BENEFITS OF TRANSIT REPORT

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Bellevue Transit Master Plan

CITY OF BELLEVUE

March 2014

Transportation Department

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INTRODUCTION

The Bellevue Transit Master Plan (TMP) will establish short- and long-term policies and projects that help foster a high-quality transit system that is more effective at connecting residents, employees, and visitors in Bellevue with the places they want to go. This report seeks to build support for the promotion of and investment in transit services and its associated infrastructure by connecting the benefits provided by transit to wider community objectives. In doing so, it is hoped that this report can clarify the discussion between municipal and transit planners, private developers, homeowners and renters, employers and employees, and other stakeholders in Bellevue—some of whom may perceive transit as counter to their goals—by providing a common understanding of what outcomes high-quality transit can be expected to facilitate.

It is important to emphasize that some of the benefits provided require coordination between plans for transit and land use: frequent transit service depends on transit-supportive land use to remain viable, and more compact urban neighborhoods depend on transit to be livable. Bellevue's Comprehensive Plan has already established policies to help it pursue its vision of a city that is diverse, dynamic, vibrant, livable, a steward of environmental quality, and a community that meets the needs of all citizens. By providing a summary of the available literature on the subject, this report explains how transit can play a role in realizing this vision for Bellevue.

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OVERVIEW

Effective transit can make a place more livable, more accessible, more sustainable, and enhance local quality of life. These benefits are well understood by transportation professionals and academics, and supporters of transit may take these truths to be self-evident. But to the average resident, developer, business-owner, or bus rider—or moreover, to the person commuting by car every day stuck sitting in traffic while buses pass by in the HOV lane—it may be less clear what benefits transit provides to them. Beyond buzzwords like 'sustainability' and 'livability', what outcomes can a city anticipate when considering the extent to which it should support and invest in transit?

A major theme arising from the Transit Master Plan's outreach to city boards and commissions, transit agency representatives, and local stakeholders is the idea that transit is an essential component of the City's mobility strategy and an increasingly important tool for addressing Bellevue's anticipated growth in travel. *Transit Master Plan Forum* participants spoke of the many ways that transit benefits Bellevue, including:

(i) **Economic Benefits** – Businesses, especially large employers, frequently locate in communities with strong public transit services;

(ii) **Environmental Benefits** – Cities benefit from reduced traffic congestion and improved air quality when people take transit;

(iii) **Community Benefits** – Since transit requires less land and energy than the private car to move the same number of people, it is often cheaper to meet mobility needs with transit rather than through other measures such as road widening or new parking facilities;

(iv) **Individual Benefits** – Public transportation provides an affordable, and for many, necessary, alternative to driving.

Figure 1 Many reports have been published documenting the various economic, environmental, and social benefits provided by public transportation. This *Benefits of Transit Report* highlights some of the findings most relevant to Bellevue presented by such organizations as the American Public Transportation Association, Victoria Transport Policy Institute, Texas Transportation Insitute, among others, and Transportation for America, including those reports pictured above.

Input from this outreach prompted a more thorough investigation into the underlying assumptions about the benefits of transit. A great deal of literature has been published on the myriad ways that transit can benefit a community, and this report does not attempt to be a comprehensive review of all that information. Rather, it seeks to briefly summarize some of the more notable findings of relevance to Bellevue's context—that is, to a growing city with urban centers and suburban neighborhoods, whose current bus-only transit system will in the coming years be expanded and improved to include more frequent bus services and East Link, a major regional light rail service. As shown in Figure 2, these findings are organized according to the four broad categories identified by TMP Forum participants: benefits to the economy, environment, community, and individuals.

Based on these categories alone, it can be seen that transit users are not the only people who benefit from transit service. Indeed, transit services and transit-supportive development can provide a wide range of benefits across many sectors of a community, including those who may never use the service directly themselves. For example, while transit riders may benefit from lower transportation costs (compared to regular automobile use) and greater passive exercise—neither of which non-riders will realize—non-riders would still benefit from reduced overall traffic congestion, improved air

Figure 2 Efficient, useful, well-utilized public transit services provide a variety of benefits, summarized here in four broad categories: benefits to the economy, environment, community, and individuals.

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quality and property values, and a more robust local economy. Transit makes communities more inclusive by connecting those who are too young to drive to school, those who are too old to drive to loved ones, leisure activities, and health care services, and those who cannot afford a vehicle or are physically unable to drive to all of the same employment and recreational opportunities that the rest of society enjoys. Transit can also help the city make more efficient use of its developable land and improve the efficiency and reduce the costs of building and maintaining infrastructure systems.

The remainder of this document is divided into four sections, consistent with the categories identified in Figure 2. Multiple statistics and sources are provided for each of the benefits found to be associated with transit. All sources are documented in the References section at the end of the report for any readers interested in digging deeper into the studies conducted by others to arrive at the information presented here.

People

Lower transportation costs

Greater mobility for people who cannot or do not want to own a car

More housing choices

Fewer hours spent in traffic

More access to jobs, services, and activities—locally and regionally

Improved safety

Communities

Stronger sense of place

More efficient use of land

More efficient public works investments

Reduced congestion on roads

Stronger economy

Environment

Healthier communities

Better air quality

Fewer greenhouse gas emissions

Better water quality

Protected farmland and open space

Transit Providers

Increased ridership

Lower operating costs

Safer operations and fewer accidents

Greater integration of facilities into local communities

Improved speed and reliability

Figure 3 The Puget Sound Regional Council (PSRC) identified numerous benefits to people, communities, the environment, and transit providers in its *Transit Supportive Planning Toolkit*.

