Northgate Non-Motorized Access to Transit and Education



Project Location: Seattle, King County, Washington, Congressional Districts 7 and 9

Project Type: Capital Project

Applicant Type: Local Government

Amount: $25 million

City of Seattle DUNS: 9483561

Partners: Washington State Department of Transportation, Puget Sound Regional Council, Sound Transit, North Seattle College

City of Seattle

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Economic Competitiveness (p.12)

- ✓ Connects people to centers of education, employment, and services
- ✓ Promotes workforce development
- ✓ Promotes business opportunities
- ✓ Supports job creation and retention
- ✓ Reduces travel time

Livability (p.17)

- ✓ Creates affordable and convenient transportation choices
- ✓ Improves access to transit
- ✓ Improves pedestrian and bicycle access
- ✓ Supports existing communities
- ✓ Promotes land use/transportation integration
- ✓ Provides access to affordable housing

Environmental Sustainability (p.22)

- ✓ Supports energy efficiency, air quality, and climate protection
- ✓ Creates opportunities for new environmental education
- ✓ Promotes best practices in sustainable infrastructure

State of Good Repair (p.23)

- ✓ Reduces infrastructure maintenance costs by over $160,000 each year
- ✓ Promotes best practices in asset management

Safety and Healthy Communities (p.23)

- ✓ Provides safer pedestrian and bicycle networks
- ✓ Promotes active transportation

p24. Secondary Criteria

Innovation (p.24)

- ✓ Deploys new pedal assist technology on a large scale
- ✓ Orca Lift/Student Discounts for students and low-income residents
- ✓ Employs bikeshare as a tool to promote equity
- ✓ Leverages significant new investments in the Northgate area
- ✓ Builds according to the best practices of sustainable infrastructure

Partnerships (p.26)

- ✓ Builds on a long history of regional collaboration
- ✓ Demonstrates strong neighborhood and business support

p27. Project Readiness

- Project Readiness and NEPA
- Financial Feasibility and Sources of Funds
- Risk Mitigation Plan
- Environmental Approvals
- Legislative Approvals
- State and Regional Planning Approvals

Go to **http://www.seattle.gov/transportation/northgate_tiger2.htm** to download copies of all materials, including letters of support and relevant planning documents

Project Description

OVERVIEW OF TIGER GRANT REQUEST

The City of Seattle is seeking $25 million in FY 2015 TIGER funds to match approximately $29.5 million in local and private investments to connect transit, jobs and education. The Northgate Non-Motorized Access to Transit and Education project will:

- Build a pedestrian and bicycle bridge across I-5 linking North Seattle College to a new Light Rail station
- Create a host of pedestrian and bicycle safety improvements in the Northgate station area
- Launch a 250-station, citywide electric-assist bikeshare expansion to provide first-mile/last mile access to the region's light rail and Rapid Ride system
- Improve access to all of the region's education centers

Completion of the project would deliver the following benefits:

- **Reduced Travel Time**: Reduces walk time from North Seattle College and the surrounding neighborhood to Light Rail Station by 20 minutes, and saves typical bikeshare users citywide 1.6 minutes per trip
- **First-Mile/Last Mile Connections**: 181% increase in residents with access to transit service that comes every 10 minutes, from 26% of population to 73% of population
- **Increased Transportation Access to Education**: Every Seattle college (110,000 students) within a 10-minute walk or bikeshare ride of 10 minute transit
- **Safety**: Eliminates dangerous crossings for pedestrians and people on bikes
- **Creating Jobs/Ladders of Opportunities**: An apprenticeship program offering ladders of opportunity for youth employment and creating 35-40 permanent FTEs to operate bikeshare
- **Social Equity**: Low-income residents and students will receive reduced rates for bikeshare memberships

Net economic benefits of these projects, monetized within the attached Benefit-Cost Analysis, total well over $250 million. The Northgate Non-Motorized Access to Transit and Education project is expected to generate verifiable benefits that outweigh the sum of costs by at least a 3-to-1 ratio. This sum does not include qualitative benefits of the project, which are further described in the Benefit-Cost Analysis.

TIGER Funding Request

The requested $25 million TIGER funds would be used to:

- Complete the construction of the Northgate Bridge, a key project that will reconnect a neighborhood separated by a major freeway and improve safety for all travelers, particularly those walking, biking, and accessing transit
- Expand and increase access to the city's bikeshare system, which involves purchasing and installing bikeshare stations, including cutting-edge implementation of electric-assist bikes (stations incorporate bike share docks, kiosks, platforms, solar systems, and helmet-dispensing units)
- Match substantial local funds and a variety of state and regional partnerships

Local Match

Local investments of approximately $29.5 million will be used to:

- Complete the funding package for the bridge and build an extensive network of non-motorized infrastructure in Northgate
- Purchase the bikes for a planned bikeshare expansion

Seattle Vision and Leadership

- One of six cities selected to participate in People for Bikes' Green Lane Project, showing cutting-edge leadership in developing protected bikeways (2014)
- Awarded Climate Action Champion status by the White House, honoring on-going commitments to greenhouse gas reductions (2014)
- Joined Secretary Foxx's Mayor's Challenge for Safer People and Safer Streets to improve safety for all roadway users through a Complete Streets approach and context-sensitive street designs (2015)

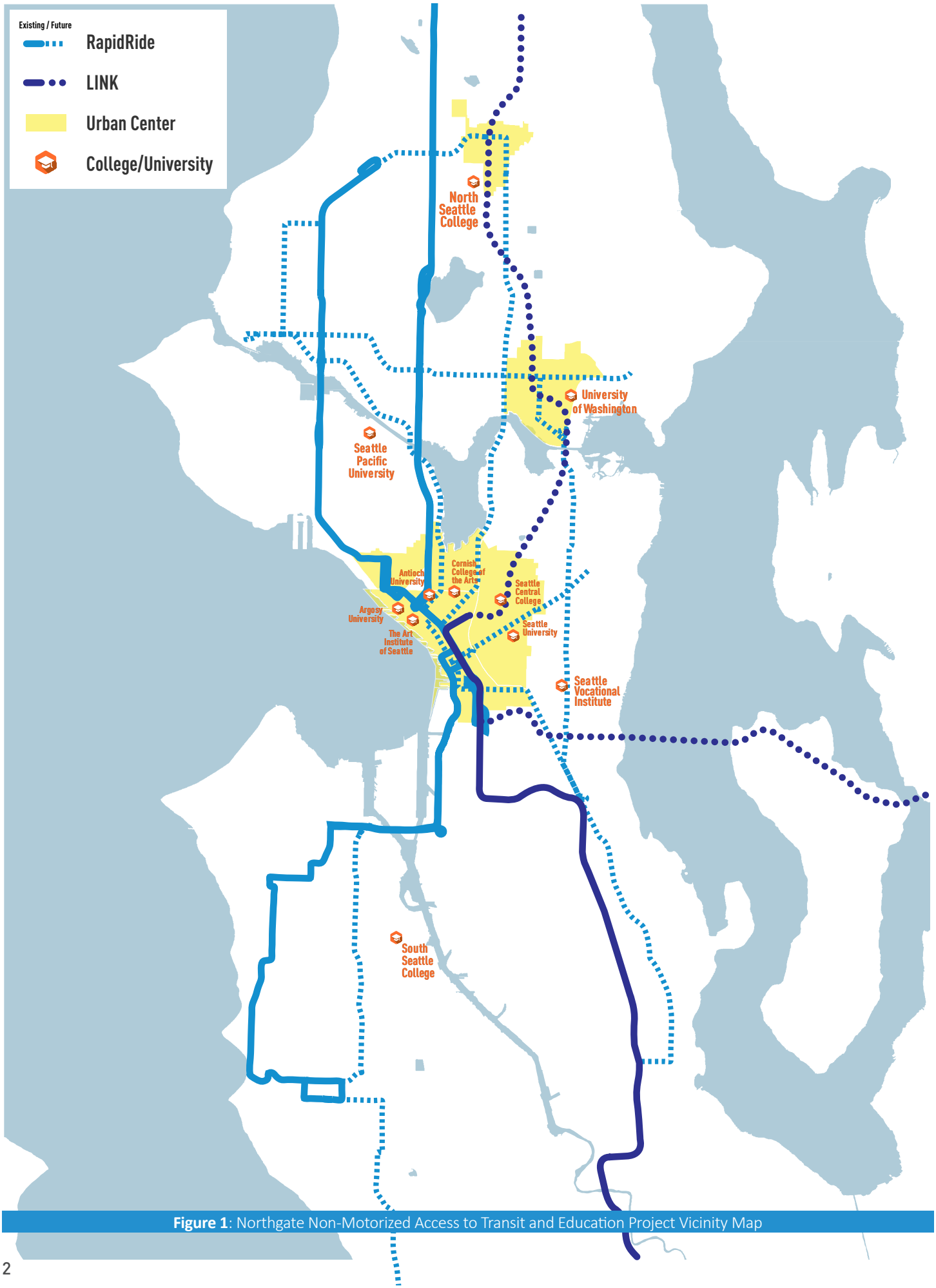


Figure 1: Northgate Non-Motorized Access to Transit and Education Project Vicinity Map

EXISTING CONDITIONS —
Transportation Challenges and Opportunities

The City of Seattle is one of the fastest growing big cities in the country, growing by 10% from 2010 to 2014 and adding 60,000 residents. Two thirds of the growth has taken place in Seattle's Urban Centers and Villages, a success of our long-range planning to focus growth and transportation investments in these areas. Seattle is a linear north/south city with only two main arteries in and out (I-5 and SR-99). Congestion, health, and climate pollution are major concerns of Seattleites. And as the city grows, residents are demanding more and better transportation options. Seattle is now investing in transit, walking and biking to build a more resilient system. In the past decade Seattle voters have approved three funding levies to increase transit:

- **Sound Transit 1** (new service started 2009): Building 16.3 miles of light rail
- **Sound Transit 2** (new service starts 2021 and 2023): Building 36 new miles of light rail
- **Proposition 1** (new service starts 2015): Increasing local bus service by 15% in the City of Seattle

In addition, voters will be asked to fund $930 million in transit and transportation investments in 2015 (Levy to Move Seattle) and will likely be asked to vote on a Sound Transit 3 funding levy to increase investment in Light Rail and Bus Rapid Transit. The Levy to Move Seattle will fund 50 miles of protected bike lanes, 60 miles of neighborhood greenways, and over $100 million in pedestrian improvements.

Seattle's investments in transit, walking, and biking are paying off (Figure 2). Over the decade and a half between 2000 and 2014, drive-alone rates dropped by 7%. This is important not only for the efficiency of the transportation system but also to support Seattle's economic and cultural diversity. As the City has grown, housing has become less affordable. Transportation is the second biggest out of pocket expense of Seattle households (Figure 3) and improving access to education and investing in transit, walking, and biking will help maintain Seattle's affordability.

Although transit is quickly improving, Seattle still faces significant challenges with first and last mile connectivity:

- **I-5 Bisects the City**: I-5 ranges from 10 to 15 lanes wide as it passes through the Seattle (350 to over 650 feet). One of its widest points is at the Northgate Way interchange. This separates residents from transit, critical services, education, and jobs.
- **High-Capacity/High-Frequency Transit Shortage**: Seattle is investing huge sums in frequent transit (10 minute frequency or better), but only 43% of the city will be within a 10 minute walk of Rapid Ride bus or Link light rail in September 2015.
- **Topography**: Seattle is extremely hilly. Seattle has invested in improving the quality of its bike infrastructure but the topography limits biking to individuals that feel athletic enough to tackle the hills.
- **Concentration of Vulnerable Populations**: Seattle's vulnerable populations (low-income and minority) are concentrated in a few neighborhoods at the periphery of the city and in southeast Seattle (Rainier Valley). Further, Seattle's shift workers are more likely to need more affordable transportation options during off-peak transit hours.
- **Location of Colleges**: Two of the Seattle College District's three main campuses are not accessible via high frequency transit (Figure 1).

Seattle's Frequent Transit

Rapid Ride Bus Transit:

- Launched in 2010
- Dedicated fleet of clean-fuel articulated buses
- Branded stations with real-time travel information
- Off-board fare payment and all door boarding
- Frequent service: 10-Minute Peak/15-minute Off-Peak
- 3 Routes in the City of Seattle/3 in King County
- 31,000 riders per day/22,000 in King County (2014)

Link Light Rail:

- Launched in 2009
- Light rail operating in mix of subway, aerial, and at-grade tracks
- Frequent service: 7.5-Minute Peak/10-Minute Off-Peak
- 1 line in Seattle (2 extensions under construction: U-Link and Northgate)
- 34,000 per day (2014)

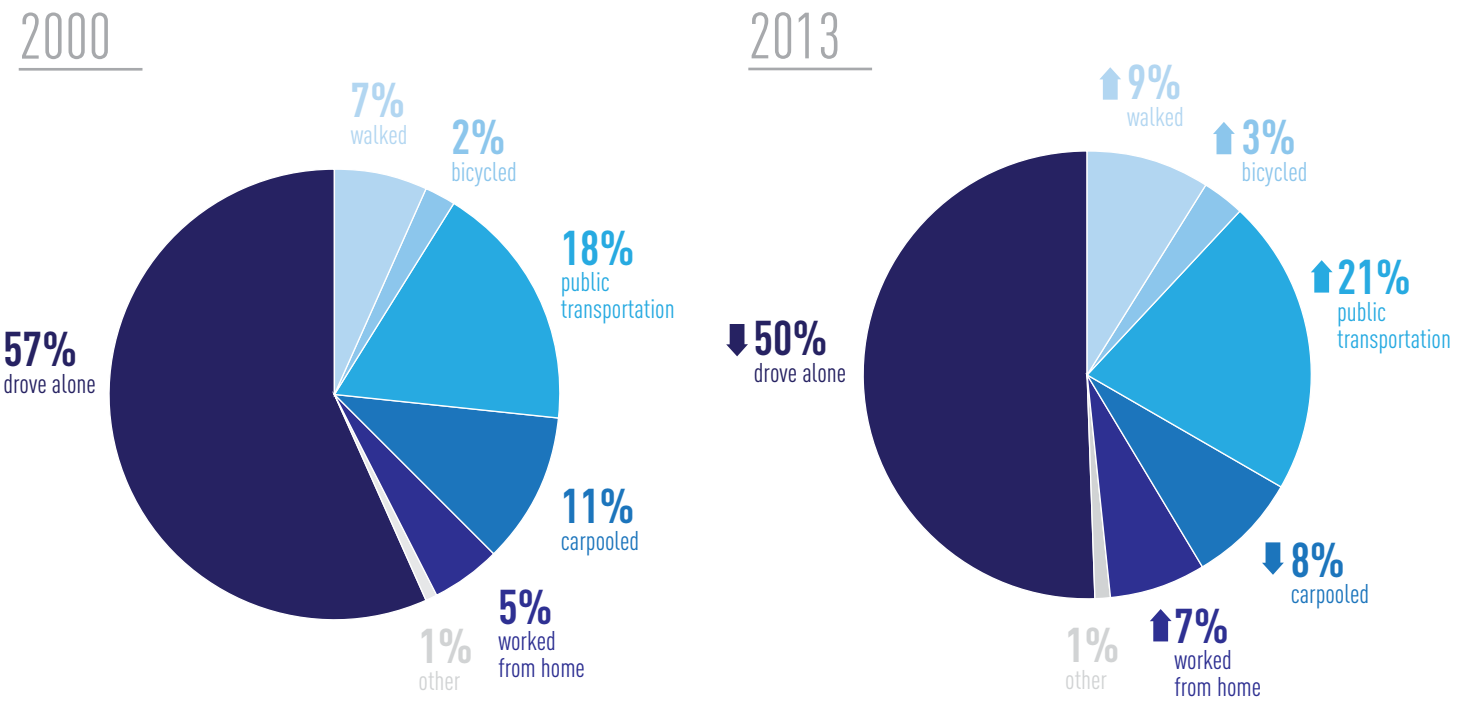


Figure 2: Change in Seattle mode split 2000-2013
(Source: American Community Survey 1-Year Estimates (1 Yr. Estimates begin in 2006) and Census 2000 Summary File 3)

Seattle's Pronto Cycle Share

Throughout the country, bikeshare systems have shown that they can serve as important parts of cities' transit systems. However, bikeshare systems need to have a sufficient critical mass of stations and bikes to serve as reliable connections to transit. Currently, Seattle's bikeshare system connects to 4 of the city's 11 light rail stations, and only 11 of the Rapid Ride stations. Today, Seattle's bikeshare system serves predominantly affluent neighborhoods and does not meet the needs of all Seattleites.

Pronto Cycle Share launched in Seattle in October 2014, with 50 stations and 500 bikes in the Central Business District and also on the University of Washington (UW) campus approximately 2 ½ miles from the downtown center (Figure 10). Pronto was the first bikeshare system in the world to include helmet distribution and return at the bikeshare station, to comply with King County's all-ages helmet law.

Bicycling is a major component of Seattle's transportation system. Seattle has the eighth-best bicycle mode share in the country at 4.5%. The private-sector recognizes this and has provided capital and operating support for Pronto Cycle Share (Figure 4).

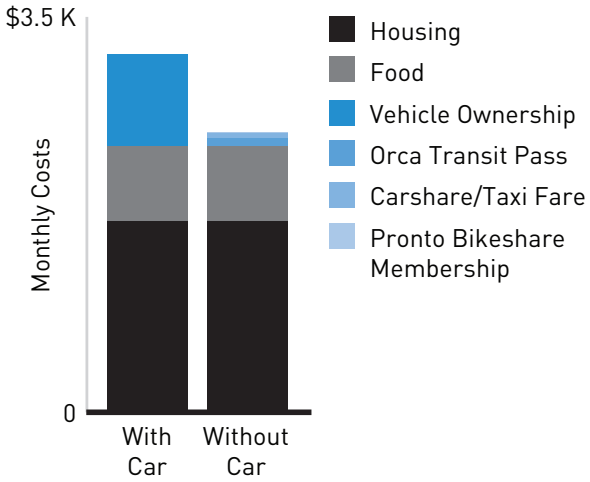


Figure 3: Transportation as % of out of pocket expenses



Figure 4: Pronto Cycle Share Private Funding Partners



Figure 5: The I-5 corridor is a major barrier bisecting the Northgate community

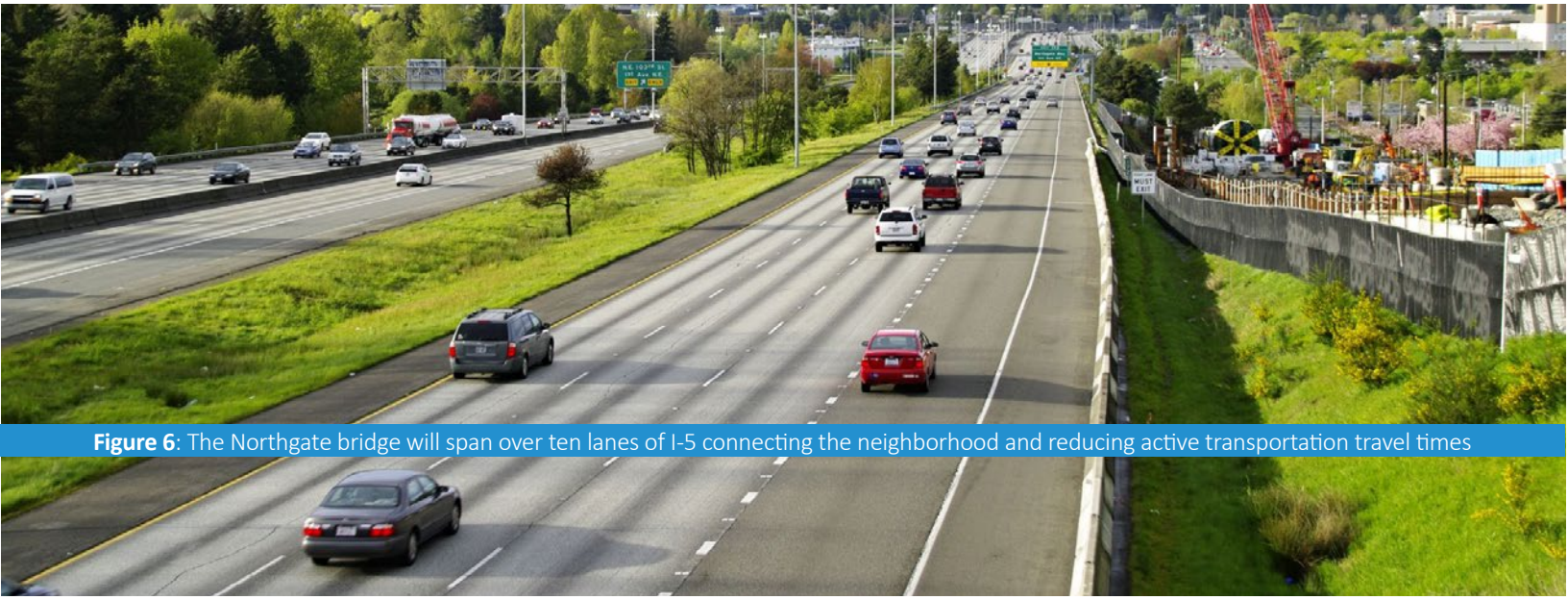
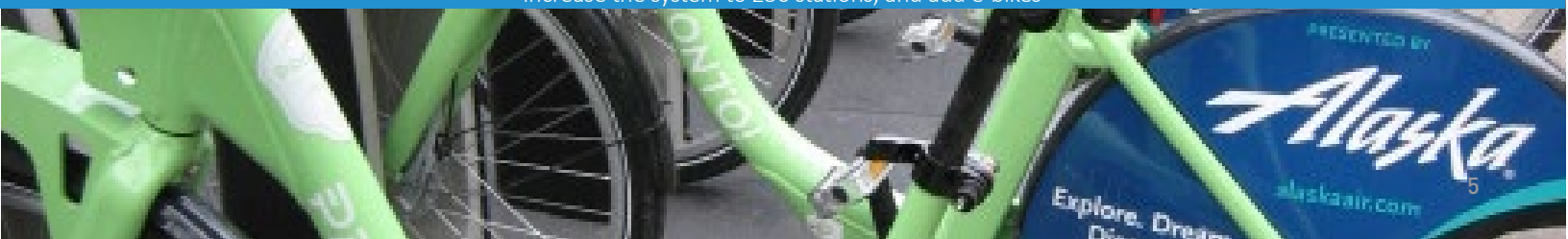


Figure 6: The Northgate bridge will span over ten lanes of I-5 connecting the neighborhood and reducing active transportation travel times



Figure 7: The Pronto Cycle Share system currently has 50 stations and 500 bicycles. With TIGER funding, Seattle would greatly expand the service area, increase the system to 250 stations, and add e-bikes



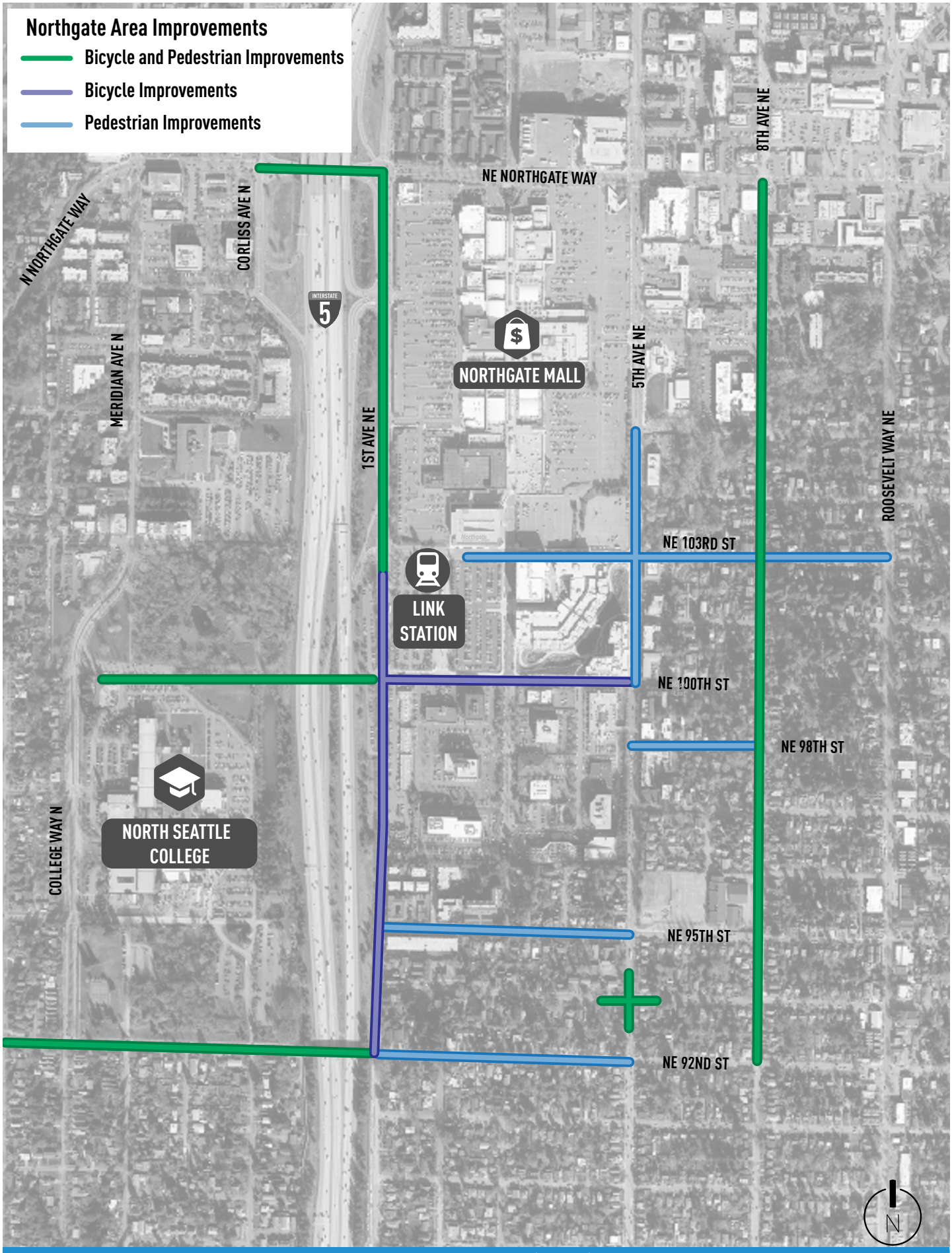


Figure 8: Project improvements in the Northgate area



Figure 9: Map showing walking routes and distance from light rail station to college

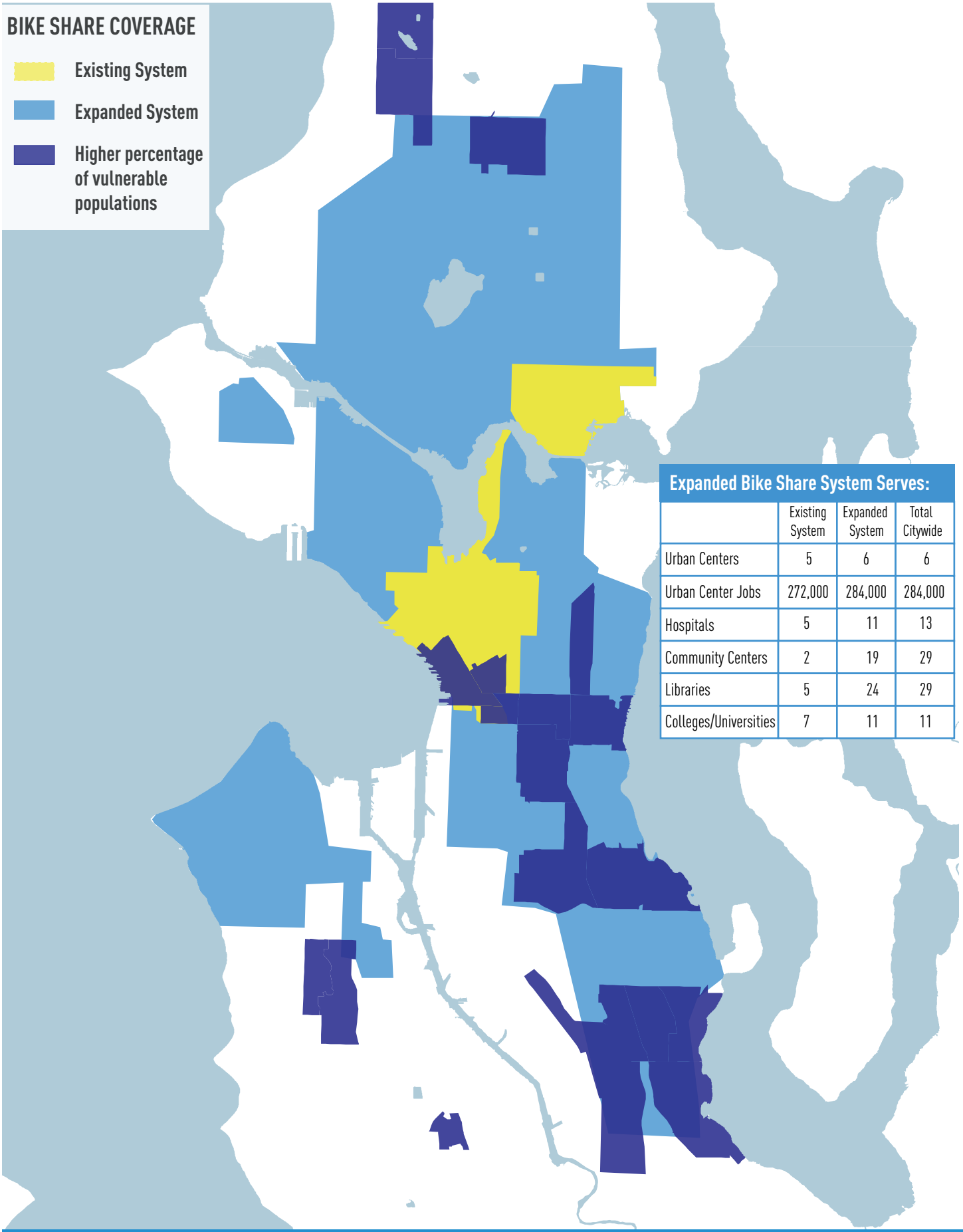
Northgate Neighborhood

The Northgate area faces many of the connectivity challenges described on page 3. The area is one of the Puget Sound region's major residential and employment centers with over 7,000 residents and 12,000 jobs. It is one of Seattle's most affordable communities and has attracted a higher proportion of economically disadvantaged populations than the city as a whole.

Transit options are very rich – the Northgate transit center is one of the region's busiest, with over 6,000 bus boardings per day – and with the construction of Sound Transit's Link Light Rail station in 2021, the Northgate neighborhood is poised to become the region's second most active transit hub. At the same time, the area's auto-oriented built environment is dominated by fast moving arterials, highway interchanges and an evolving, but still auto-bound, shopping mall.

Ten lanes of Interstate 5 (I-5) bisect the neighborhood, creating barriers between homes, jobs, schools, transit stops, and vital community services. There are only two opportunities to cross I-5 within the 409-acre urban center, making it difficult to impossible for many people to reach the light rail station. The two existing crossings of I-5 add nearly 20 minutes to the average walk time to the light rail station site, and one of those existing crossings is complicated by freeway entrances.

With the FY 15 TIGER grant and its local match, Seattle plans to bridge I-5, improve safety for people walking and biking, and create a robust bikeshare system. Together, these projects will transform the Northgate center into a transit-oriented community.



Expanded Bike Share System Serves:

	Existing System	Expanded System	Total Citywide
Urban Centers	5	6	6
Urban Center Jobs	272,000	284,000	284,000
Hospitals	5	11	13
Community Centers	2	19	29
Libraries	5	24	29
Colleges/Universities	7	11	11

Figure 10: Bikeshare service area, before and after expansion, showing overlay of Seattle's most vulnerable populations. Most vulnerable population areas have disproportionately high percentages of people of color, under 18, over 65, with disabilities, without daily access to a car, and earnings below 200% of poverty level (defined by the U.S. Census Bureau)

THE PROJECT VISION —

What Could These Transportation Investments Deliver?

The requested federal funding will carry out TIGER's mission and vision of transportation investments that transform communities, create new ladders of opportunity for struggling populations, and generate economic gains across the region and the country. By expanding the reach of Link Light Rail and Seattle's Frequent Transit Network (including the RapidRide network) with better pedestrian and bikeshare access to transit stations, the project will connect the neighborhood with thriving job centers and communities – nearby centers in central and north Seattle and more distant centers throughout the city and region. The project is divided into three components:

Northgate Pedestrian Bridge: Build an approximately 2,000 foot pedestrian and bicycle bridge that will knit together the Northgate community, reduce the walking/biking distance from 1.25 miles to 0.3 miles, and improve safety by reducing crossing of I-5 (Figure 9). This will make it easier to access NSC's Opportunity Center for Employment and Education: an innovative pilot project that combines human services, employment assistance, social services, and educational opportunities at one location. The improvements will also present new opportunities to NSC's 15,000 students and over 7,400 faculty and staff to access jobs and classes in a more time and cost-effective manner.

Northgate Area Safety Improvements: Drawing from the City of Seattle, Sound Transit, and King County bicycle and pedestrian station access study, the project will build $10 million worth of community-prioritized safety improvements: bike lanes, sidewalks, crosswalks, and bridge improvements. These projects include 1.5 miles of new protected bike lanes and 1.4 blocks of sidewalk as well as crossing improvements, improving safety for people walking and biking in the Northgate neighborhood (Figure 10).

Bikeshare Expansion: The project will expand the bikeshare system to 250 stations with 2,500 bikes. The proposed bikeshare fleet will include electric drive, pedal assist bikes (e-bikes). The proposed expansion will increase the service area from 5 square miles of the city and 14% of the population to 42 square miles serving 62% of the population (Figure 10). E-bikes will help Seattleites and visitors traverse the many hills in the city and take longer trips. Expansion plans include stations throughout the city – connecting the two initial service areas, extending along major transit corridors, incorporating tourist centers and other sites with high pedestrian volumes, densifying throughout the core service areas, and, most importantly, serving more neighborhoods that need stronger connections to transit, jobs and educational opportunities (Figure 10). Bikeshare is identified as a critical part of the solution for overcoming barriers that prevent active transportation to, from, and within Northgate (the other critical piece being construction of the pedestrian-bicycle bridge) and to the South Seattle College campus. The system has the potential to grow into a regional bikeshare system. Seed money currently set aside in a proposed state budget for Seattle's neighboring cities, Bellevue, Redmond, and Kirkland (total 276,000 residents and 246,000 jobs). Passage of the state budget is expected in June 2015.

2016: Seattle will launch the expansion of its bikeshare program with electric drive bikes

2017: Seattle will break ground on the Northgate Pedestrian Bridge

LADDERS OF OPPORTUNITY

The Northgate Non-Motorized Access to Transit and Education Project creates Ladders of Opportunities through these steps:

Connect: The Northgate Non-Motorized Access to Transit and Education Project creates connections by:

- **Opening access to education and employment**: 110,000 students and 500,000 people go to school and work in Seattle every day. The combined Northgate Bridge and bikeshare expansion will increase the number of jobs within a 10-minute walk or bike ride of frequent transit and provide frequent transit access to every college or university in Seattle.
- **Addressing the first-mile/last-mile**: North Seattle College is currently a 1.25 mile and 20- to 30-minute walk from the future Northgate Link light rail station. People walking and biking must cross one on-ramp and one off-ramp to get to the college. The proposed bridge will reduce that to a 0.3 mile and a 6-minute walk or bike with no dangerous intersection crossing. The bikeshare expansion will increase the population with ready access to bikeshare from 88,678 to 392,625 and increase the catchment area of frequent transit by 342%. The Northgate neighborhood needs better, safer connections for people walking and biking. Twenty-one (21%) of people who park at the Northgate Park and Ride lot live within one mile of it. Improving walking and biking routes will make those options more viable to potential transit users.
- **Leveling the land**: Seattle is a hilly city, which makes riding a bike a challenge for many. Electric-assist bikes can help level the land. Electric assist bikes, combined with safe facilities like the Northgate bridge and improved walking and biking routes will help make biking comfortable for people of all ages and abilities.

- **Investing in Affordable Transportation**: User data from Chicago and Washington, DC show that bikeshare users save on average $750 to $850 per year in transportation costs. Seattle will build on that by offering half-price fares for residents who qualify for Orca LIFT (a reduced rate transit pass for low-income residents) and for students enrolled in Seattle colleges and universities. In Seattle, eligible persons are at or lower than 200% of federal poverty level. In Seattle, 120,000 people between ages 18-64, including those with a disability, meet this criterion.

Work: The Northgate Non-Motorized Access to Transit and Education Project will:

- **Create permanent jobs**: The bikeshare system will create an estimated 35-40 permanent, full-time equivalent positions to operate the systems (maintaining equipment and rebalancing bikes).
- **Train youth through apprenticeships**: The City will partner with Bike Works, a local non-profit organization, to create an apprenticeship program for 8 to 10 youth to have year-round employment opportunities learning how to maintain bikes and stations.

Revitalize: The Northgate Non-Motorized Access to Transit and Education Project will revitalize Seattle neighborhoods by:

- **Bridging I-5**: The bridge will reconnect a neighborhood that was cut in half decades ago by the construction of I-5. This will improve access to jobs and education for residents of the Northgate neighborhood.
- **Supporting the Northgate Neighborhood**: The bridge will help knit a community back together and help it realize its potential as a walkable, mixed-use, and transit-oriented community.
- **Connecting Southeast Seattle**: The bikeshare network will open access to education and employment opportunities throughout Seattle, particularly for historically under-represented communities in southeast Seattle within a short walk or bike ride to light rail. It will improve first- and last-mile transit connections to employment and education centers.

Partners

FUNDING PARTNERS

City of Seattle

- Lead agency and primary grant recipient, responsible for project design, construction, operations and maintenance
- Maintains and operates a multi-modal transportation system with a value of $13 billion
- Certified Agency since 1973 with a wealth of experience leading large projects and federal grants, including TIGER I and IV grants
- Has technical, financial and legal capacity to complete this TIGER project on time and on budget
- $10 million local match contribution to project

Sound Transit

- Regional transit agency, responsible for design, construction, and operations of Link Light Rail
- $10 million local match contribution to project

Puget Sound Regional Council

- Metropolitan Planning Organization and Economic Development District representing 72 cities, four counties, four port districts, eleven transit agencies, and two Native American tribes
- Designated a Preferred Sustainable Community by the U.S. Department of Housing and Urban Development and awarded a $5 million Sustainable Communities grant in 2010
- $718,000 CMAQ grant award to plan and design Northgate non-motorized improvements
- $600,000 TAP grant award for design of Northgate Non-motorized Bridge

North Seattle College

- North Seattle College provides learning opportunities for a diverse group of over 14,000 students each year of the 46,000 total students in the Seattle College system
- Offers a new Bachelor of Applied Science degree in International Business
- Provides career training in over 50 certificate programs including emerging high-tech fields
- Home of Opportunity Center for Employment and Education and Entrepreneur Success Center
- Providing air rights and easement for Northgate Pedestrian and Bicycle Bridge

Washington State DOT

- Steward of FHWA funding distributed to public agencies throughout the state
- Providing air rights and easement for Northgate Pedestrian and Bicycle Bridge

Motivate

- Providing $3 million in-kind contribution

SUPPORTING PARTNERS

King County

- Seattle's major transit provider and operates a major transit center at Northgate
- Planning major transit-oriented development and Northgate park-and-ride facility
- Conducted feasibility analysis of Northgate Pedestrian and Bicycle Bridge

Bike Works

- Bike Works builds sustainable communities by educating youth and promoting bicycling by: providing collaborative youth programming that develops creativity, community and leadership
- Repurposing and recycling bicycles and promote environmental responsibility
- Helping more people make cycling a part of their everyday lives by keeping cycling accessible and affordable

City of Seattle

SoundTransit

Puget Sound Regional Council
PSRC

North Seattle College

Washington State Department of Transportation

motivate

King County

Bike Works



Artist rendering looking along future Northgate Bridge

Primary Selection Criteria

A. ECONOMIC COMPETITIVENESS

Investing in better bicycle and pedestrian facilities at the Northgate Station and expanding bikeshare citywide will improve economic competitiveness in five key ways:

1. **Connects People to Centers of Education, Employment, and Services**: Ensures every Seattle college and university is served by frequent transit and increases the number of jobs accessible via frequent transit network
2. **Promotes Workforce Development**: The City will partner with Bike Works to incorporate a youth apprenticeship program into operations of the bikeshare system
3. **Promotes Business Opportunities**: Increases spending power of local household by lowering out-of-pocket transportation costs
4. **Supports Job Creation and Job Retention**: Supports 35-40 permanent, full-time operating jobs
5. **Reduces Travel Time**: The typical bikeshare user will save 1.6 minutes per trip and those individuals using the Northgate pedestrian and bicycle bridge to get to and from light rail will save 20 minutes per trip

A1. Connects People to Centers of Education, Employment and Services

The proposed project will:

- Open access via a pedestrian bridge, bikeshare, and pedestrian and bike safety improvements to 110,000 college students
- Provide 287,678 more residents with access to frequent transit and 303,947 more residents with access to bikeshare, including shift workers and non-pear hour trips
- Make discounted bikeshare memberships available to up to 20% of bikeshare members
- Improve safety in a neighborhood with 436 crashes over the last 10 years

Seattle has 110,000 students attending 10 colleges and universities. Connecting people from all parts of the City to these educational opportunities is critical to Seattle's goal of ensuring all residents have equitable access to opportunity. The Seattle Colleges District has three main campuses and total enrollment at 46,000 students per year. Only one campus, Seattle Central College, has access to frequent transit. North Seattle College (15,000 students) is directly across I-5 from the future Northgate light rail station, but is a 25 minute walk from the station. South Seattle College (14,000 students) is 1.1 miles and a 20 minute walk from the nearest frequent transit (every 10 minutes or better).

