 and 32 feet and carry anywhere between 20 and 30 passengers depending on the configuration of the seating. This small type bus is very popular for local service in more urbanized areas. Two differentiating characteristics between these and the minibus or van is fuel and ADA accessibility. Many of these small buses run on either low-sulfur diesel, CNG, LNG or LPG, while the other vehicle types run on regular gasoline or diesel. Most of these manufacturers also are 100% ADA approved, meaning that all the vehicle options they produce are ADA accessible.

Capital costs of these vehicles range between \$175,000 and \$350,000 depending on specifications and accessories. For an in-service vehicle for transit use, the capital cost is approximately \$250,000. The life span of these vehicles is usually 9 to 11 years. The operations and maintenance costs of these vehicles are lower compared to the previous vehicle types based on existing operations facilities in place, fuel type, and passenger loads.

Figure 27: Small Bus Examples (Gillig left, Econoline right)



Trolleys (20 to 30 passengers)

Trolleys are a unique and easy way to create a service that separates itself from existing transit service. Over the past 20 years, rubber tire trolleys have become popular in designing or branding a service sector, such as a circulator or special event service. There are many manufacturers and refurbishing companies of trolleys, they are either available new or refurbished. They operate like a regular bus only with unique exterior and interiors to separate them from existing busses. These busses usually range between 22 and 32ft and carry anywhere between 20 to 49 passengers depending on the configuration of the seating, and most trolleys operate on diesel or unleaded gasoline.

Capital costs of these vehicles range between \$75,000 (used) to \$300,000 for new high end models. The life span of these vehicles is dependent on the level of usage. If trolleys are used on an all day basis, there is usually a 9 to 11 year lifespan. The operations and maintenance costs of these vehicles is comparable to the previous vehicle type (small bus) based on existing operations facilities in place, fuel type, and passenger loads.

Figure 28: Examples of Vintage Trolley



When determining the type of vehicle needed, there are many questions that need to be answered. What is your market? Who are your riders? Is this something that is unique to Bellevue? Once these have been answered, there will be a better understanding of the type of vehicle needed to operate the service.

Vehicle Branding

As mentioned previously, branding can be a very important element of success for a circulator system. Other agencies, such as Colorado Springs and InterCity Transit use special graphics and colors on circulator buses to help market the service. This type of branding would therefore require specific buses designated for the route. King County Metro generally does not assign specific buses for specific routes, because of the added management, oversight and maintenance issues associated with this type of operation. The only current route on which Metro currently designates specific buses is the Waterfront Street Car route (Route 99), a temporary bus operation until the street car is replaced. A less expensive way of branding the vehicle could be through the route display sign on the front of the vehicle. In the case of Issaquah's Route 200, the sign displays the route as the "Freeby". A similar type of signage could be done for a Bellevue circulator, with minimal costs involved. If special paint or design schemes were determined to

be essential for the Bellevue circulator, negotiations would need to be made with King County Metro, and funding would need to be secured to pay for the associated costs.

Another option would be for the service to be contracted out to a vendor such as Hopelink, which could then potentially allow for special branding of the vehicles. Hopelink is the contractor that operates Metro's DART service, which is a type of service that deviates from the route. Metro's current union policies only allow the DART service (other than the Paratransit service) to be contracted out. Therefore, if the circulator service were to be contracted to Hopelink, the service would need to operate as a form of a DART service, which would require that the service be allowed to deviate from the route. This type of operation needs a more flexible schedule, which then could impact the desired headways and reliability of the service.

Transit Stop Amenities

In addition to the type of vehicle serving the route, three elements that make up user comfort at the stop are easy recognition of the stop, clarity of the system information and amenities at the stop. The first characteristics make the circulator easier to comprehend for the first time user and the amenities make the system more comfortable for the regular user.

Stop recognition/way-finding

A coherent and consistent environmental graphics system to identify the service point for the potential user will increase awareness and ridership. The recognition of the circulator system stops will depend on a clear and unique graphics program of consistent forms, colors and typography. As an example, Sound Transit uses a disciplined graphics program throughout the various modes within the system, from commuter rail to bus transit centers, and light rail in the future.

The scale of the signage should be large enough to be recognized from a distance. Once the user comprehends the "brand", the size of the sign should be recognizable from a block away. This scale of recognition provides a means of way-finding for the user.

If the circulator system has only one type of service, the signage can be simpler, although the principle of consistency of colors, forms, materials and other elements that comprise "branding" should be applied. Some of these features could be applied to the vehicles to reinforce an image of the total system.

Stop information

Once the individual circulator stop is "branded" through the consistent application of environmental graphics standards, more information about the overall system should be provided at the stop. Kiosks or sign pedestals are common methods to provide an overview of the system. Here too, the consistent application of the same colors, fonts and formats will improve the total image of the complete design package.

Figure 29: Recognition and Way-finding Examples

<p><i>Easy recognition of the Sound Transit service points is facilitated by a consistent graphics program. As these images demonstrate, the colors, forms, materials and icons are consistent throughout the system. The "blade" provides a background to mount the icons that represent the various services offered at the stop</i></p>		
	<p>This example shows the icons for rail, bus and the universal "P" for parking, providing easy recognition of the services provided at this location in Puyallup.</p>	<p>The largest element, the "T", is used throughout the Sound Transit system, providing a consistent indicator of transit service.</p>
<p><i>These way-finding signs in Bellingham show the larger scale needed when making a visual connection from two blocks away. While large enough to be recognizable from a distance, they also have maps and other information that must be read at a close distance.</i></p>		

Figure 30: Stop Information

Part of the Sound Transit environmental graphics program, these two signs use consistent colors, forms and materials and iconic signs used to identify stop location. These pedestal signs show a different scale of information: the service offered at each bus bay in the Bellevue Transit Center (left) and the regional location and service connections from the South Hill Transit Center in Puyallup (right)



These pedestal signs are part of an overall way-finding system in the Seattle downtown area. A baked porcelain finish provides an easy surface to remove graffiti.

Using maps and directional/distance cues, they offer the visitor convenient information for location and destinations.



Maps can be especially useful at circulator stops, as they allow users to understand the routing itself, as well as major activity centers within the area. **Figure 31** provides an example of a map that could be applied in downtown Bellevue.

Figure 31: Potential Map Example for Downtown Bellevue



Stop Amenities

The circulator service pattern provides short headway between vehicles, making the wait at each stop short compared to local service. The ten minute headways may mean that shelters aren't essential for weather protection or benches to rest between buses. At a minimum, each stop should be provided with circulator system information and a waste receptacle. If shelters are found to be desirable for weather protection, the structure design should use the environmental graphic system of the circulator, including colors, forms, and materials.

Figure 32: Stop Amenities

These examples show stop amenities provided beyond route signage for the stop. The two-seat "mushroom" seats are integrated with the route signage (left) At right, the bench and sign provide visitors a place to wait for the Monterey shuttle in California.



The standard Metro shelter – easily recognizable.



Figure 33: Public Art at Stops

These art pieces were installed at the Lynnwood Transit Center (left) and the Portland, Oregon Transit Mall (right)

They add another element to the transit rider's experience, enriching the commute. Public art could be a valuable component to the Bellevue circulator program



Stop Design

If shelters are desirable, then the design should be unique, with a clear identity from the standard Metro shelter.

Figure 34: Stop Design

Shelters provide architects with an opportunity to explore new forms and styles. Unique and expressive forms should be integrated with the overall "look and feel" of the signage program.



While not a shelter, the "canoe" in Seattle's Eastlake neighborhood is an imageable form that could be applied toward a shelter.

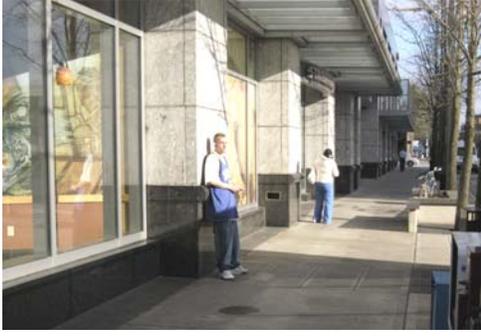
In the Crossroads area, this style of shelter is used on the streets around the Mall. Unique forms and colors signify a special district



Stops and Buildings

Urban buildings are being designed to accommodate transit users by providing canopies, seats or lean rails. Integrating amenities for the shuttle riders should be encouraged in new buildings. In an urban area such as downtown Bellevue, there are multiple opportunities to use building canopies for shelter. These opportunities should be sought to the most extent possible as part of the development of circulator stops.

Figure 35: Examples of Stops at Buildings

<p><i>The designers of Benaroya Hall in Seattle (left) and Key Bank in Bellevue (right) recognized the large numbers of transit riders on the sidewalks in front of these buildings. They provided leaning rails as part of the façade design.</i></p>		
<p><i>These buildings integrate benches into the façade design where transit routes stops are located.</i></p>		
<p><i>At Seattle's Pike Place Market, the canopy provides a place for transit riders to wait while protected from the rain. (left)</i></p> <p><i>On Queen Anne, the shelter at a major transfer point was installed near the building façade. (right)</i></p>		

CHAPTER 6: ALTERNATIVES FOR IMPROVING EXISTING DOWNTOWN TRANSIT

IMPROVING FREQUENCY AND SPAN OF SERVICE ON EXISTING ROUTES

Downtown Bellevue has a high level of transit service, as characterized by 24 routes, all day service seven days a week, and high frequency service during weekday peak hours. One potential means of improving downtown transit circulation is the modification of services currently operating in and through downtown Bellevue to provide improved circulation within downtown.

There are several drawbacks to this approach, however. Changes in frequency and service span will apply to the entirety of the modified route, thereby significantly increasing operating costs. If those improvements are otherwise supported on a full-route basis, this approach can prove a reasonable one – addressing more than one problem at once. If, on the other hand, modifications are made to an entire route that are unjustified for much of the route alignment, this approach becomes unnecessarily expensive and consumes more scarce service resources than can reasonably be justified.

Modifying existing services in downtown Bellevue has a second drawback. Since most service operating through downtown Bellevue currently operates through the Bellevue Transit Center, utilizing these routes to provide enhanced downtown transit circulation will almost certainly require intra-downtown riders to transfer to reach many desired destinations, thereby significantly increasing both travel time and the “hassle factor” of making these trips, thereby negatively impacting ridership for intra-CBD trips.

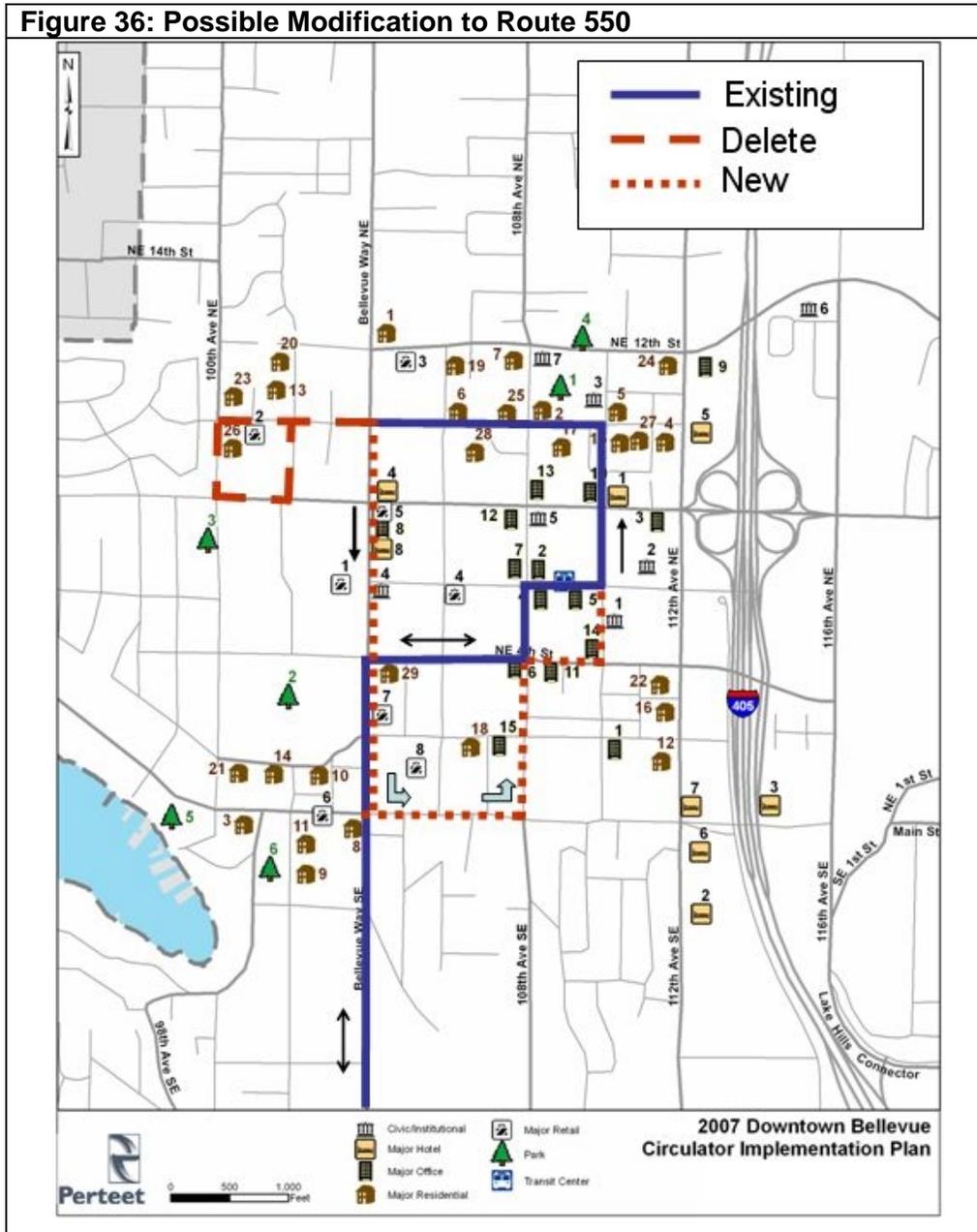
Extending a Single Existing Route

Another approach is to take an existing route that currently ends in downtown Bellevue and extend it to provide downtown circulation. This approach can potentially take advantage of excess layover/recovery time to reduce the costs of implementing a downtown circulator service. To be effective, the extended route must have a sufficiently high level of service and span of service to effectively support circulator operations and have some excess layover/recovery time to exploit in reducing the cost of circulator operations. Lacking these qualities, there is no advantage to this approach over a dedicated circulator service.

Currently only Sound Transit route 550, providing service from downtown Bellevue to Downtown Seattle has adequate service frequencies to provide, with some modifications, circulator services in downtown Bellevue. Route 550 already provides some intra-CBD circulation and could be modified to improve that function (See **Figure 36**).

The principal difficulty with this approach is that the resulting route scheduling would be very clumsy. Coming into downtown Bellevue, the route 550 could operate to the Bellevue Transit Center, then circulate through downtown Bellevue, arriving back at the Bellevue Transit Center once again before heading back to downtown Seattle. However, this scheme would require a

layover at some point with passengers on board, an undesirable operating approach. It would be more desirable to have the layover located at the Bellevue Transit Center, than elsewhere along the route. However, the relatively high frequencies of the route 550 would require significant layover space at the transit center, which is currently unavailable, and likely to be unavailable in the future.



The route 550 route alignment via I-90 from downtown Seattle also offers a significant probability of off-schedule operation due to traffic congestion/disruption. This off-schedule operation would be passed on the circulator element, resulting in a much less reliable circulator operation.

Additionally, the existing \$2.00 single-zone fare is much too high for an intra-CBD trip, but there is no simple mechanism for the determination of who is an intra-CBD rider and who is continuing outside the CBD. Since route 550 collects all of its fares on the Bellevue end of the route, the fare collection difficulties probably constitute a fatal flaw in this approach. It is unlikely that any routes operating to downtown Seattle could be incorporated into a downtown Bellevue circulator because of the fare collection difficulties introduced.