ECONOMIC BENEFITS

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Transit investments create a wealth of both short- and long-term employment opportunities. Transit system construction provides substantial short-term job creation in a variety of associated industries, and after the systems are complete, a long-term source of high-quality jobs operating and maintaining the service and infrastructure. Transit also provides a means for employees to reach jobs, which is valuable both to those employees without access to a private vehicle or the ability or desire to drive, and to employers seeking to attract a talented workforce, which is aided by the provision of commuting options. Residential, commercial, and business real estate that is served by public transportation is valued more highly by the public than similar properties not as well-served by transit. Office space proximate to rapid transit also exhibits lower vacancy rates than units outside the walkshed of rapid transit stops and stations.

Supports Employment

- Nationally, public transportation is a $57 billion industry that in 2011 employed nearly 390,000 operating employees and over 10,000 capital employees (APTA 2013, 2014a).
- As shown in Table 1, King County Metro and Sound Transit cumulatively employed over 5,500 workers in RY 2012, of which over three-quarters were full-time employees and over 60% have jobs related to transit operations (NTD n.d.).
- Table 2 on page 7 indicates that in addition to operating and capital jobs at transit agencies, transit spending also supports many more employment opportunities. Nationally, in RY 2011, $17.1 billion of capital expenditures and $38.4 billion in operating expenditures supported nearly 2 million jobs, including over 950,000 direct jobs, nearly 250,000 indirect jobs, and over 780,000

"Proximity to the variety of transportation options that the Bellevue Transit Center provides was integral to our decision to relocate Concur's headquarters from Redmond to downtown Bellevue in May 2013. Since then, we have grown from 500 to more than 800 employees and 415 of them do not regularly drive in solo. More than 50% of Concur Bellevue employees take transit to work. We expect this number to go up. As Concur grows, we strongly believe that increased transit options will help us attract and retain the best talent.

Concur employees expect real urban travel choices. Bus and rail service to Bellevue is not only about getting to work - it's about livability, quality of life and living smart. All three values are necessary for our company to thrive."

SANDY BUMSTEAD, DIRECTOR OF FACILITIES
CONCUR TECHNOLOGIES

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"Speaking from a corporate perspective, we couldn't provide mobility to our workforce without a robust transit system in Bellevue... Bellevue is going to continue to grow as a large urban center, and having reliable, efficient, high frequency transit service is going to be very important. Doing that in a way that is cost effective and provides for a variety of service across the region into Downtown Bellevue is going to be critical as we continue to address congestion, traffic issues, and provide a portfolio of different types of transportation alternatives for people."

JIM STANTON, SENIOR COMMUNITY AFFAIRS MANAGER, MICROSOFT CORPORATION

induced jobs. This translates to about 24,000 jobs per $1 billion of capital spending and about 41,000 jobs per $1 billion of operating expenditures (APTA 2013, Weisbrod and Reno 2009).

- Some 314 jobs are created for every $10 million invested in transit capital funding, and more than 570 jobs are created for every $10 million in the short-term (Cambridge Systematics 1999).
- "Of the 350,000 people directly employed by public transportation systems, more than 50 percent are operators or conductors. In addition, 10,000 to 20,000 professionals work under contract to public transportation systems or are employed by companies and government offices that support these systems. Thousands of others are employed in related services (i.e. engineering, manufacturing, construction, retail, etc.)" (Surface Transportation Policy Partnership n.d.)

Table 1 Number of employees by category and transit mode for King County Metro and Sound Transit (Report Year 2012).

	Employee Category	King County Metro					Sound Transit				Total
		Bus	Streetcar	Trolleybus	Vanpool	All Modes	Commuter Bus	Light Rail	Streetcar	All Modes	
Full Time Employees	Total Operations	2,533	22	387	36	2,978	518	282	27	827	3,805
	Vehicle Operations	1,611	12	215	—	1,838	322	106	12	440	2,278
	Vehicle Maintenance	525	4	81	—	610	106	41	3	150	760
	Non-Vehicle Maintenance	230	3	67	1	301	34	93	5	131	432
	General Administration	168	3	24	35	230	56	42	7	105	335
	Total Capital Labor	76	1	14	1	92	12	469	3	483	575
	Total Full Time	**2,609**	**23**	**401**	**37**	**3,070**	**530**	**750**	**29**	**1,310**	**4,379**
Part-Time Employees	Total Operations	940	—	125	2	1,068	64	—	—	64	1,131
	Vehicle Operations	919	—	122	—	1,041	62	—	—	62	1,104
	Vehicle Maintenance	—	—	—	—	—	—	—	—	—	—
	Non-Vehicle Maintenance	4	—	1	—	5	—	—	—	—	5
	General Administration	17	—	2	2	22	1	—	—	1	23
	Total Capital Labor	1	—	0	—	2	—	—	—	—	2
	Total Part-Time	**942**	**—**	**126**	**2**	**1,069**	**64**	**—**	**—**	**64**	**1,133**
	Total Employees (Full Time and Part-Time)	**3,551**	**23**	**526**	**39**	**4,139**	**594**	**750**	**29**	**1,373**	**5,512**

Source: National Transit Database data for RY 2012.

Increases Customer Base for Sales

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- Capital and operations expenditures on transit have a positive impact on the communities that are served. As shown in Table 3, every $1 billion in transit average spending results in the creation of 35,600 jobs, $3.5 billion in business sales, $1.8 billion in GDP, $1.6 billion in labor income, or $472 million in tax revenue. These represent five separate ways of measuring the same (or portions of the same) overall impact and therefore cannot be added together (APTA n.d., Weisbrod and Reno 2009).
- As shown in Figure 4, businesses realize a gain in sales three times the public sector investment in transit capital, such that a $10 million investment results in a $30 million gain in local sales. Transit operations spending provides an even higher rate of return to area businesses, with a $32 million increase in sales for each $10 million in transit operations spending (Cambridge Systematics 1999).
- Business sales and personal income are positively impacted by transit investment, growing rapidly over time, and increasing the overall efficiency of the economy. "A sustained program of transit