South Seattle College is situated on the far eastern edge of West Seattle on a bluff overlooking the Duwamish industrial corridor. It lacks direct east/west connections to the neighborhood's primary transit corridor on Delridge Way. Significant slopes require out of direction travel for safe walking and bicycling connections to the college. The college is located 1.5 miles from the closest bus stop at Delridge Way and Juneau Street. This is a 28 minute walk that will be a 7 minute trip on bikeshare with this expansion. The 138' elevation climb of this trip will also be improved with electric assist bicycles. The combination of investing in the Northgate Pedestrian Bridge and an expanded bikeshare system will improve access to both colleges for residents throughout and beyond Seattle (Figures 11 & 12).

NSC serves more than 15,000 students annually, many of whom are from diverse or economically disadvantaged populations. There are 17 "gainful employment" programs located at NSC, and the college now has a Bachelor of Applied Science in Application Development degree and a Bachelor of Applied Science in International Business degree. While most students transfer to the University of Washington's main campus, the College also has developed partnerships with three of the state's four-year colleges and universities: Eastern Washington University, Western Washington University, and Central Washington University. These improvements will also increase access to the Seattle College system, the University of Washington, and other colleges. The Northgate bridge, closely integrated with other new non-motorized facilities in the neighborhood, will provide significantly improved access to the transit station and other nearby destinations.

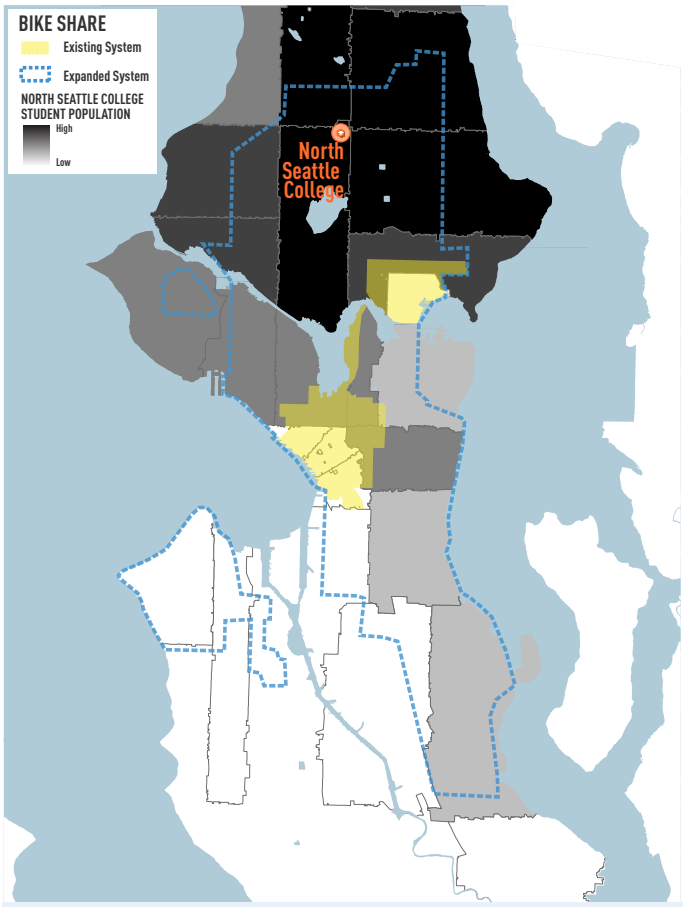
In parallel, South Seattle College serves more than 6,400 students annually, also from diverse or economically disadvantaged populations. The college offers two-year technical degrees and recently began offering a Bachelor of Applied Science in Hospitality Management, Professional Technical Teacher Education, and Sustainable Building Science Technology. It also offers extensive program support for high school completion and the development of students' basic and transitional skills.

Northgate is one of Seattle's more affordable neighborhoods, with housing prices well below the median within the City. Due to the availability of affordable housing, Northgate has attracted a higher proportion of residents from economically disadvantaged communities. Forty-eight percent of residents within the Northgate urban center are people of color compared to 34% citywide. The median household income is also lower in the Northgate area than

Seattle overall. For these residents, non-motorized access is an important rung on the ladder of opportunity, providing a low cost, healthy means of transportation.

Northgate is also a regional employment center with over 12,000 jobs. Seattle's Comprehensive Plan sets a target for the center to add over 4,000 new jobs by 2024. People traveling to job and educational opportunities by bike or foot from one side to the other must take a circuitous and uncomfortable route. Commute trip surveys show that residents living on one side of the freeway and working on the other are 50% less likely to walk or bike to work than residents living and working on the same side. Improved bicycle and pedestrian infrastructure will support economic development within the immediate station area by increasing the number of people that can walk to local businesses. The proposed project will also provide critical connections to medical services and community services clustered in Northgate.

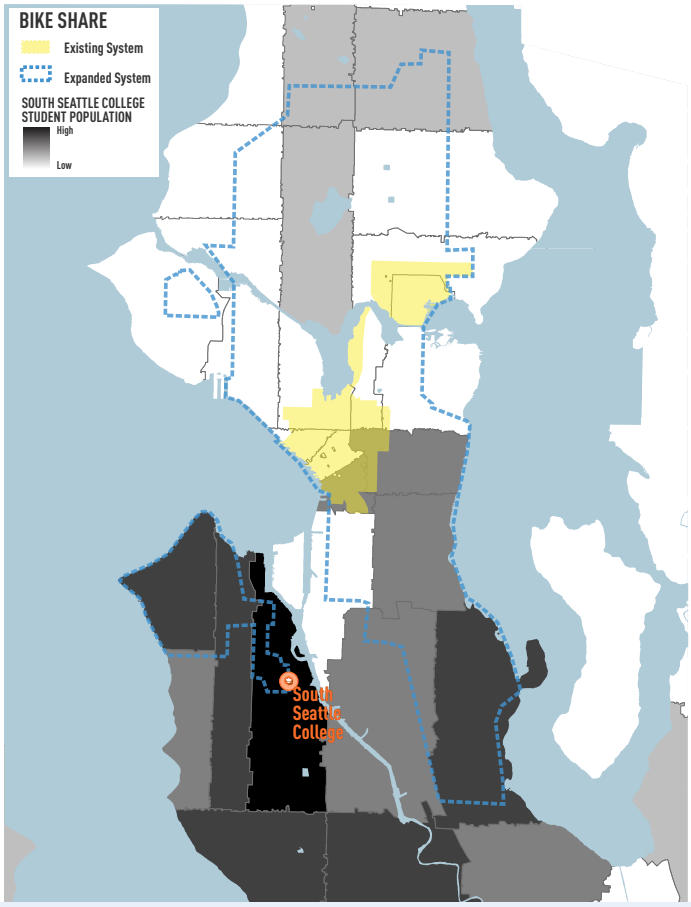
Bikeshare was commonly criticized as an upper-middle class amenity in early stages of its development throughout North American cities, but recent research indicates an important shift is underway. Since 2001, bike-to-transit



North Seattle College

- 15,000 students served each year
- 29% are academically disadvantaged
- 42% are taking classes to further their current or future work life
- 33% are people of color
- 60% are female
- 52% are over the age of 30, with a median age of 31
- 52% work part or full time
- 29% are parents
- Approximately 600 international students each quarter, hailing from 50 different countries

Figure 11: North Seattle College students by home zip code



South Seattle College

- 14,000 students served each year
- 40% speak a language other than English at home
- 54% first generation in their families to attend college
- 21% African American (double the citywide percentage)
- 42% minority population other than African American

Figure 12: South Seattle College students by home zip code

connections have grown fastest in lower-income groups. Percentage gains have been more than twice as large within lower income groups compared to higher income peers (earning over $75,000 per year). The largest percentage increases of any group was for the lowest-income users (earning under $25,000 per year). Expansion of bikeshare, paired with extension of Link Light Rail, and discounted bikeshare memberships (using Orca Link as a model) will provide residents in Northgate and other economically disadvantaged communities increased access to jobs and education throughout the region. The City of Seattle looks forward to building on successful programs from other cities such as a program in Washington DC, which donated bikeshare memberships to homeless people to assist with getting to and from appointments like job interviews, classes and training. TIGER funds for a major expansion will offer Seattle the opportunity to introduce bikeshare to low-income communities throughout the city, siting stations based on the community's need for low-cost active transportation modes. This approach is contrasted with a slow, decades-long expansion plan where each new station must be sited with short term return-on-investment as a primary criterion.

Expanding bikeshare to the Rainier Valley is necessary to fulfill Seattle's commitment to racial and social equity. The Rainier Valley is home to Seattle's largest minority and immigrant population. This area includes a population that is between 61% and 91% non-white. When conducting inclusive outreach in the Valley, Seattle reaches out to twelve language and community groups (Somali, Spanish, Vietnamese, Cambodian, Afrikaans-Oromo, Chinese, Tigrinya, Filipino, Amharic-Ethiopian, African American, youth, and people with disabilities). The median income of the Rainier Valley is 24% less that Seattle as a whole. Educational attainment is also lower in the Rainier Valley – 32% of residents completed a Bachelor's degree or higher, which is 5% lower than the citywide rate. First- and last-mile bikeshare connections to frequent transit and light rail will improve access to education such as Seattle Central College and the University of Washington, and will provide mobility choices not available to many Valley residents.

A2. Promotes Workforce Development

This project will improve access to the **Opportunity Center for Employment and Education** at NSC – a partnership of state, local, and private service providers offering employment services, social services, financial support, and post-secondary education through Employment Security/ WorkSource, Department of Social and Health Services, North Seattle College and multiple on-site partners (such as the YWCA and King County). During its first full year of operation, the Opportunity Center provided service to thousands of customers:

- **Social Services** (17,652 Customers): Food, childcare and medical services, mental health assistance, domestic violence advocacy, housing placements, etc.
- **Educational Services** (3,453 Customers): Tuition assistance for low-income and dislocated workers, college readiness workshops, etc.
- **Employment Services** (16,643 Customers): Job search support, unemployment insurance assistance, Temporary Assistance for Needy Families, etc.

Construction of the Northgate Pedestrian and Bicycle Bridge and the other non-motorized access improvements will make getting to the Opportunity Center easier by walking, biking or riding the bus and light rail for disadvantaged families and individuals, lowering transportation costs and increasing mobility choices.

In addition, the City will partner with Bike Works to provide apprentice opportunities to 8-10 youth apprentices. Bike Works is a Seattle non-profit that works to build community by educating youth and promoting bicycling since 1996. Bike Works is located in the Rainier Valley and provides youth programs that combine education, bike repair, outdoor activities and community service.

Bikeshare as a Tool for Social Equity

Boston

- "Prescribe-A-Bike": Boston pioneered "Prescribe-a-Bike" which enables doctors from safety net hospitals and health centers to prescribe a $5 annual membership to low-income residents
- Reduced Cost Memberships: 20% of Boston members have purchased reduced costs memberships for $5 per year, including free helmets and 60 minutes ride time, totaling 1,500 low-income members to date (the majority of purchasers are women and people of color)
- Stations: 13 stations in very low income neighborhoods; 33 stations in neighborhoods with substantial low-income populations

Chicago

- Youth Employment: Provides summer jobs and year round internships in bikeshare for at-risk students and resulted in 20 students being hired as mechanics and system rebalancers
- "Optimum Employment": Via a public-private partnership with the Gap, Chicago pairs seasonal positions at Divvy (winter is off-season) with complementary seasonal positions at the Gap (winter is high demand season) to create a 12-month employment opportunity

Minneapolis, MN

- Nice Ride Neighborhood: 140 long-term loaner bikes to address specific needs of low-income residents, particularly cultivating new riders

Philadelphia

- Stations: 20 bikeshare stations in low income neighborhoods
- Unbanked: Credit cards not required, enabling the unbanked to purchase memberships

Washington DC

- Mental Health: Free bikeshare membership to mentally ill patients, not only to help them get around town, but to test a hypothesis that cycling improves both physical and mental health

See p31 "Equity Program Articles " section for links to articles describing programs

A3. Promotes Business Opportunities

The Northgate Link Light Rail Station Non-motorized Access project will promote business activities by reducing travel costs for Seattle residents and visitors and connecting Seattle residents to education opportunities focused on entrepreneurship.

User Savings: Analysis from Portland State University shows that people walking and biking outspend drivers at local business districts. The study shows an important link between transportation and business patronage with car-free customers making more frequent visits to local business and spending more per visit (Figure 13). The Northgate Non-motorized Access Improvements will support denser, transit-oriented development, which will result in more business customers on a bicycle or on foot. Data from Washington DC and Chicago show that the average bikeshare member saves $750 to $850 per year by using bikeshare.

Entrepreneur Success Center: NSC's unique Entrepreneurship certificate program helps potential business owners step-by-step through solid business planning. The program has connections with the Small Business Administration (SBA), the Small Business Development Council (SBDC) and SCORE (the Small Business Council of Retired Entrepreneurs) so that students can obtain coaching on new business ideas right on campus.

The Entrepreneur Success Center (ESC), located on the North Seattle College campus, provides one-to-one assistance for individuals who are contemplating starting a business, are in the early stages of their start-up process, or are experiencing a stall-out in taking their business to the next level of development. The ESC was established to address a need in the North Seattle area that was expressed by business owners themselves. More than 45 businesses from Seattle's north end used the center in the first year. The center recently received a one of four "Shared Vision for Small Business" grants from the National Association of Community College Entrepreneurship (NACCE) and Sam's Club to fund the expansion of the center and the scaling up of services provided there.

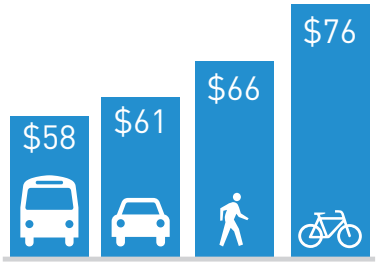


Figure 13: Average customer expenditures over a month by mode of travel. While customers who arrive by automobile spend more on average per trip, active transportation customers tend to visit more often and spend more on average over time. (Source: Clifton, K.J., Morrissey, S, Ritter, C. Business Cycles: Catering to the Bicycling Market. TR News 280, 2012)



This area of Northgate Way is a high collision location in the City, and a route between North Seattle College and the Northgate Transit Center. The new Northgate bridge will create a safer, direct route for bicyclists and pedestrians in the area.

A4. Supports Job Creation and Job Retention

The Northgate Link Light Rail Station Non-motorized Access project's $54M in spending will create 452 jobs during the construction period of the bridge and the expansion of the bikeshare system. The project will also create an estimate 35-40 Full-Time Equivalent positions to operate the bikeshare system.

A5. Reduces Travel Time

The investment in the Northgate Pedestrian and Bicycle Bridge and an expanded bikeshare system will dramatically reduce travel times for Seattle residents. The Northgate Pedestrian Bridge will shorten the walking trip from the Northgate Link light rail station to North Seattle College by 20 minutes. Students, faculty, and staff at South Seattle College will save a similar amount of time (21 minutes) by taking advantage of the proposed bikeshare expansion to transit.

Data from Chicago suggests that bikeshare users typically save 5 minutes per trip over the same trip made via bus. 2,212 people are expected to use the Northgate Pedestrian Bridge each day and 3,304 daily trips will be taken via the expanded bikeshare system each day. The attached Benefit Cost Analysis suggests that Seattle residents and visitors will save an estimated 62,114 hours per year through this project. The Figure 3elow shows how two sample customers will realize this savings (Figure 14).

The attached Benefit-Cost Analysis suggests that Seattle residents and visitors will save an estimated 60,000 hours per year through this project, valued at over $30 million.

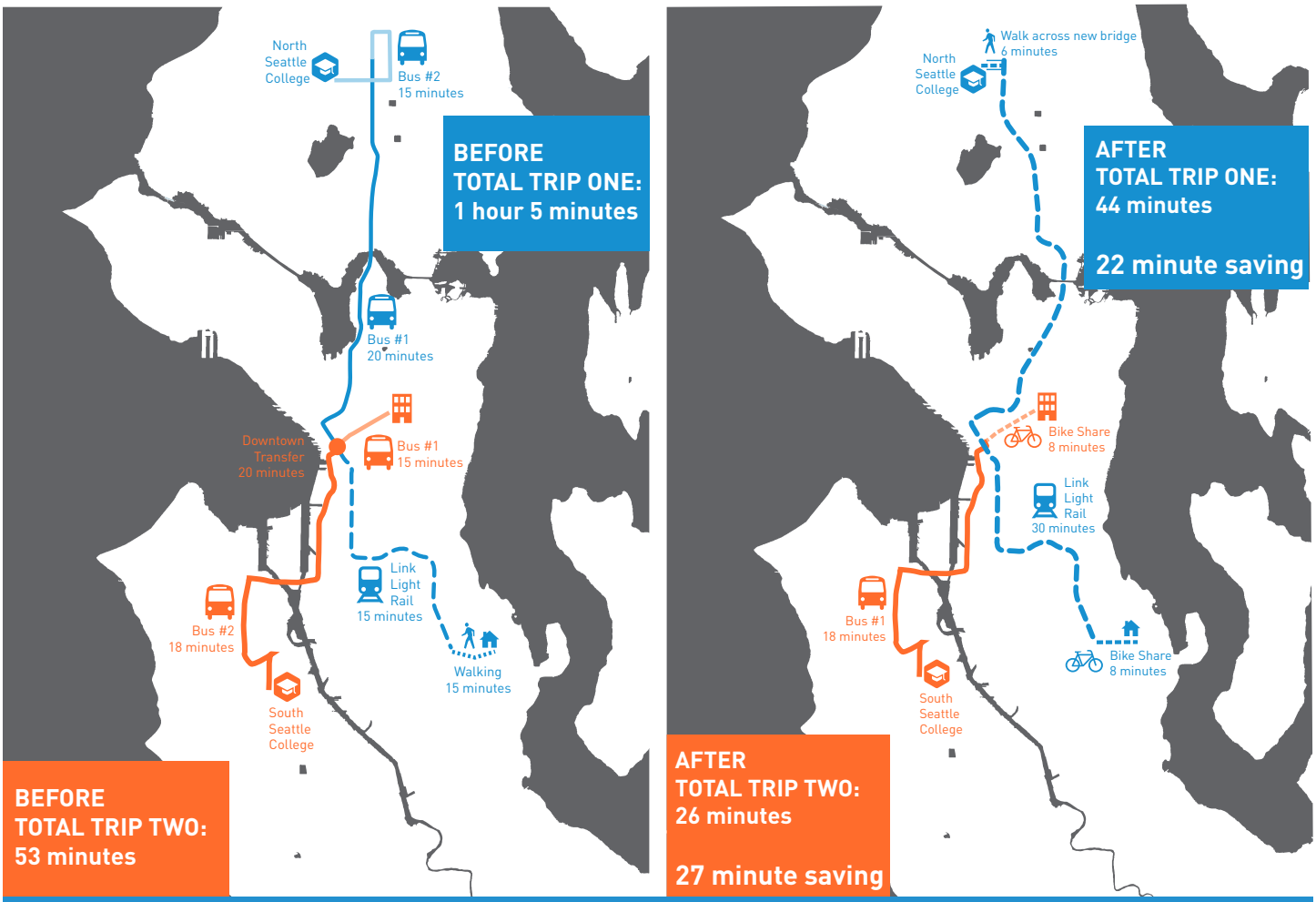


Figure 14: Sample trips to North Seattle College and South Seattle College before (left) and after (right) the Northgate Non-motorized Access to Transit and Education project is completed

B. LIVABILITY

The Northgate Non-motorized Access project will improve livability by:

1. **Creating Affordable and Convenient Transportation Choices**: Walking, biking, and transit investments will build a system that provides convenient transportation without the expense of owning a car
2. **Improving Access to Transit**: Combination of bike and pedestrian improvements and bikeshare will increase communities access to transit
3. **Improving Pedestrian and Bicycle Access**: Readily available access to bikes ensures that cycling is a viable options for all residents and visitors
4. **Supporting Existing Communities**: Focused investments in the Northgate neighborhood will help revitalize a long-challenged Seattle neighborhood; while bikeshare expansion will improve livability in southeast Seattle
5. **Promoting Land-use / Transportation Integration**: Helps fully realize the land-use/transportation benefits of the Link light rail station
6. **Providing Access to Affordable Housing**: Helps fully realize the land-use transportation benefits of the Link light rail station neighborhoods

B1. Creating Affordable and Convenient Transportation Choices

The Federal Highway Administration's fact sheet on the Benefits of Livability indicates that families in auto-dependent locations like Northgate spend 25% of their income on transportation. In Seattle, the average household spends 17% of its income on transportation (Figure 3). Numerous studies have shown that the cost of owning a car is a major burden for those families with below average incomes. Seattle is committed to ensuring that affordable and convenient transportation options are available to all members of our society, regardless of economic circumstance. Investing in walking, biking and transit is a central part of the City's strategy to use transportation as a tool to maintain affordability.

The physical and social divide created by I-5 is very visible in the Northgate neighborhood, and the City has already begun design of the bicycle-pedestrian bridge that would directly link NSC to light rail. Currently these sites are linked only by a 1.25-mile walk or ride on unfriendly, traffic-clogged roadways. The bridge will reduce a pedestrian's route to 0.3 miles on a fully-separated facility, equivalent to approximately 6 minutes per walk trip. Along with locally-funded ped-bike connections to the bridge, this new facility also provides seamless connectivity to numerous other destinations in Northgate. Popular destinations include a regional mall, large medical campuses, and numerous employment centers – as well as a network of city and county trails that radiate outward to other destinations through the city and the region.

Bikeshare systems throughout the country, as well as in many European cities, have started to make significant headway in providing low-cost travel options – either expanding the accessibility of existing transit services by expanding station catchment areas, or providing an entirely new travel option for many trips. Examples of these potential time savings are abundant throughout Seattle's transit system. For hundreds of origin-destination pairs, even the pairs where a one-seat transit trip is possible, a bikeshare trip can be substantially quicker than the equivalent bus ride. In many other cases, a bikeshare trip eliminates the need for a second bus ride within the same trip. A bikeshare user can make the first leg of his or her trip on transit, and then arrive at their final destination on a bicycle well before their second bus could arrive. In addition, bikeshare pricing is extremely affordable and in many cities, including Seattle, is the most affordable public transit option.

Travel time savings in high-density and medium-density metro areas are substantial. In a review of Chicago's bikeshare network, researchers generated 1,000 station pairs and compared travel times between transit and bikeshare for each pair. Overall bikeshare beat transit by an average of five minutes. These incremental savings added up quickly: over 32,000 hours per year based on Chicago's transit and bikeshare ridership. Similar studies in Helsinki Finland reached similar conclusions. Based on travel patterns in Helsinki, the combination of bike sharing and public transportation was estimated to save about six minutes per trip on average – a total reduction of 10% in travel times for the entire region. In Seattle the transformative potential of bikeshare as a complement to transit is especially strong. Lacking the density of some highly transit-oriented American cities (New York, Chicago, etc.), Seattle depends on moving more dispersed groups of people to the transit corridors. This issue is likely to become more pronounced with build-out of Link and other Bus Rapid Transit services, in which transit providers move to a grid-based system that provides more frequency but more trips may require a transfer.

Seattle's existing transit network provides roughly 26% of households with easy walking access to bus or rail lines that run every ten minutes or more. Through investments paid for by a voter approved initiative this number will rise to 43% of households in September of 2015. This equates to 14% of the city's population living within a half-mile of a Rapid Ride station or Link Station. The proposed

expansion of bikeshare raises this market coverage to 62% by increasing the catchment area of each station. The benefits of integrated multimodal systems can't be effectively matched by any mode alone. While it would be theoretically possible to increase bus services enough to match an integrated multimodal system, the outcomes are vastly different. An expansion of the transit system that would provide similar increases in mobility would come at a financial cost exponentially greater than the investment required for bikeshare – not to mention the additional traffic congestion, air pollution, and other undesirable outcomes that are not seen with non-motorized improvements. The proposed $10 million federal investment in Seattle's bikeshare network would require additional investment to add a single new bus route operating in daytime hours for one year. (Comparison is based on typical bus purchase prices of $600,000 for diesel vehicles and operating costs of approximately $140 per hour.)

B2. Improving Transit Access

Northgate is the site of one of King County Metro Transit's most heavily used regional transit centers. Twenty-eight bus routes traveling throughout King County stop at the Northgate Transit Center. The center incorporates five different parking areas with a total of about 1,500 park-and-ride spaces, which are typically 90 to 100 percent occupied – underscoring the need for greater non-motorized access to allow maximum utility of the region's transit options. Over 6,000 riders a day use the transit center, and a 2012 survey by Metro indicated that the majority of riders at the center get there by car. About three-quarters of riders at the station travel to downtown Seattle, and about 20% travel to the east side of King County. Sound Transit has begun construction of the Northgate Extension of its Link Light Rail system. This long-awaited 4.3 mile extension is slated to begin open to the public in 2021. It will reduce the travel time to downtown Seattle to 14 minutes and will add an estimated 62,000 riders to the regional rail system. When Sound Transit 2 is completed, the Sound Transit Link Light Rail system will extend 54 miles, linking Lynnwood, Seattle, Redmond and Federal Way. Eventually, the system will extend to Tacoma and Everett. The Northgate station is expected to have 15,000 daily boardings and will continue to be a major transit hub for the entire North Seattle area. As the Link system is built out, transit riders using the pedestrian bridge to access the Northgate station will be able access the larger Puget Sound region more easily. Until construction of the Lynnwood Link Sound Transit, King County and Seattle are working together to reduce the percentage of riders who drive to Northgate to access transit. The City's goal is to have 70% of people access the light rail station using transit, bikes, or by foot.

While the Northgate Transit Center has a very high level of transit service and very high ridership levels, currently it is located in an auto-oriented neighborhood. Northgate is the lowest ranking of Seattle's six regional growth centers for both Walk Score and Transit Score, pointing out the difficulty of pedestrians within this area compared to other urban growth centers. This TIGER project improves access to the existing transit center and to the future light rail station, resulting in higher numbers of people walking and biking to access transit services. The Northgate Access Study, conducted by Sound Transit in partnership with Seattle and King County, estimated that the pedestrian-bicycle bridge and related improvements in the neighborhood would result in a 6% increase in boardings at the Northgate station – about 870 daily boardings. The study also indicated that about 2,800 station users would benefit from these improvements.

B3. Improves Pedestrian and Bicycle Access

Over the next 20 years, Seattle will add 120,000 new residents and 115,000 jobs within city limits. Key to accommodating this growth will be investments in bicycle and pedestrian infrastructure and nurturing Seattle's culture of using active transportation modes in a manner that purposefully benefits the city's livability, affordability, public health, economic competitiveness, and natural environment.

The City has set aggressive goals for increasing the share of people walking, biking and using transit as part of its Climate Action Plan and as a part of its Bicycle Master Plan and Pedestrian Master Plan. Within Seattle's Center City, over 50% of commuters currently use these modes rather than drive a car to work. Seattle wants to extend this success to its other neighborhoods, as well as encourage people to use these modes for non-work trips. This TIGER grant funds non-motorized improvements that will help increase bicycling and walking by employees, students and shoppers in the each of Seattle's urban centers.

The Bicycle Master Plan and Pedestrian Master Plan signify an important shift in the way Seattle will accommodate people riding a bicycle or walking for any trip purpose. Citywide, progress is remarkable. For example, the increase in bicycling in the city over the past several years makes Seattle sixth in the country for the percentage of people who commute to work by bicycle. The Seattle Bicycle Master Plan surveyed residents to better understand barriers to bicycling. Seattle residents cited: travel time/distance, unsafe motorist behavior, inadequate bike facilities, and hills among the top barriers. These are all factors that will be addressed through this grant. An expanded e-bike based bike sharing system will increase the amount of distance a person can cover via bicycle and reduce/eliminate the effect of hills. Given the safety record of bikeshare, it is clear that

drivers operate more safely around bike sharing bikes. In addition, Northgate Pedestrian Bridge and associated bike lanes will improve bike facilities. This will strengthen the safety figures and increased ridership citywide.

Northgate lags far behind many Seattle neighborhoods. Many of the residential streets within the Northgate center do not currently have sidewalks, and where sidewalks do exist, they are substandard. This is reflected in the relatively low Walk Score in the Northgate center (85) compared to other Seattle urban centers (90-98). In 2011 Seattle began a new systematic bicycle counts program that uses National Bicycle and Pedestrian Documentation (NBPD) methodology to count bicycles (and pedestrians) at 50 locations citywide, four times a year. In both 2011 and 2012, despite being a major crossing of I-5, Northgate Way was among the five locations with the lowest bicycle volumes.

Construction of new sidewalks/walkways or improvements to sidewalks are planned to occur along eight streets within the core of the Northgate center as part of this package of improvements, encouraging more people to walk to community services and to access the transit network. A Safe Routes to School improvement linking to Olympic View Elementary is also part of this project. The Northgate Pedestrian and Bicycle Bridge included in this package is identified as a catalyst project in the Bicycle Master Plan, and it will connect a wider set of improvements on both the east and west side of the bridge, providing both local and regional connections.

This TIGER project also includes three protected bike lane projects paid for by local dollars. One protected bike lane will run north-south, parallel to the Link Light Rail line from NE 92nd St to the Northgate light rail station at NE 103rd St, and will directly connect to the pedestrian and bicycle bridge across I-5. The facility will make bicycling safer for all ages and abilities in the corridor. A second protected bike lane along NE 100th St to 5th Ave N.E. is also included in this package. This facility will also directly connect to the Northgate Pedestrian and Bicycle Bridge and will link to the Burke Gilman Trail, the "bike highway" of the Puget Sound region, through an east-west greenway connection. A third protected bicycle lane in this package of improvements also connects across I-5 at NE 92nd St, providing a connection to neighborhood-level routes south of the college to Green Lake and Woodland Park Zoo.

King County Department of Transportation (KCDOT) completed the Northgate Pedestrian Bridge Feasibility Study Report in December 2012. The report identifies possible alignments, bridge types and estimated costs for a bridge. The study reported that a bridge would reduce the walking distance from the transit center to NSC from 1.2 miles to approximately 0.25 miles. The report cites a previous study indicating that a bridge would result in a 30% reduction in average walking time to the Northgate Transit Center and Light Rail Station, and would effectively expand the area walk shed (0.5 miles) to more than 150 buildings and bike shed (3.0 miles) to more than 3,000 additional buildings (Figure 15).

B4. Supporting Existing Communities

In 1950, the Northgate Center, the first shopping center to be identified as a mall, opened, and in 1954 the North Seattle area was annexed into the City of Seattle. The I-5 freeway, designed with an exit at Northgate Way, was built in the mid-1960s, dividing the community and restricting access, with only two crossings within the neighborhood. North Seattle College was established in 1970 across from the mall on I-5's west side. Easy freeway access and the presence of the mall and college resulted in the rapid auto-

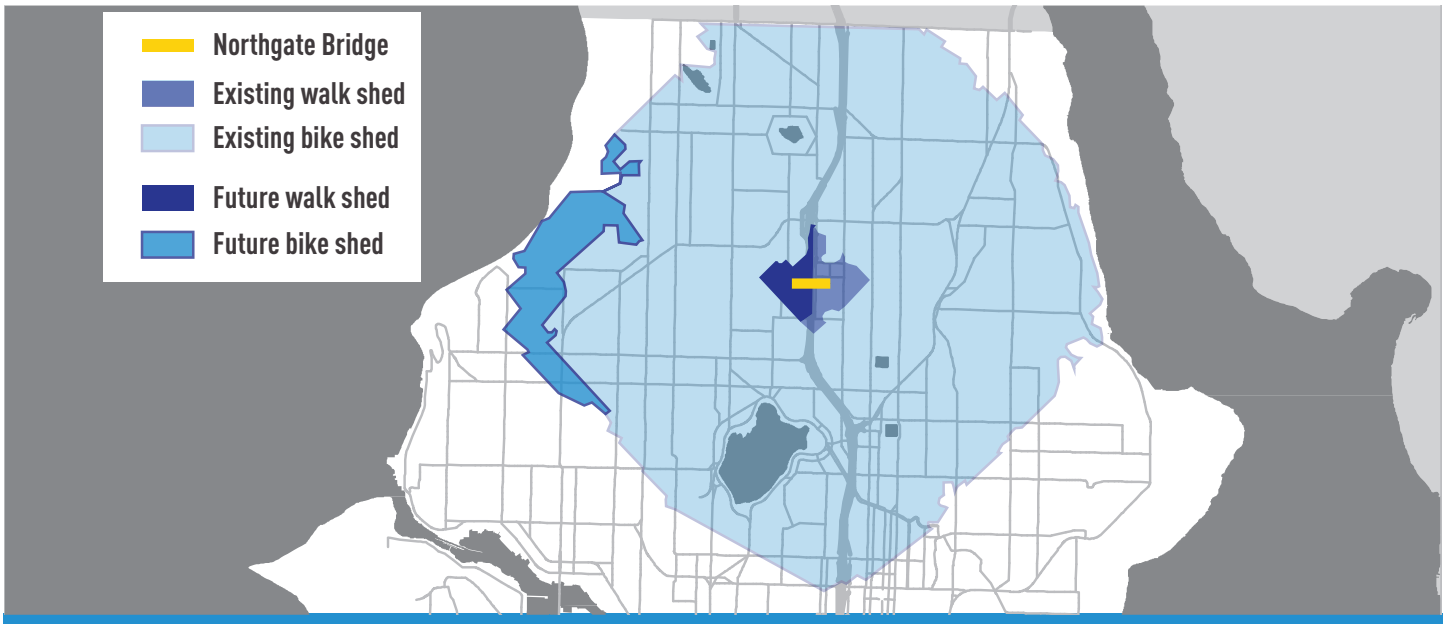


Figure 15: Before/after walkshed map showing mobility impact of Northgate Bridge

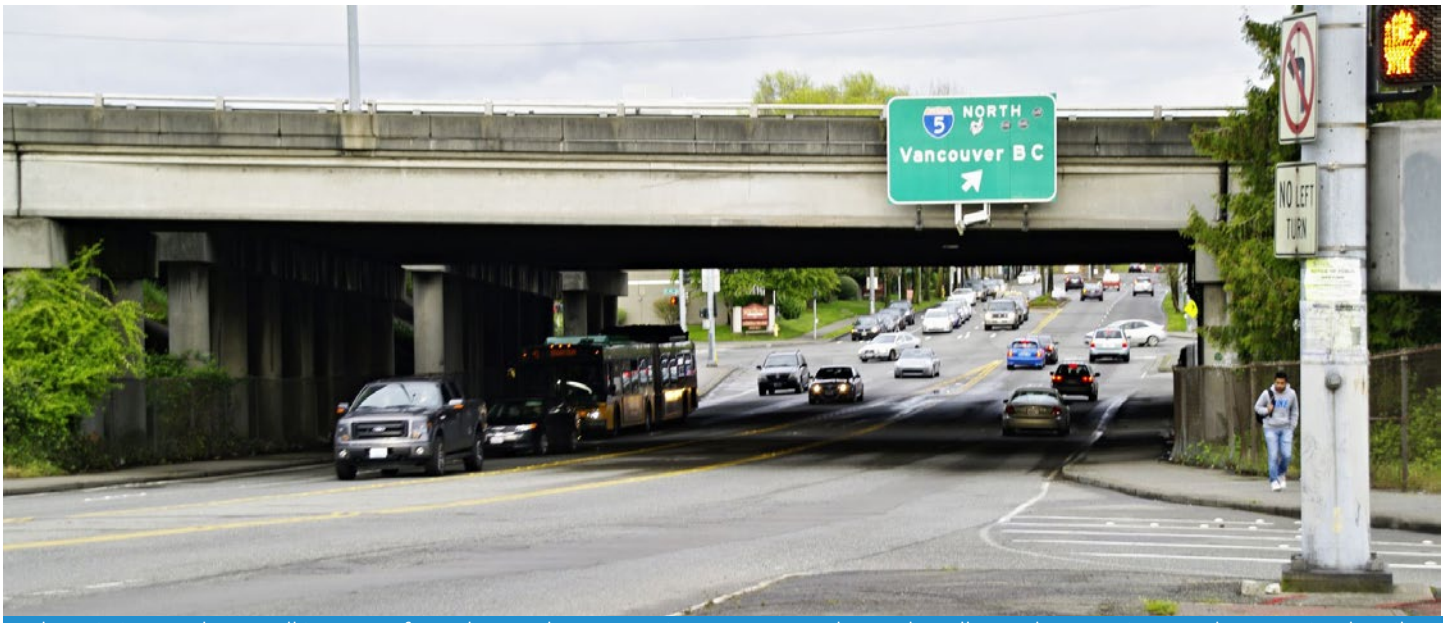
oriented development of the area, without improvements in pedestrian and bicycle infrastructure. In 1970, Seattle Transit began operation of Washington State's first park-and-ride express bus service, the Blue Streak, from Northgate. Cars quickly filled 500 reserved parking spaces and the service was credited with eliminating 1,200 cars from the daily freeway commute. The success of the park and ride express service in Northgate led to expansion of parking with little pedestrian access, and was sited on the opposite side of I-5 from the college.

Over the next 20 years the center continued to develop in an auto-oriented fashion. In 1993, Seattle developed the Northgate Comprehensive Plan, setting the goal of transforming the center into a mixed-use, transit-oriented community. Passage of the Sound Move transit plan, funding light rail in Seattle, kick-started efforts to revitalize the community, and in 2001, the City updated the Northgate Comprehensive Plan. As a result, Seattle engaged in a significant revitalization program for the center, providing infrastructure improvements such as the Northgate Branch Library and Community Center, the Maple Leaf Community Garden and the Fifth Avenue Northeast Street Improvements, spurring a mall redevelopment, transit-oriented development on a former parking lot and other developments in the area.

The Great Recession severely impacted this revitalization effort and slowed development within the center. Between 2005 and 2014, the Northgate Urban Center only achieved 40% (1,000 units) of its targeted residential growth for 2024. The nearby urban villages of Ballard and Bitter Lake have each surpassed their goals by 280% (2,800 units) and 147% (1,170 units), respectively. Northgate achieved 30% of its new employment target of 4,200 jobs. Development of Sound Transit's Northgate Link Light Rail extension provides a tremendous opportunity to complete the revitalization of this employment center, develop a sustainable, transit-oriented, mixed use community and to reach the targeted employment growth levels.