Other than route 550, no other route operating in or through downtown Bellevue appears to have both adequate directional service frequencies (4 trips per hour or more) and adequate service span (6 a.m. to 7 p.m. weekdays) to serve as a downtown circulator operation.

Some modification of a combination of routes to improve circulation within downtown Bellevue is discussed in a later section.

Modifying the Proposed Bellevue-Redmond BRT (Rapid Ride)

Over the next few years, a bus rapid transit (BRT) connection between downtown Bellevue and Downtown Redmond is planned to operate via Crossroads and Overlake. Suggestions have been made to extend this route's alignment in downtown Bellevue to provide circulator services much as those described for route 550. This provides an opportunity to use the BRT operation as the circulator, and defer implementation of a circulator until the BRT is implemented (likely in 2011), or replace an interim circulator at such time that the BRT operation begins.

There are a number of benefits to extending the BRT as a downtown circulator. The BRT could still allow for special branding of the bus to have a unique identify, and potentially include improved, uniquely designed stops with real-time information. In addition, using the BRT as a circulator could allow the City to obtain service hours through Speed and Reliability partnerships. However, this operation would preclude operating a smaller vehicle for the circulator service, using instead whatever vehicle is most appropriate to the BRT operation, almost certainly a full-size 40-foot or articulated 60-foot bus.

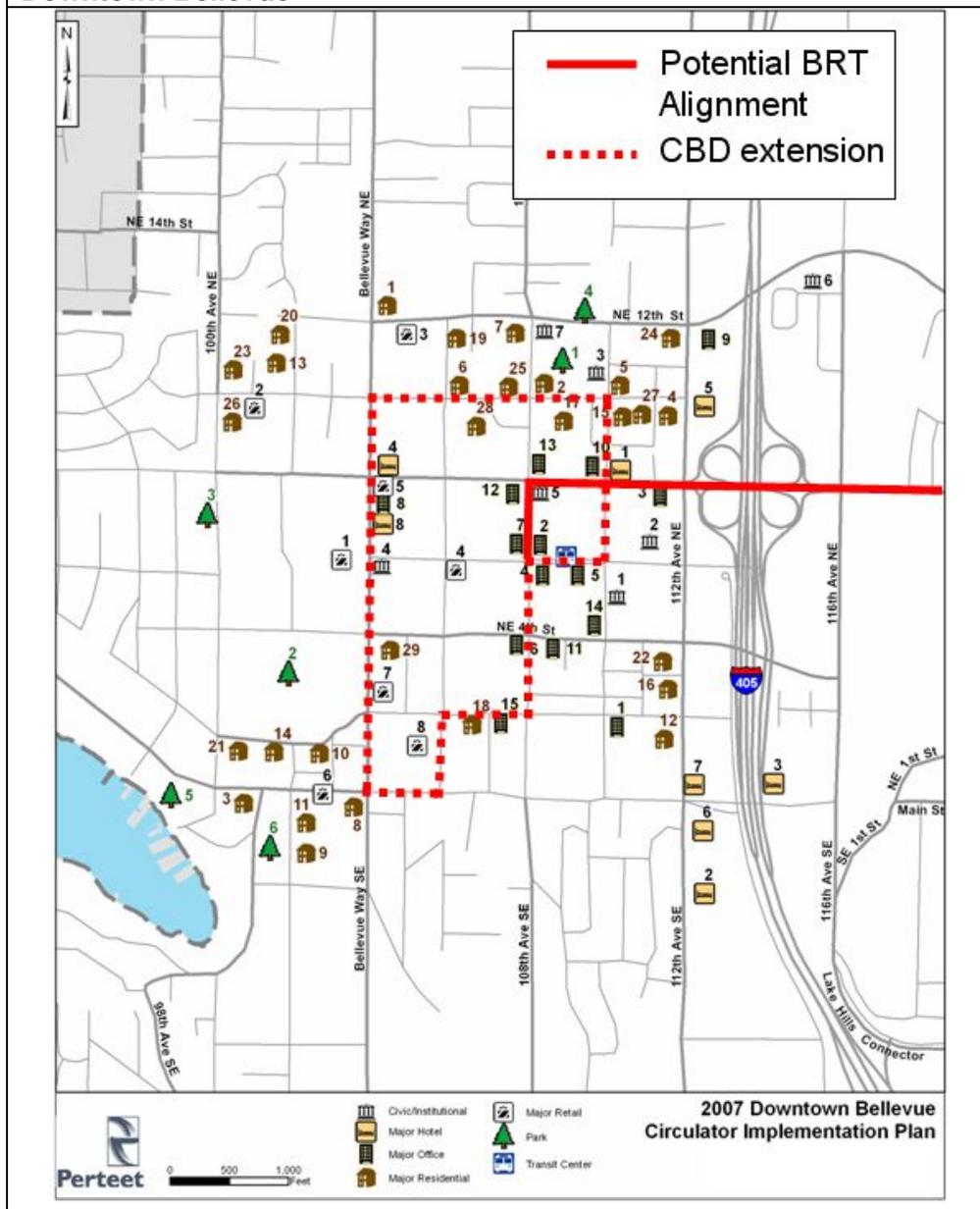
Many of the negative characteristics attributed to route 550 are also applicable to this approach, although it lacks the specific fare collection difficulties of the route 550 approach. At the point that the BRT service is operated at minimum 15-minute service headways and operates during the entire 6 a.m. to 7 p.m. weekday time period, the BRT extension could be made to satisfy minimum circulator requirements.

As with the route 550 operation, at some point, layover/recovery time would have to be taken with passengers on board (if it operated as a loop). If the route doesn't operate as a loop, but rather operates in two directions on the same streets terminating at the north end of downtown, a layover site would need to be identified at the end of the route.

Fare issues also are introduced with this approach, given the desire to operate a circulator route as a fare-free service. This could be addressed with the implementation of a fare-free zone in downtown Bellevue for all routes (see the discussion of a fare-free zone elsewhere in this document).

In addition, a circulator type of operation is not consistent with the type of operation envisioned for BRT. A circulator is considered local service that connects destinations within one area, with closely spaced stops. A BRT operation has the overall goal of providing frequent, but fast service between long distances, and with limited stops.

Figure 37: Potential Extension of Bellevue-Redmond Rapid Ride in Downtown Bellevue



Modifying a Combination of Existing Routes

The most important trip attractors in downtown Bellevue have been identified and are included in **Figure 3**. In the attempt to identify an optimum downtown Bellevue circulation plan, we have endeavored to provide as much service to as many of these identified trip attractors as possible. Given the spatial distribution of these sites, it is not possible to include them all in the recommended service plan, but an attempt has been made to include as many as possible of those deemed most important.

As demonstrated earlier, existing geographic coverage of the Bellevue CBD by existing services is very comprehensive. It may be possible to improve downtown transit circulation somewhat by modifying a few selected routes' alignment in the downtown core to better connect major trip attractors/generators.

In selecting candidate routes for this analysis, the following characteristics were identified:

- Routes operating all day in the Bellevue CBD between the hours of 6 a.m. and 7 p.m.
- Routes have a service frequency of at least 2 trips per hour
- Route modifications would be low-cost or no-cost
- Modifications that would not unduly increase travel time for existing riders

Five routes were identified that met these criteria which also offered some potential for improving downtown circulation with modest changes. These were King County Metro routes 222, 230, 233, 234, and 240. Ultimately route 234 was eliminated since any changes would have impacted existing services to Overlake Medical Center and the developing Group Health complex on 116th Avenue NE.

By making some minor modifications to the other four routes, service through downtown Bellevue could be increasingly concentrated along 108th Avenue NE, SE Main Street, Bellevue Way and NE 10th Street. This simple quadrangle provides service within ¼-mile of most of the identified trip generators/attractors in the downtown core area. This approach does not offer much help in improving connectivity between the downtown core and Overlake Medical Center.

Modify Route 222

Route 222 currently enters the Bellevue CBD from the south via Bellevue Way. By modifying the existing routing to operate via SE Main Street and 108th Avenue NE, rather than the existing alignment via NE 4th Street and 106th Avenue NE, service frequencies along the downtown loop described above can be enhanced. This is a no-cost modification. The proposed changes are shown in **Figure 38**.

Extend Route 230

Route 230 currently enters downtown Bellevue from the east on NE 8th Street and exits to the north via Bellevue Way, operating via 110th Avenue NE, NE 6th Street, 108th Avenue NE, and NE 4th Street. By extending the route 230 alignment south to Main Street rather than NE 4th Street, additional access to the southern CBD and Old Bellevue could be provided at minimal (or no) cost.

Route 230 operates all day at 30-minute intervals serving Redmond, Crossroads, downtown Bellevue and Kirkland. The proposed modification is shown in **Figure 39**.

Figure 38: Potential Route 222 Modifications

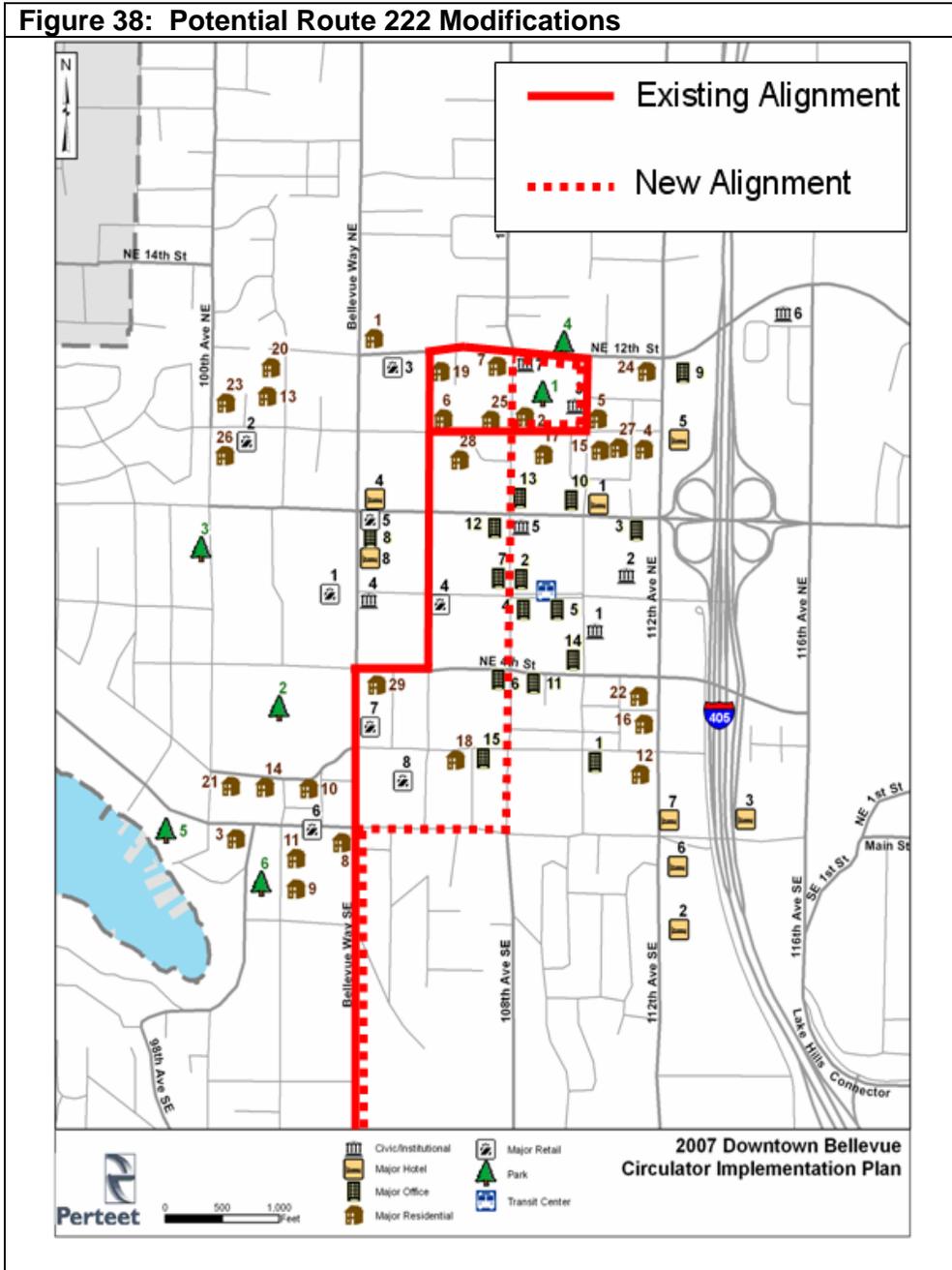
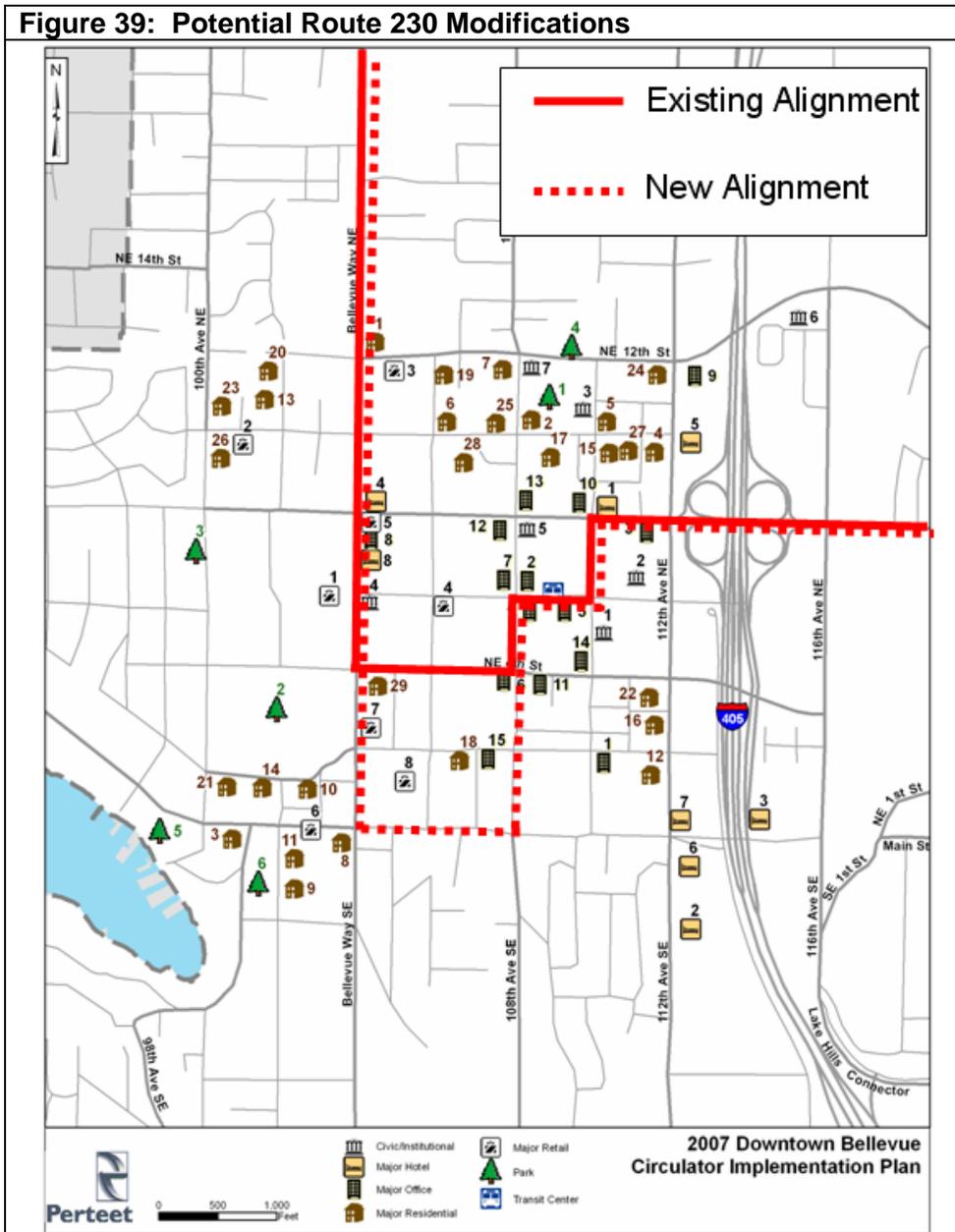