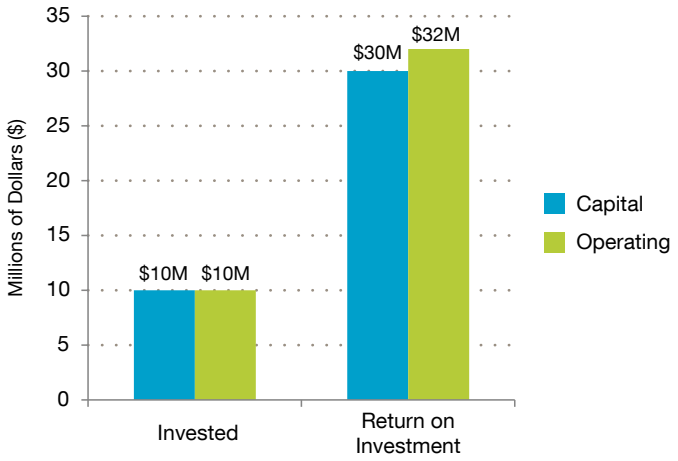

Figure 4 Adapted from "Public Transportation: Benefits for the 21st Century" (APTA 2007).

Table 2 Number of jobs by category supported by transit expenditures nationally (Report Year 2011).

Category of Jobs	Total Transit Expenditures (Billions of Dollars)		Jobs Supported per $1 Billion Dollars		Total Jobs Supported by RY 2011 Transit Spending		
	Capital	Operating	Capital	Operating	Capital	Operating	Total
Direct Jobs	—	—	8,202	21,227	139,902	814,312	954,215
Indirect Jobs	—	—	7,875	2,934	134,325	112,554	246,879
Induced Jobs	—	—	7,711	16,979	131,527	651,350	782,877
Total Spending/Jobs	17.1	38.4	23,788	41,140	405,754	1,578,217	1,983,971

Adapted from "2013 Public Transportation Fact Book" (APTA 2013). Data from Weisbrod and Reno 2009.

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capital investment will generate an increase of $2 million in business output and $0.8 million in personal income for each $10 million in the short run (during year one). In the long term (during year 20), these benefits increase to $31 million and $18 million for business output and personal income respectively" (Cambridge Systematics 1999).

– "Transit capital and operating investment generates personal income and business profits that produce positive fiscal impacts. On average, a typical state/local government could realize a 4 to 16 percent gain in revenues due to the increases in income and employment generated by investments in transit" (Cambridge Systematics 1999).

"With 19% of Bellevue residents being older adults and the numbers rapidly increasing in the coming years, the need for available, accessible and easy transit is vital. Transit provides active living such as entertainment, shopping, dining, doctor's appointments, etc. for day, afternoon, and evening travel. Keeping seniors mobile will keep the money in Bellevue!"

HOUSING & TRANSPORTATION COMMITTEE
BELLEVUE NETWORK ON AGING

Improves Property Values

– "Public transit can increase the development potential of real estate near high-capacity transit lines and stations, and thereby increase property values. This 'transit premium' can range from as little as a few percent increase to over 150 percent" (NRA 2012).

– Proximity to public transportation leads to higher home values in many cases. "However, it is more difficult to agree on the magnitude of the impact

Table 3 Short-term economic impact per billion dollars of national investment in transit.

Economic Impact	Impact per $1 Billion of Transit Capital Spending	Impact per $1 Billion of Transit Operations Spending	Impact per $1 Billion of Transit Average Spending
Jobs – Employment in the Thousands of Jobs	23.8	41.1	35.6
Output – Business Sales in Billions of Dollars	$3.00	$3.80	$3.50
Gross Domestic Product (GDP) – Value Added in Billions of Dollars	$1.50	$2.00	$1.80
Labor Income in Billions of Dollars	$1.10	$1.80	$1.60
Tax Revenue in Millions of Dollars (Rounded)	$350	$530	$472

Adapted from "2013 Public Transportation Fact Book" (APTA 2013). Data from Weisbrod and Reno 2009.

than on its generally positive direction. One review of the literature identifies studies in which the premium for home prices ranges from 6 percent to 45 percent (Cervero et al. 2004). Another sets the range between 3 percent and 40 percent (Diaz 1999). A third exploration, involving heavy and light rail systems only, finds a maximum premium of 32 percent, although some studies find no effect and others find negative effects (Hess and Almeida 2007). Summarizing the available research, Duncan (2008: 121) laments that generalization is quite difficult owing to different methodologies and contexts and concludes: 'The most that one might safely generalize from the body of literature is that properties near stations sell at small to modest premiums (somewhere between 0% and 10%)'" (Wardrip 2011: 2).

- In Vancouver, BC, office building occupants not only derive direct benefits from being close to rapid transit, but the office buildings located near light rail stations also achieve higher rents than other locations. Tenants throughout suburban Vancouver are willing to pay a premium for daily access to public transportation (Jones Lang LaSalle 2011).
- "Large tenants [are] gravitating to transit oriented buildings" and the "[o]verwhelming majority of suburban office developments are located within 500 meters of a rapid transit station" (Jones Lang LaSalle 2013: 1).
- Between 1997 and 2001, commercial properties located near Dallas Area Rapid Transit (DART) stations increased in value by 24.7 percent, while properties not served increased in value by only 11.5 percent (Weinstein and Clower 2005).
- Values of residential properties near DART stations rose 32.1 percent compared with a 19.5 percent increase for properties not served by rail stations. The total value of new investment completed, ongoing, or planned from 1999 through 2005 was more than $3.3 billion (Weinstein and Clower 2005).

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"We need a transit system to serve Downtown Bellevue, otherwise it won't grow."

VIC BISHOP, BELLEVUE TRANSPORTATION COMMISSION, TRANSIT MASTER PLAN FORUM

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"There's extreme competition for talent, so it's recruitment, retention... What you've got in downtown Bellevue is a critical mass. You've got housing, you've got restaurants, you've got retail, and you've got transit."
(Seattle Times 2013)

STEVE SCHWARTZ, MANAGING DIRECTOR
JONES LANG LASALLE

"Bus travel to and from downtown Bellevue from employment centers to homes, and parts in between, helps employees, residents, and business patrons move Bellevue's economy forward."