This TIGER grant will improve access for residents, employees, and visitors of the Northgate urban center to the wide variety of amenities that make Seattle known for its quality of life. There are many parks, open spaces, community gardens and environmental areas that provide a connection with nature. The Thornton Creek Water Quality Channel is the center piece of the Thornton Place transit-oriented development adjacent to the Northgate Transit Center. The Northgate bridge and the greenways it links will connect the Licton Springs Park, Mineral Springs Park, the NSC Environmental area, the water quality channel, Northgate Community Center, Olympic View playfield, Thornton Creek Park and two regional trails, the Interurban Trail between Everett and Seattle and the Burke-Gilman Trail.

Access to healthy food is a top priority for the City of Seattle. Seattle's Food Action Plan has made it a priority to eliminate food inequities that disproportionately affect low-income residents, children, seniors, and communities of color. This TIGER grant will improve access to two community gardens in the Northgate community, Maple Leaf and Licton Springs, making it easier for residents to grow their own food.



The existing northern walking route from the Northgate Transit Center to North Seattle College takes 30 minutes. The route is a hostile environment for bicyclists and pedestrians.

B5. Promoting Land-use / Transportation Integration

Seattle's growth management strategy, a modern "urban village" approach, is a smart growth policy that emphasizes significant public investment such as parks, libraries, community and transit centers, along with transit service investments, into urban centers with the greatest potential for locating more residents, jobs, stores and services in a close proximity. The approach reduces the burden of automobile reliance, promotes healthy travel alternatives, shortens commutes and provides more time and opportunities for recreation, leisure, shopping and social interaction. An outcome of this strategy, often called livability, fosters a rich environment in which to enjoy all aspects of daily life.

One of many tools developed by the region's Metropolitan Planning Organization the Puget Sound Regional Council (PSRC), as part of Growing Transit Communities, are the Transit Community Profiles. These profiles assess station areas and provide recommendations to ensure equitable future development. At Northgate, the profile identified good social infrastructure paired with an immediate risk of displacement for lower income residents. This understanding strengthens the City and County effort to maximize the affordable and low- income housing in the TOD and expand the non-motorized improvements to existing low income housing developments and areas not directly accessible to the station area. The Northgate profile also indicated lower scores for physical form and activity because of the lack of sidewalks and overall pedestrian connectivity.

This TIGER application directly targets this shortcoming. The Northgate Urban Design Framework (UDF), funded through the HUD grant and completed in December 2013, provides an integrated transportation and land-use vision for implementing the key strategies identified by the Growing Transit Communities report. Those specific elements that relate and support this TIGER application include: improving the pedestrian environment through improved sidewalks, providing a new pedestrian and bicycle crossing of the I-5 barrier, completing bicycle facilities tying Northgate to adjacent neighborhoods and activity centers, targeting dense development in sites near the light rail station and establishing affordable housing targets in the station area. As development continues in the area, the UDF suggests coordinated improvement to break up the superblocks into shorter, walkable blocks with pedestrian amenities and linked open spaces. Amongst Sound Transit's 12 park-and-ride lots, Northgate has the highest proportion of drivers coming from within one mile, showing the potential market for alternatives to driving. Approximately 21% of Northgate park-and-ride users travel less than a mile, compared to 9% average for all Sound Transit lots.

Consistent with Seattle's Race and Social Justice Initiative, the pubic engagement process was focused on inclusive outreach targeted to reach economically disadvantaged communities. It built upon strong and sustained relationships and partnerships with organizations representing these populations. As a result of this planning and the public's requests Seattle, Sound Transit, King County and PSRC have dedicated $21,300,000 to non-motorized access to improve access throughout the urban center. This investment is in addition to the light rail station and integrated bus transit center.

B6. Providing Access to Affordable Housing

City of Seattle voters have a long history of supporting affordable housing development and preservation by their approval of five ballot measures since 1981. In November 2009, Seattle voters overwhelmingly approved a seven-year, $145 million renewal of the Seattle Housing Levy. Over two-thirds of levy funding is dedicated to the Rental Production & Preservation program, which provides affordable rental housing. At least 60% of these funds serve households with an income below 30% of median income. The housing levy supports bikeshare expansion by focusing residential and commercial activity in dense, bike-friendly hubs. New bikeshare services will also support implementation of the housing levy, increasing the marketability of new housing units that cater to car-free urban lifestyles. Seattle's 2004 Comprehensive Plan set a growth target of 2,500 new household units within the Northgate urban center by 2024. Through 2013, only about 750 of these units had been developed, leaving a need of about 1,750 new housing units. The 2013 Northgate Urban Design Framework provides a vision for a compact healthy community with affordable housing choices for a diverse population. The plan calls for the transformation of an auto-centric office retail area into a livable, walkable, dense urban center anchored by a multi-modal transit station. Northgate offers a number of unique opportunities to meet affordable housing objectives.

The Puget Sound region's Growing Transit Communities Partnership (HUD Sustainable Communities partnership) provided King County $500,000 for a catalyst demonstration transit-oriented development (TOD) project to include affordable housing at the site of the Northgate Transit Center park-and-ride south of Northgate Mall. Seattle and King County are looking at opportunities to provide affordable housing through the development agreement for the site.

Monetized benefits in the project's Benefit-Cost Analysis show household travel savings worth over $100 million accruing from the project.

C. ENVIRONMENTAL SUSTAINABILITY

The Northgate Non-motorized Access project will improve environmental sustainability through:

1. **Supports Energy Efficiency, Air Quality and Climate Protection**: The project will reduce cold starts and short SOV trips, reducing greenhouse gas emissions
2. **Create Opportunities for New Environmental Education**: The project will have interpretive elements that enhance travelers understanding of the natural environment
3. **Sustainable Infrastructure Practices**: The project will include recycled and low-energy materials, along with green stormwater infrastructure

C1. Supports Energy Efficiency, Air Quality and Climate Protection

Seattle has made reducing emissions pollution a central unifying goal in its land-use and transportation strategies. Guided by its Climate Action Plan, Seattle is a recognized leader on environmental issues, showing the world that it's possible to grow economically while shrinking the city's carbon footprint. Road-based transportation creates 40% of Seattle's greenhouse gas emissions, making it the major source of emissions in the city. Due to its importance, Seattle has set a goal of reducing road-based greenhouse gas emissions by 82% from 2008 levels by 2030. In order to meet this goal, Seattle has placed an emphasis on increasing the number of people walking and biking. These improvements will result in mode shift towards non-motorized travel, which will reduce vehicle miles traveled. The reduction in vehicle miles traveled will result in a reduction in hydrocarbons, particulate matter, and carbon dioxide.

Trips that are shorter than 3 miles are easily ridden or those shorter than one-half mile are easily walked if sufficient facilities exist. These shorter trips are also the ones with a high rate of GHG emissions due to the cold starts. The typical bikeshare trip in the US is 1.25 to 1.5 miles. Research indicates that bike sharing alternatives decrease car use considerably. In one recent study of bikeshare systems, 52% of bikeshare users in Minneapolis and 41% in Washington D.C. had decreased their SOV travel since after beginning bikeshare memberships. Reducing the walking distance from the Northgate Link station to the NSC will reduce travel time by 15-20 minutes, increasing transit's time travel savings over SOV trips and decreasing the likelihood people will drive to NSC.

By reducing vehicle trips and encouraging people to walk and bike, this project will significantly reduce harmful emissions. Reductions in congestion and idling time are direct results of bike- and transit-oriented mode shift.

In 2019 these effects will result in about 4,600 pounds fewer emissions of hydrocarbons and a reduction of about 3,200 pounds of nitrous oxide each year. Consistent with Seattle's aggressive greenhouse gas reduction goals, carbon emissions will be reduced by over 1.2 million pounds each year.

C2. Creates New Opportunities for Environmental Education

The NSC campus includes environmentally-sensitive wetlands, which have inspired a college-wide commitment to sustainability for nearly two decades. The college uses the wetlands as a teaching facility, and in the past five years this work has expanded to include not only environmental education, but also social, cultural, and economic sustainability. The bridge design includes educational and interpretive wayfinding along the bridge and approaches to narrate the important watershed features, natural features and resources of the area. The campus Sustainability Committee has been involved actively in the review of the Northgate bridge project to minimize habitat displacement.

C3. Sustainable Infrastructure Practices

The City of Seattle and the Seattle Department of Transportation are striving to be leaders in environmental stewardship. SDOT's GreenDOT program is the department's Environmental Management System (EMS) and is our commitment to go beyond basic compliance with environmental rules. We continually work to identify and implement improvements in how we do our work that reduce environmental impact and increase sustainability. The City is a leader in sustainable infrastructure practices, green stormwater infrastructure (GSI) and climate change. This TIGER project will be implemented consistent with these practices. Construction materials will be reused and recycled whenever possible, use of "green" concrete and asphalt materials will be maximized, lighting will be designed for low energy consumption and the design will support enhancement of environmentally sensitive areas.

The quantifiable benefits of the project include over $2 million in savings from reduced emissions, as detailed in the Benefit-Cost Analysis.

D. STATE OF GOOD REPAIR

The Northgate Non-motorized Access project will improve state of good repair through:

1. **Reduces Heavy Vehicle Mileage by Increasing Non-motorized Travel**
2. **Furthers Asset Management Best Practices**

D1. Reduces Heavy Vehicle Mileage by Increasing Non-motorized Travel

Walking and bicycling trips that replace vehicular trips lead to less wear and tear on existing facilities, and reduce the public expense associated with overlays and other routine maintenance. The average person on a bike, roughly estimated at 200 pounds, produces 20 times less stress on roadways than the average driver. A typical motor vehicle weighs in at about 4,000 pounds.

D2. Furthers Asset Management Best Practices

Bikeshare and Northgate Bike/Pedestrian Bridge stewardship and safeguarding will follow our asset management model. SDOT is a responsible steward for safeguarding the use, condition, safety, security, and financial management of publicly funded capital assets in accordance with stewardship expectations. Our asset management diligence is a key grantee responsibility in Map-21. SDOT stores asset ID and tracking data in our Hansen system and we administer standardized project asset management plans for our transit assets. The plans identify major asset components, useful life, design life, and service life of the infrastructure and assets, inspection and maintenance schedules, and condition assessment evaluation. These asset management plans also layout the processes and standard forms for contractor oversight when a third-party helps operate our capital assets.

The Northgate bridge will be added to 139 other bridges currently managed by SDOT with the rules and guidelines contained in the National Bridge Inspection Standards and further detailed in MAP-21. All of the bridge components will be inventoried into an element level condition assessment and consolidated into our Bridge Manage System (BMS). SDOT is periodically audited by FHWA, FTA, and the Washington State Auditors Office and is currently is compliance with all federal laws and rules associated with asset management.

The Benefit-Cost Analysis shows that reduced vehicle usage will result in savings of over $8 million over the life of the project.

E. SAFETY AND HEALTHY COMMUNITIES

The Northgate Non-motorized Access project will improve the safety of and health of Seattle and the Northgate neighborhood through:

1. **Safer Pedestrian and Bicycle Networks**: The proposed projects will reduce crashes in an area that has seen 436 crashes and 197 injuries within the last 10 years, generating $18.5 million in safety benefits over 20 years
2. **Active Transportation**: Building safe infrastructure and expanding an e-bike bikeshare system to serve people of all ages and abilities will generate $222 million in health benefits over 20 years

E1. Safer Pedestrian and Bicycle Network

The Northgate Non-motorized Access project will create safe walking and biking connections and result in mode shifts toward non-motorized travel, which will reduce the number of collisions. More travelers and commuters will choose not to travel in their automobiles. Instead they will walk or bike to their destinations. This will result in reduced loss of life, injuries, and property damage.

Northgate Way between First Avenue NE (just east of I-5) and Meridian Avenue N (west of I-5) is a high collision location. Over the last ten years, 436 crashes have occurred resulting in 197 injuries. Within the Northgate urban center, 2,005 crashes have occurred resulting in 889 injuries and 5 fatalities. This project will provide a new crossing of I-5, allowing people to walk and bike directly between the Northgate Transit Center and North Seattle College and other destinations on the west side of I-5. New protected bicycle lanes will provide safe and attractive travel options for people of all ages and abilities in three locations connecting the bridge, as well as link to regional and neighborhood bike facilities. New sidewalks and walkways will make it easier for residents, employees and people using the Northgate Transit Center and future light rail station to safely and conveniently get to their destination. The project also includes improvements to existing sidewalks and crossing to increase safety.

Bikeshare offers long-term, compounding safety benefits of its own. Research shows there is safety in numbers and that as more individuals bicycle the crash rate drops. Due to the atypical demographic mix of bikeshare users, public perceptions are also changed for the better. Typical bikeshare users include commuters in suits, tourists, children and families, and many other users that don't fit common stereotypes of urban cyclists. Since the launch of bikeshare in the United States in 2008 there have been 23 million bikeshare trips in the United States without a single fatality. Finally, as more people are encouraged to choose

cycling as a transportation mode – even occasionally – more people find themselves consciously or sub-consciously more aware of the safety issues that face cyclists and pedestrians. The city as a whole will benefit from having road users who are more empathetic, cautious, and thoughtful for other travelers regardless of their primary mode or their current mode. Finally, the Pronto Cycle Share system has helmets available at every bikeshare station in the system. This ensures that all riders can comply with King County law. **The Benefit-Cost Analysis shows over $18 million in savings from improved safety.**

E2. Active Transportation

Increasing evidence from experts shows that physical inactivity has become a major public health problem that has expensive economic consequences. The U.S. Centers for Disease Control and Prevention estimated that $147 billion in added annual health costs could be attributed to obesity. Research shows that increased physical activity due to additional pedestrian and bicycle trips results in significant health benefits. The CDC has also shown that childhood obesity rates go down when more children walk or bike to school.

The 2004 study Cost-Benefit Analysis of Physical Activity Using Bike/Pedestrian Trails quantified the net benefits of money spent on trail development from a health standpoint. The study found that every $1 investment in trails for physical activity led to $2.94 in net direct annual medical benefit. Quantifiable benefits of this project include reduction in medical care costs, reduction in lost productivity, and reduction in workers compensation costs. Studies have found that employees who get more exercise by bicycling and walking to work take fewer sick leaves than other employees. In the U.K., it was found that absenteeism costs employers $478 per day and that employees who are bicyclists take 2.4 sick days per year, compared with 4.5 sick days taken by other employees. In Denmark, one study estimated that cycling saves $68.7 million in healthcare costs each year. Cities that have launched large bikeshare systems have seen remarkable increases in biking. In Washington D.C, bikeshare officials are providing bikeshare membership to mentally ill patients, not only to help them get around town, but to test a hypothesis that cycling improves both physical and mental health. Washington DC has seen a 150% increase in bicycling commute mode share since the launch of Capital Bikeshare in 2010. Over the same time Seattle's mode share has remained flat. This package of improvements will increase the amount of biking and enhance the health benefits of non-motorized choices by supporting a walkable and bike friendly urban environment that can help individuals increase their level of physical activity. The project will increase the use of active transportation modes, which will result in reduced healthcare costs, a reduction in lost productivity, and a reduction in workers compensation costs.

As a result, this TIGER project is expected to result in over $13 million of safety benefits and $4 million in health benefits for Seattle's residents and visitors.

Secondary Criteria

F. INNOVATION

The Northgate Link Light Rail Station Non-motorized Access project utilizes innovation in solving problems critical to ensuring the project's success and maximizing its impact through:

1. **Electric Drive/Pedal Assist**: Will deploy first large-scale E-bike bikesharing system in North America
2. **Orca Lift/Student Discounts**: Offer discounted bikeshare memberships to students and low-income residents
3. **Focus on Equity**: Intentional and intense focus on ensuring bikeshare serves all Seattleites
4. **Leverage**: Leverage ongoing private investment in Northgate area to have a catalytic effect on growth
5. **Sustainable Infrastructure Practices**: Build to Seattle's high standard of environmental stewardship

F1. Electric Drive/Pedal Assist Technology

Electric drive bikes are becoming increasingly common on City streets. However, no bikesharing system in the United States has launched with an electric drive and at the time of launch Seattle will be the only bikesharing system of significant size (over 100 stations) with electric drives. The City of Seattle is built on hills (Figure 16). The topography affords fantastic views and interesting streets, but it also makes it a more challenging bicycling environment. Seattle's bike master plan lays out a network of 600 miles of bike facilities to ensure people are safe riding bikes in City. Bike facilities will help people 8 to 80 feel safe on bikes. E-bikes still require people to pedal. They will provide minimal if any assistance on flat ground, but they will provide additional power to help people navigate streets with steep grades. **The electric bikes will decrease the average travel time of riders by 4.5 minutes or 35%, increasing the catchment area of transit stations and reducing travel times.**

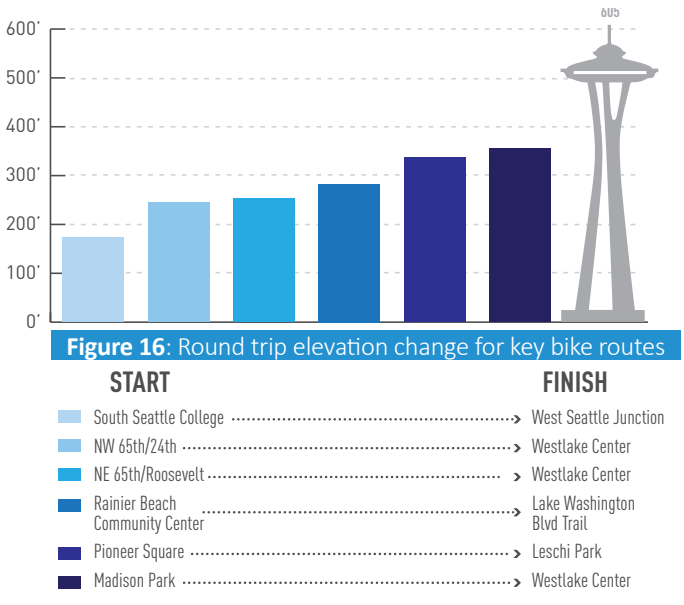


Figure 16: Round trip elevation change for key bike routes

F2. Orca Lift/Student Discounts

Orca Lift is an innovative discount program offered by the King County Metro to individuals with a household income of 200% of the Federal poverty level or less. Qualified individuals are eligible for half of their transit fare. This is particularly important for the immigrant and refugee population in Seattle which has substantially lower household incomes than US born residents (Figure 17). The expanded bikeshare system will utilize the same qualification process and criteria to offer memberships to qualified individuals at a substantial discount of the regular price. In addition, the students enrolled in Seattle colleges and universities will receive membership discounts.

F3. Focus on Equity

Early bikesharing systems have faced criticism for serving predominately wealthy, white neighborhoods. Seattle's expanded bikesharing system will have a specific focus on ensuring equitable access to a publicly funded bicycle transit system. This focus on equity from the start is unique and aligned with Seattle's core values. The proposed service area is 33.8% non-white an exact match to the City as a whole (33.5%). Data from the City's Department of Immigrant and Refugee Affairs highlights the need to provide reliable, affordable transit services to recent immigrants (19% of the City's population). Immigrants and refugees are more likely to rely on transit (14% transit mode share than the general population (11.6% transit mode share).

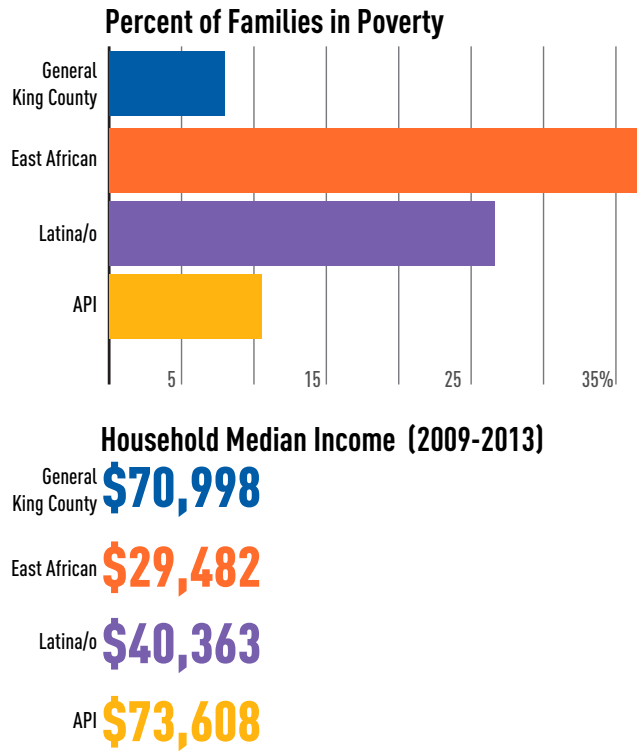


Figure 17: % of immigrant and refugee populations in Seattle living in poverty

F4. Leverage

The Northgate area has seen significant public and private investment to help set the stage for transforming it from an auto-oriented to a transit-oriented community that is more livable and sustainable. This TIGER grant leverages these investments, providing the public low-cost, affordable ways to reach them. Transportation improvements have included the Fifth Avenue Northeast Streetscape project, construction of the Third Avenue NE Extension, new sidewalks along NE 100th Street, and the NE Northgate Way and Fifth Avenue NE Intersection and Pedestrian Improvements Project. The package of non-motorized investments proposed will support Sound Transit's Northgate Link Light Rail extension, which will cost over $2.1 billion to complete, including over $145 million of federal funds, and add 62,000 daily boardings (15,000 estimated at Northgate station) to the Link Light Rail system..
Northgate Light Rail Station Non-motorized Access
Other public infrastructure improvements in the area include construction of the Northgate Branch Library, Community Center and Park campus, the Hubbard Homestead Park, the Maple Leaf and Licton Springs Community Gardens and the Thornton Creek Water Quality Channel. Expansion of community medical facilities is also occurring at the North Public Health Center. These public investments and the planned light rail station have begun to result in private investments in the area that will accelerate the transition to a more walkable, transit-oriented community. Key projects include the redevelopment of the Northgate Mall (Simon Properties – 116,750 sq. ft. of new retail and an 184,000 sq. ft. joint use parking facility), Thornton Place (Lorig Associates – transit-oriented development with 388 residential units, 144 senior housing units, and 124,870 sq. ft. of commercial uses) and 507 Northgate (Wallace Properties – 163 residential units and 55,000 sq. ft. of retail).

F5. Sustainable Infrastructure Practices

The City of Seattle and the Seattle Department of Transportation are striving to be leaders in environmental stewardship. SDOT's GreenDOT program is the department's Environmental Management System (EMS) and is our commitment to go beyond basic compliance with environmental rules. We continually work to identify and implement improvements in how we do our work that reduce environmental impact and increase sustainability. The City is a leader in sustainable infrastructure practices, green stormwater infrastructure (GSI) and climate change. This TIGER project will be implemented consistent with these practices. Construction materials will be reused and recycled whenever possible, use of "green" concrete and asphalt materials will be maximized, lighting will be designed for low energy consumption and the design will support enhancement of environmentally sensitive areas.

G. PARTNERSHIPS

The Northgate Link Light Rail Station Non-motorized Access project is built on two types of successful partnerships:

1. **Jurisdictional/Stakeholder Collaboration**: Builds on a long history of regional planning and partnership
2. **Neighborhood & Business Support**: The product of partnership with local business and community members

G1. Jurisdictional / Stakeholder Collaboration and Disciplinary Integration

The Northgate Link Light Rail Station Non-motorized Access project is the result of a strong collaboration among a broad range of government, business, and community participants. The identification of necessary non-motorized access improvements in the Northgate light rail station area is the result of a planning process that began with the designation of the Northgate community as an Urban Center in 1994 and the center's designation as one of the Puget Sound region's 27 regional growth centers. The first comprehensive plan for the center identified the need to enhance the pedestrian and bicycle network within the center, recommending a grade-separated crossing to reconnect the east and west areas of the neighborhood across I-5. In 2003 Seattle embarked on development of the Northgate Coordinated Transportation Investment Plan (CTIP), which was completed in September 2006 and made a priority of providing better pedestrian and bicycle facilities. The stakeholders group expressed its strong support of the development of pedestrian and bicycle crossing over I-5 to link the North Seattle College and the Northgate Link Light Rail station.

These improvements have also been identified as priorities in Seattle's three modal master plans: the Bicycle Master Plan, Pedestrian Master Plan and Transit Master Plan. This TIGER grant request is a direct result of the Northgate Catalyst Demonstration project that was part of the Puget Sound region's Growing Transit Communities (GTC) project, our region's participation in the joint DOT/ HUD/ EPA Sustainable Communities program. GTC funded a broad community engagement effort identifying several priorities for transforming the Northgate employment and residential growth center into a sustainable, transit-oriented community anchored by a major redevelopment of the King County Northgate Transit Center.

Project development has been a joint effort of Seattle, Sound Transit and King County Metro Transit, with Seattle taking on the role for lead agency of these improvements. King County led the initial feasibility study for the pedestrian and bicycle bridge, while Sound Transit led the Non-motorized Access Study. Non-motorized improvements at the Northgate Link Light Rail station are included in PSRC's award-winning Metropolitan Transportation Plan, Transportation 2040, and in both the Regional and State Transportation Improvement Programs. The Puget Sound region has recognized the significance of these improvements with $1.3 million of PSRC managed federal funds for the design and environmental processes. The Puget Sound region's Prosperity Partnership has identified Education and Workforce Development and Entrepreneurship and Innovation as two of the region's Economic Foundations in PSRC's Regional Economic Strategy. This TIGER project will support both of these foundations by providing better connections to the NSC.

Pronto Cycle Share formed as a partnership between the City of Seattle, King County Metro, Sound Transit, University of Washington, WSDOT, Seattle Children's Hospital, REI, Microsoft, Cascade Bicycle Club, Puget Sound Regional Council, City of Redmond, and City of Kirkland. In 2012, a business plan was prepared for the partnership with assistance from Alta Planning and Design with funding from a small federal grant. Pronto Cycle Share's non-profit formed in 2012 with the goal of launching bikeshare in the Puget Sound Region.

In 2014, Alaska Airlines, Seattle Children's Hospital, Group Health, and REI provided over $3.5 million in sponsorships available over the next 5 years to enhance $750,000 in state funding and $1,000,000 in federal funds used to launch the system. The City of Seattle has allocated additional local funds to support further expansion of stations and has secured an additional federal grant to improve access for low income populations. Seed money is currently set aside in a proposed state budget for Bellevue, Redmond, and Kirkland (total 276,000 residents and 246,000 jobs) . Passage of the state budget is expected in June 2015 and will allow Pronto to realize its initial vision of providing regional bike sharing service.

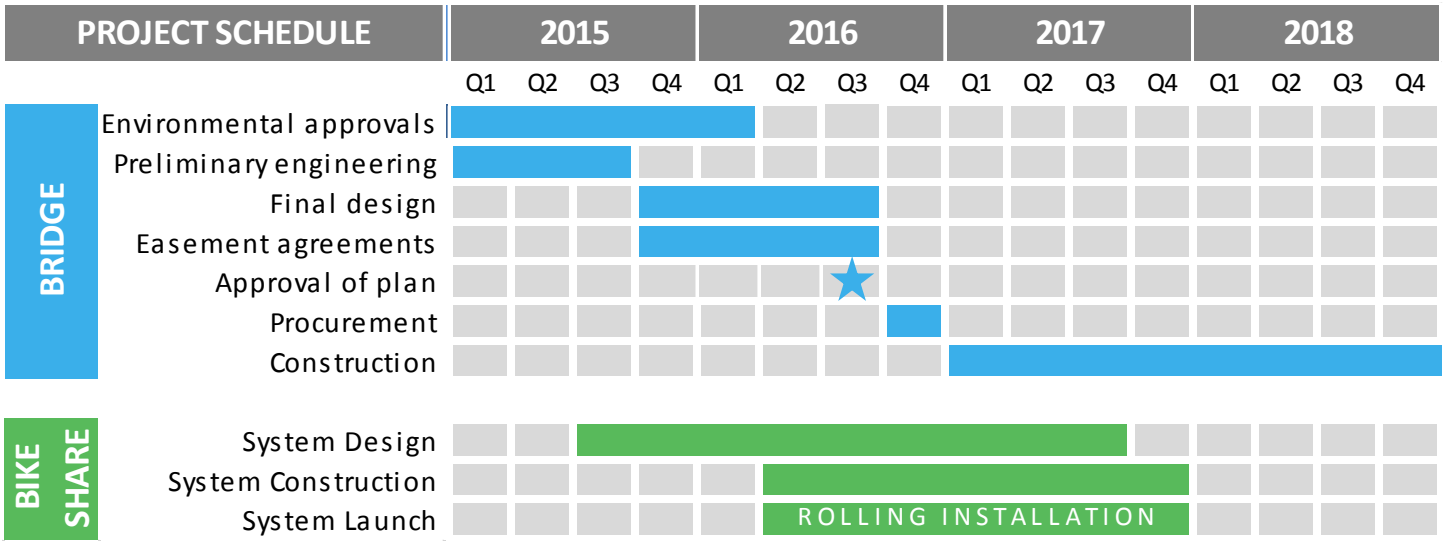
G1. Neighborhood and Business Support

The Northgate Coordinated Transportation Investment Plan, developed in coordination with the 22 members of the Northgate Stakeholders Group, identifies improvements to the non-motorized transportation network in the community one of its top priorities. As a result of this importance more than 24 elected leaders, business owners and community members have signed letters of support. Pronto has been supported by its private sector sponsors: Alaska Airlines, Seattle Children's Hospital, University of Washington, and REI.

Project Readiness

All elements of the project are ready to be implemented. The detailed schedule presented includes all project milestones and illustrates the timeliness for completion of the critical elements. All necessary pre-construction activities will be complete to allow for potential grant funding awarded to be obligated no later than June 2016. The project will begin construction rapidly upon receipt of any TIGER grant funds and these funds will be spent steadily and expeditiously once construction starts. No real estate or right-of-way acquisition is required to complete the project. Easement agreements will be secured with our funding partners, the Washington State Department of Transportation and North Seattle College. In addition, there are no significant regulatory or legislative barriers to the project.

The expanded bikeshare system will launch revenue service in summer 2016 and the Northgate Pedestrian Bridge and surrounding improvements will break ground in 2017.



Technical Feasibility

Seattle has the expertise and experience to manage this project and fulfill all federal requirements. SDOT has designed and constructed a number of large capital projects, including the Mercer East and Mercer West projects, funded with TIGER grants. The department manages a large bridge inventory, including many pedestrian and bicycle bridges, and is well versed in bridge design and construction, having completed a number of federally funded bridge projects. Construction over I-5 will require adherence to very restrictive criteria for building above the freeway, which is the main international trade connection between the US, Canada and Mexico. With the lack of construction lay down areas near the project site, it is anticipated that large components of the bridge will be constructed offsite and then brought to their final location. This will all need to be accomplished while maintaining a high level of traffic along the I-5 corridor. One method under consideration is use of a self-propelled modular transporter or self-propelled modular trailer (SPMT). These are a platform vehicle with a large array of wheels. SPMTs are used for transporting massive objects such as large bridge sections and other objects that are too big or heavy for trucks.

Seattle launched a 50 station bikesharing system in 2014. That experience provided valuable lessons to support a much larger system launch. Seattle has staff that have launched systems in Seattle, Boston, Chicago, and Washington DC (1,012 stations total). Through that experience we have learned that launching modular, solar powered bikesharing systems in dense urban environments is achievable in a short period of time. Chicago and New York launched 300 and 330 station each in 2013 in a period of approximately 90 days. E-bikes are becoming increasingly common. Madrid and Copenhagen have launched e-bike bikesharing systems. Birmingham, AL is launching a small electric bikesharing fleet (~150 bikes) using federal funds in 2015.

Financial Feasibility and Sources of Funds

This $25 million 2015 TIGER grant request represents the final funding for the Northgate Light Rail Station Non-motorized Access project, allowing Seattle to proceed to construction. It would also accomplish a critical short-term goal of achieving financial solvency for the City's bikeshare program, allowing the necessary market penetration and economies of scale to operate as a viable business enterprise. Future expansions of the bikeshare network are anticipated, and would be funded incrementally from profits on existing stations. Regionally-managed CMAQ and TAP funding has been awarded for planning, design and the environmental phase of the improvements in the Northgate station area, and the TIGER grant will allow completion of these improvements. Seattle anticipates immediate obligation of TIGER funds, advancing components of the project well before USDOT's 2017 deadline. This TIGER grant will leverage $29.5 million in committed local funding for these improvements from Seattle ($15.2 million) and Sound Transit ($10 million), in addition to private contributions ($3 million) and previously secured federal ($1.3 million). The City's contributions will come from a combination of street vacation fees and other user fees ($10.2 million) as well as city revenues ($5 million).

The TIGER funds requested will have an impact far beyond leveraging the local funding dedicated to the non-motorized access improvements at the Northgate Light Rail Station. They will support Sound Transit's North Link Light Rail extension, which will cost over $2.1 billion to complete, including over $145 million of federal funds, and will add 62,000 daily boardings (15,000 estimated at Northgate station) to the Link Light Rail system. This TIGER grant will strengthen the North Link extension and enhance the value of the federal investment in the rail line. Federal support of Seattle's bikeshare operations will also leverage existing and future corporate sponsorships, including prominent Northwest corporations such as Alaska Airlines (current title sponsor) and Children's Hospital.

	Seattle	Sound Transit	Private Funds**	Other Federal Funds	TIGER Funds	Total Cost	Estimated Completion
Northgate Bridge	$5,000,000	$5,000,000	$0	$600,000	$15,000,000	$25,600,000	Fall 2018
Northgate Station Access*	$5,000,000	$5,000,000	$0	$718,000	$0	$10,718,000	2018 to 2021 (phased)
Bike Share System Expansion	$75,000	$0	$0	$0	$10,000,000	$10,075,000	Spring 2018
Bike Share Bicycle Purchase***	$5,125,000	$0	$3,000,000	$0	$0	$8,125,000	Summer 2018
Total	$15,200,000	$10,000,000	$3,000,000	$1,318,000	$25,000,000	$54,518,000	Fall 2018

*Full project list contained in Appendix E
** In-kind contribution as described in letter of support from Motivate
*** Bikes will not be purchased with TIGER funds

Seattle is a proven manager of federal grant funds. SDOT has been authorized by WSDOT to serve as a Certified Agency (CA) since 1973, allowing it to develop, advertise, award and manage its own projects. SDOT is the oldest and largest CA in the State of Washington. In this capacity, Seattle has also served as CA for smaller agencies and non-profits, assisting them to deliver projects. As a recipient of two previous TIGER grants, as well as ARRA funding from a number of federal agencies, Seattle knows what is expected and is ready to move forward with this project. The City has put together a citywide accountability and reporting structure overseen by the Mayor of Seattle and City Council to assure the proper use of federal funds.

Risk Mitigation Plan

Seattle and its partners have identified each of the primary risk factors associated with project delivery based on analyses of similar recent projects, consultation with appropriate federal agencies, and published TIGER guidance. Each component of the project has previously received federal funding, allowing extensive fact-finding and a series of iterative improvements to the City's project delivery plans. From this process, Seattle has identified these primary risk factors and mitigation measures.

NEPA Approval: NEPA completion for Northgate improvements is expected in the third quarter of 2016. NEPA reviews for bikeshare stations will take place in 2015 and 2016. Based on previous experience in siting bikeshare stations, a categorical exclusion is expected for most or all of the stations.

Bikeshare Operating Plan: Concurrent with the submittal of this funding request, Seattle is working to contract directly with the operator of bikeshare as opposed to having a third party non-profit contract with the operator. This proposed business model is consistent with that of successful systems in large cities across the country. The specific terms of this agreement are under negotiation.

Cost Escalations or Unanticipated Expenses:
The bridge component of the project, and other elements of the Northgate ped-bike network, have been estimated with a 30% design contingency and a 2% annual cost escalation, as well as a 20% contingency on construction management soft costs, to minimize the risk of cost overruns.

Electric bike share systems are a new technology. Seattle is prepared to be in the first wave worldwide of implementing large-scale electric bike share systems. Numerous electric bike share systems are in various development stages with plans to do large scale rollouts in 2016. Costs and production timelines are therefore based on estimated costs provided by manufacturers. Our modelling provided for a reasonable range of uncertainty. The 250 station bike share system size proposed is based on a conservative cost estimate that includes the following assumptions:

1. Low-middle of cost range for bike share equipment
2. Full TIGER award
3. Existing equipment is not consistent with the electric bike system and therefore must be replaced

System size is scalable and actual number of stations will be adjusted according to final equipment acquisition price, amount of TIGER award, and equipment compatibility. In the best case scenario, i.e. the scenario with least expensive equipment and a full TIGER award, the City will purchase, install and operate up to 280 new stations. Regardless of price, with a full TIGER award, the City can guarantee purchase, installation, and operation of a minimum of 200 new stations. Stations will be installed and made operational on a rolling schedule, starting in 2016 with completion in 2017.It is the City's intent to continue to grow the system to 400+ stations in future phases.

To help ensure that the TIGER-funded project can be delivered according to the schedule and budget, Seattle is closely watching the progress of manufacturers. The City will be positioned to select based on reliability, price, quality, and ability to meet deadlines.

Procurement Delays and Project Synchronization: Seattle has worked with consultants specializing in bridge projects to review itemized lists of the materials needed for bridge construction. In these reviews, no materials with potentially long lead times have been identified. Bikeshare stations and equipment are essentially off-the-shelf components. Seattle is working closely with project partners including Sound Transit, King County Metro, and WSDOT to ensure that utilization of the bikeshare stations and the bridge will be able to occur when these facilities are constructed, regardless of on-going construction that may occur on other elements of the project. Marked pedestrian pathways are provided on all construction projects with the city, per Seattle Department of Transportation policies. Per schedule, the TIGER-funded bikeshare system would reach ground-breaking in the summer of 2016 and the bridge would be opened to public use in mid-2018.

Real Estate Acquisition: The property rights necessary to construct the bridge will be donated from WSDOT and NSC. Both agencies are proactive project partners. Negotiations for these property rights are in progress. No additional property rights are anticipated for bikeshare stations, as these facilities will be placed within the existing right-of-way.

Environmental Approvals

Early coordination with WSDOT and FHWA indicates that this project would qualify for a Documented Categorical Exclusion (DCE) under the NEPA. Technical reports are being prepared for each area of the environment that the project could potentially impact. In-field surveys (e.g., for wetlands, geotechnical, cultural resources, aesthetics, etc.) as well as thorough background and literature searches are aiding in the alternatives analysis and design of the pedestrian bridge. Once a preferred alternative is identified, the project team will complete the impact analysis portion of each technical report, which will then be incorporated into the NEPA DCE. A draft DCE is anticipated to be submitted to WSDOT in the third quarter of 2015, with final approval in the first quarter of 2016.

Legislative Approvals

Both the Seattle City Council and Sound Transit Board have taken legislative action committing to this project and its funding. On June 25, 2012, the Seattle City Council passed Resolution 31389 agreeing to commit $10 million for improvements in non-motorized access in the Northgate light rail station area. On June 28, 2012, Sound Transit adopted Motion M2012-42 authorizing provision of $10 million for non-motorized access improvements in the Northgate light rail station area. Sound Transit updated this agreement in 2015, extending the life of the original agreement and ensuring the availability of their $10 million contribution. $5.2 million in street use fees collected in 2014 and prior will be approved for use as part of the City's 2016 budget.

Local, Regional, and State Planning Approvals

The Northgate Light Rail Station Non-motorized Access project is included in the regional Metropolitan Transportation Plan (MTP), Transportation 2040, and has also been included in both the State and Regional Transportation Improvement Program (TIP). The project is a result of the region's HUD Sustainable Communities Initiative partnership, PSRC's Growing Transit Communities. These improvements are also included in a number of city planning documents, including Seattle's Bicycle, Pedestrian and Transit Master Plans, as well as the local transportation plan for the Northgate regional growth center, the Northgate Coordinated Transportation Improvement Plan.