Figure 39: Potential Route 230 Modifications



Extend Route 233

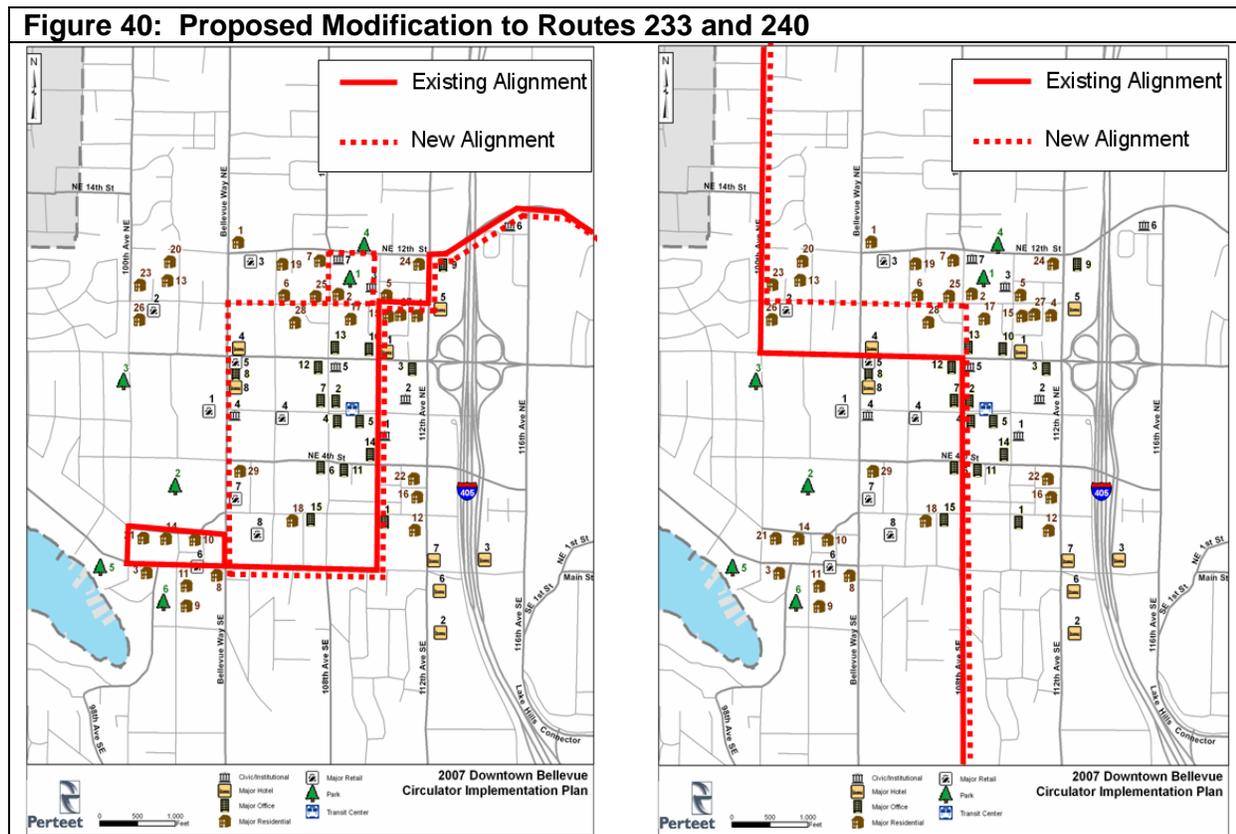
Route 233 enters downtown Bellevue via NE 12th Street and terminates in Old Bellevue, operating via 112th Avenue NE, NE 10th Street, 108th Avenue NE and Main Street. By extending the route back up Bellevue and across 10th Street, additional connectivity across the western edge of the CBD core could be provided. This addition may add an additional vehicle, depending on the recovery time provided and the layover location used. The route could operate as a loop downtown with no layover, but would likely add a long layover at the other end of the route.

Route 233 operates all day at 30-minute intervals serving Redmond, Overlake and downtown Bellevue. The suggested modification is shown in **Figure 40**.

Modify Route 240

Route 240 enters downtown Bellevue on 100th Avenue NE and exits to the south via 108th Avenue SE, operating via NE 8th Street. By moving route 240 from NE 8th Street to NE 10th Street, connectivity for the many residential units along NE 10th Street will be enhanced and route 240 will avoid the traffic congestion and delay associated with operation on NE 8th Street.

Route 240 operates all day at 30-minute intervals serving Clyde Hill, downtown Bellevue and Factoria. The suggested modification is shown in **Figure 40**.



Ride Free Area Structure

Another option for improving transit service in downtown is through the provision of a Ride Free Area (RFA). A RFA would be bounded by NE 12th Street to the north, I-405 to the east, Main Street to the south, and 100th Avenue NE to the west.

King County Metro prepared an analysis of Ride Free areas in July 2003. The study concluded that a Bellevue RFA would be operationally feasible when viewed from the perspective of Metro service only. However, a RFA system in downtown Bellevue could lead to rider confusion when not all routes are included as part of the ride free system, such as Sound Transit routes. King County Metro routes that originate in downtown Seattle (where a fare-free zone exists) would

need to be exempt from the fare free zone, so that the fare can be collected. Only Route 261 links downtown Bellevue with downtown Seattle. It is possible that this route will be discontinued in the near future as new service is added to the NE 8th Street corridor, such as Rapid Ride. At the time of the study, only about 133 riders were estimated to travel on Metro routes each weekday solely within the RFA, meaning that there would be only a small loss of revenue to recover (and only a small transportation benefit). The fare-free zone would require that the County's current fare structure be changed so that all Eastside routes collect fares as passengers exit the vehicle. This raises significant issues regarding driver impacts and security that would need to be addressed, such as fare disputes. In addition, there would be added confusion for collecting payment from riders who board enroute to downtown.

Sound Transit provides considerable service in downtown Bellevue, and any further assessment of a RFA would need to involve discussions with Sound Transit about impacts on customers and possible revisions to their service in these areas. The route 550 would need to be exempt, as this route originates in downtown Seattle. Since well before the implementation of Sound Transit service in September, 1999, King County Metro and Sound Transit (ST) have worked together to provide an interconnected network of transit service in King County. The RFA extensions or example new RFAs examined here will impact this network. A new RFA would impact ST financially, in the form of lost revenue, should ST decide also to provide ride free service.

Revenue that King County Metro would need to recover from the City of Bellevue to make any RFA revenue neutral would be calculated as the difference between lost revenue and operating cost savings. In addition to lost revenue, there would be some one-time startup costs that would vary depending on the size and complexity of the operation of any new RFA. When the King County analysis was conducted, specific startup costs had not yet been calculated. The study estimated that the annual lost revenue to operating a fare free zone in downtown Bellevue at between \$53,000 and \$77,000.⁵

In summary, the following challenges would need to be addressed if a RFA were implemented in downtown Bellevue:

- Potential rider confusion regarding routes included or not included in RFA
- Method of fare collection for riders who board or alight outside of downtown
- Ability to track boarding and alighting of riders within downtown
- Lost revenues associated with RFA
- Startup costs associated with RFA

Operating Costs

As part of this circulator study, some additional analysis was conducted to determine the potential cost to Bellevue for a RFA. To determine the cost for a RFA in downtown, an estimate is needed of intra-CBD trips. As a starting point, we will estimate that all of the BTC boardings represent either transfers or trips bound for locations outside downtown Bellevue. This is probably not altogether true but it is unlikely that the volume of current fare-paid intra-CBD trips is very significant.

⁵ Analysis of Ride Free Areas, King County Metro, July 2003.

There is very little existing rider data to help estimate the market for intra-CBD trips. While Metro routinely gathers ridership data at each of the bus stops in downtown Bellevue, there is no way of discerning the destination to which boarding riders are bound. The highest volume of intra-CBD trips are probably destined for the Bellevue Transit Center. However, many of those trips are destined for points outside the downtown core.

The most recent Metro ridership data shows 6,716 transit boardings and 6,684 transit alightings in downtown Bellevue on an average weekday. Of those boardings, 2,400 were observed in or adjacent to the Bellevue Transit Center, many representing transfers between routes at this location. This leaves approximately 4,300 daily boardings at other downtown locations, some of which may also represent transfers although we have no way of determining just how many.

Of the remaining 4,300 downtown boardings, we will assume that only 3% represent intending intra-CBD trips, a reasonable assumption given the short length and relatively high cash fare for such trips – 129 daily trips in all. It is likely that many of these intra-CBD trips are currently made by Metro monthly pass holders, who do not represent a potential revenue loss of a fare-free zone or circulator operation. However, we will ignore the monthly pass effects for the time being.

Using 129 daily trips as the weekday baseline for intra-CBD trips, we estimate Saturday and Sunday ridership at 60% and 30% of weekday ridership, respectively. Thus, we estimate 77 average Saturday intra-CBD trips and 39 Sunday trips. This represents an average of 761 weekly intra-CBD trips on existing Metro and Sound Transit routes – about 40,000 trips per year.

Estimating an average fare for current riders is much more difficult. Full-fare cash passengers pay \$1.50 to \$2.00 per trip on Metro routes. However, a significant proportion of those riders take advantage of a number of reduced-fare opportunities, including elderly and disabled discount cash fares and monthly passes, full-fare monthly passes and youth cash fares and passes. For purposes of this discussion, we will use an average fare of \$1.25 as an average of all the various fares collected.

In this manner, the cost of operating a fare-free zone in downtown Bellevue is estimated as approximately **\$50,000** per year, based on assumptions concerning current intra-CBD ridership and average fares collected.

Upon the completion of the RFA analysis conducted as part of this circulator study, the City's project team determined that a RFA was not to be included in an implementation scenario because:

- Many of the buses in downtown are Sound Transit service, which is not part of the partnership program, and would require further (likely longer) discussion and negotiation with Sound Transit and Metro, so it is therefore not a short-term implementation option;

- If implemented with Metro routes only, it would be confusing to the user, and not necessarily provide any real value as some of the best downtown coverage is provided by Sound Transit (Route 550);
- The objective is to provide circulation, which indicates an appropriate remedy is route restructuring, while also focusing on improving ease of use (transit signage/way-finding);
- Per King County Metro, fare free areas may not be eligible for partnership programs (which is one of the key parameters of this implementation plan);
- There are a host of significant operational and institutional issues which may not be resolvable in the short term for implementation.

IMPROVED TRANSIT INFORMATION

This section provides an overview of ways that transit information can be enhanced to provide better information to customers that aids in customer comfort, understanding and predictability of the transit system. Most of the existing transit stops in downtown Bellevue include only a transit pad, sign and sometimes a schedule. Routes with high boarding activity (25+ boardings per day) may include a shelter.

Improved Way-finding

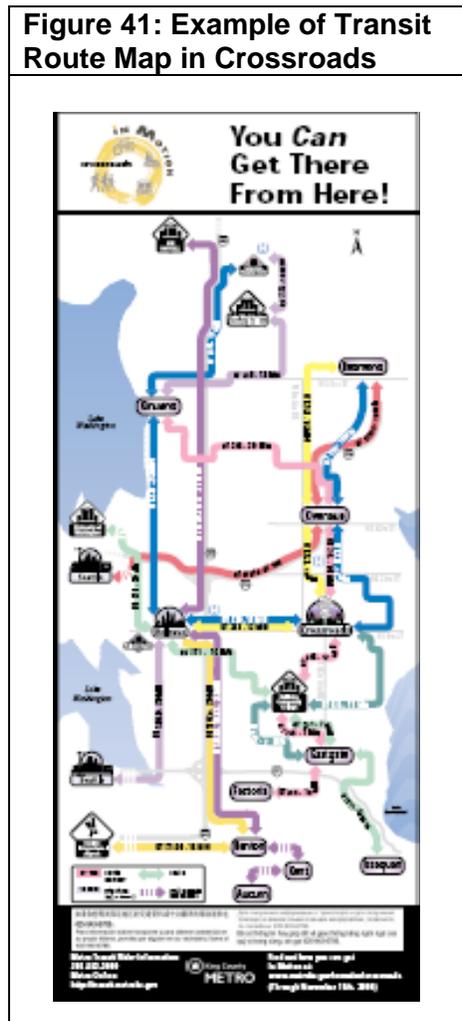
As mentioned previously, a coherent and consistent environmental graphics system to identify the service point for the potential user will increase awareness and ridership. There are a number of opportunities to enhance way-finding for existing transit services. The City is currently embarking on a downtown way-finding program that includes pedestrian directional signage and kiosks at key locations within the downtown area. The primary purpose of this way-finding is to direct riders to the Bellevue Transit Center, in addition to other key activity centers throughout downtown.

Way-finding can be enhanced at each transit stop, or primary stops, through the provision of better signage or kiosks that include a map of the transit routes. The City has conducted similar way-finding approaches in the Crossroads neighborhood, as part of a project called “Crossroads in Motion” that was conducted in 2004-05. The project goal was to increase transit ridership in the Crossroads neighborhood through enhanced transit signage and maps, and residential transit coordinators who helped persons, especially those who had limited English language skills, better understand how to use Metro transit service. The improved bus route signage included routing data, as well as detailed schedule information, and a specially designed map containing visual cues to help orient the rider with certain landmarks, primary destination names, and basic route paths. The map showed routes to and from Crossroads and travel times to various destinations. The information was visually communicated as much as possible to make the map accessible to non-English speakers. The signs provided Metro rider information, and In Motion and RTC contact information in addition to the map itself. The maps were installed in mid-size signage holders at 16 stops in the Crossroads neighborhood. Of the 16 stops, 14 had no signage at all before the change and two stops had mid-size signage holders already in place. A survey

that was conducted after the project showed successful results. The survey results showed the following major findings:

- 45% of the survey respondents had noticed the maps posted at bus stops in the area
- 90% found the maps easy to understand and thought the maps useful if installed in other neighborhoods
- 15% of those surveyed saw new places they could go by bus
- 9% of the respondents stated they took a new bus trip as a result of the map

An example of the route maps that were used in that neighborhood is shown in **Figure 41**.



Real Time Technology

New technologies related to Intelligent Transportation Systems (ITS) are very important when transit has become an integral part of the transportation system. The ITS program is a system that adds information and communications technology to transport infrastructure and vehicles. Its

goal is to manage factors that are typically at odds with each other, such as vehicles, loads, and routes to improve safety and reduce vehicle wear, transportation times and fuel costs.

ITS technology has been used as a result of traffic congestion, as a way to provide real-time control and communication. Real-time information (or Information Dissemination) websites allow passengers to confirm scheduling information, improve transfer coordination, and reduce wait times. Electronic transit status information signs at bus stops help passengers manage time, and on-board systems such as next-stop audio enunciators help passengers in unfamiliar areas reach their destinations. There are many benefits to real-time data technology. Below are examples of existing systems and the benefits that this technology has provided not only the customer, but also the agencies themselves providing this service.

Figure 42: Example of Real Time Information Display



Acadia National Park ITS Field Operational Test

A final report that evaluated this operational test incorporates the results of seven different individual test reports that examine customer satisfaction associated with the deployment of ITS at the Acadia National Park, in Maine. The park is visited by an increasing number of people each year, exceeding 2.5 million annually in 2002. The overall objective of the field operational test was to provide more timely and accurate traveler information to visitors regarding the Island Explorer free shuttle bus service, improve shuttle bus operations, reduce parking lot congestion and improve aesthetics and safety by decreasing the number of vehicles parked alongside roads, and enhance the growing tourist economy with improved mobility.