BETTY NOKES, PRESIDENT AND CEO
BELLEVUE CHAMBER OF COMMERCE

- Although large-scale transit-oriented development (TOD) is generally less common around standard local bus services, in markets where buses carry a significant share of travelers, "opportunities for higher-density development around bus routes abound," and the improvements in service frequency, speed, passenger amenities, and station permanence offered by express and bus rapid transit (BRT) services "gives developers a more substantial presence, which can support adjacent development" (Dunphy, Myerson, and Pawlukiewicz 2003: vii). "Enlightened zoning, which allows higher densities and requires less parking along well-served bus corridors, will create opportunities for development that supports transit, even if developers do not consider such development 'transit oriented'" (Dunphy, Myerson, and Pawlukiewicz 2003: 19).

Stimulates Downtown Vitality

- Vacancy of office space with rapid transit access is well below half the rate of the rest of the market in Vancouver, BC. "The direct vacancy rate for buildings within 0.5 km of a rapid transit station is 4.8% compared to the 12.3% direct vacancy rate of the rest of the market, and the average asking net rental rate is approximately 8% higher" (Jones Lang LaSalle 2011: 2).
- "[T]he direct vacancy rate of office space located just outside the Index's radius, 0.5 km – 1 km from a light rail station, is 315% higher than the Index itself at 15.1% and the average net asking rates are 12.9% lower. This major discrepancy over a relatively short distance illustrates the value that tenants place on immediate access to rapid transit" (Jones Lang LaSalle 2011: 2).
- "Surrey's vacancy rate for office space without rapid transit access is 25%, yet buildings near the SkyTrain are a hot commodity with a direct vacancy

rate of just 0.4%" (Jones Lang LaSalle 2011: 5).

- "Cleveland managed to transform a modest $50 million investment in bus rapid transit into $5.8 billion in new transit-oriented development. By putting bus rapid transit (BRT) along a strategic corridor and concentrating government redevelopment efforts there, Cleveland managed to leverage $114.54 dollars of new transit-oriented investment for every dollar it invested into the BRT system, adding jobs and revitalizing the city center" (Hook, Lotshaw, and Weinstock 2013).
- Public transportation improvements cause more clustered and higher-density employment and enable urban growth, giving rise to agglomeration economies by improving labor market accessibility, increasing information exchange and facilitating industrial specialization. In the case of central city employment density, indirect productivity effects of transit include estimated wage increases ranging between $1.5 million and $1.8 billion per metropolitan area annually, depending on the size of the city. And the larger the city, the greater the agglomeration benefit of expanding transit (Chatman and Noland 2013).
- "Residents of neighborhoods with good transit and mixed land use drive less than half as much on average as residents elsewhere," which results in "more dollars circulating in the local economy" because "expenditures on vehicles and fuel provide less employment and business activity than expenditures on other consumer goods, and much less than expenditures on transit service" (Litman 2009).

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"Abundant transit and great overall mobility are key strategies to support the growth of our thriving and livable downtown."

PATRICK BANNON, PRESIDENT
BELLEVUE DOWNTOWN ASSOCIATION

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ENVIRONMENTAL BENEFITS

Congestion wastes a significant amount of time, fuel, and money, and congestion costs are increasing. In 2006, the United States was responsible for 24 percent of global oil consumption, and the average American consumed 25.2 barrels of oil that year (Baxandall, Dutzik, and Hoen 2008). Increased transit use has positive environmental implications, directly correlating to fewer cars making daily commutes, thereby reducing the use of and fuel, greenhouse gas emissions, smog, and the associated impacts on public health. When coordinated with transit-supportive land use planning, transit helps to focus and intensify development, thereby reducing the amount of land consumed.

"An important benefit of transit is that whenever a transit trip replaces a single auto trip it eases the congestion that hurts all businesses and all commuters. Bellevue could not reach its projected growth without transit. We can't just build roads to meet our growth."

TOM TANAKA, BELLEVUE TRANSPORTATION COMMISSION, TRANSIT MASTER PLAN FORUM

Emissions Mitigation

- In the early 2000s, public transportation produced an average of about 95% less carbon monoxide, 92% fewer volatile organic compounds, and 45% less carbon dioxide compared to private automobiles (Shapiro, Hassett, and Arnold 2002, APTA 2003).
- "People living…within one-quarter mile of rail and one-tenth of a mile from a bus stop drive 4,400 fewer miles annually than persons in households with no access to public transit" (APTA 2010).
- Public transportation saves 37 million metric tons of CO2 annually. This is equivalent to the emissions of 4.9 million households—roughly the same as if New York City, Washington, DC, Atlanta, Denver, and Los Angeles all stopping using electricity (APTA 2009).
- "Planting new forest is one way to remove CO2 from the atmosphere…To match the total effect of [providing] public transportation, the U.S. would have to plant 23.2 million acres of new forest (annually)" (Bailey et al. 2008).
- If public transportation service did not exist and all riders instead traveled in private vehicles in 2011,

"With transportation accounting for nearly 47 percent of our communities' greenhouse gas emissions in Washington state, policies that accelerate energy-efficient transit choices and transit ridership will be a key part of the solution to reduce transportation-related GHG emissions."

ANDY WAPPLER, VICE PRESIDENT OF CORPORATE AFFAIRS, PUGET SOUND ENERGY

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498 urban areas across the United States would have suffered an additional 865 million hours of delay and consumed 450 million more gallons of fuel. The monetized value of this additional delay and fuel consumption was estimated by the Texas Transportation Institute to be about $20.8 billion, or 15 percent more than the congestion costs realized with public transportation systems in place (Schrank, Eisele, and Lomax 2012).