A number of Seattle's long-range plans call out the need for this project and the Northgate community has consistently prioritized bicycle and pedestrian improvements. Support has continued to be very strong during stakeholder involvement for the Northgate Catalyst project within PSRC's Growing Transit Communities effort. The Northgate pedestrian and bicycle bridge is also identified within the PSRC's Regional Bike Network as a key connection.

Additionally, bikeshare services have been identified as a citywide and regional priority by a coalition of agencies including King County, Seattle, and several rapidly-growing cities within the urban area. Seattle and PSRC have worked for several years to bring the bikeshare program to this region. A partnership of regional agencies, local agencies, and other stakeholders formed in 2011 to develop a plan for bikeshare and identified key objectives:

- Develop a regional bikeshare system that allows multiple jurisdictions to participate and provides a consistent user experience and single pricing structure.
- Provide a new mobility option for the region that extends the reach of public transit.
- Increase the opportunity for residents and visitors to take part in healthy physical activity.
- Reduce carbon emissions from the transportation sector.



Equity Program Articles

Boston: http://www.slate.com/blogs/moneybox/2014/04/09/prescribe_a_bike_boston_medical_center_has_a_new_prescription_to_fight_obesity.html

Chicago I: http://chi.streetsblog.org/2013/08/20/600-youth-bike-apprenticeships-help-spread-benefits-of-divvy-citywide/

Chicago II: http://articles.chicagotribune.com/2014-03-28/business/ct-employment-skills-0328-biz-2-20140328_1_divvy-alta-bicycle-share-inc-seasonal-workers

Minneapolis: http://www.startribune.com/nice-ride-launches-neighborhood-program-in-east-side-frogtown-and-north-mpls/268631692/

Philadelphia: https://nextcity.org/daily/entry/philadelphia-bike-share-start-latecomer-lessons

Washington DC: http://www.wjla.com/articles/2012/03/capital-bikeshare-launches-homeless-bike-sharing-program-74105.html

Technical Appendices

A. Benefit-Cost Analysis Executive Summary
   - Benefit-Cost Analysis Data Tables

B. Wage Rate Certification

C. Project Performance Evaluation

D. Funding Commitments

E. Northgate Station Area Improvements

F. Changes from Pre-application

G. Letters of Support

H. Planning Documents



Model of Northgate Bridge over I-5 connecting to Link Light Rail



Northgate Non-Motorized Access to Transit and Education

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Letters of Support

- Seattle Mayor and City Council
- Sound Transit
- North Seattle College
- Motivate
- U.S. Senator Maria Cantwell
- King County Council
- King County Executive Dow Constantine
- King County Department of Transportation
- Puget Sound Regional Council
- Washington State Department of Transportation
- University of Washington
- Congressman Jim McDermott, Washington State
- Washington State 46th Legislative District Representatives
- Downtown Seattle Association
- Seattle Pedestrian Advisory Board
- Seattle Bicycle Advisory Board
- Microsoft Corporation
- Seattle Parks Foundation
- Cascade Bicycle Club
- Bike Works
- Washington Bikes
- Feet First
- City of Redmond
- City of Kirkland
- Lake City Neighborhood Alliance

Go to:
http://www.seattle.gov/transportation/northgate_tiger2.htm to download copies of all materials, including letters of support and relevant planning documents

APPENDIX A

Benefit – Cost Analysis Summary and Technical Documentation

EXECUTIVE SUMMARY

A Benefit-Cost Analysis was conducted to quantify impacts of the Northgate Non-Motorized Access to Transit and Education project. Benefits and costs are calculated and presented throughout this document for the completed project referred to as "Northgate Non-Motorized Access to Transit and Education" as well as for the project's two components.

1. Northgate pedestrian bridge, protected bicycle facilities, and associated improvements, referred to as "Bridge Construction"
2. Bikeshare Expansion, referred to as "Bikeshare Expansion".

The total Northgate Non-Motorized Access to Transit and Education project produces the following benefits:

- *Benefit: Cost* – **Total benefit to cost ratio is 3.1**
- *Monetized Benefits* – **Monetized benefits exceed $393 million over the life of the project**[1]
- *Net Benefits* - Benefits net of costs exceed $265 million
- *Mode Shift* - The primary source of benefits is the shifting of trips from motorized trips to walking and biking
- *Categories* - The mode-shift creates the following categories of benefits:
    - reduced emissions
    - fewer vehicle accidents
    - reduced health costs
    - decreased travel costs and
    - other factors detailed in this document.

The results of the Benefit-Cost analysis are shown in **Table 1**. Total monetized economic benefits are shown in **Table 2**.

[1] Benefits are in present value (discounted at 3% in 2015 year dollars).

Table 1 — Summary of Benefit-Cost Analysis Results		
Discounted Benefits		Total
Health Savings		222,721,879
Emissions Reduction		2,421,933
Vehicle Crash Reduction		18,457,506
Maintenance Savings		8,645,958
Congestion Reduction Savings		6,341,912
Travel Cost Savings		103,049,370
Travel Time Reduction Savings		31,696,131
Reduced Traffic Congestion Costs		6,189,358
Total Benefits	$	393,334,689
Discounted Costs		Total
Capital	$	48,485,665
Maintenance & Operation	$	79,501,397
Total Benefits	$	127,987,062
BCA Ratio		3.07
Net Discounted Benefits - Costs	$	265,347,627

Table 2 — Long Term Outcomes (Present Value)				
		3% Discount Rate		7% Discount Rate
Quality of Life (Livability)				
Household Travel Savings	$	103,049,370	$	59,699,711
Travel Time Savings	$	31,696,131	$	13,154,612
Improved Health Benefits	$	222,721,879	$	146,295,691
Environmental Sustainability				
Reduced Emissions	$	2,421,933	$	997,785
Economic Competitiveness				
Reduced Traffic Congestion Costs	$	6,341,912	$	2,757,103
Safety				
Reductions in Collision Savings	$	18,457,506	$	8,024,490
State of Good Repair				
Reduction in Road Maintenance Costs	$	8,645,958	$	3,758,078

Benefits for the two project components are shown below.

Bridge Construction

- *Benefit: Cost* – **Benefit to cost ratio is 2.4**
- *Monetized Benefits* – **Benefits total $85 million over the life of the project**[2]
- *Net Benefits* - Benefits net of costs exceed $50 million
- *Mode Shift* - The primary source of benefits is the shifting of trips to work, school and errands out of motor vehicles and into walking and biking
- *Categories* - The mode-shift creates the following categories of benefits:
  - decreased travel cost
  - reduced travel time
  - fewer emissions
  - decreased traffic congestion
  - reduced vehicle crashes
  - reduced road maintenance
  - decreased health costs

Bikeshare Expansion

- *Benefit:Cost* - **Benefit to cost ratio is 3.3**
- *Monetized Benefits* - **Benefits total $307 million over the life of the project**[3]
- *Net Benefits* – Benefits net of costs total $214 million
- *Mode Shift* - The primary source of benefits is the shifting of trips to bikeshare from other vehicular modes.
- *Categories* - The mode-shift creates the following categories of benefits
  - decreased travel cost
  - reduced travel time
  - fewer emissions
  - decreased traffic congestion
  - reduced vehicle crashes
  - reduced road maintenance
  - decreased health costs

Table 2A displays the benefits and costs of the project.

Table 2A- Northgate Non-Motorized Access to Transit and Education Present Value (2015 $'s, 3% Discount Rate)	
Benefits	
Total Benefits	**$393,334,689**
Bridge Construction	$85,638,000
Bikeshare Expansion	$307,696,689
Costs	
Total Costs	**$127,987,062**
Bridge Construction	$35,014,000
Bikeshare Expansion	$92,973,062

[2] Benefits are in (75 years) in present value (discounted at 3% in 2015 year dollars).

[3] Benefits over the life of the project (20 years) in present value (discounted at 3% in 2015 year dollars).

BENEFITS

Monetized Benefits

The Northgate Non-Motorized Access to Transit and Education project provides a wide range of benefits that can be monetized. The project provides significant health benefits by increased physical activity, reduced household transportation costs and travel time savings, reduced traffic congestion, improved safety, reduced road maintenance costs, and reduced vehicle emissions. Monetized benefits have been evaluated on the basis of aggregate mode shift to walking and bicycling modes facilitated by the project implementation.

Monetized benefits resulting from this shift have been estimated in the following categories:

- Reduced cost of vehicle emissions
- Reduced external costs of vehicle travel
    - Traffic congestion
    - Traffic crashes
    - Roadway maintenance
- Reduced healthcare costs
    - Reduction in medical care costs
    - Reduction in lost productivity
    - Reduction in workers compensation costs
- Travel time savings
- Reduced household transportation spending

Discount rates are applied specific to each project component as follows:

Bridge Construction

- 3% and 7% annual real rate
- 20 year evaluation period
- three years for project construction (2016-2018)
- 20 years of project benefits (2019-2038)
- Remaining net benefits of the fully-maintained facilities over their full 75 year asset life is claimed as a lump sum at the end of the analysis period in 2038.

Bikeshare Expansion

- 3% and 7% annual real rate
- 20 year evaluation period
- one and a half years for project construction (2016-2017)
- 20 years of project benefits (2017-2036).
- No benefit was calculated after the 20 year project lifespan as significant reinvestment (approaching initial investment) would be necessary at that date.

Qualitative Benefits
The project will also result in numerous qualitative benefits – not monetized for the benefit-cost analysis (BCA) – that will improve the quality of life and economic competitiveness of the region.

The additional qualitative benefits not monetized in the BCA are as follows for each project component:

Bridge Construction

- improved access to parks and open space
- improved access for disadvantaged communities
- improved access to job centers and employment services and
- improved connection of neighborhoods with retail businesses

Bike Share Expansion

- increased property values associated with access to new services
- improved access for disadvantaged communities currently underserved by public transit
- improved access to job centers and employment services and the accompanying increase in economic efficiency
- improved access to parks and open space
- increased trip distance due to introduction of electric bikes

Specific to bike share, it is important to note that the BCA does not monetize any increase in trip distance or trip number due to the introduction of electric bicycles. As the first large scale electric bike share system in the country, no precedent exists to show a change in travel behavior with electric bikes. However, new research coming out of the Institute of Transport Economics finds that people travel more often and farther on personal electric bicycles. Trip distance more than doubled, going from 4.8 to 10.3 kilometers per trip. Daily trips likewise increased from .9 to 1.4 trips per day.

Had the trip length been doubled to 4.2 instead of 2.1 miles in our BCA, consistent with the results of the study from the Institute for Transport Economics the overall BCA ratio would increase to 3.77 from 3.68 and net benefits would increase from $238,561,655 to $246,582,942.

PROJECT COSTS

Costs are as follows:

- Total actual project construction costs: $54.5M
  - Bridge Construction, construction: $36.3M
  - Bikeshare Expansion, equipment and construction $18.2M
- Total project annual operations and maintenance cost: $5.4M
  - Bridge, operations and maintenance: $29,000
  - Bikeshare Expansion, operations and maintenance: $5.4M

Bridge construction costs were prepared by KPFF Consulting Engineers in 2014. Bikeshare costs were estimated by the Seattle Department of Transportation based on the experience of other cities.

METHODOLOGY

To ensure a seamless benefit-cost analysis, the two project components, Bridge Construction and Bikeshare Expansion, use similar methods and categories for analysis. The Northgate Non-Motorized Access to Transit and Education BCA expands on the methodology suggested by National Cooperative Highway Research Program (NCHRP) Report 552: *Guidelines for Analysis of Investments in Bicycle Facilities* by incorporating local demographic information and utilizing new data and research that has become available since the *Guidelines for Analysis* were published in 2006.

One notable enhancement is the consideration of benefits from both bicycling and walking activity, using different impact areas for each mode. By comparison, NCHRP methodology attempts to measure only bicycling benefits, and does not quantify pedestrian benefits for shared-use paths. Another key improvement is the estimate of utilitarian (non-commute) and access to transit in addition to work commute trips. This addition helps capture the full range of walking and bicycling activity in the project area. The benefit-cost analysis also considers local travel patterns, trip distances and public health data to create a detailed, complete picture of benefits generated by the proposed bicycle and pedestrian facilities.

A major advantage of this benefit-cost analysis approach is the ability to quantify benefits at a line-item level for each distinct type of benefit associated with the project. This allows benefits to be quantified and compared for each TIGER grant selection criterion. This also means the benefit-cost analysis omits calculation of recreational benefits of the project from the analysis, so that it can be evaluated solely on its merits as a transportation facility in accordance with TIGER grant selection guidelines. By contrast, the standard NCRHP benefit-cost analysis includes recreational benefits that often make up 90% of the calculated value of bicycle projects, due to savings from newly active people. These methodology improvements should be considered when comparing benefit-cost analysis results for this project with other TIGER grant applications.

TECHNICAL DOCUMENTATION

BASELINE DATA INPUTS – BRIDGE CONSTRUCTION

Demographics

The benefit-cost analysis related to the Bridge Construction considers several population groups within two project impact areas: a half-mile buffer area for walking impacts and a three-mile buffer area for bicycling impacts. These geographies are standard areas of influence used by bicycle and pedestrian planning professionals and were recently acknowledged by the Federal Transit Administration in the *Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law* that went into effect August 19, 2011. Population groups within these areas were quantified using the following sources:

Employed Populations
BCA input: Employed population
Source:
2008-2012 American Community Survey (ACS) 5-Year Estimates, U.S. Census Bureau. *TCRP Report 153: Guidelines for Providing Access to Public Transit Stations, 2012,* Transit Cooperative Research Program. "Average station access mode share by station type"
Method: The number of employed people within the walking and bicycling impact areas was captured at a census block group level for block groups with their geographic center located within a half-mile or three mile buffer of proposed projects, respectively. This population is used in conjunction with Journey to Work mode split data. A portion of the employed population that journey to work via transit were also assumed to access trips via cycling and walking. The assumed station type used was Urban Neighborhood with Parking.

Student Populations
BCA input: College student population
Source: *2008-2012 American Community Survey (ACS) 5-Year Estimates*, U.S. Census Bureau.
Method: The populations of college-enrolled students living within the walking and bicycling impact area were captured for Census Block Groups with their geographic center located within the project impact areas. The data represent the most recent demographic estimates available for the area.

Travel Patterns – Mode Share

Baseline mode share data was collected for driving, bicycling and walking activity among the different demographic groups listed above. The following data sources were used to estimate mode split for each group:

Employed Populations
BCA input: Mode split of employed population (Journey to Work)
Source: *2008-2012 American Community Survey (ACS) 5-Year Estimates*, U.S. Census Bureau.

Student Populations
BCA input: Mode split of college students

Source: *Data Extraction Tool*, 2009 National Household Travel Survey (NHTS)[4]

Method: College student mode shares were based on travel survey data from the 2009 National Household Transportation Survey. National numbers were used in lieu of local college estimates, which aggregate bicycle and walking trips.

[4] http://nhts.ornl.gov/det/Extraction3.aspx

Travel Patterns – Trip Length and Purpose

Area residents will use the bicycle and pedestrian transportation facilities for more than just work commute trips. To capture the full range of walking and bicycling activity, an estimated number of trips of other purposes were extrapolated from work trips based on data from the 2009 National Household Travel Survey (NHTS).[5] NHTS shows that for every work trip Americans make by bicycle, they also make an average of 1.61 utilitarian (non-commute) trips by bicycle. For walking, this ratio is 4.32.

To accurately estimate the relative benefits resulting from each type of bicycling and walking trip, each trip was weighted according to the average distance for a trip of that mode and purpose. Trip distance multipliers were also provided by NHTS Average trip distances were assigned as follows:

- Bicycling trips:
  - Work commute trips: 3.54 miles
  - College commute trips: 2.09 miles
  - Utilitarian trips: 1.89 miles
- Walking trips:
  - Work commute trips: 0.67 miles
  - College commute trips: 0.56 miles
  - Utilitarian trips: 0.67 miles

Travel Patterns – New Trips Utilizing Bridge Construction

Trip generation was calculated as above for the walking and bicycling catchment areas on both the east and west sides of the bridge. Using the trip purpose and mode, a proportion of trips were distributed over the bridge, as given in **Table 3**. Few commute trips were assumed to cross the bridge, while a larger number of trips to access transit, particularly by walking, are assumed to cross when the bridge opens. The largest group assumed to cross the bridge are college trips, both walking and bicycling, generating from the east side of the bridge. This distribution is expected to increase, and a 1% growth rate was applied from the bridge opening in 2019.

Table 3 — Bridge Construction New Trip Distribution

	West		East	
	Bicycling	Walking	Bicycling	Walking
Weekday commute trips				
Bicycling/walking trips	2.00%	1.00%	2.00%	1.00%
Walk- or bike-to-transit trips	1.50%	5.00%	1.00%	3.00%
College bicycle/walking trips	0.00%	5.00%	30.00%	30.00%
Daily utilitarian trips	2.00%	1.00%	2.00%	1.00%

[5] http://nhts.ornl.gov/tables09/Login.aspx?ReturnUrl=/tables09/ae/TableDesigner.aspx

BASELINE DATA INPUTS – BIKE SHARE EXPANSION

Demographics

The Bikeshare Expansion benefit-cost analysis considers population within a designated service area and determines an expected number of bikeshare users and trips/year based on demographic indicators.

BCA Input: Trips

Source: A linear model was created to estimate the total number of annual trips based on data from seven bikeshare systems:

1. Hubway – Boston, MA; Brookline, MA; Cambridge, MA; Somerville, MA
2. Nice Ride MN – Minneapolis, MN; St. Paul, MN
3. Capital Bikeshare – Washington, DC; Montgomery County, MD; Alexandria, VA; Arlington County, VA
4. Denver B-cycle – Denver, CO
5. Divvy – Chicago, IL
6. CoGo – Columbus, OH
7. Bikeshare Toronto – Toronto, ON

The independent variables for the linear regression are the population of the bikeshare service area and the number of jobs in the bikeshare service area. The bikeshare service area is defined as the land area that is within a quarter-mile from each peripheral station in the system. The service area does not need to be contiguous. The dependent variable for the regression is trips per month, which was calculated from total annual trips and normalized to the number of operating months the system has. The data sources for the ridership model are listed in **Table 4**.

Table 4 — Sources for Ridership Model

	Population of the service area	Jobs in the service area	Trips per month
Hubway	U.S. Census Bureau, 2009-2013 5-Year American Community Survey, Table B01003, Block Group level data.	U.S. Census Bureau, American Community Survey 2006-2010 Five-year estimates. Special Tabulation: Census Transportation Planning, Table A202100.*	North American Bikeshare Association, International Bike-Share Database, 2015. Data is self-reported.
Nice Ride MN		U.S. Census Bureau. 2013. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/. Selected 2011 Primary Jobs.	
Capital Bikeshare			
Denver B-cycle			
Divvy			
CoGO			
Bikeshare Toronto	Statistics Canada, 2011 National Household Survey	Toronto Employment Survey, 2011, Table 4, http://www1.toronto.ca/city_of_toronto/city_planning/sipa/files/pdf/survey2011.pdf	

BCA Input: Unique bikeshare users (annual members & casual users)
Source: It was assumed that Seattle would have a similar ratio of casual user trips to member trips as Boston and Washington, DC, both of which are 0.28. This ratio was provided directly by Hubway and Capital Bikeshare. Boston and Washington, DC were chosen because of they are the most similar cities to Seattle for which data was available. The ridership model was used to calculate total trips per month for Seattle. This was then converted to casual user trips per month and annual member trips per month using the 0.28 ratio. This was then converted to unique users by assuming that casual members take 2.2 trips/month and annual members take 7 trips/month, based on 2-years of Capital Bikeshare ridership data that was compiled in Chicago DOT's successful TIGER Grant application from 2011. It was assumed that every casual pass sold was a unique user.

Travel Patterns – Mode Shift, Split, and Speed

BCA Input: Alternative mode split of bikeshare trips
Source: Survey data from Capital Bikeshare (Washington D.C.) and Hubway (Boston), asking bikeshare users what mode they would use for their trip if bikeshare did not exist.

In order to calculate travel time savings the BCA needs average travel speed for each mode of transportation used in Seattle.

BCA Inputs: Average travel speed: Walk, Personal Bike, Electric Bike, Bus & Streetcar, Light Rail, Carsharing, Taxi, Personal Car
Sources:
Bike & E-Bike - Cherry, Christopher. "Electric Bike Use in China and Their Impacts on the Environment, Safety, Mobility and Accessibility." April 1, 2007. Accessed May 21, 2015. Pg. 13

Bus & Streetcar - 2013 King County Metro Bus, Trollybus, DART, Streetcar (Revenue Miles/Revenue Hours) http://metro.kingcounty.gov/am/reports/annual-measures/service-provided.html
Light Rail - http://seattletransitblog.com/2009/12/30/link-light-rail-in-the-north-american-context/
Personal Car, Taxi and Carsharing – Assumption based on Google Maps direction data compiled here for many US cities: http://infinitemonkeycorps.net/projects/cityspeed/

Travel Patterns – Trip Length

The Bikeshare Expansion will provide both standard bicycles and electric bicycles (e-bikes) for rent. These distinct modes have different usage characteristics and therefore, different average trip lengths.

BCA Inputs: Average Trip Length
Source: Average trip length was calculated as the average of three peer cities for which data was available: Minneapolis, Boston, and Denver.
Note: E-Bike and Conventional Bike trip lengths are identical in the BCA as reliable research was not available on the subject. However, reliable research shows that average travel speed of E-bikes is significantly higher. This suggests that the average trip length for an E-bike would be longer. This effect was not quantified in the BCA but a longer E-bike trip length would increase the magnitude of benefits for emissions reduction, crash reduction, maintenance reduction, congestion reduction, travel cost savings, and travel time savings.

FORECASTS AND ASSUMPTIONS

Demographics

Bridge Construction

Future estimates were created by using linear growth rates to match Puget Sound Regional Council (PSRC) 2040 population and demographic forecasts by the 934 zone TAZ for the bicycling and walking impact areas. These growth rates were used to create annual estimates for each year evaluation period ending in 2038 through linear extrapolation between the base year (2012) and forecast year (2040).

Bikeshare Expansion

Service area population: U.S. Census Bureau, 2009-2013 5-Year American Community Survey, Table B01003, Block Group level data.

Travel Patterns

Bridge Construction

The Bridge Construction will have a strong influence on travel patterns in the bicycling and walking impact areas. Bicycling and walking mode shift curves were forecasted for each population group.

Employed Population

Mode shift forecasts for work commute trips within the bicycling and walking impact areas was based on mode shares documented by ACS Journey to Work data for other west coast communities that have made comparable investments in bicycling and walking transportation. According to the 2014 Alliance for Biking & Walking *2014 Benchmarking Report* Seattle has the fourth highest bicycling and walking commute levels of large US cities. A future mode share of 10% for cycling commute trips and 4% for walking trips were selected to reflect the changing land use and mode shift goals and targets observed elsewhere. Bicycle access to mode share was assumed to increase over time to levels consistent access mode share seen in other west coast cities as reported in the BART Bicycle Plan: Modeling Access to Transit, 2010, Bay Regional Transit Authority.

College Population

For college students, bicycling and walking growth rates were scaled to match the forecast growth rates for work commute trips.

Bikeshare Expansion

The Bikeshare Expansion will have a significant impact on travel behavior in the project area. Mode shift towards biking and away from other modes was projected using survey data from bikeshare users in Washington D.C. and Boston. Mode shift was calculated as fixed percentages applied to a growing ridership base. In other words, the mode share of the bikeshare system was not projected to grow more than is observed in more mature systems throughout the country.

Estimating Change From Baseline

Bridge Construction

For each year in the benefit-cost analysis period, forecasted mode shift was multiplied by demographic data to estimate increases over baseline for the following figures for both bicycling and walking modes:

- Work commute bicycling/walking users and number of trips, access to transit trips for work purposes
- College commute bicycling/walking users and number of trips

- Number of utilitarian (non-commute) bicycling/walking trips, based on NHTS trip purpose ratios from number of work and college bicycling/walking users

Trip distances are estimated according to the transportation mode and purpose of the trip from NHTS 2009 data. Each new bicycling and walking trip was assumed to have a chance to replace a trip of any other mode equal to the baseline mode split for that trip type, with bicycling or walking removed from the total mode split. For example, if baseline drive alone mode share was 80% for college trips, with baseline bicycling mode share at 5%, a trip shifted to bicycling was assumed to have a 80% of out 95% chance (100% mode split – 5% bicycling, removed) of replacing a drive alone trip, or about 84.2%. These assumptions allow estimates for the following figures:

- Reduced vehicle trips
- Reduced VMT

The number of bicycling/walking users and VMT reduced were used in conjunction with benefit multipliers to monetize the benefits of the forecasted mode shift by year.

Bikeshare Expansion

The benefits of the Bikeshare Expansion were quantified in two main ways, using VMT reduction and Trips Diverted from each existing mode.

VMT Methodology-

- For each year, *bikeshare trips* are multiplied by *percentage of trips diverted* from modes that contribute to VMT (Personal Car, Taxi, & Carsharing) and by *average trip length*. This results in a VMT reduction per year.
- VMT reduction per year is then multiplied by benefit multipliers for **Emissions, Crash Reduction, Maintenance Savings, and Congestion Reduction** to produce dollar effects for each benefit.

Trips Diverted Methodology-

- *Alternative mode split percentages* (what mode would a bikeshare user have used for a given trip if bikeshare facilities did not exist) are multiplied by *total bikeshare trips* (minus a small percentage of trips caused by induced demand) to produce *trips diverted* from each alternative mode.
- **Household Travel Cost Savings** are calculated by multiplying *the number of trips diverted* per mode by their respective *cost per trip* benefit multiplier.
- **Travel Time Savings** are calculated by multiplying trips diverted per mode by (bikeshare travel time minus the travel time of a given mode). This travel time savings per mode is then multiplied by the value of *travel time benefit multiplier*
- **Health Savings** are calculated using *trips diverted* and *unique users.* Unique users are divided into annual members and casual users, each have slightly different methodologies.
    - Annual users – the number of *annual members* is multiplied by the *mode shift percentage from inactive modes* (Bus, Rail, Carsharing, Taxi, and Personal Car) and by the overall *percentage of inactive adults* in society. This yields a figure of annual users that transition from an inactive to an active lifestyle. The number of *newly active annual users* is multiplied by the *health benefit multiplier* to quantify the benefits of becoming active in dollar terms.
    - Casual users – the number of *casual users* is multiplied by the overall *percentage of inactive adults in society*. This yields the number of *newly active casual users* due to

Seattle bikeshare. Since casual users may only use bikesharing facilities a few times per year the *health benefit multiplier* is discounted by 50%.

BENEFIT MULTIPLIERS

Based on available research, the following types of benefits were quantified for the Northgate Non-Motorized Access to Transit and Education project using the increased number of bicycling/walking users and reduced VMT forecast annually:

- Reduced cost of vehicle emissions
- Reduced external costs of vehicle travel
  - Traffic congestion
  - Traffic crashes
  - Roadway maintenance
- Reduced healthcare costs
  - Reduction in medical care costs
  - Reduction in lost productivity
  - Reduction in workers compensation costs
- Travel time savings
- Reduced household transportation spending

Multipliers used to translate new bicycling/walking users and reduced VMT into the benefits listed above were drawn from the following sources:

Vehicle Emissions Rates

Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks (EPA report 420-F-05-022).[6]

- Carbon dioxide: 369 g/VMT
- Carbon monoxide: 12.4 g/VMT
- Hydrocarbons: 1.36 g/VMT
- Particulate matter: 0.0052 g/VMT (PM10) and 0.0049 g/VMT (PM2.5)
- Nitrous oxides: 0.95 g/VMT

Emissions Costs

- *From NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5*[7] Volatile organic compounds: $1,700/ton
- Particulate matter: $168,000/ton
- Nitrous oxides: $4,000/ton

Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (May 2013: revised November13), page 18

- Carbon dioxide: $57/ton (in 2019 escalating per source - *See Tiger Benefit-Cost Analysis (BCA) Resource Guide for additional information.)*

External Vehicle Travel Costs

Crashes vs. Congestion – What's the Cost to Society? AAA, 2008. (Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5.).[8]

[6] https://www.whatcomsmarttrips.org/pdf/Emission%20Facts%202005.pdf
[7] http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.d0b5a45b55bfbe582f57529 cdba046a0
[8] http://newsroom.aaa.com/Assets/Files/20083591910.CrashesVsCongestionFullReport2.28.08.pdf

- Traffic crashes: $0.37/VMT
- Traffic congestion: $0.13/VMT.

Notes: Cost of crashes divided by 7.21, ratio of crash to congestion costs.

Kitamura, R., Zhao, H., and Gubby, A. R. *Development of a Pavement Maintenance Cost Allocation Model*. Institute of Transportation Studies – University of California, Davis.[9]

- Roadway maintenance: $0.15/VMT

Vehicle Operating Costs

Average Cost of Owning and Operating an Automobile. 2011 [most recent data year] Bureau of Transportation Statistics.[10]

- Reduced household transportation cost: $0.596/VMT

2012 National Transportation Statistics (Table 3-17: Average Cost of Owning and Operating an Automobile, 2012). Research and Innovative Technology Administration, Bureau of Transportation Statistics.[11]

Cost of Travel Time

TIGER BCA Resource Guide (2014). FHWA. Recommended Hourly Values of Travel Time Savings.

- Hourly monetized value of $12.98 for all surface transportation of all types was used

Travel time differences between modes is based upon average distance by type of trip and speed of travel, assuming trips by vehicle, transit and bike have a small fixed time component for waiting (transit), walking to-and-from vehicle or bike, start-up and shut-down procedures and parking.

Health Benefits

Health Care Reduction Modifier: $1,144.38
Method: The Health Care Reductions Multiplier was derived from the health care figures provided in the report cited in the footnote below. This report references 1998 Behavioral Risk Factor Surveillance System (BRFSS) data[12] [13] Detail on the application of these reports is included in the attached BCA spreadsheet.

RESIDUAL BENEFITS TO END OF PROJECT LIFE

Bridge Construction

The expected lifespan for the bridge is 75 years before the bridge will require substantial maintenance or replacement. Since this analysis only captures 20 years of benefits from the facility, a residual value of the investment is left over. The yearly maintenance on the bridge retains the facility in good repair, so the value of the investment is retained. The value of this remaining net benefit is conservatively estimated by assuming the annual benefits, net of O&M costs, for the remaining life

[9] http://pubs.its.ucdavis.edu/publication_detail.php?id=19
[10] http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_17.html
[11] http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_17.html
[12] Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf
[13] Population Estimates Program, Population Division, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt

remain constant at 2038 levels. Discounted to 2038, this value is $105 million, which is added as a benefit in the final year of the analysis.

Bikeshare Expansion

The lifespan of the Bikeshare Expansion is estimated at 20 years. Therefore, no residual benefits were calculated as the system would require substantial reinvestment, likely equal to the initial capital costs.

2015 YEAR DOLLARS

All benefit multipliers have been converted from their original sources to 2015 year dollars using Bureau of Labor Statistics. CPI Inflation Calculator. [14]. The stream of benefits and costs are calculated in 2015 constant year dollars prior to discounting to present value.

DISCOUNTING

Net present values were calculated by discounting the stream of project benefits and costs using both the 3% and 7% real rates as endorsed in the Federal Register grant announcement.

[14] Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm

BENEFIT-COST ANALYSIS RESULTS

Bridge Construction

The project will deliver significant net benefits over its 75 year life, with an estimated net present value of $51 million at 3% discount rate. This results in a BCA Ratio of 2.46. The benefit-cost analysis results tables are available on the following pages. The original Excel document used to calculate the results is available in the BCA attachment. **Table 5** demonstrates the summary of net benefits and **Table 6** displays the individual benefits at 3% and 7% discounts.

Bikeshare Expansion

The project will deliver significant net benefits over its 20 year life, with an estimated net present value of $214,723,627 million at 3% discount rate. This results in a BCA Ratio of 3.68. The benefit-cost analysis results tables are available on the following pages. The original Excel document used to calculate the results is available in the BCA attachment. **Tables 7** and **8** demonstrate the summary of net benefits for 3% and 7%, respectively, and **Table 9** displays the individual benefits at 3% and 7% discounts.

Table 5 - Summary of Net Benefits (Northgate Bridge Construction)

Calendar Year	Initial Project Costs	Remaining Life Net Benefits at End of Analysis Period (3)	Operations and Maintenance Costs (1)	Benefits (2)	Net Annual Benefits	Cumulative Benefits
2016	$ 11,747,572					
2017	$ 11,405,411					
2018	$ 11,073,214					
2019			$ 25,766	$ 1,250,538	$ 1,224,772	$ (33,001,425)
2020			$ 25,016	$ 1,280,197	$ 1,255,181	$ (31,746,244)
2021			$ 24,287	$ 1,310,632	$ 1,286,345	$ (30,459,899)
2022			$ 23,580	$ 1,342,498	$ 1,318,918	$ (29,140,981)
2023			$ 22,893	$ 1,375,078	$ 1,352,185	$ (27,788,796)
2024			$ 22,226	$ 1,408,749	$ 1,386,523	$ (26,402,272)
2025			$ 21,579	$ 1,443,402	$ 1,421,823	$ (24,980,449)
2026			$ 20,950	$ 1,479,164	$ 1,458,214	$ (23,522,235)
2027			$ 20,340	$ 1,516,347	$ 1,496,007	$ (22,026,228)
2028			$ 19,748	$ 1,554,470	$ 1,534,722	$ (20,491,506)
2029			$ 19,172	$ 1,593,659	$ 1,574,486	$ (18,917,020)
2030			$ 18,614	$ 1,634,178	$ 1,615,564	$ (17,301,455)
2031			$ 18,072	$ 1,675,530	$ 1,657,459	$ (15,643,997)
2032			$ 17,545	$ 1,719,001	$ 1,701,456	$ (13,942,541)
2033			$ 17,034	$ 1,763,423	$ 1,746,389	$ (12,196,152)
2034			$ 16,538	$ 1,809,257	$ 1,792,719	$ (10,403,433)
2035			$ 16,057	$ 1,856,551	$ 1,840,495	$ (8,562,939)
2036			$ 15,589	$ 1,905,232	$ 1,889,643	$ (6,673,295)
2037			$ 15,135	$ 1,955,901	$ 1,940,766	$ (4,732,529)
2038		$ 53,363,363	$ 14,694	$ 2,007,766	$ 55,356,435	$ 50,623,906
					Net Present Value:	**$ 50,623,906**

Notes:

(1) Estimated annual maintenance cost of $29,000. This maintenance level will preserve the full value and functionality of the facilities for 75 years.
(2) Includes all monetized benefits of the project, including: air quality and carbon benefits of reduced vehicle emissions; reduced costs of traffic congestion, crashes and road maintenance; healthcare cost savings; and reduced household travel time and transportation expenses.
(3) Credit in 2038 for additional 55 years of remaining net benefits of fully maintained transportation facilities at end of the 20-year analysis period.