The objectives of the ITS Operational test, as identified in the report included:

1) Disseminate accurate and timely information to visitors regarding on-site parking, bus arrival and departure times, and on-board transit status information. The following activities were done as part of this test:

- Real-time bus departure electronic message signs were installed at the Visitor Center and the Jordan Pond House bus stops, and at the Village Green in Bar Harbor.
- Automated on-board next-stop enunciators were installed on each Island Explorer bus.
- Parking information was made available on the Acadia website (This parking information was available for a limited amount of time during the post-deployment evaluation period).

- 2) Assist Park Service managers and rangers with congestion management, mobility, and emergency response.
 - Automatic vehicle/ranger geo-location applications (planned but not deployed).
 - Entrance traffic volume recorders (planned but not deployed).
 - Parking lot monitoring devices (planned but not deployed, manual counts were collected instead to provide parking lot status information for two of the most popular parking lots).
- 3) Improve operations for the Island Explorer free shuttle bus service.
 - Island Explorer two-way voice communications were installed on buses.
 - GPS Automatic vehicle locator (AVL) system.
 - On-board automatic passenger counters (APC).
- 4) Enhance tourist economy
 - Real-time transit status signs and parking information were installed to reduce congestion, improve mobility, and allow visitors to manage time to visit local businesses.

Post-deployment data were collected during the summer tourist season of 2002. Mail-back questionnaires and interviews were used to measure impacts of ITS on customer satisfaction. A visitors' survey was conducted on the Island Explorer and at a number of selected sites within the Park from July 29 to September 1, 2002. These interviews along with a more extensive mail-back questionnaire were offered to visitors in order to garner more specific information on visitor awareness, use, and experience with ITS technologies at the Park. A total of 1,278 adults agreed to the mail-back survey, and 928 usable questionnaires were returned for a 74% response rate.

Transit Management

- More than 80% of visitors surveyed indicated the real-time bus departure signs and the on-board next-stop announcements made it easier for them to get around. 69-80% of visitors believed the ITS helped save them time.
- 44% of bus passengers who experienced real time parking information reported it helped them decide to ride a bus.
- Visitors who used ITS at Acadia and experienced ITS transit applications reported longer vacation stays than visitors who did not use ITS, or only used parking information. 58% of visitors who experienced ITS transit applications reported spending \$301 or more during their stay. Only 46% of visitors who did not use ITS reported spending this much.

Traveler Information

- More than 86% of visitors surveyed who experienced ITS at Acadia indicated the information they received was accurate, clearly understandable, and easy to use.

- Most respondents indicated they had a high-quality experience regardless of using (or not using) traveler information.⁶

Pilot Implementation of Public Transport Signal Priorities and Real-Time Passenger Information, Helsinki, Finland

This study evaluated a pilot project designed to provide real-time passenger information and signal priority to tram and bus lines in the City of Helsinki, Finland. Automated Vehicle Location (AVL) and Computer Assisted Dispatch (CAD) systems were installed on Tram Line-4 and Bus Line-23. In addition, transit signal priority was provided on each route, and real-time schedule information was displayed at each transit stop.

Field measurements were collected from April 1998 to May 2000 in order to evaluate the technical performance of each system in terms of service accessibility, travel times, punctuality, and regularity. The evaluation was conducted using records of in-vehicle data, interviews, surveys, simulations, and a representative test ride observations before and after system deployment.

Ridership

The field study showed the system had positive effects on the level-of-service for each mode of transportation. Overall, the improvements in bus line performance were greater than those for the tramline since the tramline had signal priority in operation prior to field testing.

Based on a cross-section of test ride observations, in-vehicle studies, and ticket sales information; the pilot project increased the number of tram passengers by 0-2%, and increased the number of bus passengers by 10-12%.

Delays, Travel Time, and Reliability

Delays at signals were reduced by 44% (1 min 13 sec) on the tramline, and 48% (3 min 18 sec) on the bus line. However, stop time for both modes increased slightly (3-5 sec) since drivers ahead of schedule increased their stop time to balance routing schedules.

Total travel times decreased 1% (21 sec) on the tramline, and 11% (3 min 18 sec) on the bus line. The reduction was primarily the result of reduced signal delays.

On-time arrival improved by 22% on the tramline, and 58% on the bus line.

Based on reductions in signal delay, travel time savings were estimated at 9 seconds per kilometer (sec/km). Since approximately 27 million passenger-miles per year accrued on the 8.1 km section of tramline; the system saved an estimated 67,500 passenger-hours per year. Correspondingly, the bus line saved 35,800 passenger-hours per year.

Customer Satisfaction Personal Interviews

⁶ Evaluation of Acadia National Park ITS Field Operational Test: Final Report

Approximately half of the persons interviewed used the line daily or almost daily. 71% of the tram passengers and 83% of the bus passengers noticed the traveler information displays. The displays were regarded as useful by 66% of the tram passengers and 78% of the bus passengers.

The most desirable features of the display were:

- Information on the remaining wait time;
- Option to choose another line;
- Understandability of the display; and
- Knowing if an expected vehicle had already passed so the rider could make use of remaining wait time.

Customer Satisfaction Surveys

More than half of the respondents used the line daily or almost daily with 90% of the respondents noticing a traveler information display. The displays were regarded as useful by 95% of the respondents.

The most desirable features of the display were:

- Knowing the remaining wait time; and
- Knowing if the expected vehicle had already passed.

Fuel Consumption and Emissions

Simulations were used to evaluate fuel consumption and emissions for buses before and after system deployment. The calculations considered the average total length of delays, and the amount of time buses were in motion and standing still. The simulation model (VEMOSIM) indicated the following:

- Fuel consumption decreased by 3.6%;
- Nitrogen oxides decreased by 4.9%;
- Carbon monoxide decreased by 1.8%;
- Hydrocarbons decreased by 1.2%; and
- Particulate matter decreased by 1%.

Costs of Systems

A Transit Cooperative Research Program (TCRP) synthesis report was reviewed that was available on the US Department of Transportation, ITS web page.⁷ The information presents real-time bus arrival information systems based on literature research and survey of transit agencies in the United States and abroad. The focus of the report is on bus systems, rather than all transit modes. While transit agencies initially deployed automatic vehicle location (AVL) systems to increase operational efficiency, the side benefit of being able to provide real-time bus

⁷ US Department of Transportation, ITS website; TCRP Synthesis 48: Real-Time Bus Arrival Information Systems

arrival information to customers was recognized by the transit agencies. The capital costs for the underlying AVL system and additional real-time information system (including the prediction model software cost) for a number of agencies are presented in **Table 6**. The total capital cost for the AVL and real-time information systems ranged from a low of \$60,000 for the Fairfax (Virginia) CUE with 12 AVL-equipped vehicles to more than \$70 million for the London Buses with an AVL-equipped fleet of 5,700. The cost information from other countries were exchanged into US dollars.

Table 6: Real-Time System Cost Comparison

Agency	Number of Vehicles with AVL	Type of AVL	Total Capital Cost of AVL System	Additional Capital Cost for Providing Real-Time Information	Prediction Model Software Cost as Reported
RTD	1,111	GPS	\$15,000,000	\$1,000,000	NR
City Bus	25	GPS	\$150,000	N/A	NR
DTC	189	GPS	\$12,000,000	\$500,000	NR
Fairfax CUE	12	GPS	\$60,000	Included in AVL cost	Included in AVL cost
Glendale Beeline	20	GPS	\$171,000 (includes the capital cost of 2 signs)	Included in total AVL cost	Included in AVL cost
LADOT/LACMT A—Metro Rapid System	150	Loop inductors	\$2,100,000 (includes cost of transit priority system – signal equipment, roadway sensors, etc.)	\$600,000	\$300,000
San Francisco Muni	827	GPS	\$9,600,000	Included in AVL cost	Included in AVL cost
Tri-Met	689	GPS	\$7,000,000	\$750,000	Included
ATC Bologna	450	GPS	\$4,891,400	\$782,600	Developed with internal resources
Kaohsiung	250	GPS	\$187,500	\$187,500	
Taichung	250	GPS	\$187,500	\$187,500	
Taipei	135	GPS	\$270,000	\$300,000	\$20,000
London Buses	5,700	Signpost	\$23,251,500-\$27,901,800	\$46,503,000 estimated for 4000 signs	NR
YTV	340	DGPS and Signpost	\$1,400,000	\$1,100,000	\$250,000
Centro	6	GPS	\$705,300	NR	NR
King County Metro	1,300	Signpost	\$15,000,000	\$1,000,000 to upgrade on-board hardware plus \$250,000 in software	\$500,000
Dublin Bus	156	GPS	\$660,300	\$97,900	\$81,000
Kent County Council	141	DGPS	\$2,000,000	Included in AVL cost	Included in AVL cost

The annual operating and maintenance (O&M) costs for the underlying AVL system and additional real-time information system are presented in **Table 7**. Many of the responding agencies were not able to provide the annual O&M costs of these systems. This lack of information is due in part to the difficulty in allocating tangential costs (e.g., communication, utility, and software maintenance) across systems and components.

Table 7: Real-Time Operating and Maintenance Cost Comparisons

Agency	Number of Vehicles with AVL	Total Annual O&M Cost of AVL System	Total Annual O&M Cost for Providing Real-Time Information	Annual Maintenance Cost for Prediction Model Software Cost as Reported
RTD	1,111	NR	\$150,000	NR
City Bus	25	NR	[no data provided]	[no data provided]
DTC	189	\$200,000	\$150,000	NR
Fairfax CUE	12	NR	\$30,000	NR
Glendale Beeline	20	Included in AVL cost	Included in AVL cost	Included in AVL cost
LADOT/LACMTA—Metro Rapid System	150	NR	N/A	Negligible
San Francisco Muni	827	\$1,300,000	Included in AVL O&M cost	Included in AVL O&M cost
Tri-Met	689	\$200,000	\$100,000	NR
ATC Bologna	450	\$391,308	\$48,914	NR
Kaohsiung	250	\$112,500	\$37,500	NR
Taichung	250	\$112,500	\$37,500	NR
Taipei	135	\$87,750	\$200,000	\$30,000
London Buses	5,700	\$7,750,500	Included in cost of real-time system	NR
YTV	340	\$100,000	NR	NR
Centro	6	\$41,233	\$38,753	NR
King County Metro	1,300	\$400,000	[no data provided]	[no data provided]
Dublin Bus	156	\$111,816	\$22,363	NR
Kent County Council	141	\$60,000	Included in AVL cost	NR

Notes: RTD = Regional Transportation District;

NR = not reported;

N/A = not available;

DTC = Delaware Transit Corporation;

CUE = City-University-Energysaver;

LADOT/LACMTA = Los Angeles DOT/Los Angeles County Metropolitan Authority;

Tri-Met = Tri-County Metropolitan Transportation District of Oregon;

ATC Bologna = Azienda Trasporti Consorziati Bologna;

YTV = Helsinki Metropolitan Area Council.

CHAPTER 7: IMPLEMENTATION

This chapter provides an overview of three scenarios for potential implementation of an improved downtown Bellevue transit circulation system by the City of Bellevue and King County Metro. These three scenarios were developed based upon a review of the route options and alternative assessments described in Chapters 5 and 6.

While the results of the route option evaluation showed that the “Old Bellevue” (Option B) route had the best overall score (due to its service to a greater number of residents and activity centers and relatively tight route structure), it was felt by project team members that the travel time could be slowed due to the congestion that occurs on Main Street in Old Bellevue. Furthermore, it was agreed that the “Core Route” (Option A) came close enough to Old Bellevue (Main Street at Bellevue Way) that this part of downtown was adequately served.

The “Hybrid” (Option D) route also scored well as part of the evaluation. However, the length of this route would result in substantial operating costs, and again, the spur to Old Bellevue was seen as a potential drawback due to potential for slower operating speeds.

The “Core” route was seen as the best potential circulator route to serve the most number of major activity centers, population and employment, while being the most likely to have a relatively low operating cost.

The Overlake Hospital Route (Option C) scored relatively well, and meets the need to serve the hospital. In addition, the 2001 Recommended Route (Option F) scored relatively well, only because it serves the greatest number of employees, residents and major activity centers. However, the lengthy route and significant operating costs made this option fatally flawed.

The “Northeast Quadrant” route had the lowest score, due to its inability to provide access to most of the downtown’s major activity areas. While it connects Overlake Hospital to downtown, it was felt by the project team that the circulator should be more focused on downtown.

Because the provision of better service to the Overlake Hospital area was identified as an important need by stakeholders, it was determined that implementation scenarios should try to respond to that need. The implementation scenarios focused on serving the major activity, employment and residential centers within the core of downtown and identified other ways to better connect Overlake Hospital to downtown. The following three possible implementation scenarios were identified for more detailed analysis:

- Option 1 – Core Downtown Route with Modification to Route 222/233
- Option 2 – Overlake Hospital Route
- Option 3 – Modifications to Existing Metro Routes

COST ESTIMATION

Cost Methodology for Circulator and Modified Bus Routes

King County Metro was contacted to determine the best methodology for developing estimated operating costs for each of the implementation scenarios. King County's *Transit Now* ordinance requires that operating cost estimates be a fully allocated cost. This cost includes costs related to fuel, drivers, maintenance, signage, scheduling, and new stop and shelter facilities. The following have been identified as the currently-applicable unit operating costs for services provided by that agency:

Table 8: Costs per Vehicle Type

Vehicle Type	Cost per Platform Hour	Cost per Platform Mile
Van (19+ passenger)	\$83.71	\$1.47
30-foot Bus	\$83.71	\$1.93
40-foot Bus	\$83.93	\$2.13
60-foot (Articulated) Bus	\$84.93	\$2.79
Hybrid	\$84.57	\$2.49

In order to calculate the estimated operating costs for any alternative, it is first necessary to calculate the platform hours and miles operated by the alternative and then apply to corresponding cost coefficients based upon the type of vehicle being used to operate that alternative. Costs for platform hours are additive to costs for platform miles.

For the modifications to existing Metro services, platform hours appear to remain unchanged for each of the routes having their downtown Bellevue alignments modified – that is, any increases in running time can be absorbed into the existing schedule. In that case, the operating cost impacts arise solely from an increase or decrease in the length of the downtown route alignment, since the deadhead miles to or from the operating base also remain unchanged.

In some cases, some assumptions will be made as to the type of vehicle or mix of vehicles assigned to each alternative. Cost factors from **Table 8** will be used based on those assumptions.

An average operating speed in downtown Bellevue of 8 miles per hour will be used, inclusive of all stops for passenger pickup and drop-off, traffic signals and traffic delays, in calculating running times based on route alignment lengths. Where needed, an average of 18 miles per hour will be used to calculate vehicle deadhead time between the East Operating Base and downtown Bellevue.

Operating costs for each vehicle will be calculated for the circulator alternative and will be summed to arrive at an operating cost total for that alternative. Capital costs will be based on the most recent information gathered from King County Metro for such items as shelters and signs.

SCENARIO 1 – CORE ROUTE WITH MODIFICATIONS TO ROUTE 222/233

Core Downtown Route

This implementation scenario combines the development of a “core” circulator route with a restructured Route 222/233. The “Core Downtown” route, as shown in **Figure 43**, is a simple one-directional route in a rectangular form. The 2-mile long route would begin along 110th Avenue NE at the Bellevue Transit Center, moving in a southbound (clockwise) direction. A new stop would need to be added on the west side of 110th Avenue NE in the vicinity of the transit center, either north or south of NE 6th Street. Moving southward, the route would turn west onto Main Street, then traverse north along Bellevue Way. At NE 10th Street, the route would turn east, and then turn south at 110th Avenue NE, and head back to its origin at the transit center. The travel time in one direction is approximately 15 minutes (at an average travel speed of 8 mph). One transit stop would be located at approximately every superblock. Ten new transit stops would be needed where they are currently missing, primarily along 110th Avenue NE, but also on Bellevue Way and NE 10th Street. Transit stops would include new signage including a route map, but no new shelters would be required. It is recommended that the layover occur either at or near the Bellevue Transit Center, or on the south side of NE 10th Street between 106th Avenue NE and 108th Avenue NE. Service would operate at 10 minute headways between the hours of 6 a.m. and 7 p.m. on weekdays, and between 9 a.m. and 7 p.m. on Saturdays and Sundays.