Reduces Land Consumption

- In a review of tax maps, the VTC (Voorhees Transportation Center) collected information on properties within "Transit Villages"—a product of a 2002-2003 initiative in New Jersey. "Using before and after comparisons, this report found a substantial increase in development, mostly within one half mile of the transit stations," and "a property 1,000 feet away from a station is valued approximately $9,745 less than a property 100 feet away, all else constant" (Perk and Catalá 2009: 8–9, 57).
- "Businesses in transit-intensive areas save on land required for parking and its associated costs. Where public transportation is a factor, the number of parking spaces required for offices and retail business can be reduced by 30% and 50%, respectively – saving between $2,000 and $20,000 per parking space" (FAST n.d.).
- "Sprawling development generates less in tax revenue than the costs it incurs. Similarly, it is cheaper to provide public infrastructure and services to smart growth. However, for various cultural and economic reasons, the public perception of public transit is as a subsidy whereas spending on automobile infrastructure is viewed an investment" (Trigg 2009).
- The top North American Bus Rapid Transit (BRT)

"The students, faculty, and staff of Bellevue College play an important role on campus and in the community in creating a sustainable city, and public transportation is a big part of that. Bellevue College is committed to honor and practice sustainability in college life and culture, teaching and learning, and community leadership. By reducing greenhouse gases and pollution run-off, conserving ecologically sensitive lands and open spaces, and supporting access to education, transit supports equity, health, and conservation of the environment. These benefits provide a powerful rationale for the upgrade and expansion of the region's public transportation network."

DERIC GRUEN, SUSTAINABILITY DIRECTOR
BELLEVUE COLLEGE

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lines have been found to stimulate and concentrate local development just as much, if not more, than when compared to other transit options like rail. The most important factor in predicting successful transit-oriented development is government intervention, followed by land potential. "Rezoning a corridor to encourage mixed-use development, creating a comprehensive plan for the area, actively reaching out to investors, marketing the program, offering financial incentives — these elements of a strong official involvement directly predicted TOD success" (Hook, Lotshaw, and Weinstock 2013, Jaffe 2013a).

"Employees at our headquarters in Bellevue documented on RideshareOnline.com savings of over 35 metric tons of CO2 Equivalent in 2013 through alternative commuting. With continued investment in transit infrastructure, we believe the already strong, positive environmental impacts of our alternative commuters could be increased dramatically, year after year."

CHI PAK, SENIOR MANAGER OF CORPORATE SUSTAINABILITY, T-MOBILE USA, INC.

Reduces Fossil Fuel Use

- Public transportation's overall effects save the United States 4.2 billion gallons of gasoline annually (APTA 2014a).
- In 2009, congestion in 439 urban areas across the country wasted 3.9 billion gallons of fuel—the equivalent to 78 super tankers (Metropolitan King County Council 2011).
- Public transportation in the U.S. saves the equivalent of 900,000 automobile fill-ups each day (APTA 2010).
- "For every 10,000 solo commuters who leave their cars at home and commute on an existing public transportation service for one year, the nation reduces fuel consumption by 2.7 million gallons" (FAST n.d.).

Figure 5 Energy and emission benefits from public transportation.

Changes in Fuel Use Due to Public Transportation	Total Energy Savings (Billion Gallons of Gasoline Equivalent)	Carbon Dioxide Emission Reductions (Million Metric Tons)
Reduction Directly from Riding Public Transportation as Replacement of Private Vehicle Miles, Gross	1.80	16.2
(Less Fuel Currently Used by Public Transportation)	(1.38)	(12.3)
Savings to Private Vehicle Drivers Because of Congestion Reduction Due to Public Transportation	0.34	3.0
Secondary Reduction Due to Reduced Travel Distance Related to Public Transportation Related Location Decisions	3.40	30.1
Total Savings Due to Public Transportation	**4.16**	**37.0**

Adapted from "2013 Public Transportation Fact Book" (APTA 2013). Data from Bailey, Mokhtarian, and Little 2007 and Todd and Hale 2007.

COMMUNITY BENEFITS

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Public transportation stops and station areas are natural focal points for economic and social activities, helping to create strong neighborhood centers that are economically stable, safe, and productive. The ability to travel conveniently in an area without a car is an important component of a community's livability (Mackie 2008). Communities that invest in public transit choices also enhance quality of life by helping to ensure that everyone breathes cleaner air (Sierra Club 2001).

Travel Congestion Mitigation

- "Metro Transit provides alternatives to congestion and reduces congestion through its ridership. If public transportation was not available, travelers in the Puget Sound region would experience an additional 14.1 million hours of delay – nearly 6 hours of additional delay per peak auto-commuter" (Metropolitan King County Council 2011).
- As noted in the Environmental Benefits section, 498 urban areas across the United States would have suffered an additional 865 million hours of delay in 2011 if all public transportation users instead drove in private vehicles (Schrank, Eisele, and Lomax 2012).
- Public transportation in the United States saves the equivalent of 420,000 service station tanker trucks contributing to congestion annually (Bailey, Mokhtarian, and Little 2007).
- In October of 2003, Los Angeles transit workers went on strike for thirty-five days, shutting down major bus and rail lines. Average delay during peak periods increased 47 percent on these roads on major L.A. freeways, and the effects were largest on those that parallel transit routes. For example, on U.S. 101, which parallels the Red Line subway, average delay increased 90 percent during the strike. By comparison, average delay on freeways that do

"Nearly a third of our students ride transit as their primary mode of transportation, which alleviates congestion in our neighborhood and throughout Bellevue."