Table 6: Net Present Value (Northgate Bridge Construction) Discounted at 3% and 7%

Table 6 - Net Present Value Discounted at 3% and 7%						
	Household Travel Savings		Travel Time Savings		Improved Health Benefits	
Calendar Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2019	$ 419,931	$ 360,571	$ 309,465	$ 88,776	$ 78,876	$ 67,727
2020	$ 429,648	$ 355,124	$ 305,762	$ 92,685	$ 79,951	$ 66,083
2021	$ 439,718	$ 349,860	$ 302,173	$ 96,802	$ 81,070	$ 64,503
2022	$ 450,067	$ 344,708	$ 298,629	$ 101,089	$ 82,195	$ 62,953
2023	$ 460,746	$ 339,695	$ 295,171	$ 105,590	$ 83,354	$ 61,454
2024	$ 471,780	$ 334,827	$ 291,792	$ 110,341	$ 84,567	$ 60,018
2025	$ 483,143	$ 330,073	$ 288,472	$ 115,296	$ 85,791	$ 58,611
2026	$ 494,863	$ 325,442	$ 285,220	$ 120,523	$ 87,068	$ 57,260
2027	$ 506,944	$ 320,923	$ 282,030	$ 125,971	$ 88,354	$ 55,933
2028	$ 519,435	$ 316,538	$ 278,920	$ 131,745	$ 89,712	$ 54,669
2029	$ 532,279	$ 312,239	$ 275,849	$ 137,790	$ 91,095	$ 53,437
2030	$ 545,563	$ 308,068	$ 272,860	$ 144,121	$ 92,506	$ 52,236
2031	$ 559,243	$ 303,988	$ 269,917	$ 150,787	$ 93,965	$ 51,077
2032	$ 573,365	$ 300,013	$ 267,036	$ 157,799	$ 95,471	$ 49,955
2033	$ 587,927	$ 296,132	$ 264,206	$ 165,168	$ 97,019	$ 48,867
2034	$ 602,950	$ 292,346	$ 261,432	$ 172,914	$ 98,610	$ 47,812
2035	$ 618,451	$ 288,652	$ 258,713	$ 181,056	$ 100,247	$ 46,788
2036	$ 634,409	$ 285,031	$ 256,031	$ 189,604	$ 101,921	$ 45,792
2037	$ 650,868	$ 281,494	$ 253,397	$ 198,607	$ 103,651	$ 44,828
2038	$ 667,866	$ 278,047	$ 250,819	$ 208,066	$ 105,426	$ 43,891
2039-2093	$ 17,881,730	$ 3,875,962	$ 3,496,404	$ 11,443,655	$ 2,822,709	$ 611,837
TOTAL 2015 Present Value	$ 1,900,000	$ 656,000	$25,538,000	$ 9,064,000	$ 4,644,000	$ 1,706,000

Table 6 (continued): Net Present Value (Northgate Bridge Construction) Discounted at 3% and 7%

Table 6 - Net Present Value Discounted at 3% and 7%								
	Reduced Emissions		Reduced Traffic Congestion Costs		Reductions in Accident Savings		Reduction in Road Maintenance Costs	
Calendar Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2019	$ 22,972	$ 19,725	$ 69,859	$ 59,984	$ 203,227	$ 174,500	$ 95,263	$ 81,797
2020	$ 23,799	$ 19,671	$ 71,476	$ 59,078	$ 207,929	$ 171,863	$ 97,467	$ 80,561
2021	$ 24,357	$ 19,379	$ 73,151	$ 58,202	$ 212,803	$ 169,316	$ 99,751	$ 79,367
2022	$ 25,549	$ 19,568	$ 74,873	$ 57,345	$ 217,811	$ 166,822	$ 102,099	$ 78,198
2023	$ 26,472	$ 19,517	$ 76,649	$ 56,511	$ 222,980	$ 164,397	$ 104,522	$ 77,061
2024	$ 27,431	$ 19,468	$ 78,485	$ 55,701	$ 228,319	$ 162,040	$ 107,025	$ 75,956
2025	$ 28,424	$ 19,418	$ 80,375	$ 54,911	$ 233,818	$ 159,740	$ 109,602	$ 74,878
2026	$ 29,454	$ 19,370	$ 82,325	$ 54,140	$ 239,491	$ 157,498	$ 112,261	$ 73,827
2027	$ 30,870	$ 19,542	$ 84,335	$ 53,388	$ 245,337	$ 155,312	$ 115,002	$ 72,802
2028	$ 31,988	$ 19,493	$ 86,413	$ 52,659	$ 251,382	$ 153,190	$ 117,835	$ 71,808
2029	$ 33,145	$ 19,443	$ 88,549	$ 51,944	$ 257,598	$ 151,109	$ 120,749	$ 70,832
2030	$ 34,347	$ 19,395	$ 90,759	$ 51,250	$ 264,027	$ 149,091	$ 123,763	$ 69,886
2031	$ 35,209	$ 19,138	$ 93,035	$ 50,571	$ 270,647	$ 147,116	$ 126,866	$ 68,961
2032	$ 36,886	$ 19,301	$ 95,384	$ 49,910	$ 277,482	$ 145,192	$ 130,070	$ 68,059
2033	$ 38,228	$ 19,255	$ 97,807	$ 49,264	$ 284,529	$ 143,314	$ 133,373	$ 67,178
2034	$ 39,619	$ 19,210	$ 100,306	$ 48,634	$ 291,799	$ 141,482	$ 136,781	$ 66,319
2035	$ 41,063	$ 19,165	$ 102,885	$ 48,020	$ 299,301	$ 139,694	$ 140,298	$ 65,482
2036	$ 42,559	$ 19,121	$ 105,539	$ 47,417	$ 307,024	$ 137,941	$ 143,917	$ 64,660
2037	$ 44,558	$ 19,271	$ 108,278	$ 46,829	$ 314,990	$ 136,230	$ 147,651	$ 63,858
2038	$ 46,181	$ 19,226	$ 111,105	$ 46,256	$ 323,216	$ 134,562	$ 151,507	$ 63,076
2039-2093	$ 1,236,481	$ 268,014	$ 2,974,784	$ 644,801	$ 8,653,917	$ 1,875,783	$ 4,056,523	$ 879,273
TOTAL 2015 Present Value	**$ 1,900,000**	**$ 656,000**	**$ 4,746,000**	**$ 1,697,000**	**$ 13,808,000**	**$ 4,936,000**	**$ 6,472,000**	**$ 2,314,000**

Table 7 - Summary of Net Benefits (Bikeshare Expansion), Discounted at 3% Real Rate

Calendar Year	Initial Project Costs	Operations and Maintenance Costs	Benefits (2)	Net Annual Benefits	Cumulative Benefits
2016	$ 7,716,436			$ (7,716,436)	$ (7,716,436)
2017	$ 6,543,229	$ 5,136,676	$ 7,463,468	$ (4,216,437)	$ (11,932,873)
2018		$ 4,987,064	$ 16,195,539	$ 11,208,475	$ (724,398)
2019		$ 4,841,810	$ 17,963,363	$ 13,121,553	$ 12,397,155
2020		$ 4,700,787	$ 17,684,975	$ 12,984,189	$ 25,381,344
2021		$ 4,563,870	$ 17,410,580	$ 12,846,709	$ 38,228,053
2022		$ 4,430,942	$ 17,140,441	$ 12,709,499	$ 50,937,553
2023		$ 4,301,886	$ 16,874,494	$ 12,572,609	$ 63,510,161
2024		$ 4,176,588	$ 16,612,674	$ 12,436,086	$ 75,946,247
2025		$ 4,054,940	$ 16,355,218	$ 12,300,278	$ 88,246,525
2026		$ 3,936,835	$ 16,101,454	$ 12,164,620	$ 100,411,145
2027		$ 3,822,170	$ 15,851,628	$ 12,029,458	$ 112,440,603
2028		$ 3,710,844	$ 15,605,678	$ 11,894,834	$ 124,335,437
2029		$ 3,602,761	$ 15,363,260	$ 11,760,498	$ 136,095,935
2030		$ 3,497,827	$ 15,125,167	$ 11,627,340	$ 147,723,275
2031		$ 3,395,948	$ 14,890,488	$ 11,494,540	$ 159,217,815
2032		$ 3,297,037	$ 14,659,451	$ 11,362,414	$ 170,580,229
2033		$ 3,201,007	$ 14,431,998	$ 11,230,991	$ 181,811,221
2034		$ 3,107,774	$ 14,208,075	$ 11,100,301	$ 192,911,522
2035		$ 3,017,256	$ 13,987,885	$ 10,970,629	$ 203,882,150
2036		$ 2,929,375	$ 13,770,852	$ 10,841,477	$ 214,723,627
2037					
2038					
				Net Present Value:	$ 214,723,627

Table 8 - Summary of Net Benefits (Bikeshare Expansion), Discounted at 7% Real Rate

Calendar Year	Initial Project Costs	Operations and Maintenance Costs	Benefits (2)	Net Annual Benefits	Cumulative Benefits
2016	$ 7,716,436			$ (7,716,436)	$ (7,716,436)
2017	$ 6,543,229	$ 4,759,804	$ 6,915,882	$ (4,387,151)	$ (12,103,587)
2018		$ 4,448,415	$ 14,446,271	$ 9,997,856	$ (2,105,731)
2019		$ 4,157,397	$ 15,424,157	$ 11,266,760	$ 9,161,029
2020		$ 3,885,418	$ 14,617,453	$ 10,732,035	$ 19,893,063
2021		$ 3,631,232	$ 13,852,684	$ 10,221,452	$ 30,114,515
2022		$ 3,393,675	$ 13,127,926	$ 9,734,252	$ 39,848,766
2023		$ 3,171,659	$ 12,441,087	$ 9,269,429	$ 49,118,195
2024		$ 2,964,167	$ 11,790,183	$ 8,826,016	$ 57,944,211
2025		$ 2,770,249	$ 11,173,541	$ 8,403,291	$ 66,347,503
2026		$ 2,589,018	$ 10,588,953	$ 7,999,935	$ 74,347,437
2027		$ 2,419,643	$ 10,034,951	$ 7,615,307	$ 81,962,745
2028		$ 2,261,349	$ 9,509,933	$ 7,248,584	$ 89,211,329
2029		$ 2,113,410	$ 9,012,217	$ 6,898,807	$ 96,110,136
2030		$ 1,975,150	$ 8,540,865	$ 6,565,716	$ 102,675,851
2031		$ 1,845,934	$ 8,094,017	$ 6,248,082	$ 108,923,934
2032		$ 1,725,172	$ 7,670,546	$ 5,945,374	$ 114,869,308
2033		$ 1,612,310	$ 7,269,232	$ 5,656,921	$ 120,526,230
2034		$ 1,506,832	$ 6,888,914	$ 5,382,081	$ 125,908,311
2035		$ 1,408,254	$ 6,528,614	$ 5,120,359	$ 131,028,670
2036		$ 1,316,126	$ 6,187,044	$ 4,870,918	$ 135,899,589
2037					
2038					
				Net Present Value:	$ 135,899,589

Note:

(4) Includes all monetized benefits of the project, including: air quality and carbon benefits of reduced vehicle emissions; reduced costs of traffic congestion, crashes and road maintenance; healthcare cost savings; and reduced household travel time and transportation expenses.

Table 9 - Net Present Value Discounted at 3% and 7% (Bikeshare Expansion)

	Household Travel Savings		Travel Time Savings		Improved Health Benefits	
Calendar Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2017	$ 5,171,775	$ 4,792,328	$ 157,574	$ 146,013	$ 1,906,775	$ 1,766,877
2018	$ 11,297,567	$ 10,077,325	$ 336,757	$ 300,385	$ 4,075,038	$ 3,634,896
2019	$ 12,752,657	$ 10,950,009	$ 358,259	$ 307,618	$ 4,335,228	$ 3,722,423
2020	$ 12,554,558	$ 10,376,924	$ 352,694	$ 291,518	$ 4,267,884	$ 3,527,604
2021	$ 12,359,535	$ 9,833,833	$ 347,215	$ 276,261	$ 4,201,587	$ 3,342,982
2022	$ 12,167,543	$ 9,319,165	$ 341,822	$ 261,803	$ 4,136,320	$ 3,168,022
2023	$ 11,978,532	$ 8,831,433	$ 336,512	$ 248,101	$ 4,072,066	$ 3,002,219
2024	$ 11,792,458	$ 8,369,227	$ 331,285	$ 235,116	$ 4,008,811	$ 2,845,094
2025	$ 11,609,274	$ 7,931,212	$ 326,138	$ 222,811	$ 3,946,538	$ 2,696,192
2026	$ 11,428,936	$ 7,516,120	$ 321,072	$ 211,150	$ 3,885,232	$ 2,555,083
2027	$ 11,251,399	$ 7,122,753	$ 316,085	$ 200,099	$ 3,824,879	$ 2,421,359
2028	$ 11,076,620	$ 6,749,974	$ 311,175	$ 189,626	$ 3,765,464	$ 2,294,633
2029	$ 10,904,556	$ 6,396,704	$ 306,341	$ 179,702	$ 3,706,971	$ 2,174,540
2030	$ 10,735,165	$ 6,061,923	$ 301,582	$ 170,297	$ 3,649,387	$ 2,060,733
2031	$ 10,568,405	$ 5,744,664	$ 296,897	$ 161,384	$ 3,592,698	$ 1,952,881
2032	$ 10,404,236	$ 5,444,008	$ 292,285	$ 152,938	$ 3,536,889	$ 1,850,674
2033	$ 10,242,616	$ 5,159,088	$ 287,745	$ 144,934	$ 3,481,947	$ 1,753,817
2034	$ 10,083,508	$ 4,889,080	$ 283,275	$ 137,348	$ 3,427,858	$ 1,662,028
2035	$ 9,926,871	$ 4,633,203	$ 278,875	$ 130,160	$ 3,374,610	$ 1,575,043
2036	$ 9,772,667	$ 4,390,717	$ 274,543	$ 123,348	$ 3,322,189	$ 1,492,611
TOTAL 2015 Present Value	$218,078,879	$144,589,691	$ 6,158,131	$ 4,090,612	$ 74,518,370	$49,499,711

Table 9 (continued): Net Present Value Discounted at 3% and 7% (Bikeshare Expansion)

Table 9 - Net Present Value Discounted at 3% and 7% (Bikeshare Expansion)								
	Reduced Emissions		Reduced Traffic Congestion Costs		Reductions in Accident Savings		Reduction in Road Maintenance Costs	
Calendar Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2017	$ 11,909	$ 11,035	$ 40,836	$ 37,840	$ 118,972	$ 110,243	$ 55,627	$ 51,546
2018	$ 25,763	$ 22,981	$ 87,272	$ 77,846	$ 254,258	$ 226,796	$ 118,883	$ 106,042
2019	$ 27,408	$ 23,534	$ 92,845	$ 79,721	$ 270,493	$ 232,257	$ 126,474	$ 108,596
2020	$ 27,637	$ 22,843	$ 91,403	$ 75,548	$ 266,291	$ 220,102	$ 124,509	$ 102,912
2021	$ 27,530	$ 21,904	$ 89,983	$ 71,594	$ 262,154	$ 208,582	$ 122,575	$ 97,526
2022	$ 27,420	$ 21,001	$ 88,585	$ 67,847	$ 258,082	$ 197,666	$ 120,671	$ 92,422
2023	$ 27,306	$ 20,132	$ 87,209	$ 64,297	$ 254,073	$ 187,321	$ 118,796	$ 87,585
2024	$ 27,189	$ 19,297	$ 85,854	$ 60,932	$ 250,126	$ 177,517	$ 116,951	$ 83,001
2025	$ 27,372	$ 18,700	$ 84,520	$ 57,743	$ 246,241	$ 168,226	$ 115,134	$ 78,657
2026	$ 27,245	$ 17,917	$ 83,208	$ 54,721	$ 242,416	$ 159,422	$ 113,346	$ 74,541
2027	$ 27,115	$ 17,165	$ 81,915	$ 51,857	$ 238,650	$ 151,078	$ 111,585	$ 70,639
2028	$ 26,983	$ 16,443	$ 80,642	$ 49,143	$ 234,943	$ 143,172	$ 109,852	$ 66,942
2029	$ 26,564	$ 15,582	$ 79,390	$ 46,571	$ 231,293	$ 135,678	$ 108,145	$ 63,439
2030	$ 26,711	$ 15,083	$ 78,157	$ 44,133	$ 227,700	$ 128,578	$ 106,465	$ 60,119
2031	$ 26,571	$ 14,443	$ 76,942	$ 41,824	$ 224,163	$ 121,848	$ 104,811	$ 56,972
2032	$ 26,430	$ 13,829	$ 75,747	$ 39,635	$ 220,681	$ 115,471	$ 103,183	$ 53,991
2033	$ 26,286	$ 13,240	$ 74,571	$ 37,560	$ 217,253	$ 109,428	$ 101,580	$ 51,165
2034	$ 26,141	$ 12,675	$ 73,412	$ 35,595	$ 213,878	$ 103,701	$ 100,002	$ 48,487
2035	$ 26,252	$ 12,253	$ 72,272	$ 33,732	$ 210,556	$ 98,273	$ 98,449	$ 45,949
2036	$ 26,099	$ 11,726	$ 71,149	$ 31,966	$ 207,285	$ 93,130	$ 96,920	$ 43,545
TOTAL 2015 Present Value	**$ 521,933**	**$ 341,785**	**$ 1,595,912**	**$ 1,060,103**	**$ 4,649,506**	**$ 3,088,490**	**$ 2,173,958**	**$ 1,444,078**

BENEFIT COST ANALYSIS
TIGER FY 2015: NORTHGATE NON-MOTORIZED ACCESS TO TRANSIT AND EDUCATION

BCA Ratio:	**3.07**
Net Discounted Benefits:	**$ 265,347,627**

Summary of Results		
Discounted Benefits		**Total**
Health Savings	$	222,721,879
Emissions Reduction	$	2,421,933
Vehicle Crash Reduction	$	18,457,506
Maintenance Savings	$	8,645,958
Congestion Reduction Savings	$	6,341,912
Travel Cost Savings	$	103,049,370
Travel Time Reduction Savings	$	31,696,131
Total Benefits:	**$**	**393,334,689**
Discounted Costs		
Capital	$	48,485,665
Maintenance & Operation	$	79,501,397
Total Costs:	**$**	**127,987,062**

Net Discounted Benefits - Costs	$	265,347,627
BCA Ratio		3.07
Discount Rate		3%

Bike Share Expansion (BSE) Benefit Cost Calculations

Summary of Results

Project Year: -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Discounted Benefits	Total	Year: 2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Health Savings	$ 218,078,879			$ 5,171,775	$ 11,297,567	$ 12,752,657	$ 12,554,558	$ 12,359,535	$ 12,167,543	$ 11,978,532	$ 11,792,458	$ 11,609,274	$ 11,428,936	$ 11,251,399	$ 11,076,620	$ 10,904,556	$ 10,735,165	$ 10,568,405	$ 10,404,236	$ 10,242,616	$ 10,083,508	$ 9,926,871	$ 9,772,667
Emissions Reduction	$ 521,933			$ 11,909	$ 25,763	$ 27,408	$ 27,637	$ 27,520	$ 27,420	$ 27,306	$ 27,189	$ 27,072	$ 27,245	$ 27,115	$ 26,983	$ 26,554	$ 26,573	$ 26,430	$ 26,286	$ 26,141	$ 26,052	$ 26,052	$ 26,099
Vehicle Crash Reduction	$ 4,549,506			$ 116,972	$ 254,258	$ 270,493	$ 264,291	$ 262,174	$ 260,082	$ 254,078	$ 250,126	$ 246,231	$ 242,416	$ 238,650	$ 234,942	$ 231,291	$ 227,700	$ 224,163	$ 220,681	$ 217,253	$ 213,878	$ 210,556	$ 207,285
Maintenance Savings	$ 2,473,956			$ 56,816	$ 115,883	$ 120,434	$ 121,409	$ 122,370	$ 123,317	$ 119,671	$ 118,795	$ 118,951	$ 115,136	$ 113,246	$ 111,665	$ 109,662	$ 108,143	$ 106,465	$ 104,811	$ 103,183	$ 101,580	$ 100,002	$ 98,446	$ 96,920
Congestion Reduction Savings	$ 1,595,912			$ 40,835	$ 77,272	$ 82,845	$ 81,403	$ 89,983	$ 88,585	$ 87,209	$ 85,854	$ 84,520	$ 83,208	$ 81,915	$ 80,642	$ 79,390	$ 78,157	$ 76,942	$ 75,747	$ 74,573	$ 73,418	$ 72,282	$ 71,149
Travel Cost Savings	$ 4,518,370			$ 1,905,774	$ 4,070,038	$ 4,335,269	$ 4,267,894	$ 4,202,587	$ 4,138,370	$ 4,072,055	$ 4,008,154	$ 3,946,638	$ 3,885,232	$ 3,824,875	$ 3,765,494	$ 3,706,941	$ 3,649,382	$ 3,592,698	$ 3,536,889	$ 3,482,747	$ 3,427,896	$ 3,374,674	$ 3,322,149
Travel Time Reduction Savings	$ 9,158,131			$ 157,574	$ 336,757	$ 358,259	$ 352,694	$ 347,215	$ 341,822	$ 336,512	$ 331,285	$ 326,138	$ 321,072	$ 316,085	$ 311,176	$ 306,344	$ 301,582	$ 296,897	$ 292,286	$ 287,745	$ 283,275	$ 278,875	$ 274,543
Total Benefits:	**$ 367,896,489**			$ 7,463,468	$ 16,195,539	$ 17,963,363	$ 17,684,975	$ 17,410,580	$ 17,140,441	$ 16,874,494	$ 16,612,674	$ 16,355,218	$ 16,101,454	$ 15,851,628	$ 15,605,678	$ 15,363,260	$ 15,125,167	$ 14,890,488	$ 14,659,451	$ 14,431,998	$ 14,208,075	$ 13,987,885	$ 13,770,852
Discounted Costs																							
Capital	$ 14,259,665		$ 7,716,436	$ 6,543,229																			
Maintenance & Operation	$ 78,713,397			$ 5,136,676	$ 4,987,064	$ 4,841,810	$ 4,700,787	$ 4,563,870	$ 4,430,942	$ 4,301,886	$ 4,176,588	$ 4,054,940	$ 3,936,835	$ 3,822,170	$ 3,710,844	$ 3,602,761	$ 3,497,827	$ 3,395,948	$ 3,297,037	$ 3,201,007	$ 3,107,774	$ 3,017,256	$ 2,929,375
Total Costs:	**92,973,062**																						
Net Discounted Benefits - Costs	**$ 214,723,627**																						
BCA Ratio	**3.31**																						

Primary Inputs

		Year:	-1 2015	0 2016	1 2017	2 2018	3 2019	4 2020	5 2021	6 2022	7 2023	8 2024	9 2025	10 2026	11 2027	12 2028	13 2029	14 2030	15 2031	16 2032	17 2033	18 2034	19 2035	20 2036	
# of Trips			0	0	500,000	1,100,625	1,205,026	1,222,911	1,240,032	1,257,392	1,274,996	1,292,845	1,310,945	1,329,299	1,347,909	1,366,779	1,385,914	1,405,317	1,424,992	1,444,941	1,465,171	1,485,683	1,506,483	1,527,573	
# of E-Bike Trips	50%				250,000	550,313	603,013	611,455	620,016	628,696	637,498	646,423	655,473	664,649	673,954	683,390	692,957	702,659	712,496	722,471	732,585	742,842	753,241	763,787	
# of Standard Bike Trips	50%				250,000	550,313	603,013	611,455	620,016	628,696	637,498	646,423	655,473	664,649	673,954	683,390	692,957	702,659	712,496	722,471	732,585	742,842	753,241	763,787	
Average E-Bike Trip Length (miles)	2.1																								
Average Bike Trip Length (miles)	2.1																								
Weighted Average Trip Length (miles)	2.1																								
# of Stations	250																								
Unique Bikeshare Users (total)					50,000	112,500	131,134	132,970	134,832	136,719	138,633	140,574	142,542	144,538	146,561	148,613	150,694	152,804	154,943	157,112	159,312	161,542	163,803	166,097	annual casual ratio
annual					4,677	10,523	11,217	11,373.80	11,533.03	11,694.49	11,858.22	12,024.23	12,192.57	12,363.27	12,536.35	12,711.86	12,889.83	13,070.29	13,253.27	13,438.82	13,626.96	13,817.74	14,011.19	14,207.34	0.09353741
casual					45,323	101,977	119,917	121,596	123,299	125,025	126,775	128,550	130,350	132,175	134,025	135,901	137,804	139,733	141,690	143,673	145,685	147,724	149,792	151,889	
Bikeshare Mode Shift	Weighted Alternative Mode				Trips Diverted																				
Walk		22%	add to <100% to account for induced demand		108,785	239,463	262,395	266,068	269,793	273,570	277,400	281,284	285,222	289,215	293,264	297,370	301,533	305,754	310,035	314,375	318,777	323,240	327,765	332,354	
Personal Bike		10%			48,973	107,802	118,126	119,780	121,457	123,157	124,881	126,630	128,402	130,200	132,023	133,871	135,745	137,646	139,573	141,527	143,508	145,517	147,555	149,620	
Bus & Streetcar		15%			73,326	161,409	176,866	179,342	181,853	184,399	186,981	189,599	192,253	194,944	197,674	200,441	203,247	206,093	208,978	211,904	214,870	217,879	220,929	224,022	
Light Rail		19%			96,475	212,365	232,702	235,960	239,263	242,613	246,009	249,454	252,946	256,487	260,078	263,719	267,411	271,155	274,951	278,800	282,704	286,664	290,675	294,744	
Carsharing		18%			89,650	197,343	216,242	219,269	222,339	225,452	228,608	231,808	235,054	238,344	241,681	245,065	248,496	251,975	255,502	259,079	262,706	266,384	270,114	273,895	
Taxi		5%			35,057	77,170	84,560	85,744	86,944	88,162	89,396	90,647	91,917	93,203	94,508	95,831	97,173	98,533	99,913	101,312	102,730	104,168	105,627	107,105	
Personal Car		8%			37,733	83,061	91,015	92,289	93,581	94,892	96,220	97,567	98,933	100,318	101,723	103,147	104,591	106,055	107,540	109,045	110,572	112,120	113,690	115,281	
Discount Rate	3%																								

Impact Model

Health Savings	Year:	-1 2015	0 2016	1 2017	2 2018	3 2019	4 2020	5 2021	6 2022	7 2023	8 2024	9 2025	10 2026	11 2027	12 2028	13 2029	14 2030	15 2031	16 2032	17 2033	18 2034	19 2035	20 2036
Unique Bikeshare Users (total)	50,000			50,000	112,500	131,134	132,970	134,832	136,719	138,633	140,574	142,542	144,538	146,561	148,613	150,694	152,804	154,943	157,112	159,312	161,542	163,803	166,097
annual	4,677			4,677	10,523	11,217	11,374	11,533	11,694	11,858	12,024	12,193	12,363	12,536	12,712	12,890	13,070	13,253	13,439	13,627	13,818	14,011	14,207
casual	45,323			45,323	101,977	119,917	121,596	123,299	125,025	126,775	128,550	130,350	132,175	134,025	135,901	137,804	139,733	141,690	143,673	145,685	147,724	149,792	151,889
Mode Shift from Inactive Mode (Bus, Rail, Carsharing, Taxi, Personal Car)	66%																						
Population Inactivity Rate	19%																						
affected annual users	Annual Users x Mode Shift x Inactivity Rate=			590.46	1,329	1,416	1,436	1,456	1,476	1,497	1,518	1,539	1,561	1,583	1,605	1,627	1,650	1,673	1,697	1,722	1,746	1,771	1,794
affected casual users				8,611	19,376	22,784	23,103	23,427	23,755	24,088	24,424	24,766	25,113	25,465	25,821	26,183	26,548	26,921	27,298	27,680	28,068	28,461	28,859
Savings/Year/User	*May need to address E-Bikes here																						
annual	$ 1,120.62	Savings x Affected Annual Users=		$ 661,685.77	$ 1,488,792.98	$ 1,586,952.83	$ 1,609,170.17	$ 1,631,698.55	$ 1,654,542.33	$ 1,677,705.93	$ 1,701,193.81	$ 1,725,010.52	$ 1,749,160.67	$ 1,773,648.92	$ 1,798,480.00	$ 1,823,658.72	$ 1,849,189.95	$ 1,875,078.61	$ 1,901,329.71	$ 1,927,948.32	$ 1,954,939.60	$ 1,982,308.75	$ 2,010,061.07
casual (20% of benefit)	$ 560.31	*Savings x Affected Casual Users x 30%=		$ 4,825,050.48	$ 10,856,363.59	$ 12,766,275.26	$ 12,945,003.11	$ 13,126,233.16	$ 13,310,000.42	$ 13,496,340.43	$ 13,685,289.19	$ 13,876,883.24	$ 14,071,159.61	$ 14,268,155.84	$ 14,467,910.02	$ 14,670,460.76	$ 14,875,847.21	$ 15,084,109.07	$ 15,295,286.60	$ 15,509,420.61	$ 15,726,552.50	$ 15,946,724.24	$ 16,169,978.38
Total				$ 5,486,736.25	$ 12,345,156.57	$ 14,353,228.09	$ 14,554,173.28	$ 14,757,931.71	$ 14,964,542.75	$ 15,173,046.35	$ 15,386,483.00	$ 15,601,893.76	$ 15,820,320.27	$ 16,041,804.75	$ 16,266,390.02	$ 16,494,118.49	$ 16,725,037.15	$ 16,959,187.68	$ 17,196,616.31	$ 17,437,368.93	$ 17,681,492.10	$ 17,929,032.99	$ 18,180,039.45

VMT	Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
% of Trips Diverted from Single Occupancy Vehicles (Personal Car + Taxi + Carsharing)	32%	*derived from Capital Bikeshare mode shift data																					
VMT Reduction (miles)	% Trips Diverted x Trips x Average Trip Length=			341,127	750,905	822,816	834,335	846,016	857,860	869,870	882,048	894,397	906,918	919,615	932,490	945,545	958,782	972,205	985,816	999,618	1,013,612	1,027,803	1,042,192

Emissions Reduction (pounds)	= VMT Reduction x Pounds Per Mile																						
Hydrocarbons				1,023	2,251	2,467	2,502	2,537	2,572	2,608	2,645	2,682	2,719	2,757	2,796	2,835	2,875	2,915	2,956	2,997	3,039	3,082	3,125
Particulate Matter				8	17	18	19	19	19	19	20	20	20	21	21	21	22	22	22	22	23	23	23
Nitrous Oxides				714	1,573	1,723	1,747	1,772	1,797	1,822	1,847	1,873	1,899	1,926	1,953	1,980	2,008	2,036	2,065	2,094	2,123	2,153	2,183
Carbon Monoxide				9,325	20,528	22,494	22,808	23,128	23,452	23,780	24,112	24,450	24,793	25,140	25,492	25,849	26,211	26,577	26,950	27,327	27,709	28,097	28,490
Carbon Dioxide				277,509	610,866	669,365	678,736	688,239	697,874	707,644	717,551	727,597	737,783	748,112	758,586	769,206	779,975	790,895	801,967	813,195	824,579	836,124	847,829

Emissions Reduction ($ Benefit)	= Pounds Reduction x Savings Per Pound																						
Hydrocarbons				$ 927	$ 2,041	$ 2,236	$ 2,268	$ 2,299	$ 2,332	$ 2,364	$ 2,397	$ 2,431	$ 2,465	$ 2,499	$ 2,534	$ 2,570	$ 2,606	$ 2,642	$ 2,679	$ 2,717	$ 2,755	$ 2,794	$ 2,833
Particulate Matter				$ 1,242	$ 2,733	$ 2,995	$ 3,037	$ 3,079	$ 3,123	$ 3,166	$ 3,211	$ 3,255	$ 3,301	$ 3,347	$ 3,394	$ 3,442	$ 3,490	$ 3,539	$ 3,588	$ 3,638	$ 3,689	$ 3,741	$ 3,793
Nitrous Oxides				$ 2,553	$ 5,620	$ 6,156	$ 6,244	$ 6,332	$ 6,420	$ 6,510	$ 6,602	$ 6,694	$ 6,788	$ 6,883	$ 6,979	$ 7,077	$ 7,175	$ 7,275	$ 7,378	$ 7,481	$ 7,586	$ 7,692	$ 7,800
Carbon Dioxide				$ 7,912	$ 17,758	$ 19,459	$ 20,490	$ 21,162	$ 21,848	$ 22,550	$ 23,266	$ 24,406	$ 25,160	$ 25,930	$ 26,717	$ 27,091	$ 28,343	$ 29,182	$ 30,039	$ 30,914	$ 31,808	$ 33,188	$ 34,126
Total				$ 12,634	$ 28,152	$ 30,848	$ 32,039	$ 32,872	$ 33,723	$ 34,590	$ 35,476	$ 36,786	$ 37,714	$ 38,660	$ 39,625	$ 40,180	$ 41,614	$ 42,639	$ 43,684	$ 44,751	$ 45,838	$ 47,415	$ 48,553

Crash Reduction	VMT Reduction x Cost of Crashes Per Mile=			$ 126,217	$ 277,835	$ 304,442	$ 308,704	$ 313,026	$ 317,408	$ 321,852	$ 326,358	$ 330,927	$ 335,560	$ 340,258	$ 345,021	$ 349,852	$ 354,750	$ 359,716	$ 364,752	$ 369,859	$ 375,037	$ 380,287	$ 385,611
Maintenance Savings	VMT Reduction x Cost of Maintenance Per Mile=			$ 59,015	$ 129,907	$ 142,347	$ 144,340	$ 146,361	$ 148,410	$ 150,488	$ 152,594	$ 154,731	$ 156,897	$ 159,093	$ 161,321	$ 163,579	$ 165,869	$ 168,192	$ 170,546	$ 172,934	$ 175,355	$ 177,810	$ 180,299
Congestion Reduction Savings	VMT Reduction x Cost of Congestion Per Mile Travelled=			$ 43,323	$ 95,365	$ 104,498	$ 105,961	$ 107,444	$ 108,948	$ 110,473	$ 112,020	$ 113,588	$ 115,179	$ 116,791	$ 118,426	$ 120,084	$ 121,765	$ 123,470	$ 125,199	$ 126,951	$ 128,729	$ 130,531	$ 132,358

Household Travel Cost Savings	=Trips Diverted x Cost Per Trip	Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Bus & Streetcar					$ 201,647	$ 443,875	$ 486,382	$ 493,192	$ 500,096	$ 507,098	$ 514,197	$ 521,396	$ 528,695	$ 536,097	$ 543,603	$ 551,213	$ 558,930	$ 566,755	$ 574,690	$ 582,735	$ 590,893	$ 599,166	$ 607,554	$ 616,060
Light Rail					$ 265,305	$ 584,003	$ 639,930	$ 649,089	$ 658,374	$ 667,785	$ 677,326	$ 686,997	$ 696,801	$ 706,740	$ 716,814	$ 727,027	$ 737,380	$ 747,875	$ 758,515	$ 769,301	$ 780,235	$ 791,319	$ 802,555	$ 813,946
Carsharing					$ 1,120,631	$ 2,466,799	$ 2,703,021	$ 2,740,863	$ 2,779,225	$ 2,818,145	$ 2,857,599	$ 2,897,605	$ 2,938,171	$ 2,979,306	$ 3,021,016	$ 3,063,310	$ 3,106,197	$ 3,149,683	$ 3,193,779	$ 3,238,492	$ 3,283,833	$ 3,329,804	$ 3,376,422	$ 3,423,692
Taxi					$ 307,453	$ 676,781	$ 741,593	$ 751,975	$ 762,503	$ 773,178	$ 784,002	$ 794,978	$ 806,108	$ 817,393	$ 828,837	$ 840,441	$ 852,207	$ 864,138	$ 876,236	$ 888,503	$ 900,942	$ 913,555	$ 926,345	$ 939,314
Personal Car					$ 297,411	$ 654,451	$ 717,307	$ 727,309	$ 737,458	$ 747,755	$ 758,202	$ 768,802	$ 779,557	$ 790,469	$ 801,541	$ 812,775	$ 824,174	$ 835,740	$ 847,476	$ 859,385	$ 871,469	$ 883,730	$ 896,171	$ 908,795
Total					$ 2,022,898	$ 4,452,904	$ 4,879,337	$ 4,947,648	$ 5,016,915	$ 5,087,151	$ 5,158,372	$ 5,230,589	$ 5,303,817	$ 5,378,070	$ 5,453,363	$ 5,529,710	$ 5,607,126	$ 5,685,626	$ 5,765,225	$ 5,845,938	$ 5,927,781	$ 6,010,770	$ 6,094,921	$ 6,180,250

Travel Time Savings	=Trips Diverted x (Bikeshare Travel Time - Mode Travel Time)	Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	Average Travel Time in Minutes (over Weighted Average Trip Distance)	Weighted Alternative Mode																						
Weighted Average Bikeshare Travel Time	16.21																							
Walk	46.15	22%			$ 705,790	$ 1,553,621	$ 1,702,403	$ 1,726,237	$ 1,750,404	$ 1,774,910	$ 1,799,759	$ 1,824,955	$ 1,850,505	$ 1,876,412	$ 1,902,681	$ 1,929,319	$ 1,956,329	$ 1,983,718	$ 2,011,490	$ 2,039,651	$ 2,068,206	$ 2,097,161	$ 2,126,521	$ 2,156,293
Personal Bike	18.43	10%			$ 23,607	$ 51,966	$ 56,942	$ 57,739	$ 58,548	$ 59,367	$ 60,199	$ 61,041	$ 61,896	$ 62,763	$ 63,641	$ 64,532	$ 65,436	$ 66,352	$ 67,281	$ 68,223	$ 69,178	$ 70,146	$ 71,128	$ 72,124
Bus & Streetcar	12.15	15%			($4,438)	($9,771)	($10,705)	($10,855)	($11,008)	($11,162)	($11,319)	($11,478)	($11,639)	($11,803)	($11,968)	($12,136)	($12,306)	($12,478)	($12,652)	($12,828)	($13,006)	($13,186)	($13,368)	($13,552)
Light Rail	7.04	19%			($191,668)	($421,909)	($462,313)	($468,786)	($475,349)	($482,004)	($488,752)	($495,594)	($502,533)	($509,568)	($516,702)	($523,936)	($531,271)	($538,709)	($546,250)	($553,898)	($561,653)	($569,516)	($577,489)	($585,574)
Carsharing	7.94	18%			($367,285)	($808,431)	($885,852)	($898,205)	($910,752)	($923,496)	($936,440)	($949,588)	($962,943)	($976,509)	($990,290)	($1,004,289)	($1,018,510)	($1,032,958)	($1,047,636)	($1,062,548)	($1,077,699)	($1,093,093)	($1,108,733)	($1,124,624)
Taxi	5.94	7%			($77,979)	($171,650)	($188,089)	($190,722)	($193,392)	($196,099)	($198,845)	($201,629)	($204,451)	($207,314)	($210,216)	($213,159)	($216,143)	($219,169)	($222,238)	($225,349)	($228,504)	($231,703)	($234,947)	($238,236)
Personal Car	7.94	8%			($67,580)	($148,761)	($163,007)	($165,289)	($167,603)	($169,949)	($172,329)	($174,741)	($177,187)	($179,668)	($182,183)	($184,734)	($187,320)	($189,943)	($192,602)	($195,298)	($198,033)	($200,805)	($203,616)	($206,467)
Total					$ 167,170	$ 367,984	$ 403,224	$ 408,869	$ 414,593	$ 420,398	$ 426,283	$ 432,251	$ 438,303	$ 444,439	$ 450,661	$ 456,970	$ 463,368	$ 469,855	$ 476,433	$ 483,103	$ 489,866	$ 496,725	$ 503,679	$ 510,730

Project Costs

Annual Costs																							
Project Cost 2015 Constant Normal $		$ 9,100,000.00	$ 9,100,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Maintenance Cost 2015 Constant Normal $			$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00
Discounted Costs		$ 7,716,436	$ 11,679,905	$ 4,987,064	$ 4,841,810	$ 4,700,787	$ 4,563,870	$ 4,430,942	$ 4,301,886	$ 4,176,588	$ 4,054,940	$ 3,936,835	$ 3,822,170	$ 3,710,844	$ 3,602,761	$ 3,497,827	$ 3,395,948	$ 3,297,037	$ 3,201,007	$ 3,107,774	$ 3,017,256	$ 2,929,375