Operating and Capital Costs

The estimated annual operating and one-time capital costs are shown below in **Table 9**. Operating costs are based on a combination of cost per platform hour and cost per platform mile for a 19-passenger van, as explained in the previous section. The operating cost is for the first year of operation (2008), and the costs would increase per year at an inflation rate of 5 percent.

Capital needs include new circulator related signage with maps. Transit stops are included as part of the operating costs, based on a discussion with King County Metro. A total of 3 19-passenger vans (including one as a spare) would likely be provided by King County Metro, however, there may be some costs associated with repainting vehicles to have a unique look.

In addition, there would be costs incurred by partner agencies for marketing the service. An estimate of \$20,000 has been assumed, however, marketing costs could vary.

Reconfigured Routes 222 / 233

In addition to the circulator route, which does not provide any service to the Overlake Medical Center complex on 116th Avenue NE, Scenario 1 also includes provisions for modifications to Route 222 and Route 233. Early next year, King County Metro is planning to interline routes 222 and 233 through downtown Bellevue, as shown by the solid line in Figure 44. Currently, route 222 is a long, circuitous route that currently serves Overlake, Bellevue Community College, Eastgate and Factoria before entering downtown Bellevue from the south along Bellevue Way SE. Route 233 currently serves the Bear Creek Park and Ride enroute to Bellevue via Bel-Red Road. By moving the proposed interlined route to 116th Avenue NE, via NE 8th Street, Overlake Hospital is better served. This modification would not have any effect to the route length or travel time, and therefore does not incur any additional operation costs.

Figure 43: Core Route



Table 9: Core Route Estimated Operating and Capital Costs

Item	Core Circulator Route One Direction 10 minute headway
Annual Revenue Hours	8,840
Annual Revenue Miles	66,300
Annual Operating Costs ^{1,2,3}	
Weekday (6 a.m. to 7pm)	\$664,560
Weekend (9 a.m. to 7pm)	\$206,752
Total	\$871,312
Marketing costs	\$20,000
One Time Capital Costs	
New map signage ⁴	\$30,000 (15)

Notes:

1. Cost is based on 2007 fully allocated cost of \$83.71 per hour; \$1.47 per mile for a 19 passenger van (King County Metro)
2. Costs for platform mile include routing to layover inside BTC, and 1.6 mi. each way to Bus base
3. Annual cost should be inflated by 3% per year; Inflation costs would be funded by city
4. Cost for a route map sign estimated at \$2000 per stop

When the NE 10th Street overpass of I-405 is completed, scheduled for 2009, it is recommended that the Route 222/233 use that facility to return to downtown Bellevue, bypassing the traffic congestion and delay often experienced on NE 8th Street in this area.

Figure 44: Route 222/233 Modifications to Serve Overlake Hospital



Benefits and Constraints

Benefits

- Core route offers a simple, easy to understand route structure
- Serves key major activity centers in the downtown core
- Core route provides access to northern and southern peripheries of downtown
- General ease of routing (all right turns, no failing intersections) for core route
- Has the lowest operating cost
- Overlake Hospital served better without impacting circulator

Constraints

- Core route does not serve Overlake Hospital area
- Route is one-directional which may deter some riders

Needs

- Three buses for core (including one spare)
- Installation of 10 new stops for core route
- 15 signage maps for core route
- Marketing materials as needed

SCENARIO 2 – OVERLAKE HOSPITAL ROUTE

This implementation scenario includes a circulator route that builds off the “Core Route” to extend to the Overlake Hospital area, as shown in **Figure 45**. The route length is 3.16 miles. From NE 10th Street, the route continues east, then north on 112th Avenue NE, east on NE 12th Street, south on 116th Avenue NE, then west on NE 8th Street back to 110th Avenue NE. When the NE 10th Street extension is opened, it is recommended that the route use NE 10th Street to reduce travel time associated with congestion along NE 8th Street. The travel time in one direction is approximately 24 minutes (at an average travel speed of 8 mph). It is recommended that the route operate in two directions due to the significant travel time. One transit stop would be located at approximately every superblock (for a total of 38 stops in both directions). This would require 21 new stops in addition to the 17 existing stops. Transit stops would include a pole with new signage including a route map. In addition, it is recommended that a shelter be added at the library and at Whole Foods, as these are major activity areas that are set back from the sidewalk, where there are limited opportunities to use existing building canopies for shelter.

The service should start with 19-passenger vans, rather than buses, to keep operating (fuel) and capital costs lower, but could eventually upgrade to 30 foot small buses.

Service could operate at 10 minute or 15 minute headways between the hours of 6 a.m. and 7pm on weekdays, and between 9 a.m. and 7pm on Saturdays and Sundays. For a 10-minute headway, it is recommended that layovers occur at the transit center. For a 15-minute headway, it is recommended that layovers for drivers be accommodated through the use of a rollback, or “Extraboard” rather than having a designated layover space. The extraboard driver is used to relieve regular bus drivers in order to maintain 15 minute headways between buses.

Operating and Capital Costs

The estimated annual operating and one-time capital costs are shown below in **Table 10**. Operating costs are based on a combination of cost per platform hour and cost per platform mile for a 19-passenger van, as further explained in the previous section. The operating cost is for the first year of operation (2008), and the costs would increase per year at an inflation rate of 5 percent. **Table 10** below shows the costs for both a 10 minute headway and a 15 minute headway operation. Both headway options are also shown for one direction and two direction routing. The operating cost for a two-directional 15 minute headway service is approximately \$2.4 million, while the operating cost for a two-directional 10 minute headway service is approximately \$2.6 million. The reason for the relatively small difference in cost is due to the extraboard associated with the 15 minute headway service. This extraboard would be needed throughout the day, at every hour when layovers are conducted. The extraboard cost is approximately 85 percent of the hourly cost associated with a regular driver.

Figure 45: Overlake Hospital Route



Table 10: Overlake Hospital Route Estimated Operating and Capital Costs

Item	Circulator 1 Direction 10 min	Circulator 2 Directions 10 min	Circulator 1 Direction 15 min ⁴	Circulator 2 Directions 15 min ⁴
Annual Revenue Hours	13,936	27,872	8,840	17,680
Annual Revenue Miles	97,068	194,136	64,704	129,408
Annual Operating Costs ^{1,2,3}				
Weekday (6 a.m. to 7pm)	\$994,240	\$1,988,480	\$912,470	\$1,824,940
Weekend (9 a.m. to 7pm)	\$309,296	\$618,592	\$283,936	\$567,872
Total	\$1,303,536	\$2,607,072	\$1,196,406	\$2,392,812
Marketing Costs	\$20,000	\$20,000	\$20,000	\$20,000
One Time Capital Costs				
New map signage ⁵	\$30,000 (15)	\$76,000 (38)	\$30,000 (15)	\$76,000 (38)

Notes:

1. Cost is based on 2007 fully allocated cost of \$83.71 per hour; \$1.47 per mile for a 19 passenger van (King County Metro)
2. Cost per mile includes routing to layover inside BTC, and 1.6 mi. each way to Bus base
3. Annual cost should be inflated by 3% per year; Inflation costs would be funded by city
4. 15 minute headway scenario assumes 2 buses, with extraboard layover
5. Cost for route map sign estimated at \$2,000 per stop

Benefits and Constraints

Benefits

- Provides regular service between Overlake Hospital area and downtown core.
- Serves 39,173 employees within 1/8 mile of route.
- Serves 8,058 residents within 1/8 mile of route.
- Serves key major activity centers in the downtown core.
- Has the highest ridership of all implementation scenarios.
- Longer travel time is off-set by two-directional movement.

Constraints

- Requires two directional operation.
- Has a significant operating cost.
- Has higher capital costs due to more stops, shelters, and buses.

Needs

- 6 – 8 vans, depending on headway (including spares).
- Installation of 21 new stops, including 2 shelters.
- 38 signage maps for route.
- Marketing materials as needed.

SCENARIO 3 –RESTRUCTURED METRO ROUTES (222, 230, 233, 234, 240)

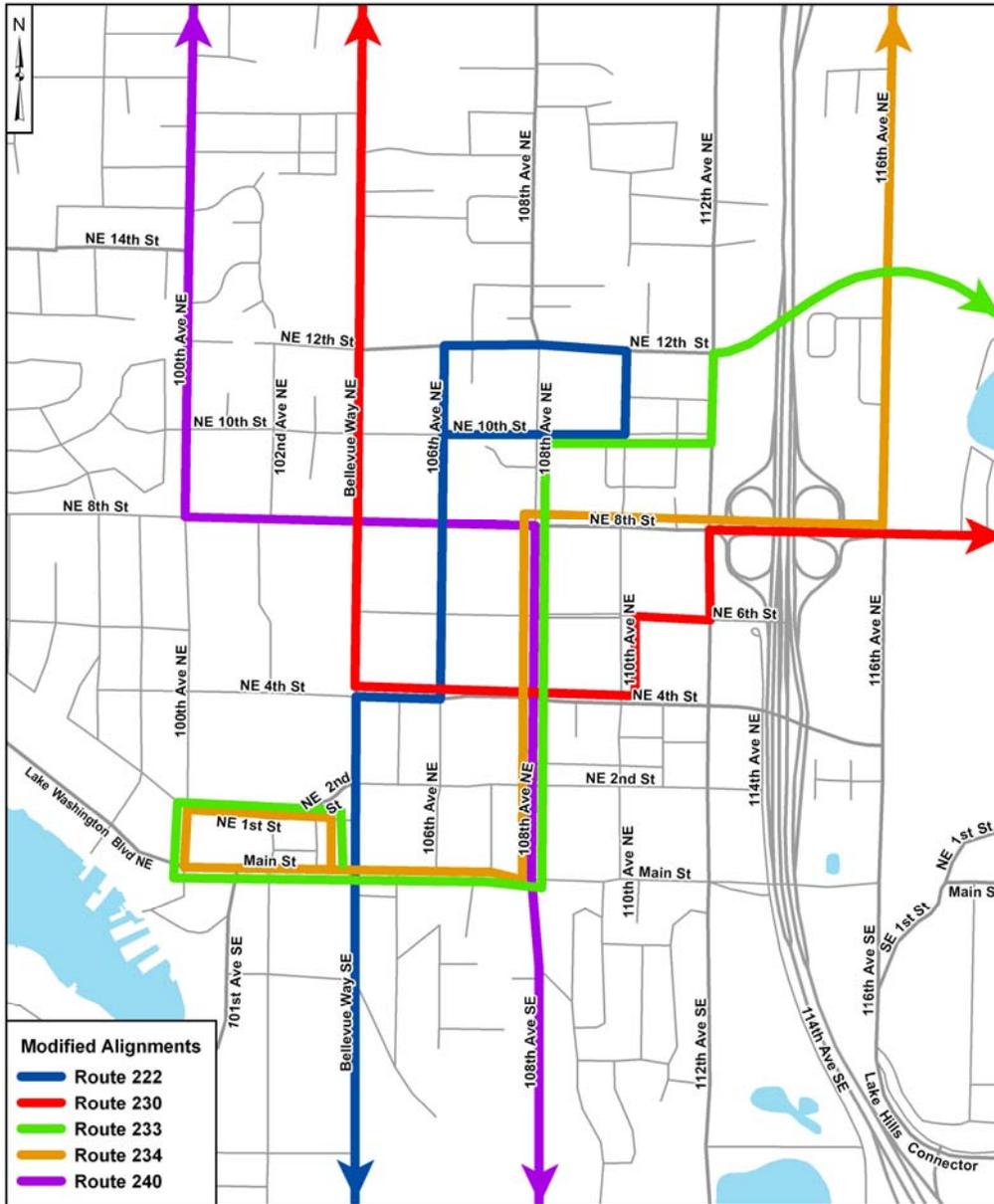
Restructured Existing Routes

Current route alignments in downtown Bellevue have been selected to provide maximum geographic coverage of the downtown area at the expense of service frequency. Thus, while nearly every location in downtown Bellevue is served by one or more transit routes, the frequency of service provided by those routes is often inadequate to promote transit usage. Many of the existing routes have long headways (the spacing between trips operating on the same street in the same direction) or simply do not operate at all during certain periods of the day. Additionally, given the many unique route alignments through downtown Bellevue used by these many routes, it is very difficult for the casual rider to know in advance just which bus he should catch to get to his desired destination and to return.

This implementation scenario assumes the restructuring of Metro routes 222, 230, 233, 234 and 240, all which circulate through downtown Bellevue. Each operates all day, offering service every 30 minutes weekdays. By making a few modest modifications to these existing routes in the downtown core, service frequencies along a central loop, similar to the stand-alone “Core Route” loop, can be enhanced and by adopting similar alignments for each route in downtown Bellevue, the apparent complexity of transit routing in this area can be reduced.

Figure 46 shows the existing downtown route alignments of these four routes. As the figure demonstrates, the route alignments of the four routes through downtown Bellevue are spread over several of the major arterial streets in the core, resulting in a relatively confusing network with fairly light (every 30 minutes) service frequencies on each.

Figure 46: Existing 222, 230, 233, 234 and 240 Alignments



Modified Alignments

- Route 222
- Route 230
- Route 233
- Route 234
- Route 240

Perteeet

0 500 1,000 Feet

Data Sources: King County

**2007 Downtown Bellevue
Circulator Implementation Plan
Modified Route Alignments
Figure 46**

Route 222/233

Route 222 currently serves Overlake, Bellevue Community College, Eastgate and Factoria before entering downtown Bellevue from the south along Bellevue Way SE, continuing via NE 4th Street and 106th Avenue NE. The current route terminus is located in the northern portion of downtown Bellevue near the intersection of 110th Avenue NE and NE 10th Street.

Route 233 serves the Bear Creek Park and Ride and Overlake enroute to Bellevue via Bel-Red Road. Route 233 enters downtown Bellevue via NE 12th Street, continuing via 112th Avenue NE, NE 10th Street, 108th Avenue NE and Main Street to its terminus in Old Bellevue.

Early next year, it is planned to interline routes 222 and 233 through downtown Bellevue as shown in the following figure, operating via Bellevue Way, NE 4th Street and 108th Avenue NE. Downtown Bellevue circulation is served relatively well by the planned 222/233 alignment. However, by moving the east-west connection from NE 4th Street to Main Street, the 108th Avenue/Main Street downtown circulation pattern can be reinforced.

The proposed change and recommended modifications are illustrated in **Figure 47**. The proposed modifications appear to affect neither the route alignment length nor the travel time of route 222/233 and therefore are unlikely to have any operating cost consequences. Given the minor alignment modification, it is unlikely that a negative ridership impact will be experienced by existing riders as a result of this change.