RAY WHITE, VP ADMINISTRATIVE SERVICES
BELLEVUE COLLEGE

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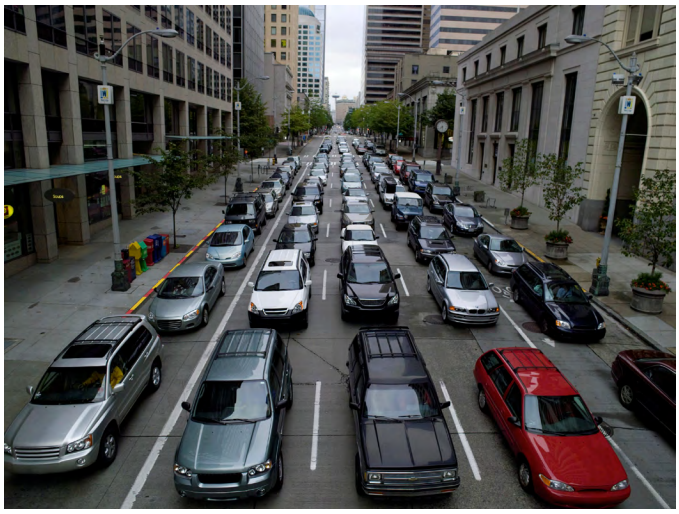
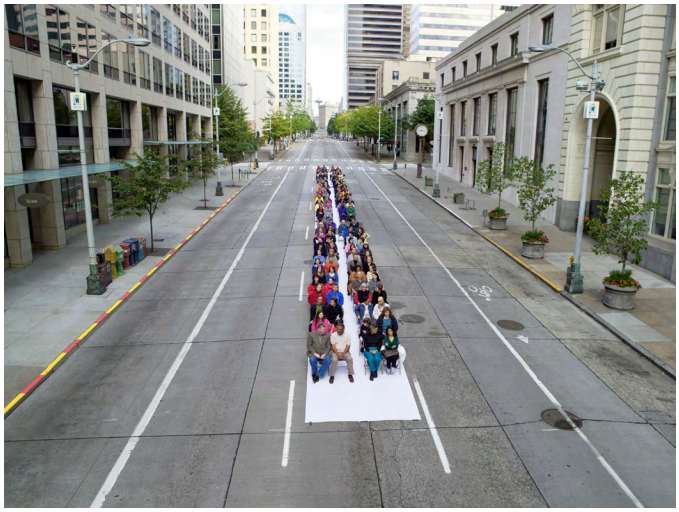
Figure 6 Two hundred people traveling in 177 cars (top, middle) or three buses (bottom). (Source: I-Sustain 2010).





not parallel transit corridors increased by only 29 percent. Delay on U.S. 101 during the morning peak increased 123 percent, while on freeways that didn't parallel transit, morning peak delay increased only 56 percent (Anderson 2013, Jaffe 2013b).

Improves Roadway Efficiency

- 17 percent of commuters trips into Downtown Bellevue during peak times are on transit—freeing capacity for freight and other vehicles.
- Without transportation choices such as walking, bicycling and transit, there would be 62,413 more cars more cars on the road in New Orleans, 167,061 more cars on the road in San Diego, and 2,610,280 more cars on the road in New York City (Sierra Club 2001).
- "[T]raffic congestion is a non-linear function, meaning that a small reduction in urban-peak traffic volume can cause a proportionally larger reduction in delay. For example, a 5% reduction in traffic volumes on a congested highway (for example, from 2,000 to 1,900 vehicles per hour) may cause a 10-30% increase in average vehicle speeds (for example, increasing traffic speeds from 35 to 45 miles per hour). As a result, even relatively small changes in traffic volume or capacity on congested roads can provide relatively large reductions in traffic delay" (VTPI 2013).
- "In 2012, there were nearly 70,600 daily transit riders during the peak commute periods, on the high-demand corridors in the central Puget Sound area. This took more than 43,800 cars off the road, which in turn avoided approximately 674,700 pounds of CO2 emissions daily" (WSDOT 2013).
- "Most HOV lanes continue to be more effective at moving more people during peak periods than general purpose (GP) lanes. At the monitoring locations, the average HOV lane carries about 34% of the people on the freeway in the morning and evening peak periods. At eight of the ten monitoring

locations, HOV lanes moved more people than the average adjacent GP lanes" (WSDOT 2012).

– "On an average weekday, Metro provides service for more than 113,000 people on major state routes. It offers commute options that reduce the need for regional investment in parking infrastructure and roadways. On weekdays in the afternoon, Metro moves more than 21,000 people on freeways and major state routes, roughly the equivalent of seven lanes of traffic" (King County Metro 2013).

Figure 7 King County Metro provides service equivalent to 7 lanes of freeway traffic.

Reduces Parking Demand

– "At the University of Washington, in Seattle, biennial telephone surveys of faculty, staff, and students about their travel behaviors and attitudes show that the U-PASS program there helped reduce demand for parking facilities. The 12,000 current campus parking spaces are fewer than existed in 1983, despite the addition of 8,000 more people to the campus community since then. The University was also able to avoid building 3,600 new parking spaces, thus saving $100 million in construction costs" (Nuworsoo 2005).

– "Brown, Hess, and Shoup estimate the total monthly cost (construction, interest payments, and operation) of a single debt-financed parking space in a 1,500-space parking structure at UCLA to be $223 per month in 2002, similar to the $227 per month per space of a new parking structure at the University of Colorado, Boulder. [...] In comparison, UCLA spent approximately $71,000 a month for the BruinGO pass program, which induced 1,000 drive-alone commuters to give up their parking spaces. At $71 per parking space per month, the cost of the pass to the University was only a third of the cost per parking space" (Nuworsoo 2005).

– "One of the most important strategies for reducing the costs of TOD development is the adoption of appropriate parking supply requirements. The

TMP projects are found to improve roadway efficiency. When considered at a system level, TMP projects (see page 60 of the Transit Speed and Reliability Report) are projected to diminish congestion levels and travel delay at the City of Bellevue's signalized intersections. These improvements in travel time translate to societal savings of $2.5–$4.2 million annually during the PM peak alone (see page 80). Similar benefits are found when considering Peak-Period Person Throughput (PPPT) by mode for the corridor segments that comprise the Frequent Transit Network (FTN). For example, on Bellevue Way NE between NE 10th St and NE 32nd Pl, the 2030 projected PPPT on transit is 36 percent of all person trips, yet transit represents only 0.8 percent of all vehicle trips along this corridor. Clearly, bus service is projected to make efficient use of the roadway capacity at this and other locations in the City of Bellevue.