						Project Year			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Year		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
Area Population Projections	**Ann. Growth**																												
West - Bike (3 mile radius)																													
Total population	0.78%	126,595	127,580	128,573	129,573	130,581	131,597	132,621	133,653	134,692	135,740	136,796	137,861	138,933	140,014	141,104	142,201	143,308	144,423	145,546	146,679	147,820	148,970	150,129	151,297	152,474	153,661	154,856	Universe
Employed population	1.75%	75,669	76,989	78,333	79,700	81,091	82,506	83,946	85,411	86,901	88,417	89,960	91,530	93,128	94,753	96,406	98,089	99,800	101,542	103,314	105,117	106,951	108,817	110,716	112,648	114,614	116,614	118,649	Universe
College/graduate population	0.78%	12,000	12,093	12,187	12,282	12,378	12,474	12,571	12,669	12,768	12,867	12,967	13,068	13,170	13,272	13,375	13,479	13,584	13,690	13,796	13,904	14,012	14,121	14,231	14,342	14,453	14,566	14,679	Universe
East - Bike (3 mile radius)																													
Total population	0.78%	104,519	105,332	106,152	106,978	107,810	108,649	109,494	110,346	111,204	112,070	112,942	113,820	114,706	115,598	116,498	117,404	118,317	119,238	120,166	121,101	122,043	122,992	123,949	124,914	125,885	126,865	127,852	Universe
Employed population	1.75%	58,056	59,069	60,100	61,149	62,216	63,301	64,406	65,530	66,674	67,837	69,021	70,225	71,451	72,698	73,966	75,257	76,570	77,907	79,266	80,649	82,057	83,489	84,946	86,428	87,936	89,471	91,032	Universe
College/graduate population	0.78%	23,258	23,439	23,621	23,805	23,990	24,177	24,365	24,555	24,746	24,938	25,132	25,328	25,525	25,723	25,924	26,125	26,328	26,533	26,740	26,948	27,157	27,369	27,582	27,796	28,013	28,230	28,450	Universe
West - Ped (0.5 mile radius)																													
Total population	0.78%	10,259	10,339	10,419	10,500	10,582	10,664	10,747	10,831	10,915	11,000	11,086	11,172	11,259	11,346	11,435	11,524	11,613	11,704	11,795	11,887	11,979	12,072	12,166	12,261	12,356	12,452	12,549	Universe
Employed population	1.75%	5,819	5,921	6,024	6,129	6,236	6,345	6,455	6,568	6,683	6,799	6,918	7,039	7,162	7,287	7,414	7,543	7,675	7,809	7,945	8,084	8,225	8,368	8,514	8,663	8,814	8,968	9,124	Universe
College/graduate population	0.78%	1,561	1,573	1,585	1,598	1,610	1,623	1,635	1,648	1,661	1,674	1,687	1,700	1,713	1,726	1,740	1,753	1,767	1,781	1,795	1,809	1,823	1,837	1,851	1,866	1,880	1,895	1,909	Universe
East - Ped (0.5 mile radius)																													
Total population	0.78%	4,133	4,165	4,198	4,230	4,263	4,296	4,330	4,363	4,397	4,432	4,466	4,501	4,536	4,571	4,607	4,643	4,679	4,715	4,752	4,789	4,826	4,863	4,901	4,939	4,978	5,017	5,056	Universe
Employed population	1.75%	2,273	2,313	2,353	2,394	2,436	2,478	2,522	2,566	2,610	2,656	2,702	2,749	2,797	2,846	2,896	2,946	2,998	3,050	3,103	3,158	3,213	3,269	3,326	3,384	3,443	3,503	3,564	Universe
College/graduate population	0.78%	604	609	613	618	623	628	633	638	643	648	653	658	663	668	673	678	684	689	694	700	705	711	716	722	727	733	739	Universe
Baseline Commute Modeshare	**Ann. Growth**																												
West - Bike																													
Employed mode share	3.51%	4.07%	4.22%	4.36%	4.52%	4.68%	4.84%	5.01%	5.19%	5.37%	5.56%	5.75%	5.96%	6.17%	6.38%	6.61%	6.84%	7.08%	7.33%	7.59%	7.85%	8.13%	8.41%	8.71%	9.02%	9.33%	9.66%	10.00%	
Access to transit mode share	0.00%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	
College mode share	3.51%	1.67%	1.73%	1.79%	1.86%	1.92%	1.99%	2.06%	2.13%	2.21%	2.28%	2.37%	2.45%	2.53%	2.62%	2.72%	2.81%	2.91%	3.01%	3.12%	3.23%	3.34%	3.46%	3.58%	3.71%	3.84%	3.97%	4.11%	
East - Bike																													
Employed mode share	3.31%	4.29%	4.43%	4.57%	4.73%	4.88%	5.04%	5.21%	5.38%	5.56%	5.75%	5.94%	6.13%	6.34%	6.55%	6.76%	6.99%	7.22%	7.46%	7.70%	7.96%	8.22%	8.50%	8.78%	9.07%	9.37%	9.68%	10.00%	
Access to transit mode share	0.00%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	
College mode share	3.31%	1.67%	1.73%	1.79%	1.85%	1.91%	1.97%	2.04%	2.10%	2.17%	2.24%	2.32%	2.40%	2.48%	2.56%	2.64%	2.73%	2.82%	2.91%	3.01%	3.11%	3.21%	3.32%	3.43%	3.54%	3.66%	3.78%	3.91%	
West - Ped																													
Employed mode share	2.52%	2.10%	2.15%	2.20%	2.26%	2.32%	2.37%	2.43%	2.49%	2.56%	2.62%	2.69%	2.76%	2.82%	2.90%	2.97%	3.04%	3.12%	3.20%	3.28%	3.36%	3.45%	3.53%	3.62%	3.71%	3.81%	3.90%	4.00%	
Access to transit mode share	0.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	
College mode share	2.52%	6.82%	6.99%	7.17%	7.35%	7.53%	7.72%	7.92%	8.12%	8.32%	8.53%	8.74%	8.96%	9.19%	9.42%	9.66%	9.90%	10.15%	10.41%	10.67%	10.94%	11.21%	11.49%	11.78%	12.08%	12.38%	12.69%	13.01%	
East - Ped																													
Employed mode share	1.48%	2.73%	2.77%	2.81%	2.85%	2.89%	2.94%	2.98%	3.02%	3.07%	3.11%	3.16%	3.21%	3.25%	3.30%	3.35%	3.40%	3.45%	3.50%	3.56%	3.61%	3.66%	3.72%	3.77%	3.83%	3.88%	3.94%	4.00%	
Access to transit mode share	0.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	
College mode share	1.48%	6.82%	6.92%	7.02%	7.13%	7.23%	7.34%	7.45%	7.56%	7.67%	7.79%	7.90%	8.02%	8.14%	8.26%	8.38%	8.51%	8.63%	8.76%	8.89%	9.02%	9.16%	9.29%	9.43%	9.57%	9.71%	9.86%	10.00%	
Baseline Area Bike and Ped Trips	**Calculation**																												
West - Bike																													
Bicycling trips	Emp*Share*2	6,164	6,492	6,837	7,201	7,585	7,988	8,413	8,861	9,332	9,829	10,352	10,903	11,483	12,094	12,738	13,416	14,130	14,881	15,673	16,507	17,386	18,311	19,285	20,312	21,393	22,531	23,730	Employed
Bike-to-transit trips	Emp*Share*2	8,626	8,777	8,930	9,086	9,244	9,406	9,570	9,737	9,907	10,080	10,255	10,434	10,617	10,802	10,990	11,182	11,377	11,576	11,778	11,983	12,192	12,405	12,622	12,842	13,066	13,294	13,526	Number
College bicycle trips	ColPop*Share*2	402	419	437	456	476	496	518	540	564	588	613	640	667	696	726	758	791	825	860	897	936	977	1,019	1,063	1,109	1,157	1,207	Employed
Daily utilitarian trips	Mult*ComTrips	9,931	10,459	11,015	11,602	12,220	12,870	13,554	14,276	15,035	15,836	16,678	17,566	18,500	19,485	20,522	21,615	22,765	23,975	25,251	26,595	28,011	29,501	31,070	32,725	34,467	36,300	38,232	Bicycle/w
East - Bike																													
Bicycling trips	Emp*Share*2	4,976	5,231	5,498	5,779	6,075	6,386	6,712	7,056	7,417	7,796	8,195	8,614	9,055	9,518	10,005	10,517	11,055	11,620	12,215	12,840	13,497	14,187	14,913	15,676	16,477	17,320	18,206	Employed
Bike-to-transit trips	Emp*Share*2	6,618	6,734	6,851	6,971	7,093	7,216	7,342	7,470	7,601	7,733	7,868	8,006	8,145	8,288	8,432	8,579	8,729	8,881	9,036	9,194	9,354	9,518	9,684	9,853	10,025	10,200	10,378	Number
College bicycle trips	ColPop*Share*2	779	811	844	879	915	953	992	1,033	1,075	1,120	1,166	1,214	1,264	1,316	1,370	1,426	1,485	1,546	1,610	1,676	1,745	1,817	1,892	1,970	2,051	2,135	2,223	Employed
Daily utilitarian trips	Mult*ComTrips	8,017	8,428	8,858	9,311	9,788	10,289	10,814	11,368	11,950	12,560	13,203	13,878	14,589	15,335	16,119	16,944	17,811	18,721	19,680	20,687	21,745	22,857	24,027	25,256	26,546	27,904	29,332	Bicycle/w
West - Ped																													
Walking trips	Emp*Share*2	244	255	265	277	289	301	314	328	342	357	372	388	405	422	440	459	479	500	521	543	567	591	617	643	671	700	730	Employed
Walk-to-transit trips	Emp*Share*2	4,073	4,144	4,217	4,290	4,365	4,441	4,519	4,598	4,678	4,760	4,843	4,927	5,013	5,101	5,190	5,280	5,372	5,466	5,561	5,658	5,757	5,858	5,960	6,064	6,170	6,277	6,387	Number
College walking trips	ColPop*Share*2	213	220	227	235	243	251	259	268	276	286	295	305	315	325	336	347	359	371	383	396	409	422	436	451	466	481	497	Employed
Daily utilitarian trips	Mult*ComTrips	1,055	1,102	1,146	1,198	1,249	1,301	1,358	1,418	1,479	1,543	1,608	1,677	1,751	1,824	1,902	1,984	2,071	2,162	2,253	2,348	2,451	2,555	2,668	2,780	2,901	3,026	3,156	Bicycle/w
East - Ped																													
Walking trips	Emp*Share*2	124	128	132	137	141	146	150	155	160	165	171	176	182	188	194	200	207	214	221	228	235	243	251	259	267	276	285	Employed
Walk-to-transit trips	Emp*Share*2	1,591	1,619	1,647	1,676	1,705	1,735	1,765	1,796	1,827	1,859	1,892	1,925	1,958	1,992	2,027	2,063	2,099	2,135	2,172	2,210	2,249	2,288	2,328	2,369	2,410	2,452	2,495	Number
College walking trips	ColPop*Share*2	82	84	86	88	90	92	94	96	99	101	103	105	108	110	113	115	118	121	123	126	129	132	135	138	141	145	148	Employed
Daily utilitarian trips	Mult*ComTrips	536	553	571	592	610	631	649	670	692	713	739	761	787	813	839	865	895	925	955	986	1,016	1,051	1,085	1,120	1,154	1,193	1,232	Bicycle/w
Project New Mode Bike/Ped Trips	**% of Baseline Area Bike/Ped Trips in Initial Year**																												
West - Bike		Annual Growth Rate of % of Area Trips After Initial Year																											
Bicycling trips	2.00%	1%							177	189	201	213	227	241	257	273	291	309	329	350	372	396	421	448	476	507	539	573	Estimate
Bike-to-transit trips	1.50%	1%							146	150	154	158	163	167	172	177	182	187	192	197	203	208	214	220	226	232	239	245	Estimate
College bicycle trips	0.00%	1%							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Estimate
Daily utilitarian trips	2.00%	1%							286	304	323	344	366	389	414	440	468	498	530	563	599	638	678	721	767	816	868	924	Estimate
Project utilization daily biking trips									609	642	678	715	755	798	842	890	940	994	1,050	1,110	1,174	1,241	1,313	1,389	1,470	1,555	1,646	1,742	
East - Bike																													
Bicycling trips	2.00%	1%							141	150	159	169	179	190	202	215	228	242	257	273	289	307	326	346	368	390	414	440	Estimate
Bike-to-transit trips	1.00%	1%							75	77	79	81	83	86	88	90	93	95	98	101	104	106	109	112	116	119	122	125	Estimate
College bicycle trips	30.00%	1%							310	326	343	360	379	399	419	441	463	487	512	539	567	596	627	659	693	729	766	806	Estimate
Daily utilitarian trips	2.00%	1%							227	241	256	272	289	307	326	346	367	390	414	439	466	495	525	558	592	629	668	709	Estimate
Project utilization daily biking trips									753	794	837	882	930	981	1,035	1,091	1,151	1,214	1,281	1,351	1,426	1,504	1,588	1,676	1,768	1,866	1,970	2,080	
West - Ped																													
Walking trips	1.00%	1%							3	3	4	4	4	4	4	5	5	5	6	6	6	6	7	7	8	8	8	9	Estimate
Walk-to-transit trips	5.00%	1%							230	236	243	249	256	263	271	278	286	294	302	310	319	328	337	346	356	365	375	386	Estimate
College walking trips	5.00%	1%							13	14	15	15	16	17	17	18	19	20	20	21	22	23	24	25	26	28	29	30	Estimate
Daily utilitarian trips	1.00%	1%							14	15	16	17	17	18	19	20	21	23	24	25	26	28	29	31	33	34	36	38	Estimate
Project utilization daily walking trips									261	269	277	285	294	303	312	321	331	341	352	363	374	385	397	409	422	435	449	463	
East - Ped																													
Walking trips	1.00%	1%							2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	Estimate
Walk-to-transit trips	3.00%	1%							54	55	57	58	60	62	63	65	67	69	71	73	75	77	79	81	83	86	88	90	Estimate
College walking trips	30.00%	1%							29	30	31	32	33	34	35	36	37	39	40	41	43	44	46	47	49	50	52	54	Estimate
Daily utilitarian trips	1.00%	1%							7	7	7	8	8	8	9	9	9	10	10	11	11	12	12	13	13	14	14	15	Estimate
Project utilization daily walking trips									91	94	97	100	103	106	109	113	116	120	123	127	131	135	139	144	148	153	158	162	
ALL Bike																													
Bicycling trips									318	338	360	382	406	432	459	488	518	551	585	622	661	703	747	794	844	897	953	1,013	Estimate
Bike-to-transit trips									221	227	233	240	246	253	260	267	275	282	290	298	306	315	323	332	341	351	361	370	Estimate
College bicycle trips									310	326	343	360	379	399	419	441	463	487	512	539	567	596	627	659	693	729	766	806	Estimate
Daily utilitarian trips									513	545	579	616	654	696	739	786	835	888	943	1,003	1,066	1,133	1,204	1,279	1,360	1,445	1,536	1,632	Estimate
Project utilization daily biking trips									1,362	1,436	1,515	1,598	1,686	1,779	1,877	1,981	2,091	2,208	2,331	2,462	2,600	2,746	2,901	3,065	3,238	3,422	3,616	3,822	
ALL Walk																													
Walking trips									5	5	5	6	6	6	6	7	7	8	8	8	9	9	10	10	11	11	12	12	Estimate
Walk-to-transit trips									284	292	300	308	316	325	334	343	353	363	373	383	393	404	416	427	439	451	463	476	Estimate
College walking trips									42	44	45	47	49	51	52	54	56	58	61	63	65	67	70	72	75	78	81	84	Estimate
Daily utilitarian trips									520	552	587	623	662	704	748	795	844	897	953	1,013	1,077	1,144	1,216	1,292	1,373	1,459	1,550	1,647	Estimate
Project utilization daily walking trips									850	893	937	984	1,033	1,086	1,141	1,199	1,261	1,326	1,395	1,467	1,544	1,625	1,711	1,801	1,897	1,999	2,106	2,220	
Annual Extrapolation	**Days/year**																												
ALL Bike																													
Annual commute trips	251								135,313	141,863	148,770	156,054	163,744	171,859	180,421	189,459	199,004	209,083	219,720	230,968	242,848	255,404	268,672	282,699	297,531	313,205	329,785	347,323	Bicycle/w
Annual college trips	150								46,485	48,859	51,413	54,060	56,848	59,781	62,863	66,097	69,487	73,086	76,849	80,830	84,985	89,369	93,987	98,845	103,949	109,305	114,920	120,853	College b
Annual utilitarian trips	365								187,201	198,960	211,457	224,741	238,861	253,871	269,824	286,774	304,803	323,955	344,290	365,935	388,933	413,377	439,344	466,951	496,307	527,483	560,621	595,860	Annual co
ALL Walk																													
Annual commute trips	251								72,441	74,463	76,555	78,704	80,901	83,167	85,504	87,903	90,367	92,904	95,513	98,188	100,946	103,792	106,717	109,719	112,809	115,985	119,244	122,613	Bicycle/w
Annual college trips	150								6,330	6,590	6,824	7,055	7,297	7,591	7,842	8,154	8,422	8,752	9,088	9,380	9,736	10,098	10,466	10,849	11,248	11,654	12,120	12,549	College b
Annual utilitarian trips	365								189,647	201,511	214,113	227,521	241,752	256,890	272,973	290,056	308,221	327,527	348,020	369,826	392,988	417,597	443,752	471,550	501,100	532,473	565,831	601,294	Annual co
Vehicle Modeshift	**% New Mode Bike/Ped Trips Shift from Vehicles**																												
ALL Bike																													
Vehicle commute trips replaced	61.78%								83,594	87,641	91,908	96,408	101,158	106,172	111,461	117,045	122,942	129,168	135,740	142,688	150,027	157,785	165,981	174,647	183,810	193,493	203,736	214,570	Number
College vehicle trips replaced	81.50%								37,885	39,819	41,901	44,058	46,331	48,721	51,233	53,868	56,631	59,564	62,631	65,876	69,262	72,835	76,598	80,557	84,717	89,083	93,658	98,494	Trip repla
Utilitarian vehicle trips replaced	61.78%								115,650	122,915	130,635	138,841	147,565	156,837	166,693	177,164	188,303	200,134	212,696	226,069	240,277	255,378	271,420	288,475	306,611	325,871	346,343	368,113	Number
ALL Walk																													
Vehicle commute trips replaced	67.35%								48,788	50,150	51,558	53,006	54,486	56,011	57,585	59,201	60,861	62,569	64,326	66,128	67,985	69,902	71,872	73,894	75,975	78,114	80,308	82,578	Number
College vehicle trips replaced	86.00%								5,159	5,371	5,562	5,750	5,947	6,187	6,391	6,645	6,864	7,133	7,407	7,645	7,935	8,230	8,530	8,842	9,167	9,498	9,878	10,227	Trip repla
Utilitarian vehicle trips replaced	67.35%								127,724	135,714	144,201	153,231	162,815	173,011	183,842	195,348	207,581	220,584	234,385	249,071	264,670	281,244	298,859	317,580	337,481	358,611	381,077	404,960	Number
New commute mode shift adults over baseline									407	425	444	464	484	506	529	553	578	604	632	661	692	724	758	793	830	870	911	954	New bik
Vehicle Miles Traveled Reduction (o	**Miles/trip**																												
ALL Bike																													
Commute VMT replaced	3.54								295,923	310,248	325,353	341,284	358,100	375,847	394,572	414,338	435,214	457,255	480,518	505,117	531,097	558,557	587,574	618,250	650,687	684,966	721,225	759,579	NHTS 20
College VMT replaced	2.09								79,179	83,222	87,573	92,082	96,831	101,827	107,077	112,585	118,359	124,488	130,898	137,680	144,757	152,224	160,090	168,365	177,059	186,183	195,746	205,852	NHTS 20
Utilitarian VMT replaced	1.89								218,964	232,718	247,335	262,873	279,389	296,946	315,605	335,431	356,519	378,920	402,705	428,024	454,924	483,515	513,888	546,179	580,516	616,982	655,742	696,990	Derived f
Total ALL Bike VMT reduced									**594,066**	**626,188**	**660,262**	**696,238**	**734,320**	**774,620**	**817,254**	**862,354**	**910,092**	**960,664**	**1,014,122**	**1,070,821**	**1,130,778**	**1,194,296**	**1,261,553**	**1,332,794**	**1,408,262**	**1,488,130**	**1,572,713**	**1,662,392**	
ALL Walk																													
Commute VMT replaced	0.67								32,688	33,600	34,544	35,514	36,505	37,528	38,582	39,665	40,777	41,921	43,099	44,306	45,550	46,834	48,154	49,509	50,903	52,336	53,807	55,327	NHTS 20
College VMT replaced	0.56								2,889	3,008	3,115	3,220	3,330	3,464	3,579	3,721	3,844	3,994	4,148	4,281	4,443	4,609	4,777	4,952	5,133	5,319	5,531	5,727	NHTS 20
Utilitarian VMT replaced	0.67								85,149	90,476	96,134	102,154	108,544	115,340	122,561	130,232	138,387	147,056	156,257	166,047	176,447	187,496	199,239	211,720	224,988	239,074	254,051	269,973	Derived f
Total All Walk VMT reduced									**120,726**	**127,084**	**133,793**	**140,888**	**148,379**	**156,332**	**164,723**	**173,618**	**183,008**	**192,972**	**203,503**	**214,634**	**226,440**	**238,939**	**252,170**	**266,180**	**281,024**	**296,729**	**313,389**	**331,028**	
ALL Trips																													
Commute VMT replaced									328,611	343,848	359,897	376,797	394,605	413,375	433,154	454,002	475,990	499,176	523,617	549,423	576,647	605,392	635,728	667,759	701,590	737,302	775,031	814,906	Total of w
College VMT replaced									82,068	86,230	90,688	95,301	100,161	105,292	110,656	116,306	122,203	128,483	135,046	141,961	149,201	156,833	164,867	173,317	182,193	191,501	201,277	211,580	Total of w
Utilitarian VMT replaced									304,113	323,194	343,470	365,027	387,933	412,286	438,166	465,663	494,907	525,976	558,962	594,071	631,371	671,011	713,128	757,899	805,504	856,056	909,794	966,934	Total of w
Total VMT reduced									**714,792**	**753,272**	**794,055**	**837,126**	**882,700**	**930,953**	**981,976**	**1,035,972**	**1,093,100**	**1,153,636**	**1,217,625**	**1,285,455**	**1,357,218**	**1,433,235**	**1,513,723**	**1,598,974**	**1,689,287**	**1,784,859**	**1,886,103**	**1,993,420**	
Benefits Calculations																													
Air Quality Benefits	lbs/VMT																												
Reduced Hydrocarbons (pounds/year)	0.002998287								2,143	2,259	2,381	2,510	2,647	2,791

Health Benefit Assumptions

Health Care Cost Reductions

Medical Costs			Source
Direct Medical Costs due to Physical Inactivity	$1,307,928,619	2000$	Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf
Indirect Medical Costs due to Physical Inactivity	$3,923,785,858	2000$	Same
Total Medical Costs	$5,231,714,477	2000$	Same
CA Population	32,682,794		Population Estimates Program, Population Divsion, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt
% of CA Population Physically Inactive	50%		Chenoweth, D. (2005).
CA Population Physically Inactive	16,177,983		Percent of population physically inactive multiplied by total population
Health Care Reductions Multiplier	$323.38	2000 $/person/year	Medical costs divided by physically inactive people
Medical Care Reductions Multiplier	**$450.25**	2015 $/person/year	Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm
Lost Productivity Costs			
Direct Lost Productivity Costs due to Physical Inactivity	$7,803,613,608	2000$	Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf
Indirect Lost Productivity Costs due to Physical Inactivity	$0	2000$	Same
Total Lost Productivity Costs	$7,803,613,608	2000$	Same
CA Population	32,682,794		Population Estimates Program, Population Divsion, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt
% of CA Population Physically Inactive	50%		Chenoweth, D. (2005).
CA Population Physically Inactive	16,177,983		Percent of population physically inactive multiplied by total population
Lost Productivity Reductions Multiplier	$482.36	2000 $/person/year	Medical costs divided by physically inactive people
Lost Productivity Reductions Multiplier	**$671.60**	2015 $/person/year	Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm
Workers' Compensation Costs			
Direct Lost Productivity Costs due to Physical Inactivity	$50,005,040	2000$	Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf
Indirect Lost Productivity Costs due to Physical Inactivity	$200,020,159	2000$	Same
Total Lost Productivity Costs	$250,025,199	2000$	Same
CA Population	32,682,794		Population Estimates Program, Population Divsion, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt
% of CA Population Physically Inactive	50%		Chenoweth, D. (2005).
CA Population Physically Inactive	16,177,983		Medical costs divided by physically inactive people
Workers' Compensation Reductions Multiplier	$15.45	2000 $/person/year	Medical costs divided by physically inactive people
Workers' Compensation Reductions Multiplier	**$22.53**	2015 $/person/year	Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm
No vigorous/moderate physical activity (adults)	19%		State Indicator Report on Physical Activity, 2010 Behavioral Indicators for the State of Washington
Total Health Savings/Person/Year	**$1,144.38**		

VMT Offset Assumptions

	Figure	Unit	Source
Vehicle Emissions			
Hydrocarbons	0.00300	Pounds/mile	EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks." 2005.
Particulate Matter	0.00002	Pounds/mile	Same as above. Presented in source data as 0.0052 grams per mile (PM10) and 0.0049 grams per mile (PM2.5).
Nitrous Oxides	0.00209	Pounds/mile	Same as above. Presented in source data as 0.95 grams per mile.
Carbon Monoxide	0.02734	Pounds/mile	Same as above. Presented in source data as 12.4 grams per mile.
Carbon Dioxide	0.81351	Pounds/mile	Same as above. Presented in source data as 369 grams per mile.
Carbon Dioxide Appreciation	2.50%	%/Year	
Emissions Costs			
Volatile Organic Compunds (Hydrocarbons)	$ 0.91	$/pound	From NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5 (http://www.nhtsa.dot.gov/ portal/site/nhtsa/ menuitem.d0b5a45b55bfbe582f75729 cdba046a0/).
Particulate Matter	$ 163.47	$/pound	Same as above, extrapolated to 2015
Nitrous Oxides	$ 3.57	$/pound	Same as above, extrapolated to 2015
Other Reduced Externalities			
Traffic Congestion	$ 0.13	$/mile	Crashes vs. Congestion: What's the Cost to Society? AAA. 2008. Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5. (projected to 2015 w/ 2.12% growth rate)
Vehicle Crashes	$ 0.37	$/mile	Crashes vs. Congestion: What's the Cost to Society? AAA. 2008. Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5. (projected to 2015 w/ 2.12% growth rate)
Road Maintenance Costs	$ 0.17	$/mile	Kitamura, R., Zhao, H., and Gubby, A. R. Development of a Pavement Maintenance Cost Allocation Model. Institute of Transportation Studies – University of California, Davis. http://pubs.its.ucdavis.edu/publication_detail.php?id=19
Household Transportation Savings			
Vehicle Operating Costs	$ 0.61	$/mile	Average Cost of Owning and Operating an Automobile. 2011 [most recent data year] Bureau of Transportation Statistics. 2012 National Transportation Statistics (Table 3-17: Average Cost of Owning and Operating an Automobile, 2012). Research and Innovative Technology Administration, Bureau of Transportation Statistics. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_17.html
Vehicle Operating Cost (2015)	$ 0.66	$/mile	Projected from above using annual growth rate (2.12%)
Value of Travel Time	$ 13.00	hour	http://www.dot.gov/office-policy/transportation-policy/guidance-value-time
	$0.22	minute	
Cost Per Trip			
Walk	$ -		
Personal Bike	$ -		
Bus & Streetcar	$ 2.75	$/trip	King County Metro Peak Zone 1 Fare
Light Rail	$ 2.75	$/trip	King County Metro Peak Zone 1 Fare
Carsharing	$ 12.50	$/trip	Zip Car Seattle Market Rate (mid size sedan, 1hr rental) + 1 hr meter parking $2.00 (Seattle Core Area)
Taxi	$ 8.77	$/trip	Seattle Yellow Cab King County Rates ($2.60 Meter Drop + $2.70/Mile + $0.50 (1 Minute Waiting time))
Personal Car	$ 3.39	$/trip	Vehicle Operating Cost over average trip distance + 1 hr meter parking $2.00 (Seattle Core Area)
Travel Time Savings			
	Average Speed		
Walk	2.73	miles/hr	
Personal Bike	6.84	miles/hr	Cherry, Christopher. "Electric Bike Use in China and Their Impacts on the Environment, Safety, Mobility and Accessibility." April 1, 2007. Accessed May 21, 2015. Pg. 13
E-Bike	9.01	miles/hr	Cherry, Christopher. "Electric Bike Use in China and Their Impacts on the Environment, Safety, Mobility and Accessibility." April 1, 2007. Accessed May 21, 2015. Pg. 13
Bus & Streetcar	12.41	miles/hr	2013 King County Metro Bus, Trollybus, DART, Streetcar (Revenue Miles/Revenue Hours) http://metro.kingcounty.gov/am/reports/annual-measures/service-provided.html Revenue Miles 44695239
Light Rail	25.00	miles/hr	http://seattletransitblog.com/2009/12/30/link-light-rail-in-the-north-american-context/ Revenue Hours 3601705
Carsharing	21.20	miles/hr	Assumption of Typical City Driving Speed
Taxi	21.20	miles/hr	"
Personal Car	21.20	miles/hr	"
	Travel Time for Average Trip		
Walk	46.15	Minutes	=Weighted Average Trip Distance/Speed
Personal Bike	18.43	Minutes	=Weighted Average Trip Distance/Speed
E-Bike	13.98	Minutes	=Weighted Average Trip Distance/Speed
Weighted Average Bikeshare Travel Time	16.21	Minutes	=Personal Bike Travel Time x Personal Bike Trip Share + E-Bike Travel Time x E-Bike Trip Share
Bus & Streetcar	12.15	Minutes	=(Weighted Average Trip Distance/Speed) + 2 min walk and wait time
Light Rail	7.04	Minutes	=(Weighted Average Trip Distance/Speed) + 2 min walk and wait time
Carsharing	7.94	Minutes	=(Weighted Average Trip Distance/Speed) + 2 min to find parking
Taxi	5.94	Minutes	=Weighted Average Trip Distance/Speed
Personal Car	7.94	Minutes	=(Weighted Average Trip Distance/Speed) + 2 min to find parking
Mode Shift			
Hubway (Boston) wouldn't have taken trip	2%		Used for induced demand
Capital Bikeshare (D.C.)			2011 Member Survey, used for mode shift (as it has better mode resolution)
Walk	22%		
Personal Bike	10%		
Bus & Streetcar	15%		
Light Rail	20%		
Carsharing	18%		
Taxi	7%		
Personal Car	8%		
Costs			
Capital Cost			SDOT Assumptions
Stations	250		
E-Bike Share	50%		
Review Hours	4.00		
Build/Install	$ 4,400		
Docks/Station	17		
Bikes/Station	10		
Station Cost	$ 35,000		
E-Bike Cost	$ 3,750		
Total	**18,200,000**		
Bikeshare Ridership Characteristics			
Ratio of Annual Trips to Casual Trips	0.28		Capital Bikeshare
Number of Casual Trips per Annual Trip	3.57		Capital Bikeshare
Demographic Forcasting			
Bikeshare User Growth	1.4%		Assumption based on population and employment growth rate and bikeshare system characteristics

VALUE OF EMISSIONS

Emissions Costs	2013		2014	
Volatile Organic Compunds	$1	$/pound	$1	$/pound
Particulate Matter	$163	$/pound	$153	$/pound
Nitrous Oxides	$4	$/pound	$3	$/pound
Sulfur Dioxide	$20.39	$/pound	$19.80	$/pound
Carbon Dioxide Appreciation	2.5%	%/year	3.0%	%/year

Social Cost of Carbon	Metric Ton	Short Ton	Metric Ton	Short Ton
Year	Value (2013$)	Value (2013$)	Value (2014$)	Value (2014$)
2010	$ 39.00	$ 42.99	$ 39.56	$ 43.61
2011	$ 40.00	$ 44.09	$ 40.57	$ 44.72
2012	$ 41.00	$ 45.19	$ 41.59	$ 45.84
2013	$ 43.00	$ 47.40	$ 43.62	$ 48.08
2014	$ 44.00	$ 48.50	$ 44.63	$ 49.20
2015	$ 45.00	$ 49.60	$ 45.64	$ 50.31
2016	$ 46.00	$ 50.71	$ 46.66	$ 51.43
2017	$ 47.00	$ 51.81	$ 47.67	$ 52.55
2018	$ 49.00	$ 54.01	$ 49.70	$ 54.79
2019	$ 51.00	$ 56.22	$ 51.73	$ 57.02
2020	$ 52.00	$ 57.32	$ 52.74	$ 58.14
2021	$ 52.00	$ 57.32	$ 52.74	$ 58.14
2022	$ 54.00	$ 59.52	$ 54.77	$ 60.38
2023	$ 55.00	$ 60.63	$ 55.79	$ 61.50
2024	$ 56.00	$ 61.73	$ 56.80	$ 62.61
2025	$ 57.00	$ 62.83	$ 57.82	$ 63.73
2026	$ 58.00	$ 63.93	$ 58.83	$ 64.85
2027	$ 60.00	$ 66.14	$ 60.86	$ 67.09
2028	$ 61.00	$ 67.24	$ 61.87	$ 68.20
2029	$ 62.00	$ 68.34	$ 62.89	$ 69.32
2030	$ 63.00	$ 69.45	$ 63.90	$ 70.44
2031	$ 63.00	$ 69.45	$ 63.90	$ 70.44
2032	$ 65.00	$ 71.65	$ 65.93	$ 72.68
2033	$ 66.00	$ 72.75	$ 66.95	$ 73.79
2034	$ 67.00	$ 73.85	$ 67.96	$ 74.91
2035	$ 68.00	$ 74.96	$ 68.97	$ 76.03
2036	$ 69.00	$ 76.06	$ 69.99	$ 77.15
2037	$ 71.00	$ 78.26	$ 72.02	$ 79.38
2038	$ 72.00	$ 79.37	$ 73.03	$ 80.50
2039	$ 73.00	$ 80.47	$ 74.05	$ 81.62
2040	$ 74.00	$ 81.57	$ 75.06	$ 82.74
2041	$ 76.00	$ 83.78	$ 77.09	$ 84.98
2042	$ 77.00	$ 84.88	$ 78.10	$ 86.09
2043	$ 78.00	$ 85.98	$ 79.12	$ 87.21
2044	$ 79.00	$ 87.08	$ 80.13	$ 88.33
2045	$ 80.00	$ 88.18	$ 81.15	$ 89.45
2046	$ 82.00	$ 90.39	$ 83.17	$ 91.68
2047	$ 83.00	$ 91.49	$ 84.19	$ 92.80
2048	$ 84.00	$ 92.59	$ 85.20	$ 93.92
2049	$ 85.00	$ 93.70	$ 86.22	$ 95.04
2050	$ 86.00	$ 94.80	$ 87.23	$ 96.16

USDOT BCA TIGER Resource Guide (2014):

Emission Type	$ / short ton ($2013)	$ / metric ton ($2013)
Carbon dioxide (CO_2)	(varies)*	(varies)*
Volatile Organic Compounds (VOCs)	$1,813	$1,999
Nitrogen oxides (NOx)	$7,147	$7,877
Particulate matter (PM)	$326,935	$360,383
Sulfur dioxide (SOx)	$42,240	$46,561

Cost/Benefit Category	Recommended Monetized Value(s)				Reference and Notes
Social Cost of Carbon (3%)	Year	3% SCC (2013$)	Year	3% SCC (2013$)	*Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (May 2013; revised November 2013), page 18, Table A1 "Annual SCC Values: 2010-2050 (2007$/metric ton CO_2)" http://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf
	2010	39	2031	63	
	2011	40	2032	65	
	2012	41	2033	66	
	2013	43	2034	67	
	2014	44	2035	68	
	2015	45	2036	69	
	2016	46	2037	71	
	2017	47	2038	72	
	2018	49	2039	73	
	2019	51	2040	74	
	2020	52	2041	76	
	2021	52	2042	77	
	2022	54	2043	78	
	2023	55	2044	79	
	2024	56	2045	80	
	2025	57	2046	82	
	2026	58	2047	83	
	2027	60	2048	84	
	2028	61	2049	85	
	2029	62	2050	86	
	2030	63			

NOTE:
- SCC values are per unit metric ton of carbon dioxide and already discounted forward to the reference year (in 2007 nominal dollars). Unlike previous OMB guidance on SCC values, the latest OMB guidance shows the values to the nearest dollar only. The Resource Guide converted this to 2013 dollars and also shows the value to the nearest dollar.
- See **Part II, Section 1 ("Clarification on the Social Cost of Carbon (SCC) Guidance and the Annual SCC Values")**, for methodology of how to use 3% SCC values in TIGER BCA.

Transposed Values:

| Social Cost of Carbon - Short Ton (2014$) | | | |

Bike Share Expansion Benefits and Costs Summary

Benefits and Costs - Present Value in 2015, Discounted at 3% Real Rate

Calendar Year	Initial Project Costs	Operations and Maintenance	Benefits	Net Annual Benefits	Cumulative Benefits
2016	$ 7,716,436			$ (7,716,436)	$ (7,716,436)
2017	$ 6,543,229	$ 5,136,676	$ 7,463,468	$ (4,216,437)	$ (11,932,873)
2018		$ 4,987,064	$ 16,195,539	$ 11,208,475	$ (724,398)
2019		$ 4,841,810	$ 17,963,363	$ 13,121,553	$ 12,397,155
2020		$ 4,700,787	$ 17,684,975	$ 12,984,189	$ 25,381,344
2021		$ 4,563,870	$ 17,410,580	$ 12,846,709	$ 38,228,053
2022		$ 4,430,942	$ 17,140,441	$ 12,709,499	$ 50,937,553
2023		$ 4,301,886	$ 16,874,494	$ 12,572,609	$ 63,510,161
2024		$ 4,176,588	$ 16,612,674	$ 12,436,086	$ 75,946,247
2025		$ 4,054,940	$ 16,355,218	$ 12,300,278	$ 88,246,525
2026		$ 3,936,835	$ 16,101,454	$ 12,164,620	$ 100,411,145
2027		$ 3,822,170	$ 15,851,628	$ 12,029,458	$ 112,440,603
2028		$ 3,710,844	$ 15,605,678	$ 11,894,834	$ 124,335,437
2029		$ 3,602,761	$ 15,363,260	$ 11,760,498	$ 136,095,935
2030		$ 3,497,827	$ 15,125,167	$ 11,627,340	$ 147,723,275
2031		$ 3,395,948	$ 14,890,488	$ 11,494,540	$ 159,217,815
2032		$ 3,297,037	$ 14,659,451	$ 11,362,414	$ 170,580,229
2033		$ 3,201,007	$ 14,431,998	$ 11,230,991	$ 181,811,221
2034		$ 3,107,774	$ 14,208,075	$ 11,100,301	$ 192,911,522
2035		$ 3,017,256	$ 13,987,885	$ 10,970,629	$ 203,882,150
2036		$ 2,929,375	$ 13,770,852	$ 10,841,477	$ 214,723,627
				Net Present Value:	$ 214,723,627

	Improved Health Benefits		Travel Time Savings		Household Travel Savings	
Calendar Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2016						
2017	$ 5,171,775	$ 5,171,775	$ 157,574	$ 157,574	$ 1,906,775	$ 1,906,775
2018	$ 11,297,567	$ 11,297,567	$ 336,757	$ 336,757	$ 4,075,038	$ 4,075,038
2019	$ 12,752,657	$ 12,752,657	$ 358,259	$ 358,259	$ 4,335,228	$ 4,335,228
2020	$ 12,554,558	$ 12,554,558	$ 352,694	$ 352,694	$ 4,267,884	$ 4,267,884
2021	$ 12,359,535	$ 12,359,535	$ 347,215	$ 347,215	$ 4,201,587	$ 4,201,587
2022	$ 12,167,543	$ 12,167,543	$ 341,822	$ 341,822	$ 4,136,320	$ 4,136,320
2023	$ 11,978,532	$ 11,978,532	$ 336,512	$ 336,512	$ 4,072,066	$ 4,072,066
2024	$ 11,792,458	$ 11,792,458	$ 331,285	$ 331,285	$ 4,008,811	$ 4,008,811
2025	$ 11,609,274	$ 11,609,274	$ 326,138	$ 326,138	$ 3,946,538	$ 3,946,538
2026	$ 11,428,936	$ 11,428,936	$ 321,072	$ 321,072	$ 3,885,232	$ 3,885,232
2027	$ 11,251,399	$ 11,251,399	$ 316,085	$ 316,085	$ 3,824,879	$ 3,824,879
2028	$ 11,076,620	$ 11,076,620	$ 311,175	$ 311,175	$ 3,765,464	$ 3,765,464
2029	$ 10,904,556	$ 10,904,556	$ 306,341	$ 306,341	$ 3,706,971	$ 3,706,971
2030	$ 10,735,165	$ 10,735,165	$ 301,582	$ 301,582	$ 3,649,387	$ 3,649,387
2031	$ 10,568,405	$ 10,568,405	$ 296,897	$ 296,897	$ 3,592,698	$ 3,592,698
2032	$ 10,404,236	$ 10,404,236	$ 292,285	$ 292,285	$ 3,536,889	$ 3,536,889
2033	$ 10,242,616	$ 10,242,616	$ 287,745	$ 287,745	$ 3,481,947	$ 3,481,947
2034	$ 10,083,508	$ 10,083,508	$ 283,275	$ 283,275	$ 3,427,858	$ 3,427,858
2035	$ 9,926,871	$ 9,926,871	$ 278,875	$ 278,875	$ 3,374,610	$ 3,374,610
2036	$ 9,772,667	$ 9,772,667	$ 274,543	$ 274,543	$ 3,322,189	$ 3,322,189
Total 2015 Present Value	$ 218,078,879	$ 218,078,879	$ 6,158,131	$ 6,158,131	$ 74,518,370	$ 74,518,370

	Reduced Emissions		Reduced Traffic Congestion Costs		Reduction in Accidents Savings		Reduction in Road Maintenance Costs	
Calendar Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2016								
2017	$ 11,909	$ 11,035	$ 40,836	$ 37,840	$ 118,972	$ 110,243	$ 55,627	$ 51,546
2018	$ 25,763	$ 22,981	$ 87,272	$ 77,846	$ 254,258	$ 226,796	$ 118,883	$ 106,042
2019	$ 27,408	$ 23,534	$ 92,845	$ 79,721	$ 270,493	$ 232,257	$ 126,474	$ 108,596
2020	$ 27,637	$ 22,843	$ 91,403	$ 75,548	$ 266,291	$ 220,102	$ 124,509	$ 102,912
2021	$ 27,530	$ 21,904	$ 89,983	$ 71,594	$ 262,154	$ 208,582	$ 122,575	$ 97,526
2022	$ 27,420	$ 21,001	$ 88,585	$ 67,847	$ 258,082	$ 197,666	$ 120,671	$ 92,422
2023	$ 27,306	$ 20,132	$ 87,209	$ 64,297	$ 254,073	$ 187,321	$ 118,796	$ 87,585
2024	$ 27,189	$ 19,297	$ 85,854	$ 60,932	$ 250,126	$ 177,517	$ 116,951	$ 83,001
2025	$ 27,372	$ 18,700	$ 84,520	$ 57,743	$ 246,241	$ 168,226	$ 115,134	$ 78,657
2026	$ 27,245	$ 17,917	$ 83,208	$ 54,721	$ 242,416	$ 159,422	$ 113,346	$ 74,541
2027	$ 27,115	$ 17,165	$ 81,915	$ 51,857	$ 238,650	$ 151,078	$ 111,585	$ 70,639
2028	$ 26,983	$ 16,443	$ 80,642	$ 49,143	$ 234,943	$ 143,172	$ 109,852	$ 66,942
2029	$ 26,564	$ 15,582	$ 79,390	$ 46,571	$ 231,293	$ 135,678	$ 108,145	$ 63,439
2030	$ 26,711	$ 15,083	$ 78,157	$ 44,133	$ 227,700	$ 128,578	$ 106,465	$ 60,119
2031	$ 26,571	$ 14,443	$ 76,942	$ 41,824	$ 224,163	$ 121,848	$ 104,811	$ 56,972
2032	$ 26,430	$ 13,829	$ 75,747	$ 39,635	$ 220,681	$ 115,471	$ 103,183	$ 53,991
2033	$ 26,286	$ 13,240	$ 74,571	$ 37,560	$ 217,253	$ 109,428	$ 101,580	$ 51,165
2034	$ 26,141	$ 12,675	$ 73,412	$ 35,595	$ 213,878	$ 103,701	$ 100,002	$ 48,487
2035	$ 26,252	$ 12,253	$ 72,272	$ 33,732	$ 210,556	$ 98,273	$ 98,449	$ 45,949
2036	$ 26,099	$ 11,726	$ 71,149	$ 31,966	$ 207,285	$ 93,130	$ 96,920	$ 43,545
Total 2015 Present Value	**$ 521,933**	**$ 341,785**	**$ 1,595,912**	**$ 1,060,103**	**$ 4,649,506**	**$ 3,088,490**	**$ 2,173,958**	**$ 1,444,078**