Figure 47: Existing and Proposed Modifications to Route 222/233 Alignment



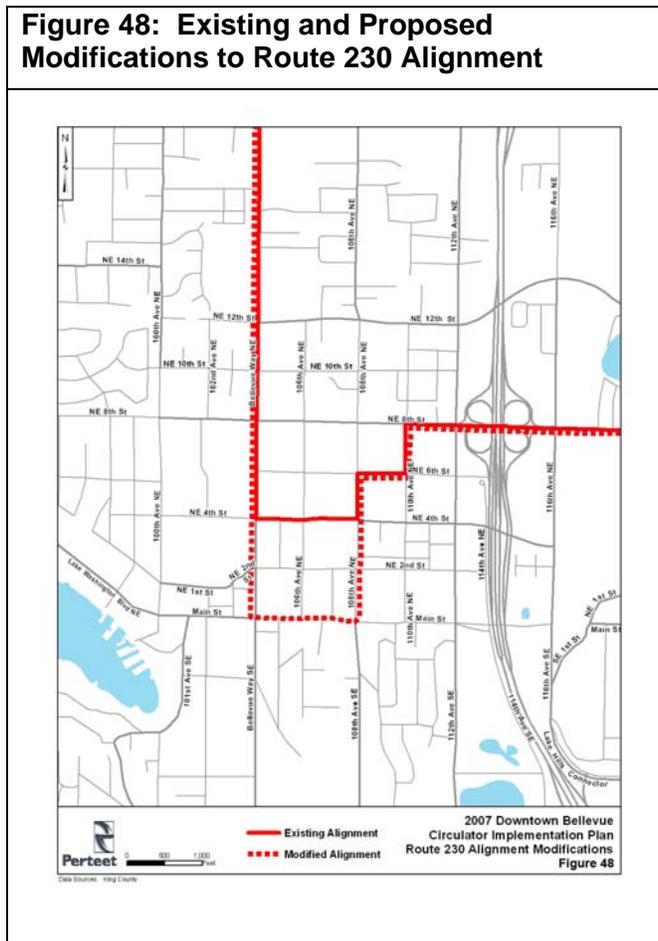
Route 230

Route 230 provides service from the Kingsgate Park and Ride and downtown Kirkland through downtown Bellevue, continuing to Crossroads, Overlake and Redmond. Route 230 enters downtown Bellevue from the north via Bellevue Way NE, continuing via NE 4th Street, 108th Avenue NE and the Bellevue Transit Center before existing eastward via NE 8th Street.

A relatively short extension of the route 230 alignment in downtown Bellevue south to Main Street could improve access to the southern downtown core and Old Bellevue for existing riders as well as reinforcing the Bellevue Way / Main Street / 108th Avenue NE downtown circulation pattern. The proposed modifications add approximately one-half mile to the route alignment length and approximately 7 minutes round trip travel time. Travel times for existing riders from the north who are bound for the Bellevue Transit Center would be increased by approximately three to four minutes. This extra running time in each direction appears to be able to be absorbed within the existing schedule, currently providing approximately 24 minutes of recovery time at the Kingsgate Park and Ride and another eight minutes in Redmond on each trip.

It is anticipated that any negative impacts to existing ridership will be negligible. The proposed extension to the edge of Old Bellevue should increase total ridership over time. The proposed route 230 modification is depicted in **Figure 48**.

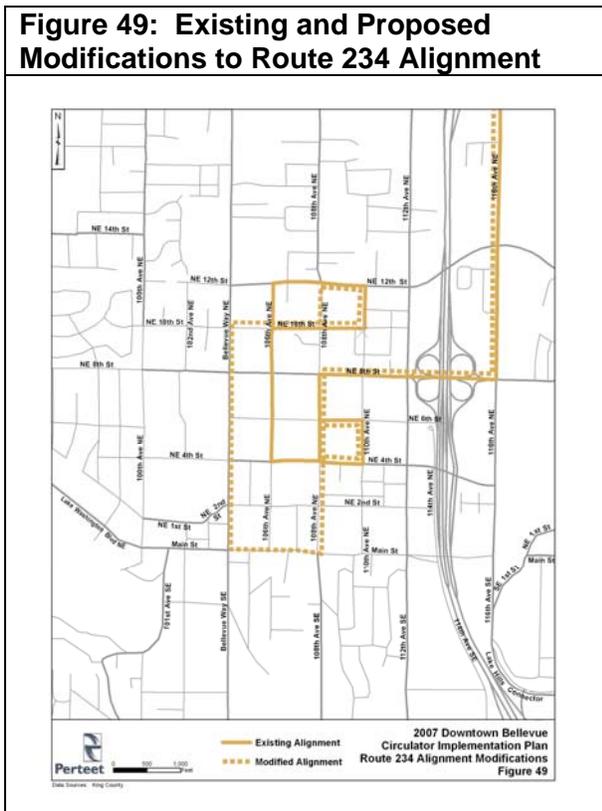
Figure 48: Existing and Proposed Modifications to Route 230 Alignment



Route 234

Route 234 serves Kenmore, Juanita and Kirkland enroute to Bellevue via 116th Avenue NE. Route 234 enters downtown Bellevue via NE 8th Street, continuing via 108th Avenue NE, NE 4th Street, 106th Avenue NE to its terminus in the northern section of the CBD. Downtown Bellevue circulation along the eastern and southern boundaries is currently served relatively well by the existing alignment. However, it could be improved on the western edge of the CBD by extending its existing alignment north on Bellevue Way from 4th Street to NE 12th and providing a new terminus near NE 10th street and 110th Avenue NE in the northern area of the CBD. The proposed modifications are illustrated in **Figure 49**.

Figure 49: Existing and Proposed Modifications to Route 234 Alignment



The proposed change adds approximately 0.77 mile to the alignment in each direction and approximately 12 minutes round trip running time. As with route 233, it appears to be possible to incorporate this extension into the existing schedule since route 234 is given approximately 17 minutes recovery time in Kenmore and another 20 minutes in Bellevue on each trip.

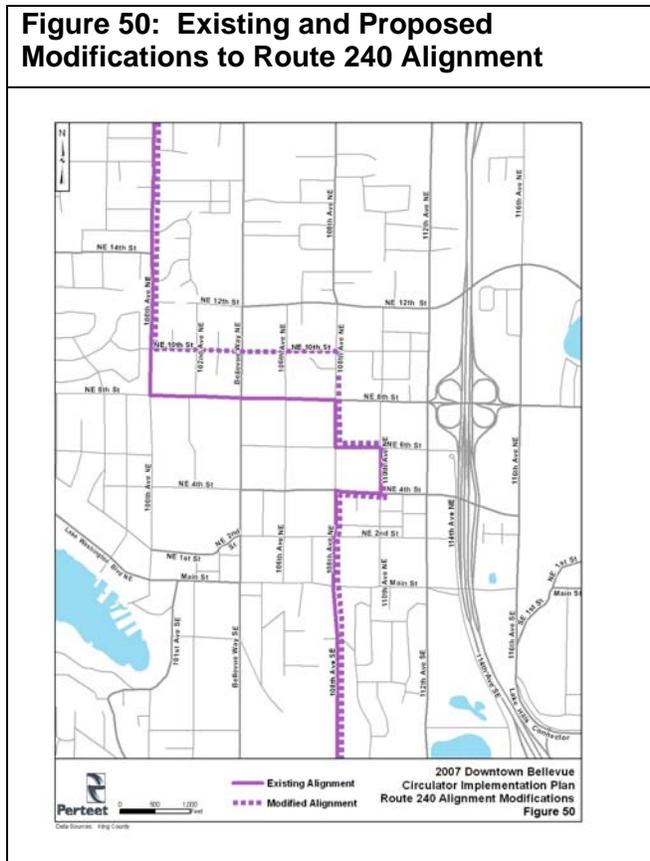
Route 240

Route 240 serves Clyde Hill enroute to Bellevue via 100th Avenue NE. Route 240 enters downtown Bellevue via NE 8th Street, continuing via 108th Avenue NE out of the south end of the CBD on its way to Factoria, Newport Hills and Renton.

Downtown Bellevue circulation could be slightly improved by moving from NE 8th Street to NE 10th Street, strengthening that corridor in the northern portion of downtown. This, however, would slightly negatively impact service to the Bellevue Square. The proposed modifications are illustrated in **Figure 50**.

The proposed change does not add to the existing alignment and might save a minute or two by avoiding traffic congestion on NE 8th Street. As such, there are no apparent schedule concerns associated with this proposed change. The move away from Bel Square could slightly impact existing riders, although it might benefit those not destined for points along NE 8th Street.

Figure 50: Existing and Proposed Modifications to Route 240 Alignment



Summary

The proposed modifications to the five routes described above, routes 222, 230, 233, 234 and 240 will all reinforce the primary downtown Bellevue circulation loop of NE 10th Street, 108th Avenue NE, Main Street and Bellevue Way NE. This loop passes quite close to a large majority of the identified downtown activity centers and they all appear able to be implemented at little or no additional operating cost. Since each of these routes operates every 30 minutes during the entirety of the weekday service period, service frequencies along the loop will be approximately 10 trips per hour in each direction.

If this scheme were adopted using existing schedules in downtown Bellevue, the trips would pass by the Bellevue Transit Center on 108th Avenue NE between noon and 1:00 PM according to the schedule shown in **Table 12**. As this table indicates, a small shift in selected route leave times could provide service at a more uniform spacing in both directions. The resulting downtown Bellevue circulation loop created by these changes is shown in **Figure 51**.

The Bellevue Transit Center currently operates as a time transfer during off-peak periods. Therefore, spreading trip times could have a negative impact to non-Bellevue downtown rides.

Table 11: Existing BTC Arrival Times by Route, Noon to 1:00 PM

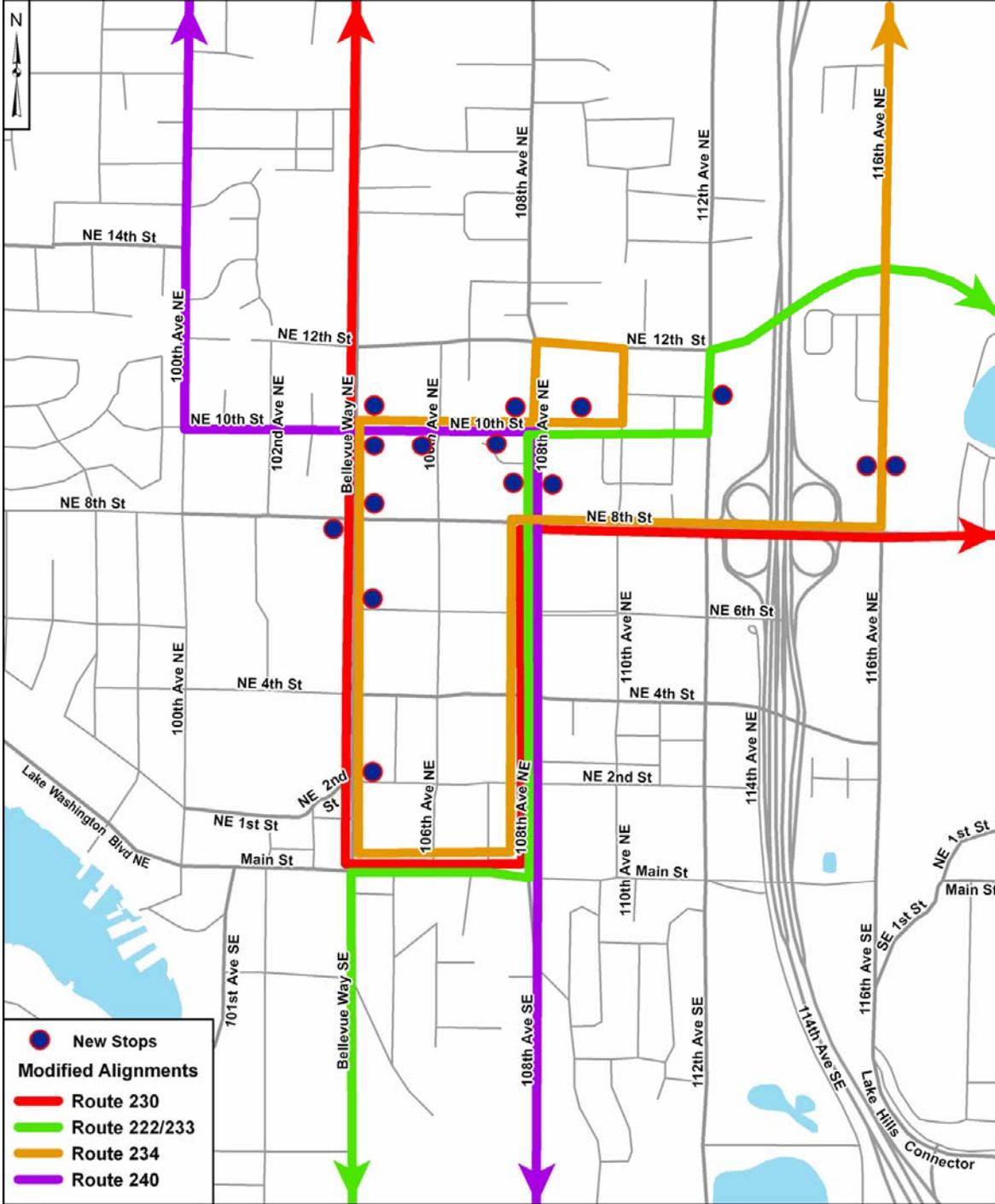
South or Westbound		North or Eastbound	
Route	Time	Route	Time
240	12:05	233	12:05
222	12:08	234	12:05
230	12:20	230	12:20
234	12:27	240	12:28
240	12:35	233	12:35
222	12:38	234	12:35
230	12:50	230	12:50
234	12:59	240	12:58

Table 12 summarizes the operating cost impacts of the modifications to routes 222, 230, 233, 234 and 240 in 2007 dollars.

Table 12: Estimated Operating Costs of Route Modifications

Route	Vehicle Type	Changes in		Number of Trips			Total Miles	Cost Factor	Total Cost
		Travel Time	Route Length	Weekday	Saturday	Sunday			
222	30-foot	no change	no change	58	44	29	0	\$1.93	\$0
230	40-foot	3.5 minutes	0.5 miles	86	55	35	13,359	\$2.13	\$28,455
233	40-foot	No change	No change	50	22	0	0	\$2.13	\$0
234	40-foot	6.0 minutes	0.8 miles	58	25	0	12,779	\$2.13	\$27,220
240	30-foot	-1.0 minute	no change	67	58	32	0	\$1.93	\$0
Total				319	204	96	37,173		\$55,675

Figure 51: Proposed CBD Route Alignments



**2007 Downtown Bellevue
Circulator Implementation Plan
Modified Route Alignments
Figure 51**

New Stops

The restructuring of routes will require additional new stops in downtown Bellevue where they are currently missing. It is recommended that new stops be added at the following locations:

- 108th Avenue NE (northbound) between NE 8th Street and NE 10th Street
- 108th Avenue NE (southbound) between NE 8th Street and NE 10th Street
- NE 10th Street (eastbound) near 106th Avenue NE
- NE 10th Street (westbound) between Bellevue Way and 106th Avenue NE
- NE 10th Street (eastbound) between 106th Avenue NE and 108th Avenue NE
- NE 10th Street (westbound) between 106th Avenue NE and 108th Avenue NE
- NE 10th Street (westbound) between 108th Avenue NE and 110th Avenue NE
- Bellevue Way (northbound) near NE 2nd Street
- Bellevue Way (northbound) near NE 6th Street
- Bellevue Way (northbound) near NE 8th Street
- Bellevue Way (southbound) near NE 8th Street
- Bellevue Way (northbound) near NE 10th Street
- 112th Avenue NE (northbound) between NE 10th Street and NE 12th Street
- 116th Avenue NE (northbound) north of NE 8th Street
- 116th Avenue NE (southbound) north of NE 8th Street

In addition to the stops, other capital costs may include improved signage at major bus stops throughout downtown, and particularly along the restructured routes. For the purposes of this study, it is assumed that approximately 20 stops would have enhanced signage. Estimated capital costs are shown in **Table 13**.

Table 13: Estimated Capital Costs of Route Modifications

One Time Capital Costs	
New transit stops ¹	\$3,000 (15)
New map signage ²	\$40,000 (20)

Notes:

1. Typical transit stop cost is \$200 for installation of new pole/sign
3. Cost for route map sign estimated at \$2,000 per stop

Benefits and Constraints

Benefits

- Least costly of all implementation scenarios
- Serves key major activity centers in the downtown core
- Uses existing Metro routes, thereby reducing need for added operating costs

Constraints

- Less easily understood than a stand alone circulator
- Loop does not provide as good of coverage to east side of downtown as circulator routes.