TRANSIT SPEED AND RELIABILITY REPORT
BELLEVUE TRANSIT MASTER PLAN

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reduced parking demand associated with dense urban development—and with TOD in particular—offers significant potential cost savings by reducing the amount of high-cost structured parking required... Revising the parking requirements for TOD projects through a shared parking provision or a TOD zoning overlay district can reduce the cost and risk of TOD projects, which in turn can increase the size of the 'transit premium'" (NRA 2012).

- In 2000, the City of Seattle conducted a parking study in 26 neighborhoods and found that the majority of neighborhoods used between 40 to 70 percent of their parking supply on average. Only a few areas (4 of the 26) used their parking to "full occupancy" standards of 80 to 85 percent (DeWitt et al. 2003).

Community Enrichment

- According to the "America in 2013" national survey, a majority of Americans consider public transit to be a meaningful community attribute. "Strength of preference for public transportation varies across the generations, and is strongest among gen Yers. However, even among the group with the weakest preference for transit, war babies/the silent generation, nearly half, 48 percent, would prefer to live in a community that has public transit they can use" (Urban Land Institute 2013).
- "The 2004 American Community Survey found that consumers place a high value on urban amenities such as shorter commute time and neighborhood walkability: 60% of prospective homebuyers surveyed reported that they prefer a neighborhood that offered a shorter commute, sidewalks and amenities like local shops, restaurants, libraries, schools and public transport over a more automobile-dependent community with larger lots but longer commutes and poorer walking conditions" (Litman 2014).

60% of homebuyers prefer walkable neighborhoods with amenities like transit over automobile-centric neighborhoods with larger lots.

Table 4 Preferences for public transportation by generation.

	Prefer Public Transportation Options	Public Transportation Options Do Not Matter
Gen Y	55%	45%
Gen X	45%	55%
Baby Boomers	52%	48%
War babies/silent generation	48%	52%
All Adults	**51%**	**49%**

Adapted from "America in 2013" (Urban Land Institute 2013).

- The 2004 ACS also revealed that "Americans place a high value on limiting their commute times and they are more likely to see improved public transportation and changing patterns of housing development as the solutions to longer commutes than increasing road capacities. This unambiguous finding suggests that, while public policies are going in one direction, public opinion is running down another path" (Belden Russonello and Stewart 2004).
- "Significant indirect productivity effects of transit service are found. For example, in the case of central city employment density, estimated wage increases range between $1.5 million and $1.8 billion per metropolitan area yearly for a 10 per cent increase in transit seats or rail service miles per capita" (Chatman and Noland 2013).
- "Transit services could concentrate development near transit stops in employment centres, lowering the transactions costs associated with intermediate inputs (Scott, 1988) and causing information spillovers that happen when workers in innovation-based industries mix and mingle with each other (Arzaghi and Henderson, 2008)" (Chatman and Noland 2013).

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INDIVIDUAL BENEFITS

Public transportation allows those living nearby to more easily travel to and from destinations that are important to them. Households with easy access to public transit are able to spend less on transportation and can thus afford to spend more on housing. But the benefits of living near transit can go beyond mere economics. Aside from lower transportation costs, the ability to travel within a large metropolitan area while avoiding traffic congestion is highly valued by some. Others are attracted to the commercial and entertainment options that often cluster around transit stations. And still others choose to use transit instead of driving their own vehicle in an effort to shrink their carbon footprint. While most transit users in Bellevue choose to use transit despite having other travel options, some are too young, too old, or physically unable to drive or do not have access to a vehicle. For these individuals, transit serves as a critical means of empowering them to reach work, school, shopping and entertainment destinations, and the variety of other opportunities available throughout the community and region.

"People with disabilities must have accessible and reliable public transportation in order to work and be productive members of their communities. When people with disabilities work, lives of isolation and poverty are transformed into lives of inclusion and self-sufficiency. When people with disabilities work, businesses experience increased profits and higher employee satisfaction and morale. People with disabilities who have jobs pay taxes, support our economy, and no longer rely upon other social services to survive."

CHRISTINA BRANDT, CHIEF EXECUTIVE OFFICER
ATWORK!

Saves Time & Money

- Nationally, the annual cost of congestion to the average commuter increased from $351 in 1982 to $808 in 2009 (Metropolitan King County Council 2011).
- In 2011, public transportation in the greater Seattle urban area reduced traffic delay due to congestion by about 16.5 million hours, valued by the researchers at 366.5 million (Schrank, Eisele, and Lomax 2012).
- Without public transportation, travel delays due to congestion—4.16 billion hours nationally, or an average of 36 hours per traveler in 2007—would have increased by 15 percent (APTA 2010).
- In addition to system-wide reduction in travel delay due to congestion, transit that makes use of

HOV facilities in the area may also save individual riders time compared to driving alone. “Average travel times and 95% reliable travel times are almost always faster in HOV lanes than in general purpose (GP) lanes. In 2011, average HOV lane travel times performed better than GP lane travel times on 40 of 46 routes and were unchanged on the remaining six routes. Forty-five HOV routes provide better reliability (95% reliable travel time) than their respective GP counterparts and one remained the same” (WSDOT 2012).