Bikeshare Expansion Ridership Projections

Constants		
Casual trips : Member trips	0.28	
Casual trips/user/month	2.2	based on CaBi data
Member trips/user/month	7	based on CaBi data
Casual fee	$ 6	
Membership fee	$ 85	

Description of the Regressions

Regression	Variables	NYC?	Dependent	Variable 1	Variable 2	Variable 3	Adjusted R Square
R_01	1	Y	trips/month	jobs in the SA			0.9779
R_02	2	N	trips/month	jobs in the SA	pop of SA		0.9516
R_03	3	N	trips/month	jobs in the SA	pop of SA	# stations	0.9356
R_04	1	N	trips/month	pop of SA			0.9606

Summary

	R_01	R_02	R_03	R_04
Total trips/month	67,851	97,276	100,502	99,690
Total trips/year	814,209	1,167,312	1,206,026	1,196,282
Casual trips/month	14,842	21,279	21,985	21,807
Member trips/month	53,008	75,997	78,517	77,883
Casual passes/month	6,747	9,672	9,993	9,912
Annual members	7,573	10,857	11,217	11,126
Casual passes/year	80,958	116,068	119,917	118,949
Revenue	$ 1,129,423	$ 1,619,226	$ 1,672,929	$ 1,659,413
Daily trips/bike	0.90	1.30	1.34	1.33

Regression 03 was selected to estimate ridership for the BCA since it offered more conceptual significance over the uni- and bi-variate models tested, and also provided a strong statistical fit with Adjusted R^2 = 0.9356

Bikeshare Peer City Comparison

	city	service area (sqmi)	# stations	station density	population	jobs	# docks	docks/station	# bikes	# annual members	annual pass time period	# 24-hr passes sold	24-hr pass time period	# other passes	other pass time period	total trips	Months of operation	daily trips per bike	total trip time period	casual:annual trips	avg trip length (mi)	avg trip duration (min)	revenue	mode shift
Similar	Minneapolis	21.8 A	169 A	7.7 A	339,299 A	314,621 A	3,045 C	18.0 C	1,525 C	3,217 C		80,453 C		12,020 C	30 day C	408,485 C	8 C	1.3 C	2014 C		2.66 C	21.38 C	$ 1,104,067 I	
	Washington DC	38.3 A	339 A	8.9 A	812,453 A	784,451 A	5,504 C	16.2 C	241 G	27,476 G	2014 G	184,869 G	2014 G			2,947,287 G	12 C	4.9 G	2014 G	0.28 G		17.4 G	$ 4,181,398 G	
	Boston	17.0 A	141 A	8.3 A	499,041 A	639,410 A	2,394 C	17.0 C	1,168 C	13,302 H	2014 H	88,779 H	2014 H			1,167,565 C, April-Dec 2014	9 C	2.6 C	2014 C	0.28 H	1.38 C	25.9 H	$ 1,665,231 H	
	Denver	9.9 A	86 A	8.7 A	148,663 A	188,196 A	1,310 D	15.2 D	719 D	3,980 E	2014 E	69,382 E	2014 E	450/ 30 day 500/ 7 day E		377,229 C	12 C	1.5 C	2014 C		2.1 D	Casual: 49 min Annual: 15 min D	$ 1,073,924 D	42% replaced car trips 29% link w/transit E
Bigger	New York City	13.9 A	332 A	23.8 A	865,563 A	2,107,340 A			5,178 F	95,533 F	014, 12 months	292,909 F	2014 F			8,791,987 F	12 C	4.7 F	2014 F	0.11 F	1.59 F			
	Chicago	31.8 A	300 A	9.4 A	755,697 A	794,004 A	5,252 C	17.5 C	3,000 C	23,229 C		401,543 C				2,448,318 C	12 C	2.2 C	2014 C	0.5 C	2.05 C	14.71 C	$ 4,900,000 J	
	Toronto	5.8 A	79 A	13.6 A	222,295 A	442,000 B	1,506 C	19.1 C	1,000 C	4,346 C		28,754 C				587,658 C	12 C	2.1 C	2013 C	0.22 C			$ 860,000 K	
Smaller	Columbus	3.3 A	30 A	9.0 A	26,105 A	86,786 A	446 C	14.9 C	225 C	684 C		14,157 C				44,898 C	12 C	0.6 C	2014 C		2.63 C	34.46 C	$ 552,365 L	
	Chattanooga	2.4 A	33 A	13.9 A	18,187 A	31,233 A																		
	Seattle	40.7	250	6.1	392,625	365,057	4325	17.3	2500															

Source

A Sam Schwartz Engineering GIS analysis of peer cities
B Toronto Employment Survey, 2011, Table 4, http://www1.toronto.ca/city_of_toronto/city_planning/sipa/files/pdf/survey2011.pdf
C North American Bike Share Association, International Bike-Share Database, 2015. Data is self-reported.
D Denver B-cycle
E Denver B-cycle Annual Report, 2014
F Citi Bike Monthly Reports, 2014
G Capital Bikeshare
H Hubway
I Nice Ride MN
J Divvy
K Bike Share Toronto
L CoGo Bike Share

Bikeshare Peer City GIS Analysis

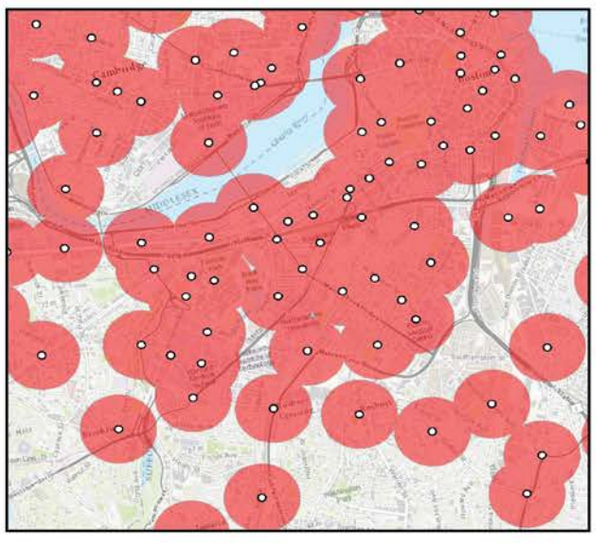
city	peer	service area (sqmi)	# stations	station density	population*	jobs**
Minneapolis	similar	21.8	169	7.7	339,299	314,621
Washington, DC	similar	38.3	339	8.9	812,453	784,451
Boston	similar	17.0	141	8.3	499,041	639,410
Denver	similar	9.9	86	8.7	148,663	188,196
New York City	bigger	13.9	332	23.8	865,563	2,107,340
Chicago	bigger	31.8	300	9.4	755,697	794,004
Toronto***	bigger	5.8	79	13.6	222,295	442,000
Columbus	smaller	3.3	30	9.0	26,105	86,786
Chattanooga	smaller	2.4	33	13.9	18,187	31,233

* Population is based on 2013 ACS 5-year data, block groups that are within (-100) feet of the 1/4-mile service area

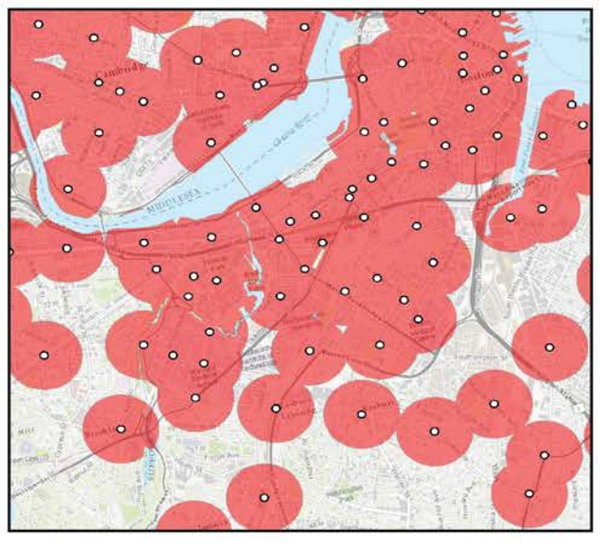
** Employment data is from On The Map, except for Boston, which is from CTTP and is based on census tract level data

*** Toronto population is from Statistics Canada, 2011 National Household Survey. Employment is from Toronto Employment Survey, 2011, Table 4, http://www1.toronto.ca/city_of_toronto/city_planning/sipa/files/pdf/survey2011.pdf

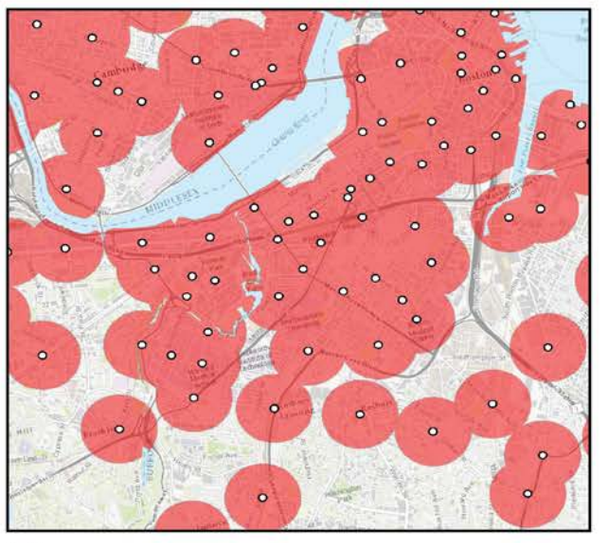
The bikeshare service area is defined as the land area that is within a quarter-mile from each peripheral station in the system. The service area does not need to be contiguous.



(1) buffer each station 1/4-mile



(2) remove waterways



(3) remove gaps

Bikeshare Peer City Service Area and Operating Characteristics

Peer City	city	# bikes	# stations	# docks	service area (sqmi)	station density	Population of Service Area	SA population density	Jobs in Service Area	SA job density	docks/station	# annual members	# 24-hr passes sold	annual trips	months of operation	trips/month	daily trips per bike	casual:annual trips	avg trip length (mi)	avg trip duration (min)	revenue	casual trips	annual trips
Similar	Minneapolis	1,525	169	3,045	21.8	7.7	339,299	15,546	314,621	14,416	18.0	3,217	80,453	408,485	8	51,061	1.3		2.7	21.4	$ 1,104,067		
Similar	Washington DC	241	339	5,504	38.3	8.9	812,453	21,235	784,451	20,503	16.2	27,476	184,869	2,947,287	12	245,607	4.9	0.28		17.4	$ 4,181,398	2,302,568	644,719
Similar	Boston	1,168	141	2,394	17.0	8.3	499,041	29,336	639,410	37,588	17.0	13,302	88,779	1,167,565	9	129,729	2.58	0.28	1.4	25.9	$ 1,665,231	912,160	255,405
Similar	Denver	719	86	1,310	9.9	8.7	148,663	14,960	188,196	18,939	15.2	3,980	69,382	377,229	12	31,436	1.5		2.1	Casual: 49 min Annual: 15 min	$ 1,073,924		
Larger	Chicago	3,000	300	5,252	31.8	9.4	755,697	23,749	794,004	24,953	17.5	23,229	401,543	2,448,318	12	204,027	2.24	0.5	2.1	14.7	$ 4,900,000	1,632,212	816,106
Larger	Toronto	1,000	79	1,506	5.8	13.6	222,295	38,327	442,000	76,207	19.1	4,346	28,754	587,658	12	48,972	2.1	0.22			$ 860,000	481,687	105,971
Smaller	Columbus	225	30	446	3.3	9.0	26,105	7,821	86,786	26,000	14.9	684	14,157	44,898	12	3,742	0.56		2.6	34.5	$ 552,365		
Larger	New York City	5,178	332		13.9	23.8	865,563	62,168	2,107,340	151,357		95,533	292,909	8,791,987	12	732,666	4.7	0.11	1.6			7,920,709	871,278
	Seattle	2,500	250	4,325	40.7	6.1	392,625	9,647	365,057	8,969	17.3	11,217	119,917	1,206,026	12	100,502	1.34	0.28	2.1	22		263,818	942,208

calculated | average of similar cities

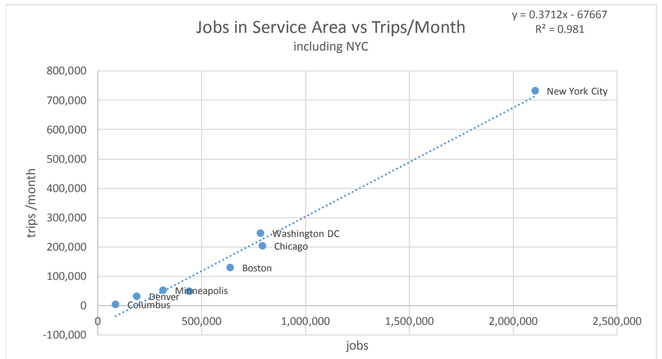
avg of DC, Boston | average of all peer cities | avg Minn, DC, Boston

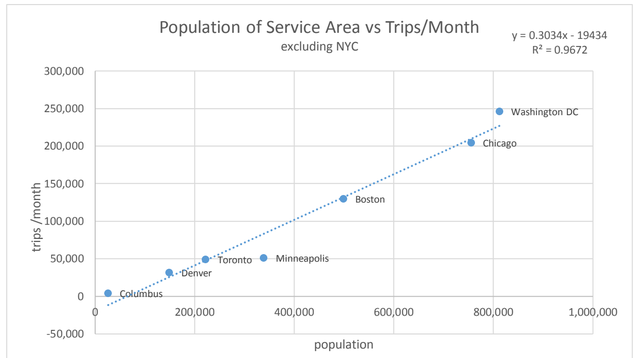
Bikeshare Peer City Service Area and Operating Characteristics

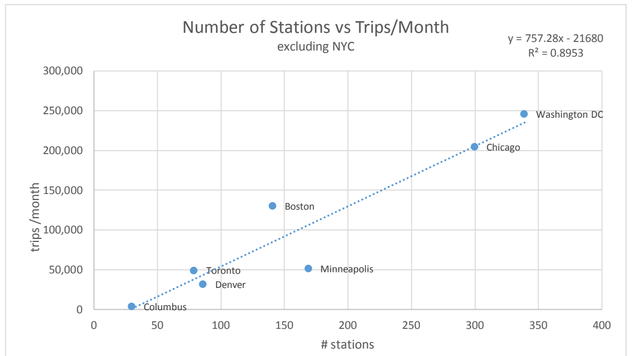
	Dependent			Independent							
City	trips/month	trips/bike	revenue	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/ station
Minneapolis	51,061	1.3	$ 1,104,067	1,525	7.7	169	339,299	314,621	15,546	14,416	18
Washington DC	245,607	4.9	$ 4,181,398	241	8.9	339	812,453	784,451	21,235	20,503	16
Boston	129,729	2.58	$ 1,665,231	1,168	8.3	141	499,041	639,410	29,336	37,588	17
Denver	31,436	1.5	$ 1,073,924	719	8.7	86	148,663	188,196	14,960	18,939	15
Chicago	204,027	2.24	$ 4,900,000	3,000	9.4	300	755,697	794,004	23,749	24,953	18
Toronto	48,972	2.1	$ 860,000	1,000	13.6	79	222,295	442,000	38,327	76,207	19
Columbus	3,742	0.56	$ 552,365	225	9.0	30	26,105	86,786	7,821	26,000	15
New York City	732,666	4.7		5,178	23.8	332	865,563	2,107,340	62,168	151,357	

All Cities - R Square								
Dependent	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/ station
trips/month	0.73	0.74	0.56	0.61	0.98	0.70	0.67	0.02
trips/bike	0.19	0.30	0.70	0.75	0.63	0.43	0.27	0.01
revenue	0.25	0.02	0.88	0.86	0.74	0.02	0.08	0.01

Excluding NYC - R Square								
Dependent	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/ station
trips/month	0.10	0.02	0.90	0.97	0.90	0.08	0.03	0.02
trips/bike	0.01	0.00	0.60	0.66	0.65	0.16	0.00	0.01
revenue	0.25	0.02	0.88	0.86	0.74	0.02	0.08	0.01







Bikeshare Ridership Regression Model 1

	Dependent			Independent							
City	trips/ month	trips/ bike	revenue	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/station
Minneapolis	51,061	1.3	$ 1,104,067	1,525	7.7	169	339,299	314,621	15,546	14,416	18
Washington DC	245,607	4.9	$ 4,181,398	241	8.9	339	812,453	784,451	21,235	20,503	16
Boston	129,729	2.58	$ 1,665,231	1,168	8.3	141	499,041	639,410	29,336	37,588	17
Denver	31,436	1.5	$ 1,073,924	719	8.7	86	148,663	188,196	14,960	18,939	15
Chicago	204,027	2.24	$ 4,900,000	3,000	9.4	300	755,697	794,004	23,749	24,953	18
Toronto	48,972	2.1	$ 860,000	1,000	13.6	79	222,295	442,000	38,327	76,207	19
Columbus	3,742	0.56	$ 552,365	225	9.0	30	26,105	86,786	7,821	26,000	15
New York City	732,666	4.7		5,178	23.8	332	865,563	2,107,340	62,168	151,357	
Seattle	67,851			2,500	6.1	250	392,625	365,057	9,647	8,969	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.990465469
R Square	0.981021845
Adjusted R Square	0.977858819
Standard Error	35559.72917
Observations	8

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3.92187E+11	3.92187E+11	310.1529665	2.15143E-06
Residual	6	7586966033	1264494339		
Total	7	3.99774E+11			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-67667.12891	18901.84071	-3.579922715	0.011644183	-113918.2669	-21415.9909	-113918.2669	-21415.99087
Jobs in Service Area	0.371223905	0.021078901	17.61116028	2.15143E-06	0.319645692	0.422802118	0.319645692	0.422802118

RESIDUAL OUTPUT

Observation	*Predicted trips/ month*	*Residuals*	*Standard Residuals*
1	49127.70731	1932.917695	0.058712194
2	223539.8346	22067.41542	0.670295681
3	169697.1482	-39967.70374	-1.214015265
4	2195.725118	29240.02488	0.888163023
5	227086.1365	-23059.63655	-0.700434305
6	96413.8371	-47442.3371	-1.441056555
7	-35450.09109	39191.59109	1.190440916
8	714627.855	18037.72831	0.547894311

Bikeshare Ridership Regression Model 2

	Dependent			Independent							
City	trips/ month	trips/ bike	revenue	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/station
Minneapolis	51,061	1.3	$ 1,104,067	1,525	7.7	169	339,299	314,621	15,546	14,416	18
Washington DC	245,607	4.9	$ 4,181,398	241	8.9	339	812,453	784,451	21,235	20,503	16
Boston	129,729	2.58	$ 1,665,231	1,168	8.3	141	499,041	639,410	29,336	37,588	17
Denver	31,436	1.5	$ 1,073,924	719	8.7	86	148,663	188,196	14,960	18,939	15
Chicago	204,027	2.24	$ 4,900,000	3,000	9.4	300	755,697	794,004	23,749	24,953	18
Toronto	48,972	2.1	$ 860,000	1,000	13.6	79	222,295	442,000	38,327	76,207	19
Columbus	3,742	0.56	$ 552,365	225	9.0	30	26,105	86,786	7,821	26,000	15
Seattle	97,276			2,500	6.1	250	392,625	365,057	9,647	8,969	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.983727381
R Square	0.96771956
Adjusted R Square	0.95157934
Standard Error	20454.15256
Observations	7

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	50168722721	25084361360	59.9570238	0.001042027
Residual	4	1673489428	418372356.9		
Total	6	51842212148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-22153.79446	17015.54537	-1.301973811	0.262838898	-69396.52211	25088.9332	-69396.52211	25088.9332
Population of Service Area	0.279798946	0.093771611	2.983834246	0.040584668	0.019447214	0.540150677	0.019447214	0.540150677
Jobs in Service Area	0.026225203	0.099525697	0.263501824	0.805181195	-0.250102432	0.302552837	-0.250102432	0.302552837

RESIDUAL OUTPUT

Observation	*Predicted trips/ month*	*Residuals*	*Standard Residuals*
1	81032.70752	-29972.08252	-1.794655352
2	225742.0849	19865.16514	1.189477738
3	134246.0081	-4516.563634	-0.270440837
4	24377.43446	7058.31554	0.422634755
5	210112.3453	-6085.845267	-0.364405602
6	51635.65179	-2664.151789	-0.159522925
7	-12573.66253	16315.16253	0.976912223

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.983458425
R Square	0.967190473
Adjusted R Square	0.950785709
Standard Error	20895.81671
Observations	7

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	51486186994	25743093497	58.95790377	0.001076465
Residual	4	1746540623	436635155.8		
Total	6	53232727618			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-24901.44911	17382.96007	-1.432520641	0.225270526	-73164.28351	23361.3853	-73164.28351	23361.3853
Population of Service Area	0.24763296	0.095796411	2.584992043	0.06100521	-0.018340516	0.513606437	-0.018340516	0.513606437
Jobs in Service Area	0.06584963	0.101674744	0.647649822	0.552507552	-0.216444715	0.348143975	-0.216444715	0.348143975

RESIDUAL OUTPUT

Observation	*Predicted trips/ month*	*Residuals*	*Standard Residuals*
1	79837.84308	-28777.21808	-1.686689291
2	227944.5004	17662.74964	1.035248458
3	140782.4629	8292.662143	0.486049221
4	24305.04661	7130.70339	0.417944535
5	214518.9056	-10492.40559	-0.614980506
6	59251.6562	-10280.1562	-0.602540153
7	-12722.1647	16463.6647	0.964967734

Bikeshare Ridership Regression Model 3

	Dependent			Independent							
City	trips/ month	trips/ bike	revenue	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/station
Minneapolis	51,061	1.3	$ 1,104,067	1,525	7.7	169	339,299	314,621	15,546	14,416	18
Washington DC	245,607	4.9	$ 4,181,398	241	8.9	339	812,453	784,451	21,235	20,503	16
Boston	129,729	2.58	$ 1,665,231	1,168	8.3	141	499,041	639,410	29,336	37,588	17
Denver	31,436	1.5	$ 1,073,924	719	8.7	86	148,663	188,196	14,960	18,939	15
Chicago	204,027	2.24	$ 4,900,000	3,000	9.4	300	755,697	794,004	23,749	24,953	18
Toronto	48,972	2.1	$ 860,000	1,000	13.6	79	222,295	442,000	38,327	76,207	19
Columbus	3,742	0.56	$ 552,365	225	9.0	30	26,105	86,786	7,821	26,000	15
Seattle	100,502			2,500	6.1	250	392,625	365,057	9,647	8,969	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.983774198
R Square	0.967811672
Adjusted R Square	0.935623345
Standard Error	23584.69919
Observations	7

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	50173498040	16724499347	30.06716237	0.009708624
Residual	3	1668714108	556238036		
Total	6	51842212148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-24469.07243	31770.09817	-0.770191905	0.497278195	-125575.704	76637.55912	-125575.704	76637.55912
# stations	51.6686446	557.6429103	0.092655432	0.932018119	-1722.999975	1826.337264	-1722.999975	1826.337264
Population of Service Area	0.246889474	0.371274045	0.664979084	0.553615992	-0.934670238	1.428449185	-0.934670238	1.428449185
Jobs in Service Area	0.041415832	0.200120613	0.206954355	0.849296397	-0.595457272	0.678288936	-0.595457272	0.678288936

RESIDUAL OUTPUT

Observation	*Predicted trips/ month*	*Residuals*	*Standard Residuals*
1	81062.5707	-30001.9457	-1.799012069
2	226121.3829	19485.86709	1.168434556
3	132505.8737	-2776.429298	-0.16648353
4	24472.05485	6963.695155	0.417565306
5	210489.4922	-6462.99223	-0.387541566
6	52800.84397	-3829.343975	-0.229619642
7	-12879.64895	16621.14895	0.996656946

Bikeshare Ridership Regression Model 4

	Dependent			Independent							
City	trips/ month	trips/ bike	revenue	# bikes	station density	# stations	Population of Service Area	Jobs in Service Area	SA population density	SA job density	docks/station
Minneapolis	51,061	1.3	$ 1,104,067	1,525	7.7	169	339,299	314,621	15,546	14,416	18
Washington DC	245,607	4.9	$ 4,181,398	241	8.9	339	812,453	784,451	21,235	20,503	16
Boston	129,729	2.58	$ 1,665,231	1,168	8.3	141	499,041	639,410	29,336	37,588	17
Denver	31,436	1.5	$ 1,073,924	719	8.7	86	148,663	188,196	14,960	18,939	15
Chicago	204,027	2.24	$ 4,900,000	3,000	9.4	300	755,697	794,004	23,749	24,953	18
Toronto	48,972	2.1	$ 860,000	1,000	13.6	79	222,295	442,000	38,327	76,207	19
Columbus	3,742	0.56	$ 552,365	225	9.0	30	26,105	86,786	7,821	26,000	15
Seattle	99,690			2,500	6.1	250	392,625	365,057	9,647	8,969	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.983442538
R Square	0.967159226
Adjusted R Square	0.960591071
Standard Error	18452.84999
Observations	7

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	50139673784	50139673784	147.249762	6.71545E-05
Residual	5	1702538364	340507672.8		
Total	6	51842212148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-19433.83055	12203.39606	-1.592493636	0.172151797	-50803.65879	11935.99768	-50803.65879	11935.99768
Population of Service Area	0.303404067	0.025003114	12.13465129	6.71545E-05	0.239131517	0.367676618	0.239131517	0.367676618

RESIDUAL OUTPUT

Observation	*Predicted trips/ month*	*Residuals*	*Standard Residuals*
1	83510.8661	-32450.2411	-1.926393924
2	227067.7142	18539.5358	1.100591179
3	131977.2386	-2247.794192	-0.133439288
4	25671.12832	5764.621684	0.342214166
5	209847.713	-5821.212954	-0.345573681
6	48011.3766	960.123395	0.056997292
7	-11513.46737	15254.96737	0.905604256

	Bike Area (3 miles)		Walk Area (.5mile)	
	West	East	West	East

Fill in the green boxes on this sheet using data from the American Community Survey.Light green boxes can be updated, or leave them as is if you don't have local data.
http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

We recommend using 5-year estimates (larger sample size), but if your region has changed significantly in the past 5 years, you can try other data sets.

Whatever data you use, make sure you're pulling the same data set for each topic!

Data source: 2008-2012 American Community Survey 5-year estimates

Demographics

Under "Geographics" select your area - usually "Place" or "Principal City"

Under "Topics" select "People" then "Basic Count/Estimate" then "Population Total"

Select Table B01003 Total Population

	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Source
Total population	126,595		104,519	100.00%	10,259		4,133	100.00%	Universe: TOTAL POPULATION: Total

Mode Split

	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Source
Employed population	75,669	59.77%	58,056	55.55%	5,819	56.72%	2,273	55.00%	Universe: WORKERS 16 YEARS AND OVER: Total
All drive to work	50,500	66.74%	35,488	61.13%	4,145	71.23%	1,573	69.20%	Universe: WORKERS 16 YEARS AND OVER: Car, truck, or van
Drive alone	42,751	56.50%	30,441	52.43%	3,529	60.65%	1,405	61.81%	Universe: WORKERS 16 YEARS AND OVER: Car, truck, or van; Drove alone
Carpool (all)*	7,749	10.24%	5,047	8.69%	616	10.59%	168	7.39%	Universe: WORKERS 16 YEARS AND OVER: Car, truck, or van; Carpooled
Public transit	12,894	17.04%	11,642	20.05%	1,020	17.53%	415	18.26%	Universe: WORKERS 16 YEARS AND OVER: Public transportation (excluding taxicab); Bus or trolley bus
Bicycle	3,082	4.07%	2,488	4.29%	200	3.44%	76	3.34%	Universe: WORKERS 16 YEARS AND OVER: Bicycle
Walk	2,949	3.90%	4,319	7.44%	122	2.10%	62	2.73%	Universe: WORKERS 16 YEARS AND OVER: Walked
Commute/utilitarian drive alone trip replacement multiplier		61.78%				67.35%			

	Bicycling	Walking	Bicycling	Walking	Bicycling	Walking	Bicycling	Walking	Source
Student mode split	1.00%	13.35%	1.00%	13.35%	1.00%	13.35%	1.00%	13.35%	NHTSA 2009
College mode split	1.67%	6.82%	1.67%	6.82%	1.67%	6.82%	1.67%	6.82%	NHTSA 2009
Access to transit mode split	5.70%	35.00%	5.70%	35.00%	5.70%	35.00%	5.70%	35.00%	TCRP Report 153 Guidelines for Providing Access to Public Transportation Stations (2012)

School Enrollment

Urban Village with Parking

	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Source
Population	126,595	100.00%	104,519	100.00%	10,259	100.00%	4,133	100.00%	
Grades K-12		0.00%		0.00%		0.00%		0.00%	Universe: POPULATION 3 YEARS AND OVER: Enrolled in school; Enrolled in grade K-12
College/university	12,000	9.48%	23,258	22.25%	1,561	15.22%	604	14.61%	Universe: POPULATION 3 YEARS AND OVER: Enrolled in school; Enrolled in college
Graduate school		0.00%		0.00%		0.00%		0.00%	Universe: POPULATION 3 YEARS AND OVER: Enrolled in school; Graduate or professional school
Total enrollment K-12	0	0.00%	0	0.00%	0	0.00%	0	0.00%	
Total college/graduate	12,000	9.48%	23,258	22.25%	1,561	15.22%	604	14.61%	

Future Estimates

Future date: 2040

	Population	Employment	Source
Population in 2010	256,392	122,100	
Population in 2040	323,504	205,171	PSRC Future population and employment projections, forecast year 2040. 938 zone TAZ Boundary system
Annual Change	0.78%	1.75%	

29 square miles

Commute Modeshare

	West		East		West		East		
	Mode Share	Annual Growth	Mode Share	Annual Growth	Mode Share	Annual Growth	Mode Share	Annual Growth	Source
Future Walking/Biking Mode Share	10.00%	3.51%	10.00%	3.31%	4.00%	2.52%	4.00%	1.48%	Provided by the client
Future Bike-to-Transit Mode Share	5.70%	0.00%	5.70%	0.00%	35.00%	0.00%	35.00%	0.00%	Assumes shift to walking & biking, keeping other modes even

Cost/Benefits Information

	Value	Source
Project Cost	$36,300,000	Provided by City of Seattle
Grant Ask	$15,000,000	Provided by City of Seattle
No vigorous/moderate physical activity (adults)	19%	State Indicator Report on Physical Activity, 2010 Behavioral Indicators for the State of Washington
Annual Investment in Bike/Ped		
Discount Rate	3%	

Trip Distribution

	West		East		
	Bicycling	Walking	Bicycling	Walking	Description
Project New Mode Bike/Ped Trips					
Bicycling trips	2.00%	1.00%	2.00%	1.00%	trips. Assumes major employers and
Bike-to-transit trips	1.50%	5.00%	1.00%	3.00%	northernmost transit center in Seattle.
College bicycle trips	0.00%	5.00%	30.00%	30.00%	Connects several proximate colleges.
Daily utilitarian trips	2.00%	1.00%	2.00%	1.00%	Held constant with commute trip ratio.

Northgate Bridge Construction Benefits and Costs Summary

Benefits and Costs - Present Value in 2015, Discounted at 3% Real Rate

Calendar Year	Initial Project Costs	Remaining Life Net Benefits at End of Analysis Period (3)	Operations and Maintenance Costs (1)	Benefits (2)	Net Annual Benefits	Cumulative Benefits
2016	$11,747,573		$0	$0	$0	$0
2017	$11,405,411		$0	$0	$0	$0
2018	$11,073,214		$0	$0	$0	$0
2019	$0		$25,766	$1,250,538	$1,224,772	-$33,001,425
2020	$0		$25,016	$1,280,197	$1,255,181	-$31,746,244
2021	$0		$24,287	$1,310,632	$1,286,345	-$30,459,899
2022	$0		$23,580	$1,342,498	$1,318,918	-$29,140,981
2023	$0		$22,893	$1,375,078	$1,352,185	-$27,788,796
2024	$0		$22,226	$1,408,749	$1,386,523	-$26,402,272
2025	$0		$21,579	$1,443,402	$1,421,823	-$24,980,449
2026	$0		$20,950	$1,479,164	$1,458,214	-$23,522,235
2027	$0		$20,340	$1,516,347	$1,496,007	-$22,026,228
2028	$0		$19,748	$1,554,470	$1,534,722	-$20,491,506
2029	$0		$19,172	$1,593,659	$1,574,486	-$18,917,020
2030	$0		$18,614	$1,634,178	$1,615,564	-$17,301,455
2031	$0		$18,072	$1,675,530	$1,657,459	-$15,643,997
2032	$0		$17,545	$1,719,001	$1,701,456	-$13,942,541
2033	$0		$17,034	$1,763,423	$1,746,389	-$12,196,152
2034	$0		$16,538	$1,809,257	$1,792,719	-$10,403,433
2035	$0		$16,057	$1,856,551	$1,840,495	-$8,562,939
2036	$0		$15,589	$1,905,232	$1,889,643	-$6,673,295
2037	$0		$15,135	$1,955,901	$1,940,766	-$4,732,529
2038	$0	$53,363,363	$14,694	$2,007,766	$55,356,435	$50,623,906
					Net Present Value:	**$50,623,906**

Notes:

(1) Estimated annual maintenance cost of $29,000. This maintenance level will preserve the full value and functionality of the facilities for 75 years.
(2) Includes all associated benefits of the project, including: air quality and carbon benefits of reduced vehicle emissions; reduced costs of traffic congestion, crashes and road maintenance; healthcare cost savings; and reduced household travel time and transportation expenses.
(3) Includes credit in 2038 for additional 55 years of remaining net benefits of maintained transportation facilities at end of 20-year analysis period.