- Fares within the downtown area would be a deterrent toward added ridership.
- May negatively impact existing riders on these routes

Needs

- Installation of 15 new stops
- 40 signage maps for route
- Marketing materials as needed

RIDERSHIP ESTIMATION

We have estimated the existing volume of intra-CBD transit ridership at approximately 40,000 rides per year (as described earlier). This assumes current routing through downtown Bellevue and retention of the existing fare structure.

However, the implementation of a new downtown transit-circulation system will change both the fare structure and the route structure in the CBD area. Both changes should greatly improve ridership. The question is – how much?

Unfortunately, we don't have any hard data to support a rigorous ridership analysis. To do that, we would need much better information concerning existing intra-CBD travel and access to potential user surveys of downtown residents, shoppers and workers to help quantify the existing market for improved downtown circulation.

Lacking both of these, we are left with an approach of finding some similar operation elsewhere and imputing similar operating results to a downtown Bellevue operation. Fortunately, we have a relatively comparable one right here in western Washington – the downtown DASH service that operates Monday through Saturday in downtown Olympia, connecting the northern Olympia CBD, including the Farmers' Market, with the State Capitol Campus.

Now in its second year of operation, the DASH service, serving an employment base of about 18,000 persons, provides a similar service to that envisioned for the Bellevue circulator. Service operates every 12 minutes on weekdays and somewhat less often on Saturdays. No Sunday service is currently available.

At its existing service levels, DASH demonstrates a productivity of 18.3 riders per revenue hour based on 2007 utilization, a respectable level for a downtown circulator. With a core downtown employment of just over 32,000 the Bellevue circulator should produce productivities rivaling those of Olympia.

From this analysis, we anticipate an eventual productivity of a downtown circulator of somewhere in the 20 – 25 riders per revenue hour range on weekdays and probably about half that on weekends, if applicable. Given projected service of 13 hours per day (equaling 26 revenue hours per day for the core route), and 10 service hours on weekends (equaling 20 revenue hours per day for the core route), we would expect annual ridership ranging between 150,000 for the core circulator route (See **Table 15**). For the Overlake Hospital circulator route, we estimate that the ridership would have an increase of 40 percent over the Core route (30 percent to account for the bi-directional movement, and 10 percent for the added employment

base), given that it is serving approximately 4,000 more employees, and that it operates in two directions. An Overlake Hospital route that operates at a 15 minute headway would likely have fewer riders. An estimate of a 30 percent increase over the one-way core route was used for this scenario. This estimate assumes that the ridership in initial years would likely be lower, but could increase to these levels after people become more familiar with the routes.

Table 15: Estimated Ridership for Scenarios

Route	Annual Revenue Hours	Ridership
Core Circulator - 10 minute headway (1 dir)	8,840	156,000
Overlake Circulator - 10 minute headway (2 dir.)	27,872	218,400
Overlake Circulator - 15 minute headway (2 dir.)	17,680	202,800
Restructured Routes 222, 230, 233, 234, 240	NA	35,000-50,000

Notes:

Ridership based on 20 riders per revenue hour weekdays and 10 riders per revenue hour on weekends

It is likely that the option modifying routes 222, 230, 233, 234 and 240 in downtown might not carry quite as many passengers because of the lack of continuity of downtown circulation and the lack of specific branding, but increased annual intra-CBD ridership might be expected to increase by 75,000 to 100,000 within a couple of years, if the downtown were designated as a Ride Free Area. And, as we have shown, the costs of that alternative are less than for the stand-alone circulator. However, given that it was determined that a Ride Free Area was deemed not feasible by the City’s project team, the increase in intra-CBD ridership for these routes would likely not be as high, given the cost of \$1.50 to \$2.00 per trip. Without a Ride Free Area attached to the restructuring, there is less value to the average cash fare rider, except for monthly pass holders. Given that, the annual ridership associated with the restructured routes (without a Ride Free Area) would be roughly half of the ridership estimated with a Ride Free Area, or 35,000 to 50,000.

MARKETING

Branding is essential to a successful circulator service or improved route structure. For a circulator system, at a minimum, the branding should include a “catchy” name, and be advertised on the exterior sign board of the van, similar to the Route 200 that serves Issaquah. If feasible, the City and King County should also explore opportunities to allow special paint schemes on the vehicles.

In addition to Metro’s standard marketing efforts that are done as part of annual service changes, it is recommended that the City work with the Bellevue Chamber of Commerce, Bellevue Downtown Association (BDA), and King County Metro to help market the service, whether it is

for a circulator, improved or restructured routing, or a fare free zone. Marketing can be done through advertisements in newspapers, such as the City's "It's Your City" paper, and through brochures to be available at public facilities, hotels, multi-family residential buildings, and other major activity centers. For the purposes of this report, it is estimated that marketing costs incurred by partner agencies will be approximately \$20,000 annually.

In addition to the marketing identified above, marketing can be done through up front capital purchases. Special signage with maps at each stop will help to market the service, and educate users how the system works, where stops and major activity areas are located. The city, King County and other agencies (including the BDA and Chamber) should collaborate to develop other marketing materials such as flyers, brochures and maps. For example, as the City's bicycle map is updated, a map of the circulator route can be added to the map.

The City's current downtown way-finding project should also be examined to determine how planned signage and kiosks can identify the circulator. For example, the city is planning to install a total of four kiosks along the NE 6th Street Pedestrian Corridor. Maps of the circulator system, or directions to the nearest circulator stop, should be included with the proposed signage and kiosks.

PHASING

Table 16 shows a potential phasing schedule for the proposed improvement to downtown transit circulation, whether as the development of a circulator, or improved/restructured existing route service. The implementation plan assumes that service would begin operation in February 2008. It also assumes that a review of the first two years of operation would be done to determine overall productivity and needed changes.

Table 16: Phasing Schedule

	2007									2008		2010		
	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Jan	Feb	Mar
Council Review Report	█													
Decision by Council		█												
Submit Service Partner Agreement			█*											
King Co. Review				█										
King Co. Council authorization					█*									
Service Planning						█	█	█						
Public Outreach for Stop locations						█	█	█						
Permitting for stops									█	█				
Design for Bus stop signs						█	█	█						
Agencies begin marketing							█	█	█					
Procure signage contractor								█						
Fabricate signage									█	█				
Develop Brochures									█	█	█			
Install Bus stops										█	█			
Begin Service											█			
Review first year operation												█	█	
Determine operation changes														█

APPENDIX A

STAKEHOLDER INTERVIEW SUMMARIES

**DOWNTOWN BELLEVUE CIRCULATION
IMPLEMENTATION PLAN
STAKEHOLDER INTERVIEWS**
Conducted March 23 – 26, 2007

Prepared for

CITY OF BELLEVUE

Prepared by
Carolyn Browne Tamler for
Perteet Inc.

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Downtown Bellevue Circulator Implementation Plan Stakeholder Interviews – conducted March 23 through 26, 2007

INTRODUCTION

Pertee, Inc., of Everett, Washington is doing an implantation plan for a Circulator Bus to serve Downtown Bellevue. Several major stakeholders in Downtown Bellevue were interviewed to learn their opinions of the need for this type of bus service, where it should operate, who it should serve and what would contribute to its success.

Seven business leaders in the Downtown Bellevue area were interviewed by Carolyn Browne Tamler during the period from March 23 though 26, 2007.

SUMMARY OF INTERVIEW RESPONSES

Every one of the stakeholders interviewed believes the Downtown Circulator is an excellent idea.

Most believe that a Circulator bus will be especially useful with employees. If the Circulator provides service from the Transit Center, before and after work times, it will make it possible for more Bellevue employees to ride the bus to work.

The Circulator will make it easier for employees, shoppers and residents of the Downtown Area to go out to lunch, do shopping and run errands.

There was consensus that a Downtown Circulator Bus will become increasingly attractive and used as more employees and residents fill the Downtown core. Even if the Circulator is not a complete success when it begins, the growth of the area will encourage more people to use the system over time.

The Circulator should have a distinctive look and name. It can be a small bus or a van; the criteria for its size should be based upon the passenger loads. Ideally, a Circulator should operate every 10 minutes, and most of those interviewed believe it should go in two directions so passengers can choose the direction that will have the shortest travel time to their destinations.

Most feel the Circulator should be a free service, and several suggested having a ride-free zone in Downtown Bellevue similar to the one in Seattle....even if the Circulator service is offered.

If the Circulator is to adequately serve employees, it will need to have service begin by 5:30 AM for service workers and 6:30 for office workers. Service will be needed throughout the day, and into the evening.

Most of those interviewed believe the exact route or routes should be left to the transportation planners, but major activity centers that need to be covered include: Overlake Medical Center, Whole Foods, the Post Office on Bellevue Way, Bel-Square, QFC, the Library, and the office and residential areas on 112th.

Most of the stakeholders interviewed believe it is very important to have signage, a map showing the route(s), a schedule and/or a GPS-operated sign that announces the arrival

***Downtown Bellevue Circulator Implementation Plan
Stakeholder Interviews - Page 2***

time of the next bus, and Wayfinding information from places throughout Downtown. Most do not see a need for special bus shelters.

All of those interviewed say that their agencies or companies will enthusiastically market a Downtown Circulator system. Some also said they would be willing to provide space for a stop or a shelter, and some might consider paying for a shelter after they receive more information about costs.

**JANET DONALDSON, VP FACILITIES AND NEW FACILITIES
OVERLAKE HOSPITAL, 425-688-5786**

Interest in the Circulator

Overlake's interest in the Circulator is primarily for its employees. Currently there are 2,200 employees in the Hospital, 500 in the medical office tower, and there will be an additional 300 to 400 when the South Tower opens. In addition, a Group Health Specialty Center is opening at the south end of the Overlake Campus that will have 800 employees. It is very difficult at present for someone from the Medical area to get to Downtown Bellevue, either with Metro or on foot.

Janet believes the Circulator is very necessary in general because it will help reduce traffic on NE 8th. If service can be provided to the Hospital, it will be a great help to employees who want to travel to Downtown Bellevue for lunch or shopping.

If the Circulator provides service to Overlake, it is likely that it will increase the number of employees taking the bus to work. This assumes that the Circulator would operate from the Transit Center.

Some of the major activity centers that need to be served include Overlake Medical Center, Bellevue Square, the Transit Center, the Library and the Post Offices (at least one of them).

Desired Characteristics of a Circulator Service

A small bus or a van (similar to the one used by Children's Hospital) would work well as a Circulator, but the size of the vehicle would depend on the number of riders. It should have a distinctive look.

Janet's ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	3
Morning service	5
Mid-day (lunch time) service	4
Evening service	3
Specific designated stops	2
Ability to wave down service along route (outside of stop)	1

At first, Janet suggested The Circulator could run every 30 minutes, but then realized that more frequent service would encourage more people to ride. Service should begin about 6:30 AM and run until about 5:00 PM to provide transportation for employees. Janet wasn't sure if the Circulator needed to go one way or travel in both directions.

The Circulator will not need bus shelters, but it would be important to have signage, maps, and information about the schedule. It would also be important to have Wayfinding from other places in Bellevue.

Contributions to the success of the project

The Hospital would absolutely be willing to provide space for bus stops, but would not likely provide money for a shelter. There are currently some Overlake employees at the NE 12th and 112th NE building complex that has a good bus pull out area. Overlake Hospital will also market the service.

***Downtown Bellevue Circulator Implementation Plan
Stakeholder Interviews - Page 4***

The Circulator will be a success if it runs all day, is reliable and connects to the right places.

Janet believes, "It can't happen too soon." Employees will be excited to have this new service.

**LESLIE LLOYD, PRESIDENT
BELLEVUE DOWNTOWN ASSOCIATION, 425-990-3096**

Interest in the Circulator

Leslie's primary interest in the Circulator is as a service for employees. It's easy to get around Downtown Bellevue on foot right now, but there is a need for an internal circulator system. Right now, on 108th between NE 4th and NE 6th, there are 7,500 employees.

Employees, shoppers and residents of the area will likely use the Circulator, if it is planned well. Leslie suggested exploring the private, non-profit model. Those in the medical district would also use it if the Circulator route goes to 116th.

The essential activity centers to be served include the Post Office, QFC, Whole Foods, Bartell's, Starbuck's, and the Medical District.

Leslie mentioned the circulator system in Boulder, CO, which uses different vans going in different directions. The routes are called "Hop," "Skip," "Leap," and "Bound." People can board parked vans in different locations.

Desired Characteristics of a Circulator Service

Leslie's ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	5
Morning service	2
Mid-day (lunch time) service	5
Evening service	3
Specific designated stops	4
Ability to wave down service along route (outside of stop)	5

A Circulator should run every 10 minutes, and would do best with two different routes: one covering the northeast quadrant and the other covering the southwest quadrant.

It is very important for the Circulator to be easily identified. A small bus or van would probably work best. Service should begin at 9 AM and run until 7 PM.

Bus shelters are important if there is a fixed stop. Signage is also important and connection with the Wayfinding system. Maps of the Circulator system should be posted and a schedule should be posted, if the Circulator will operate on a precise schedule.

A ride-free zone would also be excellent, and an on-demand service might work well.

Contributions to the success of the project

There is no need to provide space for stops since the Circulator could use the existing Metro stops. The BDA may be willing to help pay for stops or shelters, and may be willing to help market the system, depending on what the Circulator is.

The Circulator will be a success if it gets used, if there is positive feedback from the riders, and if it experiences a measurable increase in ridership over time.

ADELL PEARSALL, BUSINESS MANAGER
989 ELEMENTS, 425-454-9890

Interest in the Circulator

The 989 Elements development at NE 10th and 112th NE currently has 166 rental units in the first building, plus another 198 rental units in a second building. By 2008, they expect to develop an additional 215 rental units. Retail and commercial development just around the corner includes many high-end stores (Neiman-Marcus, Bravern) and major employers (Paccar, Google, Microsoft) that will create 3,000 new jobs. Adell believes that people want to get rid of their cars, and there is a definite need for, and interest in, a Downtown Circulator.

Residents and employees will use a Circulator for shopping, meals out, theaters and errands.

Desired Characteristics of a Circulator Service

Adell liked the look of the trolley but then realized it probably wouldn't fit in with the look of Downtown Bellevue. The Circulator does need to have a special look, but it needs to match the area.

Adell's ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	5
Morning service	5
Mid-day (lunch time) service	5
Evening service	5
Specific designated stops	5
Ability to wave down service along route (outside of stop)	1

The Circulator should run every 10- to 15 minutes. Service should begin about 7:00 AM and run until about 10 PM (to cover residents who may be drinking).

Transportation for service workers requires the Circulator to start at 5:30 AM; office workers would use the service starting at about 7:30 AM. The Circulator should operate in both directions.

The Circulator will need bus shelters, signage, maps, posted schedules and Wayfinding from other places in Bellevue.

Contributions to the success of the project

The 989 Elements will provide space or spaces for bus stops. Adell is very enthusiastic about the project and believes the company may also be likely to cover the cost of a shelter, but more information is needed. They will market the Circulator. Information will be included in the move-in packet for residents, and there will be a Concierge service that will also provide information.

The success of the Downtown Circulator will be based upon public awareness. It will need to be promoted by all of the Downtown businesses and residential centers.

**CLARK RICE, VICE PRESIDENT – SECURITY DIRECTOR
KEMPER DEVELOPMENT COMPANY, 425-460-5890**

Interest in the Circulator

Kemper is interested in a Downtown Circulator for employees, retail customers and residents. He feels that it will take a long time for transit to become truly user-friendly.

Clark believes that Bellevue people want to use their cars, but as density increases buses will become more attractive. He noted that there are currently 46,000 employees in the Bellevue CBD; 40,000 more jobs are projected by 2020.

During rush hours and holiday shopping, traffic may make it difficult for a Circulator to get around.

The greatest need for the Circulator will be with service employees who take the bus to work. There is an opportunity to make the Transit Center the connecting point for the Circulator, and provide transportation from the Center to places of employment. Downtown Bellevue is very walkable, hotels provide shuttle services and assisted living facilities have their own vans, so a Circulator would be most appealing for those who take buses to work in Bellevue.