- Based on the January 16, 2014 average national gasoline price ($3.30 per gallon) and the national unreserved parking rate ($166.26 per month), “individuals who ride public transportation instead of driving can save, on average, more than $829 this month, and $9,953 annually” (APTA 2014b). Among the twenty U.S. cities with the highest transit ridership, Seattle ranks sixth overall in savings realized by people using a monthly transit pass instead of driving—$969 in savings each month, or $11,630 annually—based on local gas prices and unreserved parking rates (APTA 2014b).
- "In addition, transit availability can reduce the need for an additional car, a yearly expense of more than $9,000 in an average household budget” (Bailey 2007).
- "National data show that there is an inverse relationship between household spending on transportation and housing: households that spend more on transportation spend less on housing, and vice versa. Shorter distances traveled means Portland residents have more money to spend on their homes. We also know that Portlanders spend more on some things — outdoor recreation and alcoholic beverages, for example. And, not incidentally, Portland has more restaurants per capita than any other large metropolitan area, save Seattle and San Francisco" (Cortright 2007).

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"During the school year, over 3,000 Bellevue School District high school students access metro transit as their primary mode of transportation to and from school. Our students depend on reliable, consistent and timely mass transit between their neighborhoods and schools to arrive to school on time and ready to learn."

TERRY PARKER, TRANSPORTATION MANAGER
BELLEVUE SCHOOL DISTRICT

"The dramatic increase in the senior population over the next two decades highlights the need for a transportation system where mobility choices and access to services are provided equally and affordably to all residents and are responsive to the needs of people for whom transit is a necessity, including seniors, people with disabilities, low-income populations, youth, people of color, people with limited proficiency in English and people without access to private vehicles. The transit system should ensure that all people have access to mobility options that allow them to move freely around the community, preserve dignity, maximize independence and provide access to the full range of activities that contribute to quality of life."

PAULA L. HOUSTON, M.H.A.
CHIEF EXECUTIVE OFFICER
SENIOR SERVICES

Reduces Carbon Footprint

- "If an individual switches a 20-mile roundtrip commute to public transportation, his or her annual CO2 emissions will decrease by 4,800 pounds per year, equal to a 10 percent reduction in a two-car household's carbon footprint" (APTA 2010).
- Households near public transit drive an average of 4,400 fewer miles than households with no access to public transit. This equates to an individual household reduction of 223 gallons per year. (APTA 2014a)
- One person switching to public transit can reduce daily carbon emissions by 20 pounds, or more than 4,800 pounds in a year (APTA 2014a).
- A single commuter switching his or her commute to public transportation can reduce a household's carbon emissions by 10% and up to 30% if he or she eliminates a second car. When compared to other household actions that limit CO2, taking public transportation can be 10 times greater in reducing this harmful greenhouse gas (APTA 2014a).

Empowers Individuals

- "Approximately 11 percent of public transportation users are en route to schools" (APTA 2010).
- "By 2025, an estimated 20 percent of the population—one in five persons—will be over age 65; providing mobility options is critical for older American and for those who care for them" (APTA 2010).
- "According to a national survey of individuals age 65 or older… more than four in five seniors believe public transportation is a better alternative to driving alone, especially at night, and 83 percent agree that public transit provides easy access to the things that older adults need in everyday life" (APTA 2010).
- "A 2002 study in the American Journal of Public

Health found that men in their early 70s who stop driving will need access to transportation alternatives, such as public transportation, for an average of six years; women in the same age group will, on average, need transportation alternatives for ten years" (Transportation for America 2011: 3).

- "A 2008 survey by AARP found that 85 percent of older Americans were either extremely concerned or very concerned about rising fuel prices, leading many to look toward other forms of transportation or to reduce their travel" (Transportation for America 2011: 3–4).
- "Low-income workers spend up to 36% of their household budget on transportation services, mostly to gain access to job sites" (Surface Transportation Policy Partnership n.d.).
- "Public transportation systems play a key role in moving former welfare recipients into the workforce as permanent wage earners. A 1999 APTA survey revealed that an estimated 94 percent of welfare recipients attempting to move into the workforce rely on public transportation" (Surface Transportation Policy Partnership n.d.).

Improves Health & Safety

- "Improving public transportation not only links people to these goods and services, but also helps communities achieve public health benefits. These include increased physical activity, reduced pollution, reduced fatalities and injuries on our transportation networks and greater community cohesion" (APHA 2012).
- In addition to reduced pollution, direct health benefits of public transportation include lower rates of respiratory and heart disease, and lower accident rates (National Safety Council 2006).
- A significant amount of time is spent driving; the average U.S. resident spends 443 hours in a car

"Transit creates more active communities. People walk more (health benefits)... A good transportation system is fundamental to viability, the city will stagnate, and residents who want that will choose not to live here."

HAL FERRIS, BELLEVUE PLANNING COMMMISSION
TRANSIT MASTER PLAN FORUM

"Transit service offers people with special needs access to vital human services, health care, educational opportunities, employment, and a wide range of other activities that in many cases they would not be able to access without transit. Transit therefore plays an important role in reducing social and economic inequalities by enhancing mobility for people, regardless of age, race, income or disability. In particular, it helps to bridge the mobility divide currently existing for many low-income families, people with disabilities, or older adults who lack access to a vehicle."

LAUREN THOMAS, INTERIM CEO
HOPELINK

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each year—the equivalent of 55 eight-hour work days. This represents time that could otherwise be spent in productive or leisure activity (Sierra Club n.d.).

- Public transportation fosters a more active lifestyle, encouraging people to walk and bike to transit stops. “Walking to and from public transportation can help physically inactive populations, especially low-income and minority groups, attain the recommended level of daily physical activity. Increased access to public transit may help promote and maintain active lifestyles” (Besser and Dannenberg 2005: 273).
- The median daily walking time of a transit user is 19 minutes, and 29 percent of all transit users meet or exceed the recommended minimum of 30 minutes of daily physical activity by walking to transit. (Besser and Dannenberg 2005).
- Men who commute to work on public transportation are 44.6% less likely to be overweight or obese due to increased active commuting (Zheng 2008).
- Public transportation is one of the safest modes of travel. Riding a transit bus is 91 times safer than car travel (Mackie 2008).

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