Desired Characteristics of a Circulator Service

A Circulator would work best as an extension of the current transit system. The most efficient way to provide a Circulator may be by contracting with taxi companies to provide on-demand service. Lincoln Square is looking at cab service to get people home late in the evening.

An elevated guide way, separated from traffic, would also be appealing.

A distinctive vehicle and a “wow factor” would help build the success of a Circulator.

Clark’s ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is “Very important”):

Frequent headways/arrivals (every 10 minutes or less)	5
Morning service	5
Mid-day (lunch time) service	5
Evening service	4
Specific designated stops	4
Ability to wave down service along route (outside of stop)	1

The Circulator should run at least every 15 minutes. To provide transportation for service workers, the Circulator should start at 5:30 AM; office workers would use the service starting at about 7:30 AM. To meet the needs of service workers, the Circulator should run until late in the evening (possibly till 2:00 AM).

The service should operate in both directions

Bus shelters are not needed, but signage and a map of the system are critical. A GPS system should post “next bus” times. Participation in Wayfinding is also essential.

Contributions to the success of the project

Metro bus stops are sufficient. Kemper might consider contributing to a bus stop or shelter. The company is willing to assist with marketing to employees in any way possible.

A Circulator will only be successful if it takes people when and where they want to go. Employees are likely to be the greatest users of the system. Many local businesses are having a struggle maintaining service employees; making transportation work better for them would help the local businesses.

A “ride-free” zone is needed, even if the Circulator service is started.

There are a couple of transit anxieties that concern people. One is what to do in the event of an emergency if they have taken a bus to work. And, some people have experience problems with “perverts” on the buses. Clark believes it is important that people feel safe and comfortable riding a bus.

**GERY (GERALYNE) RUDOLPH, GRAPHIC DESIGNER AND SHUTTLE BIKE PROJECT
COORDINATOR
CH2M HILL, 425-453-5000**

Interest in the Circulator

CH2M Hill has a special interest in the Circulator for its 400 employees. The company pays for two-thirds of the cost of an annual bus pass for their employees. Currently, about one-third of the employees take a bus to work.

A few of the employees live in the Downtown area and walk to work. The company provides free bicycles for employees to use.

The CH2M Hill office at N. 12th and 112th NE is a few blocks away from the Downtown Bellevue core. Gery says, "It's not easy to get to Downtown from here. People don't have time to get there and back on their lunch hours." Because employees cannot easily access shopping areas from the company's location, it is impacting their lives. People in the company don't take buses at lunchtime because there is no convenient way to do so.

Desired Characteristics of a Circulator Service

Gery believes there is a definite need for a Downtown Circulator bus. Employees would use it for shopping, going to the Post Office, going to restaurants for lunch, professional appointments and running errands. She adds that most employees do not go out for lunch because they cannot get to a restaurant, have a meal and return within an hour.

An electric vehicle or hybrid, i.e. a vehicle that is energy efficient, will impress the employees of CH2M Hill.

Gery's ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	5
Morning service	5
Mid-day (lunch time) service	5
Evening service	5
Specific designated stops	5
Ability to wave down service along route (outside of stop)	5

A Circulator should run at least every 10 minutes. Employees would use it in the morning and evening to get to and from the Transit Center. Morning service should start at 5:30 AM because many employees work flextime. Evening service at least until 7 PM, but preferably later for people who do Happy Hour or stay after with friends. People don't want to stand around at night waiting for a bus.

The service should operate in both directions so people could choose the shortest route to get to their destinations.

Bus shelters are definitely needed because people do not want to stand around in the rain to wait for a bus. Signage is also essential, especially to help people when the service is starting. There should be a map of the system in each shelter and a GPS system to post when the next bus is coming. The system should become part of the Wayfinding system so people can easily see where to catch the Circulator.

Contributions to the success of the project

Gery believes that CH2M Hill would be willing to contribute a lot to the success of a Circulator system. There already is a circular driveway in the middle of the complex that could easily be used as a stop. No shelter would be needed since people can wait under cover nearby. The company would be willing to promote the service through its internal newsletters, in the elevators and on easel boards in the lobby.

The Circulator will be a success if it is ubiquitous, runs every five minutes, provides the easiest way to get around in Downtown Bellevue, provides a bike rack on the buses, and has storage space for packages near the driver.

As Bellevue grows, there will be greater need for a Circulator. Bellevue is rapidly becoming a high-density urban area. Many will be living and working in the area.

There is an assumption that the service will be free. Future technologies may enhance service in the coming years.

JOHN SU, OWNER
SU DEVELOPMENT, 4250453-8886 X300

Interest in the Circulator

Su Development owns several apartments and Condos in Downtown Bellevue. When completed, the Ashwood Complex will have 440 units (about 600 residents).

People are not using transit in Downtown Bellevue right now; they walk or drive to where they need to go.

He is very enthusiastic about the need for the Downtown Circulator and believes it will be a good alternative for people to use. He says that his company would be willing to purchase a pass to use the Circulator (say \$10/year) for each of his tenants as an additional amenity for residing in one of his buildings.

Eventually, there will be 17,000 residents in Downtown Bellevue and they would use the Circulator if it were convenient. He feels the Circulator would most likely benefit the employees coming into Downtown Bellevue, but residents will begin to use it if it provides a good alternative for getting around; i.e. if it is convenient for them to use.

John will trust the planners to decide where the Circulator should go as long as they are open-minded and willing to make adjustments where needed.

Desired Characteristics of a Circulator Service

The Circulator should be a nice looking van or small bus, and it is important that it have a distinctive look.

John's ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	5
Morning service	5
Mid-day (lunch time) service	3
Evening service	5
Specific designated stops	2
Ability to wave down service along route (outside of stop)	1

The circulator should run every five to 10 minutes, and the major service needs will be in the morning and evening rush hours. Service should start at 7:00 AM and operate until 7 PM, and buses should go in both directions.

Bus shelters are not needed, but signage will be needed, at least until people get used to it. A map and posted schedule are not necessarily important, but Wayfinding from other locations to the Circulator is important.

Contributions to the success of the project

John is willing to make space for a stop in front of his properties. He would need more details about the cost before making a decision about whether to help pay for the construction of a shelter or a stop. He is very willing to market the Circulator to his tenants.

Frequency of the Circulator will determine its success. Every block should have a stop.

**Stu Vander Hoek, Developer, 425-453-1655
Vander Hoek Corporation**

Interest in the Circulator

Stu was involved in the planning for a Downtown Circulator in 2002, so this is not a new subject for him.

Stu's interest relates to his own employees (8), retail customers (20 retail tenants) and residents (130 apartment units). He feels the Downtown Circulator is needed if it takes people where they want to go in a timely manner. He believes each of these groups would use the Circulator if it worked for their needs.

He feels the most effective way to operate a Circulator is by having a ride-free zone similar to the one in Downtown Seattle.

Employees will want to use a Circulator to travel for lunch and to go to meetings. The major activity centers are along Bellevue Way, NE 10th, NE 112th and Main Street. Some of the major centers that will need to be covered by a Circulator include Surrey Downs, Ashwood, Bellevue Square, the Library and Overlake Hospital.

The Transit Center can be the base with trips out to Overlake Hospital and Old Bellevue.

The Circulator can start with a simple approach, using a van. As the many buildings under construction are completed, the need for, and use of, the Circulator will grow, and a larger vehicle can be used.

Desired Characteristics of a Circulator Service

In response to six characteristics suggested, Stu had the following ratings (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	5
Morning service	4
Mid-day (lunch time) service	5
Evening service	4
Specific designated stops	5
Ability to wave down service along route (outside of stop)	5

The service should begin by 7:30 AM, and run until 6 PM; service should be every 20 minutes. It is very important for the Circulator to have its own name and branding, and it only needs to go in a one-way direction.

The greatest focus should be on providing service in the morning and evening rush hours and during lunchtime. In between, it is not likely to be utilized much.

Bus shelters are not needed, but signage, a map of the system, a posted schedule and a Wayfinding connection are necessary support facilities.

Contributions to the success of the project

Stu will enthusiastically market the Circulator and ways it can connect through the Wayfinding project, but he does not believe it is necessary to provide space for a bus stop or to pay for a shelter.

***Downtown Bellevue Circulator Implementation Plan
Stakeholder Interviews - Page 13***

While the Circulator may be a failure in the beginning, but as the Downtown buildings fill up, traffic increases and parking costs go up, the Circulator service will appeal to an increasing number of people.

**CHARLIE HAFFENBRACK,
GLY CONSTRUCTION, BDA MEMBER, 425-451-8877**

Interest in the Circulator

Charlie's primary interest in the Circulator is for both employees and residents. With all of the new construction occurring and new employers coming on line, such as Eddie Bauer and Microsoft (at Lincoln Square), there will be a need to provide more commute options. His interest is in making sure that there are other options, and that we encourage people to use other mode choices to get to work. In addition to commuters, there is a need for residents to get to places. This is especially true for residents in Ashwood, to be able to get to places such as Whole Foods. He feels that while the current transit system can be complicated, there is a learning curve involved. To help facilitate understanding, good wayfinding is needed. Another way to potentially educate or help people access transit is through an "Ambassador" program where people tell the public how to get around.

Some of the essential activity centers to be served include Bellevue Square, Downtown Park, Meydenbauer Park/Marina (especially as it gets improved in the future), City Hall, the Convention Center, the Ashwood neighborhood, The Performing Arts Center Eastside (PACE, when it is constructed in 2009), the future Bravern development and the hospital. He also mentioned it would be good to be able to serve the auto dealers on 116th Avenue NE, so that people can drop their car off for servicing and take the bus back to home or work.

Essentially, it is important to serve all types of users, including employees, residents, and retail users (those not making big item purchases).

Desired Characteristics of a Circulator Service

Charlie's ratings for the six suggested characteristics (on a scale of 1 to 5 where 5 is "Very important"):

Frequent headways/arrivals (every 10 minutes or less)	3
Morning service	5
Mid-day (lunch time) service	5
Evening service	2
Specific designated stops	4
Ability to wave down service along route (outside of stop)	1

A Circulator should run every 15 minutes if it is used by a lot of people, possibly 20-30 minutes to peripheral areas. If it only serves a small core area, it can probably be one-directional, but if it serves a broader area, it should probably be two-directional.

It is very important for the Circulator to be easily identified, and be distinctive. A small bus or van would probably work best. Service should begin at 7 AM and run until 6 PM.

Bus shelters are important if there are 15 minute headways or longer. Signage is also important and connection with the Wayfinding system. Maps of the Circulator system should be posted and a schedule is important.

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A free fare is not necessary, but it should have a nominal fare, such as 50 cents to a dollar. This would educate people that there is a cost to the system, potentially deter homeless. This nominal fare should be collected as long as it is easy to administer.

Contributions to the success of the project

The BDA and downtown property owners have a vested interest in making sure that the circulator works. If the circulator came by GLY construction, they would likely be able to assist in marketing it or helping to fund capital facilities.

The Circulator will be a success if it is marketed right, is simple to understand, perceived as a “cool” thing to use, and there are cost savings to users.

**BELLEVUE CHAMBER OF COMMERCE REPRESENTATIVES,
SHANNON BOLDIZSAR, BELLEVUE CHAMBER OF COMMERCE
BRAD SHINN, CH2M HILL
STU VANDER HOECK, VANDER HOECK CORPORATION
JOHN VALAAS, FIRST MUTUAL BANK
BOB MACMILLIAN, MACMILLIAN & ASSOCIATES
BETTY NOKES, BELLEVUE CHAMBER OF COMMERCE**

Interest in the Circulator

Overall, there is a need for a circulator in downtown Bellevue, but it must be planned correctly. There have been numerous attempts in the past to implement a circulator, and it hasn't worked. There should be a focus in "thinking outside the box", such as privatization, different types of vehicles to serve different routes, etc.

It is important to provide access or service to some of the peripheral areas, such as Belle Fields office park, or the 12th at 112th office building, and Overlake Hospital. Brad noted that since CH2M Hill has moved to their current building, there has been a significant drop in transit users. Other important activity centers include hotels and the convention center.

There was also some discussion that the service should be done in a phased approach. It might be more useful to start out with a small circulator route that links the Overlake Hospital area to the downtown core and/or transit center. After people start to learn the system, it could be expanded to serve other areas, such as Old Bellevue.

There is a general feeling among the group that the project is being moved to quickly without gathering all of the necessary data to understand who the users are, what the market demand is, and how it should operate. If the process needs to slow down, maybe there are other potential grants to apply for, such as federal grants.

There was a general agreement that a survey is needed to better understand the user needs and market.

The service should be predictable with good awareness, and flexible, so that if it doesn't work the first time, it can be redesigned easily to work. It should focus on population centers as well.

**COMMUNITY CONVERSATION,
BELLEVUE SQUARE MALL WALKERS (15 PERSONS)**

If the City developed a Circulator service in the downtown area, what would be the most useful destinations for older adults that should be included along the route?

- Bellevue Square
- Grocery Store
- Bellevue Regional Library
- Home Depot
- Best Buy

- In the 1970's there was a service that went from downtown Bellevue to Eastgate and Factoria. It is difficult to get to Kirkland and Redmond.

- How will people get to the circulator? There needs to be more park & ride lots.

Where would the best locations be for circulator bus stops that are near downtown senior housing?

- Home Depot
- Ace Hardware
- Costco
- Lowe's
- Bellevue Way
- Bel-Red Road
- Bellevue Regional Library

What would be the most important hours for the circulator to run to meet the needs of older adults?

- Shopping hours
- 9:30 am to 3pm
- Weekends (Friday/Saturday, so people can go to movies, restaurants)

APPENDIX B

**CIRCULATOR OPTIONS
EVALUATION CRITERIA**

2007 Downtown Bellevue Circulator Implementation Plan Circulator Options Evaluation Criteria

ROUTING EVALUATION

Underserved Areas

This MOE evaluates each route option in terms of how the option serves streets currently not served by transit (including any existing routes that do not have bus stops along the portions of the route along the proposed route option). The number of linear feet would be measured.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Employment

This MOE evaluates each route based on its ability to serve the maximum number of employees. This MOE would be measured using projected employment data (for 2012) by TAZ. The employment population that is captured within a 1/8 mile of the circulator route would be measured.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Population

This MOE evaluates each route based on its ability to serve the maximum number of residents. This MOE would be measured using projected population (for 2012) data by TAZ. The residential population that is captured within a 1/8 mile of the circulator route would be measured.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Activity Centers

This MOE evaluates the number of major activity centers that are directly adjacent to the route. Major activity centers include existing or permitted large residential developments, civic/institutional uses, hotels/motels, major shopping developments, major office towers, and parks.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Travel Time

This MOE would evaluate each option based on the total travel time under optimal conditions, needed to complete the route. Longer travel times are seen as less desirable. Travel time is based on a shuttle operating at an average speed of 8 mph.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Ease of Routing

This MOE would evaluate each option based roads and/or intersections along the route that experience significant delays. The number of intersections that operate at LOS E or F during the p.m. peak in the year 2012, along the proposed route would be identified. The information on LOS will be obtained from the City's October 6, 2006 Concurrency Update. In addition, this MOE also considers the number of left turns that are needed, as left turns require longer delays and more maneuverability to weave from the inside lane to the outside lane.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Vehicle Needs

This MOE would evaluate each option based on the number of vehicles that would be needed to maintain a 10 minute headway in one direction, based on an average vehicle speed of 8 mph, and also assuming a spare vehicle is needed.

Ranking Option____(Best)
 Option____
 Option____(Worst)

Layovers

This MOE would measure the proximity of the adopted layover location at Wildwood Park for the circulator, to the route. This layover location is also the preferred location by King County Metro. The distance that would be needed to veer from the route to the layover and back would be measured.

Ranking Option____(Best)
 Option____
 Option____(Worst)