TO TRANSPOSE: *("paste special - values" cell ranges inside red boxes)*

Initial Proje	$11,747,573	$11,405,411	$11,073,214	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$53,363,363
Maintenan	$0	$0	$0	$25,766	$25,016	$24,287	$23,580	$22,893	$22,226	$21,579	$20,950	$20,340	$19,748	$19,172	$18,614	$18,072	$17,545	$17,034	$16,538	$16,057	$15,589	$15,135	$14,694
Total Econ	$0	$0	$0	$1,250,538	$1,280,197	$1,310,632	$1,342,498	$1,375,078	$1,408,749	$1,443,402	$1,479,164	########	$1,554,470	$1,593,659	########	########	########	########	########	########	########	########	########	$2,007,766
Net Discou	$0	$0	$0	$1,224,772	$1,255,181	$1,286,345	$1,318,918	$1,352,185	$1,386,523	$1,421,823	$1,458,214	########	$1,534,722	$1,574,486	########	########	########	########	########	########	########	########	########	$55,356,435
Net Cumuli	$0	$0	$0	-$33,001,425	-$31,746,244	-$30,459,899	-$29,140,981	-$27,788,796	-$26,402,272	##########	##########	########	-$20,491,506	##########	########	########	########	########	########	########	########	########	########	$50,623,906

TABLE 3A: Net Present Value of Benefits Discounted at 3% and 7%

	Household Travel Savings		Travel Time Savings		Improved Health Benefits	
Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2019	$ 419,931	$ 360,571	$ 360,411	$ 309,465	$ 78,876	$ 67,727
2020	$ 429,648	$ 355,124	369,927	305,762	79,951	66,083
2021	$ 439,718	$ 349,860	379,783	302,173	81,070	64,503
2022	$ 450,067	$ 344,708	389,905	298,629	82,195	62,953
2023	$ 460,746	$ 339,695	400,355	295,171	83,354	61,454
2024	$ 471,780	$ 334,827	411,143	291,792	84,567	60,018
2025	$ 483,143	$ 330,073	422,249	288,472	85,791	58,611
2026	$ 494,863	$ 325,442	433,702	285,220	87,068	57,260
2027	$ 506,944	$ 320,923	445,507	282,030	88,354	55,933
2028	$ 519,435	$ 316,538	457,704	278,920	89,712	54,669
2029	$ 532,279	$ 312,239	470,243	275,849	91,095	53,437
2030	$ 545,563	$ 308,068	483,213	272,860	92,506	52,236
2031	$ 559,243	$ 303,988	496,565	269,917	93,965	51,077
2032	$ 573,365	$ 300,013	510,342	267,036	95,471	49,955
2033	$ 587,927	$ 296,132	524,542	264,206	97,019	48,867
2034	$ 602,950	$ 292,346	539,192	261,432	98,610	47,812
2035	$ 618,451	$ 288,652	554,306	258,713	100,247	46,788
2036	$ 634,409	$ 285,031	569,863	256,031	101,921	45,792
2037	$ 650,868	$ 281,494	585,904	253,397	103,651	44,828
2038	$ 667,866	$ 278,047	602,465	250,819	105,426	43,891
2039-2093	$ 17,881,730	$ 3,875,962	$ 16,130,644	$ 3,496,404	$ 2,822,709	$ 611,837
TOTAL 2015 Present Value	**$ 28,531,000**	**$ 10,200,000**	**$ 25,538,000**	**$ 9,064,000**	**$ 4,644,000**	**$ 1,706,000**

34928.36518 52100.22373 1747.606568
36466.36228 54394.34752 1824.558748
38085.98412 56810.22526 1905.594941
39772.78717 59326.31257 1989.992481
41543.61478 61967.73349 2078.594108
43412.94322 64756.08128 2172.124127
45362.40466 67663.95793 2269.663522
47418.8511 70731.41668 2372.555807
49562.49947 73928.94851 2479.811155
51833.96399 77317.13485 2593.461659
54212.38389 80864.85912 2712.463571
56703.35994 84580.47561 2837.09712
59325.94294 88492.40108 2968.315494
62084.89402 92607.73736 3106.356911
64984.07345 96932.24257 3251.414517
68031.68962 101478.1606 3403.899009
71235.35566 106256.8474 3564.191304
74598.21772 111272.9958 3732.448816
78140.44801 116556.6955 3909.680842
81862.27449 122108.2863 4095.898787
4502425.097 6715955.748 225274.4333

TABLE 3B: Net Present Value of Benefits Discounted at 3% and 7%

	Reduced Emissions		Reduced Traffic Congestion Costs		Reductions in Accident Savings		Reduction in Road Maintenance Costs	
Year	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount	3% Discount	7% Discount
2019	$ 22,972	$ 19,725	$ 69,859	$ 59,984	$ 203,227	$ 174,500	$ 95,263	$ 81,797
2020	23,799	19,671	71,476	59,078	207,929	171,863	97,467	80,561
2021	24,357	19,379	73,151	58,202	212,803	169,316	99,751	79,367
2022	25,549	19,568	74,873	57,345	217,811	166,822	102,099	78,198
2023	26,472	19,517	76,649	56,511	222,980	164,397	104,522	77,061
2024	27,431	19,468	78,485	55,701	228,319	162,040	107,025	75,956
2025	28,424	19,418	80,375	54,911	233,818	159,740	109,602	74,878
2026	29,454	19,370	82,325	54,140	239,491	157,498	112,261	73,827
2027	30,870	19,542	84,335	53,388	245,337	155,312	115,002	72,802
2028	31,988	19,493	86,413	52,659	251,382	153,190	117,835	71,808
2029	33,145	19,443	88,549	51,944	257,598	151,109	120,749	70,832
2030	34,347	19,395	90,759	51,250	264,027	149,091	123,763	69,886
2031	35,209	19,138	93,035	50,571	270,647	147,116	126,866	68,961
2032	36,886	19,301	95,384	49,910	277,482	145,192	130,070	68,059
2033	38,228	19,255	97,807	49,264	284,529	143,314	133,373	67,178
2034	39,619	19,210	100,306	48,634	291,799	141,482	136,781	66,319
2035	41,063	19,165	102,885	48,020	299,301	139,694	140,298	65,482
2036	42,559	19,121	105,539	47,417	307,024	137,941	143,917	64,660
2037	44,558	19,271	108,278	46,829	314,990	136,230	147,651	63,858
2038	46,181	19,226	111,105	46,256	323,216	134,562	151,507	63,076
2039-2093	$ 1,236,481	$ 268,014	$ 2,974,784	$ 644,801	$ 8,653,917	$ 1,875,783	$ 4,056,523	$ 879,273
TOTAL 2015 Present Value	**$ 1,900,000**	**$ 656,000**	**$ 4,746,000**	**$ 1,697,000**	**$ 13,808,000**	**$ 4,936,000**	**$ 6,472,000**	**$ 2,314,000**

1821.678624 2439.134702 5015.131678 16579.0668
1919.747218 2570.443544 5285.117232 17814.16759
2023.683136 2709.608434 5571.255693 18778.63409
2133.451937 2856.583257 5873.452241 20558.65822
2249.598434 3012.097489 6193.206763 22079.32712
2372.5735 3176.754825 6531.760523 23709.68836
2502.609323 3350.866155 6889.752743 25455.75938
2640.218928 3535.118393 7268.595794 27326.63003
2785.811968 3730.060043 7669.417464 29827.79801
2940.090784 3936.631504 8094.151316 32004.32847
3103.17114 4154.987776 8543.116048 34333.30095
3276.037339 4386.446795 9019.021482 36830.49331
3458.929621 4631.330225 9522.528995 38886.63988
3652.663202 4890.729602 10055.88291 42368.30885
3857.788776 5165.382277 10620.59929 45436.04532
4075.056324 5456.292434 11218.74286 48722.16315
4305.220699 5764.470786 11852.39176 52242.32248
4548.791853 6090.600129 12522.94989 56009.70671
4806.814815 6436.079707 13233.29425 60902.32647
5080.316835 6802.284952 13986.25288 65274.18194
279417.4259 374125.6724 769243.9083 3590080.007

Northgate Bridge Construction Benefits by Selection Criteria*		
Sustainability Benefits		Present Value 2015 $'s
Reduced Hydrocarbons Emissions Costs	$109,967	$110,000
Reduced Particulate Matter Emissions Costs	$147,240	$147,000
Reduced Nitrous Oxides Emissions Costs	$302,741	$303,000
Reduced Carbon Dioxide Emissions Costs	$1,339,643	$1,340,000
Economic Competitiveness Benefits		
Reduced Traffic Congestion Costs	$4,746,372	$4,746,000
Livability Benefits		
Household Travel Savings	$28,530,926	$28,531,000
Travel Time Savings Costs	$25,537,964	$25,538,000
Reduction in Medical Care Costs	$1,826,975	$1,827,000
Reduction in Lost Productivity	$2,725,172	$2,725,000
Reduction in Workers Compensation Costs	$91,411	$91,000
Safety Benefits		
Reduced Vehicle Crash Costs	$13,807,627	$13,808,000
State of Good Repair Benefits		
Reduced Roadway Maintenance Costs	$6,472,325	$6,472,000
Project Costs		
Capital Costs	$34,226,197	$34,226,000
*Operation and Maintenance Costs**	$788,260	$788,000
Project Net Benefits		
Total Benefits	$85,638,363	$85,638,000
Total Costs	$35,014,457	$35,014,000
Net Benefits	**$50,623,906**	**$50,624,000**
B/C Ratio		2.46

**Totals over full 75 year life. All dollar values discounted at 3% real rate.*

2009 National Household Travel Survey (NHTS)

FOR INFORMATIONAL PURPOSES ONLY, DO NOT CHANGE VALUES IN THIS SHEET

Trip Distances

	Biking	Walking	Unit	
Commute	3.54	0.67	Miles	NHTS 2009 average bicycle trip distance for "Work" trips
College	2.09	0.56	Miles	NHTS 2009 average trip distance for "School/Daycare/Religious" trips
Utilitarian	1.89	0.67	Miles	Derived from NHTS 2009
School (children)	0.77	0.36	Miles	SRTS 2010, percent of students who walk or bicycle by parent's estimate of distance
Utilitarian Trip Multiplier	1.61	4.32	Ratio	Ratio of utilitarian trips by mode (all trip purpose responses except Refused, Don't Know, Not Ascertained, Home, Work, School/Daycare/Religious, Social/Recreational) to NHTS "Work" trips. Used to estimate number of other bicycling trips given bicycling commute mode share.
Social/Recreational Trip Multiplier	4.77	3.91	Ratio	Ratio of utilitarian trips to work trips by mode, NHTS 2009

Annual work days	251	261 Weekdays - 10 Federal holidays
Annual K-12 school days	180	State minimum
Annual college class days	150	Assumes two 15-week semesters/three 10-week quarters, with classes every weekday

Trips by Trip Purpose

Mode	Refused	Don't know	Not ascertained	Home	Work	School/ Daycare/ Religious activity	Medical/ Dental services	Shopping/ Errands	Social/ Recreational	Family personal business/ Obligations	Transport someone	Meals	Other reason	All	*Utilitarian trips (includes medical/dental services, shopping/errands, family personal business, obligations, transport someone, meals, other)*	*Ratio of work trips to utilitarian trips*	*Ratio of work trips to social/ recreationaltrips*
Bicycle	.	0	.	1,681	306	143	6	320	1,459	46	53	65	3	4,082	493	1.61	4.77
Walk	0	8	2	14,799	2,631	1,854	219	4,608	10,293	2,665	873	2,480	530	40,962	11,375	4.32	3.91

College Trips	**Bike**	**Other**	**POV**	**Transit**	**Unreported**	**Walk**	**Total**
Sum of Person Trips (in millions)	80.97	283.56	3875.58	262.44	3.94	329.86	4836.35
Mode Split	1.67%	5.86%	80.13%	5.43%	0.08%	6.82%	100.00%
POV Trip Replacement	81.50%					86.00%	
Walk Trip Replacement	6.94%						
Transit/Other Trip Replacement	11.48%					12.12%	
Bike Trip Replacement						1.80%	
Sum of Person Miles (in millions)	168.97	2,680.21	39,645.64	2,281.17	38.07	158.33	44,972.39
Average Trip Length	2.09	9.45	10.23	8.69	9.66	0.48	9.30

Average Person Trip Length (miles, Travel Day) by Trip Purpose and Mode

Mode	Refused	Don't know	Not ascertained	Home	Work	School/ Daycare/ Religious	Medical/ Dental services	Shopping/Errands	Social/Recreational	Family personal business/Obligations	Transport someone	Meals	Other reason	**All**	*Utilitarian trips (includes medical/dental services, shopping/errands, family personal business, obligations, transport someone, meals, other)*
Car	6.99	5.86	20.4	9.33	13.43	7.21	10.58	6.09	16.4	12.22	7.83	7.21	18.35	**9.74**	
Van	6.61	5.6	.	9.67	11.19	6.25	9.67	7.11	16.3	11.8	6.97	9.5	16.34	**9.61**	
SUV	13.81	8.64	11.68	10.25	11.4	6.15	11.96	7.02	22.08	14.06	7.3	9.83	23.38	**10.73**	
Pickup truck	17.68	13.1	52.12	10.83	13.88	12.91	12.54	7.85	17.29	12.92	8.43	7.39	15.87	**11.28**	
Average car/van/SUV/pickup truck trip length	11.2725	8.3	28.06667	10.02	12.475	8.13	11.1875	7.0175	18.0175	12.75	7.633	8.483	18.485	**10.34**	
Bicycle	.	1.13	.	2.16	3.54	1.48	2.67	1.48	2.41	1.65	1.06	2.08	2.42	**2.26**	1.89
Walk	0.67	0.61	0.36	0.71	0.67	0.56	0.74	0.56	0.86	0.53	0.51	0.47	1.19	**0.7**	0.67

Table 4. Comparison of Usual Travel Mode To and From School for K-8th Grade Students in 2009

Travel mode (2009)	Travel to school	Travel from school	Average	Drive Alone Replacement
Personal vehicle	45.30%	39.00%	42.15%	
Walk	11.70%	15.00%	13.35%	49%
Bicycle	1.00%	1.00%	1.00%	43%
School bus	39.40%	41.90%	40.65%	
Transit	1.60%	2.00%	1.80%	
Other	1.00%	1.00%	1.00%	
Total	100%	100%	100%	

SR2S Baseline Data Report, 2010 (http://www.saferoutesinfo.org/resources/collateral/SRTS_baseline_data_report.pdf)

Percent of students who walk or bicycle by parent's estimate of distance

	Walk	Bicycle	N	N Walk	N Bike	Avg Feet
< 1/4 mile	41%	4%	20,548	8,425	822	660
1/4 to 1/2 mile	18%	5%	15,506	2,791	775	1,980
1/2 to 1 mile	9%	4%	19,069	1,716	763	3,960
1 to 2 mile	2%	2%	22,347	447	447	7,920
> 2 mile	1%	1%	42,181	422	422	10,560
Total	71%			13,801	3,229	
Weighted average	1,247	548		1,875	4,055	
Weighted average (miles)				**0.355121**	**0.767973011**	

TCRP Report 153 Guidelines for Providing Access to Public Transportation Stations (2012)

http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_153.pdf

Average station access mode share by station type

Station Type	Walk	Bicycle	Feeder Bus	Auto Drop-Off	Auto Park-and-Ride
Urban Commercial	82%	1%	10%	2%	5%
High-Density Urban Neighborhood	72%	2%	14%	4%	10%
Medium-Density Urban Neighborhood	80%	1%	9%	4%	7%
Urban Neighborhood with Parking	35%	3%	21%	10%	31%
Historic Transit Village	25%	1%	3%	14%	53%
Suburban TOD	32%	2%	13%	14%	39%
Suburban Village Center	30%	2%	16%	12%	40%
Suburban Neighborhood	29%	1%	11%	13%	46%
Suburban Freeway	10%	1%	12%	12%	65%
Suburban Employment Center	29%	3%	25%	9%	36%
Suburban Retail Center	30%	2%	19%	11%	39%
Intermodal Transit Center	27%	1%	36%	6%	30%
Special Event/Campus	55%	2%	24%	6%	13%
Satellite City	7%	6%	12%	16%	59%

Benefits Model Inputs

	Figure	Unit	Source
Vehicle Emissions			
Hydrocarbons	0.002998287	Pounds/mile	EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks." 2005.
Particulate Matter	0.000022267	Pounds/mile	Same as above. Presented in source data as 0.0052 grams per mile (PM10) and 0.0049 grams per mile (PM2.5).
Nitrous Oxides	0.002094391	Pounds/mile	Same as above. Presented in source data as 0.95 grams per mile.
Carbon Monoxide	0.02734	Pounds/mile	Same as above. Presented in source data as 12.4 grams per mile.
Carbon Dioxide	0.81351	Pounds/mile	Same as above. Presented in source data as 369 grams per mile.
Carbon Dioxide Appreciation	2.50%	%/Year	
Emissions Costs	2015 $'s		
Volatile Organic Compunds	$1,700	$/ton	From NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5 (http://www.nhtsa.dot.gov/ portal/site/nhtsa/ menuitem.d0b5a45b55bfbe582f57529 cdba046a0/).
Particulate Matter	$306,500	$/ton	Same as above, extrapolated to 2014
Nitrous Oxides	$6,700	$/ton	Same as above, extrapolated to 2015
Other Reduced Externalities	2015 $'s		
Traffic Congestion	$0.11	$/mile	Crashes vs. Congestion: What's the Cost to Society? AAA, 2008. Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5.
Vehicle Crashes	$0.32	$/mile	Crashes vs. Congestion: What's the Cost to Society? AAA, 2008. Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5.
Road Maintenance Costs	$0.15	$/mile	Kitamura, R., Zhao, H., and Gubby, A. R. Development of a Pavement Maintenance Cost Allocation Model. Institute of Transportation Studies – University of California, Davis. http://pubs.its.ucdavis.edu/publication_detail.php?id=19
Household Transportation Saving	2015 $'s		
Vehicle Operating Costs	$0.66	$/mile	Average Cost of Owning and Operating an Automobile. 2011 [most recent data year] Bureau of Transportation Statistics. 2012 National Transportation Statistics (Table 3-17: Average Cost of Owning and Operating an Automobile, 2012). Research and Innovative Technology Administration, Bureau of Transporta
Vehicle Operating Costs 2012	$0.61	$/mile	
Value of Travel Time	12.98	hour	
	$0.22	minute	
Health Care Cost Reductions			
Medical Costs			
Direct Medical Costs due to Physical Inactivity	$1,307,928,619	2000$	Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityTopl
Indirect Medical Costs due to Physical Inactivity	$3,923,785,858	2000$	Same
Total Medical Costs	$5,231,714,477	2000$	Same
CA Population	32,682,794		Population Estimates Program, Population Division, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt
% of CA Population Physically Inactive	50%		Chenoweth, D. (2005).
CA Population Physically Inactive	16,177,983		Percent of population physically inactive multiplied by total population
Health Care Reductions Multiplier	$323.38	2000 $/person/year	Medical costs divided by physically inactive people
Medical Care Reductions Multiplier	**$440.90**	2015 $/person/year	Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm
Lost Productivity Costs			
Direct Lost Productivity Costs due to Physical Inactivity	$7,803,613,608	2000$	Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf
Indirect Lost Productivity Costs due to Physical Inactivity	$0	2000$	Same
Total Lost Productivity Costs	$7,803,613,608	2000$	Same
CA Population	32,682,794		Population Estimates Program, Population Division, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt
% of CA Population Physically Inactive	50%		Chenoweth, D. (2005).
CA Population Physically Inactive	16,177,983		Medical costs divided by physically inactive people
Lost Productivity Reductions Multiplier	$482.36	2000 $/person/year	Medical costs divided by physically inactive people
Lost Productivity Reductions Multiplier	**$657.66**	2015 $/person/year	Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm
Workers' Compensation Costs			
Direct Lost Productivity Costs due to Physical Inactivity	$50,005,040	2000$	Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf
Indirect Lost Productivity Costs due to Physical Inactivity	$200,020,159	2000$	Same
Total Lost Productivity Costs	$250,025,199	2000$	Same
CA Population	32,682,794		Population Estimates Program, Population Division, U.S. Census Bureau (1999). ST-99-1 State Population Estimates and Demographic Components of Population Change: July 1, 1998 to July 1, 1999. http://www.census.gov/population/estimates/state/st-99-1.txt
% of CA Population Physically Inactive	50%		Chenoweth, D. (2005).
CA Population Physically Inactive	16,177,983		Medical costs divided by physically inactive people
Workers' Compensation Reductions Multiplier	$15.45	2000 $/person/year	Medical costs divided by physically inactive people
Workers' Compensation Reductions Multiplier	**$22.06**	2015 $/person/year	Bureau of Labor Statistics. CPI Inflation Calculator. http://www.bls.gov/data/inflation_calculator.htm

Travel Time Savings

	Average Speed	
Walk	2.73	miles/hr
Bike	10.00	miles/hr
Transit/Other	9.62	miles/hr
Vehicle	21.20	miles/hr

		Bike Trip Time			Walk Trip Time		
Fixed Time	Miles >	Commute 3.54	College 2.09	Utilitarian 1.89	Commute 0.67	College 0.56	Utilitarian 0.67
0		77.80	45.93	41.61	14.73	12.31	14.65
3		24.24	15.54	14.36	7.02	6.36	7.00
12		34.07	25.03	23.80	16.18	15.49	16.16
12		22.02	17.92	17.36	13.90	13.58	13.89

	Bike Trip Time Savings			Walk Trip Time Savings		
Minutes	Commute	College	Utilitarian	Commute	College	Utilitarian
Walk	53.56	30.39	27.25	0.00	0.00	0.00
Bike	0.00	0.00	0.00	-7.71	-5.95	-7.65
Transit/Other	9.83	9.49	9.44	1.45	3.18	1.50
Vehicle	-2.22	2.38	3.00	-0.83	1.28	-0.77

	Bike Trip Time Weighting*			Walk Trip Time Weighting*			*Mode Shift %ages
	Commute	College	Utilitarian	Commute	College	Utilitarian	
Walk	5.92%	6.94%	5.92%				
Bike				3.47%	1.80%	3.47%	
Transit/Other	27.36%	11.48%	27.36%	24.58%	12.12%	24.58%	
Vehicle	61.78%	81.50%	61.78%	67.35%	86.00%	67.35%	
Weighted Time Savings Minutes	4.48781	5.13371	6.04959	-0.46917	1.37729	-0.41143	

tion Statistics. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_17.html

OBJECTID	Shape_Leng	Shape_Area	TotalPop	TotalEmp	TotalK_12	TotalWalk	TotalBike	TotalSOV	TotalHOV	TotalTrans	TotalOther	TotalColle	Ped_Area	West	East
1	3212	359545	1556	879	101	56	29	440	248	102	4	375	0	1	0
3	3214	505608	1589	985	48	10	0	665	86	189	35	195	1	1	0
5	2098	244894	1459	858	89	0	30	514	92	207	15	90	0	1	0
6	2413	322920	1424	867	77	16	0	587	195	40	29	62	0	1	0
7	3821	517299	737	480	66	25	0	292	71	79	13	82	0	1	0
8	3006	378782	1491	849	341	78	10	502	112	116	31	177	0	1	0
10	2809	276499	1099	701	25	64	31	207	148	108	143	348	0	1	0
11	2295	302615	1675	1224	185	133	53	479	95	357	107	240	0	1	0
18	3469	522350	1368	680	285	0	29	552	56	8	35	56	0	1	0
19	3996	661526	1238	715	156	22	0	485	66	63	79	55	0	1	0
20	2961	374098	1575	860	166	90	10	487	91	145	37	103	0	1	0
21	2413	264131	1057	663	47	26	7	387	73	129	41	216	0	1	0
22	2411	304870	957	621	38	15	31	394	33	56	92	15	0	1	0
23	2825	323768	1801	1226	213	26	88	703	179	230	0	152	0	1	0
24	2428	324913	842	436	109	6	5	271	41	55	58	49	0	1	0
25	2423	294325	1391	678	166	16	0	412	45	188	17	119	0	1	0
26	2449	317335	675	244	77	0	33	108	96	7	0	50	0	1	0
31	8369	1827737	1393	624	323	0	0	487	42	29	66	61	0	1	0
32	2998	343651	1429	931	103	42	20	576	113	139	41	98	0	1	0
33	2921	421876	1595	959	139	17	66	541	223	82	30	272	1	1	0
34	2267	244088	1707	1139	15	16	0	592	291	208	32	147	0	1	0
35	2501	277093	1202	936	23	28	0	534	79	261	34	146	0	1	0
36	2832	414422	1191	671	146	29	18	487	29	81	27	114	1	1	1
37	2085	270370	1004	593	93	24	0	414	20	95	40	72	1	1	1
38	3357	439905	1938	1009	218	9	58	504	119	239	80	418	1	1	1
55	2822	411533	1124	680	150	26	12	444	59	83	56	144	0	1	0
57	2509	315473	918	514	103	15	11	380	12	69	27	74	0	1	0
58	2871	421511	1329	924	82	33	11	596	13	227	44	97	0	1	0
59	2164	201014	737	446	87	19	0	281	20	92	34	85	0	1	0
60	2085	191628	1057	702	77	17	46	255	135	167	82	162	0	1	0
61	2269	261355	1025	596	130	17	37	358	25	94	65	33	0	1	0
62	2425	325866	1386	853	136	21	65	346	77	221	123	93	0	1	0
63	2596	360736	1441	819	51	51	44	383	80	224	37	93	0	1	0
64	2568	330571	1395	844	179	84	23	488	58	81	110	13	0	1	0
65	2460	294901	1271	829	194	56	54	440	48	174	57	54	0	1	0
66	3123	410780	1585	973	215	13	71	547	84	148	110	40	0	1	0
67	2588	390771	1457	799	264	36	47	430	55	141	90	13	0	1	0
68	2432	324806	1115	748	96	18	16	498	95	89	32	32	0	1	0
69	2605	366895	1366	772	134	12	37	474	87	81	81	12	0	1	0
70	2226	305805	1391	909	204	25	0	686	104	42	52	127	0	1	0
71	2202	295569	965	571	46	0	0	367	27	151	26	76	0	1	0
73	2504	310415	1020	564	153	12	25	257	82	70	118	38	0	1	0
74	1760	191106	889	587	57	14	0	293	95	153	32	178	0	1	0
76	4222	648137	1175	725	103	0	51	543	19	30	82	76	0	1	0
78	2393	319675	1290	747	114	0	36	408	127	111	65	99	0	1	0
79	1928	224450	1090	685	82	49	0	365	125	78	68	56	0	1	0
80	2102	261799	2075	1528	35	11	167	768	59	410	113	377	0	1	0
81	2001	211240	869	626	15	30	17	301	16	233	29	104	0	1	0
82	5662	1005393	1197	460	207	0	0	331	32	43	54	45	0	1	0
83	2529	279206	955	640	113	0	88	328	63	151	10	162	0	1	0
84	2112	263170	1226	722	165	0	87	335	54	71	175	142	0	1	0
85	2218	270018	986	653	106	20	66	429	10	105	23	53	0	1	0
86	2089	253964	1232	779	175	55	18	567	45	26	68	49	0	1	0
87	2622	348425	1444	834	164	48	53	398	57	183	95	100	0	1	0
88	2702	335566	1361	922	97	63	49	557	44	112	97	71	0	1	0
89	3311	600770	1003	533	117	8	51	245	55	85	89	95	0	1	0
90	3009	370758	1205	793	158	69	65	339	92	191	37	66	0	1	0
91	6522	918299	1314	744	173	0	14	495	68	100	67	16	0	1	0
94	2676	229694	1331	1003	24	71	76	495	87	239	35	231	0	1	0
95	2297	306208	1323	824	143	29	11	337	76	199	172	31	0	1	0
96	2511	270143	1807	1024	110	28	118	558	49	167	104	296	0	1	0
117	3877	788381	1164	582	146	27	0	337	101	97	20	70	0	1	0
118	2636	422627	1333	736	193	9	0	508	83	97	39	63	0	1	0
124	3946	631017	3018	1104	340	94	23	770	99	83	35	488	0	1	0
125	2816	406954	1661	923	168	46	16	657	42	107	55	247	0	1	0
126	2293	325307	1282	453	68	0	0	196	56	82	119	53	0	1	0
127	2806	321363	1041	449	69	40	0	339	12	43	15	15	0	1	0
128	4503	750387	969	665	120	0	14	318	124	125	84	139	0	1	0
129	2412	322714	1265	768	113	0	76	425	21	138	108	179	0	1	0
130	2811	404468	1239	413	102	35	0	237	33	57	51	9	0	1	0
131	2832	404514	874	398	124	0	0	302	26	61	9	74	0	1	0
140	2742	411206	1522	1069	165	102	51	568	116	207	25	165	0	1	0
141	4788	650660	884	415	126	7	10	255	59	41	43	27	0	1	0
142	4284	900854	1016	628	59	0	10	420	140	51	7	47	0	1	0
144	4576	820778	1332	495	118	16	0	281	83	94	21	104	0	1	0
145	4723	974398	1274	773	80	22	0	362	162	169	58	145	0	1	0
146	2877	340686	664	379	55	25	14	218	35	55	32	24	0	1	0
147	6752	2103227	1118	746	115	0	12	546	63	30	95	114	0	1	0
148	2352	305009	1129	709	119	7	24	379	115	101	83	176	0	1	0
149	1865	177353	966	574	80	20	18	371	28	47	90	65	0	1	0
150	2090	272560	1504	876	146	0	48	393	116	156	163	167	0	1	0
151	4237	829767	1434	1175	15	168	26	412	181	294	94	126	0	1	0
152	2293	301148	2100	1393	55	98	46	652	15	344	238	115	0	1	0
162	2524	276060	917	568	92	26	42	337	35	71	57	92	0	1	0

163	2270	295781	1165	785	42	39	50	340	34	224	98	186	0	1	0
165	2621	286780	1291	896	93	11	69	440	140	142	94	103	0	1	0
166	1874	196182	1333	952	96	30	44	525	158	130	65	30	0	1	0
173	2429	246959	1213	535	53	17	0	151	203	142	22	86	0	1	1
175	1896	219820	1328	1010	90	27	45	571	70	247	50	123	0	1	0
176	2208	188375	1512	1069	64	27	0	657	16	314	55	158	0	1	0
177	2228	211942	872	738	22	10	84	424	65	106	49	42	0	1	0
178	1813	174683	1597	868	107	59	57	463	57	171	61	224	0	1	0
179	2280	320544	1371	862	49	86	120	467	34	43	112	161	0	1	0
180	2297	318850	1434	829	211	77	21	493	60	66	112	154	0	1	0
183	3193	221976	664	379	55	25	14	218	35	55	32	24	0	1	1
184	2429	326022	1938	1009	218	9	58	504	119	239	80	418	1	1	0
185	1934	212534	1004	593	93	24	0	414	20	95	40	72	1	1	0
186	2050	86568	1124	680	150	26	12	444	59	83	56	144	0	1	1
187	1194	76404	1296	973	17	42	94	415	57	233	132	226	0	1	0

OBJECTID	Shape_Leng	Shape_Area	TotalPop	TotalEmp	TotalK_12	TotalWalk	TotalBike	TotalSOV	TotalHOV	TotalTrans	TotalOther	TotalColle	Ped_Area	West	East
36	2832	414422	1191	671	146	29	18	487	29	81	27	114	1	1	1
37	2085	270370	1004	593	93	24	0	414	20	95	40	72	1	1	1
38	3357	439905	1938	1009	218	9	58	504	119	239	80	418	1	1	1
173	2429	246959	1213	535	53	17	0	151	203	142	22	86	0	1	1
183	3193	221976	664	379	55	25	14	218	35	55	32	24	0	1	1
186	2050	86568	1124	680	150	26	12	444	59	83	56	144	0	1	1
2	2425	245644	1032	677	55	0	19	357	43	245	13	178	0	0	1
9	2198	145355	1195	813	0	215	0	274	16	308	0	803	0	0	1
12	1860	164758	1239	490	45	94	15	192	41	105	43	467	0	0	1
13	1449	130028	3104	1223	36	280	23	482	73	250	115	2829	0	0	1
14	1817	200487	1945	944	8	292	14	342	23	257	16	1046	0	0	1
15	1516	141669	1209	790	22	202	0	87	130	312	59	616	0	0	1
16	1199	71299	593	236	0	138	0	40	0	58	0	409	0	0	1
17	1264	74128	1282	178	0	57	0	40	0	64	17	1216	0	0	1
39	4519	556741	1323	808	125	45	6	465	85	163	44	175	0	0	1
40	2230	307845	1253	758	171	21	87	433	75	92	50	86	0	0	1
41	2230	267418	778	450	45	11	23	220	62	110	24	97	0	0	1
42	3090	442416	1519	872	183	20	62	448	33	243	66	148	0	0	1
43	2834	355295	790	528	67	0	71	324	40	85	8	46	0	0	1
44	3587	616114	1503	852	293	0	33	458	99	89	173	70	0	0	1
45	3287	567841	1256	771	197	0	0	421	171	141	38	31	0	0	1
46	4171	983804	1026	390	188	0	0	258	34	49	49	36	0	0	1
47	3014	413735	678	343	85	15	6	209	18	50	45	28	0	0	1
48	2108	178123	932	575	128	4	40	354	57	103	17	180	0	0	1
49	2713	386246	1195	625	267	35	52	346	30	126	36	48	0	0	1
50	2500	362332	1456	975	112	48	27	522	31	185	162	279	0	0	1
51	2020	245363	1187	728	146	20	9	400	0	199	100	158	0	0	1
52	2441	326853	1249	912	116	88	32	381	68	218	125	82	0	0	1
53	2491	267062	1000	721	130	46	5	321	125	110	114	113	0	0	1
54	2450	362213	1479	1018	10	0	71	521	55	258	113	174	0	0	1
56	2181	183116	1550	865	52	242	48	336	85	146	8	974	0	0	1
75	2558	373437	1333	695	150	68	110	325	87	77	28	81	0	0	1
92	2265	230512	804	453	0	13	13	235	51	110	31	94	0	0	1
93	3507	314007	1296	973	17	42	94	415	57	233	132	226	0	0	1
97	2512	345801	1084	570	126	93	0	324	39	81	33	38	0	0	1
98	2349	278805	1031	620	109	12	20	383	63	110	32	102	0	0	1
99	3226	569045	1984	1060	239	80	70	597	117	104	92	268	0	0	1
100	2811	404763	983	476	171	8	29	342	43	27	27	39	0	0	1
101	2813	405518	1246	742	145	41	37	390	34	216	24	233	0	0	1
102	2606	370738	1228	752	86	0	25	460	133	109	25	92	0	0	1
103	4715	894520	1024	549	160	0	27	362	19	55	86	104	0	0	1
104	2645	288392	986	522	56	0	0	267	53	146	56	92	0	0	1
105	1429	126422	1453	997	108	21	0	748	0	228	0	74	0	0	1
106	3244	411989	1123	593	153	31	0	418	30	93	21	66	0	0	1
107	2764	337110	880	365	186	48	16	198	20	44	39	84	0	0	1
108	3400	622002	1430	865	180	0	21	453	116	205	70	59	0	0	1
109	5308	600207	1536	675	311	0	46	494	15	77	43	65	0	0	1
110	3952	567751	1604	847	270	47	61	419	135	110	75	82	0	0	1
111	3236	493817	900	490	76	12	51	304	0	91	32	33	0	0	1
112	3124	507804	1288	454	107	80	47	223	26	55	23	125	0	0	1
113	4922	987953	1407	997	94	34	0	575	89	299	0	255	0	0	1
114	3062	377273	1013	482	72	0	14	383	44	32	9	48	0	0	1
115	3459	511436	1457	876	262	31	0	454	177	119	95	142	0	0	1
116	2931	489866	1434	712	137	0	51	494	67	58	42	198	0	0	1
120	3657	512976	1603	774	242	15	26	507	58	81	87	81	0	0	1
121	3355	550270	1339	871	68	117	63	391	61	223	16	357	0	0	1
122	2778	376597	1916	1095	184	0	45	705	42	197	106	278	0	0	1
123	2539	369487	1495	806	265	37	39	416	65	124	125	154	0	0	1
132	2269	261485	1062	587	81	35	39	380	43	25	65	258	0	0	1
133	2675	344437	1243	583	79	53	40	159	36	272	23	657	0	0	1
134	1945	147599	1852	848	16	219	92	284	16	162	75	1602	0	0	1
135	2420	327396	1762	972	188	34	162	419	49	258	50	680	0	0	1
136	1626	165607	1669	830	154	70	123	446	26	131	34	897	0	0	1
137	1630	165934	1641	1121	0	403	29	369	83	203	34	1059	0	0	1
138	2429	330966	1596	1071	113	230	91	467	62	168	53	453	0	0	1
139	2224	259792	1154	601	24	64	24	292	35	132	54	368	0	0	1
143	2054	247337	1411	705	193	0	20	463	20	183	19	164	0	0	1
153	3295	331933	1602	1054	139	6	0	714	131	128	75	95	0	0	1
154	1855	207050	1823	963	114	89	41	475	33	287	38	238	0	0	1
155	3242	437034	1002	674	80	0	12	337	27	221	77	198	0	0	1
156	2448	324476	535	320	54	0	15	238	17	50	0	46	0	0	1
157	2433	326115	1109	730	101	11	14	433	142	130	0	78	0	0	1
158	2757	487399	1202	637	133	0	5	361	161	93	17	30	0	0	1
159	3277	654189	1508	760	165	12	0	409	120	123	96	215	0	0	1
160	3994	522632	1250	675	94	0	44	430	27	116	58	134	0	0	1
168	6056	473825	764	406	87	0	12	283	42	57	12	56	0	0	1
169	2693	371236	834	395	146	36	11	201	76	52	19	102	0	0	1
170	3380	583222	1061	506	238	18	16	252	34	105	81	117	0	0	1
171	3597	505069	1000	649	57	0	15	392	121	81	40	91	0	0	1
172	3319	555352	1406	871	117	24	22	444	81	195	105	130	0	0	1
174	3542	488084	1114	535	82	42	0	193	150	108	42	184	0	0	1
182	1408	75500	1135	843	0	140	11	269	15	397	11	789	0	0	1

VALUE OF EMISSIONS

Emissions Costs	2013		2015	
Volatile Organic Compunds	$1,813	$/ton	$1,700	$/ton
Particulate Matter	$326,935	$/ton	$306,500	$/ton
Nitrous Oxides	$7,147	$/ton	$6,700	$/ton
Sulfur Dioxide	N/A	$/ton	$39,600.00	$/ton
Carbon Dioxide Appreciation	2.5%	%/year	3.0%	%/year

Social Cost of Carbon	Metric Ton	Short Ton	Metric Ton	Short Ton
Year	Value (2013$)	Value (2013$)	Value (2015$)	Value (2015$)
2010	$ 39.00	$ 42.99	$ 39.56	$ 43.61
2011	$ 40.00	$ 44.09	$ 40.57	$ 44.72
2012	$ 41.00	$ 45.19	$ 41.59	$ 45.84
2013	$ 43.00	$ 47.40	$ 43.62	$ 48.08
2014	$ 44.00	$ 48.50	$ 44.63	$ 49.20
2015	$ 45.00	$ 49.60	$ 45.64	$ 50.31
2016	$ 46.00	$ 50.71	$ 46.66	$ 51.43
2017	$ 47.00	$ 51.81	$ 47.67	$ 52.55
2018	$ 49.00	$ 54.01	$ 49.70	$ 54.79
2019	$ 51.00	$ 56.22	$ 51.73	$ 57.02
2020	$ 52.00	$ 57.32	$ 52.74	$ 58.14
2021	$ 52.00	$ 57.32	$ 52.74	$ 58.14
2022	$ 54.00	$ 59.52	$ 54.77	$ 60.38
2023	$ 55.00	$ 60.63	$ 55.79	$ 61.50
2024	$ 56.00	$ 61.73	$ 56.80	$ 62.61
2025	$ 57.00	$ 62.83	$ 57.82	$ 63.73
2026	$ 58.00	$ 63.93	$ 58.83	$ 64.85
2027	$ 60.00	$ 66.14	$ 60.86	$ 67.09
2028	$ 61.00	$ 67.24	$ 61.87	$ 68.20
2029	$ 62.00	$ 68.34	$ 62.89	$ 69.32
2030	$ 63.00	$ 69.45	$ 63.90	$ 70.44
2031	$ 63.00	$ 69.45	$ 63.90	$ 70.44
2032	$ 65.00	$ 71.65	$ 65.93	$ 72.68
2033	$ 66.00	$ 72.75	$ 66.95	$ 73.79
2034	$ 67.00	$ 73.85	$ 67.96	$ 74.91
2035	$ 68.00	$ 74.96	$ 68.97	$ 76.03
2036	$ 69.00	$ 76.06	$ 69.99	$ 77.15
2037	$ 71.00	$ 78.26	$ 72.02	$ 79.38
2038	$ 72.00	$ 79.37	$ 73.03	$ 80.50
2039	$ 73.00	$ 80.47	$ 74.05	$ 81.62
2040	$ 74.00	$ 81.57	$ 75.06	$ 82.74
2041	$ 76.00	$ 83.78	$ 77.09	$ 84.98
2042	$ 77.00	$ 84.88	$ 78.10	$ 86.09
2043	$ 78.00	$ 85.98	$ 79.12	$ 87.21
2044	$ 79.00	$ 87.08	$ 80.13	$ 88.33
2045	$ 80.00	$ 88.18	$ 81.15	$ 89.45
2046	$ 82.00	$ 90.39	$ 83.17	$ 91.68
2047	$ 83.00	$ 91.49	$ 84.19	$ 92.80
2048	$ 84.00	$ 92.59	$ 85.20	$ 93.92
2049	$ 85.00	$ 93.70	$ 86.22	$ 95.04
2050	$ 86.00	$ 94.80	$ 87.23	$ 96.16

USDOT BCA TIGER Resource Guide (2014):

Emission Type	$ / short ton ($2013)	$ / metric ton ($2013)
Carbon dioxide (CO_2)	(varies)*	(varies)*
Volatile Organic Compounds (VOCs)	$1,813	$1,999
Nitrogen oxides (NOx)	$7,147	$7,877
Particulate matter (PM)	$326,935	$360,383
Sulfur dioxide (SOx)	$42,240	$46,561

Cost/Benefit Category	Recommended Monetized Value(s)				Reference and Notes
Social Cost of Carbon (3%)	Year	3% SCC (2013$)	Year	3% SCC (2013$)	*Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (May 2013; revised November 2013), page 18, Table A1 *Annual SCC Values: 2010-2050 (2007$/metric ton CO_2)* http://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf
	2010	39	2031	63	
	2011	40	2032	65	
	2012	41	2033	66	
	2013	43	2034	67	
	2014	44	2035	68	
	2015	45	2036	69	
	2016	46	2037	71	
	2017	47	2038	72	
	2018	49	2039	73	
	2019	51	2040	74	
	2020	52	2041	76	
	2021	52	2042	77	
	2022	54	2043	78	
	2023	55	2044	79	
	2024	56	2045	80	
	2025	57	2046	82	
	2026	58	2047	83	
	2027	60	2048	84	
	2028	61	2049	85	
	2029	62	2050	86	
	2030	63			

NOTE:
- SCC values are per unit metric ton of carbon dioxide and already discounted forward to the reference year (in 2007 nominal dollars). Unlike previous OMB guidance on SCC values, the latest OMB guidance shows the values to the nearest dollar only. The Resource Guide converted this to 2013 dollars and also shows the value to the nearest dollar.
- See **Part II, Section 1 ("Clarification on the Social Cost of Carbon (SCC) Guidance and the Annual SCC Values")**, for methodology of how to use 3% SCC values in TIGER BCA.

Transposed Values:

| Social Cost of Carbon - Short Ton (2014$) | | | |

	2020							Baseline		Project	
	Average Weekday New Bike/Ped Trips	% of New Trips that Replace Vehicle Trips	# of New Trips that Replace Vehicle Trips	Vehicle Miles Reduced per New Trip Replacing Vehicle Trip	Weekday Reduced Vehicle Miles	Annual Reduced Vehicle Miles	Total Trips	# Bike/Ped Trips	% Bike/Ped Trips	# Bike/Ped Trips	% Bike/Ped Trips
Total Weekday Trips	2,329	67%	1,559	1.8	2,830	753,272					
Pedestrian Trips	893	68%	607	0.7	402	127,084					
Work Commute	297	67%	200	0.7	134	33,600	18,586	5,020	27.0%	5,317	28.6%
School Commute	44	81%	36	0.6	20	3,008	4,607	375	8.1%	419	9.1%
Utilitarian (Daily)	552	67%	372	0.7	248	90,476					
Bike Trips	1,436	66%	951	2.6	2,428	626,188					
Work Commute	565	62%	349	3.5	1,236	310,248	307,149	34,257	11.2%	34,822	11.3%
School Commute	326	81%	265	2.1	555	83,222	37,513	1,639	4.4%	1,965	5.2%
Utilitarian (Daily)	545	62%	337	1.9	638	232,718					

	Benefit per Vehicle Mile Reduced	Benefit per new Trip Replacing Vehicle Trip	Total Annual Benefits	Sources	
Benefits from Replacing Vehicle Trips	$1.97	$3.36	$1,484,099		
Direct Benefits to User	$1.60	$2.73	$1,204,440		
Reduced Travel Cost	$0.66	$1.13	$498,080	1	498,080
Reduced Travel Time	$0.57	$0.97	$428,847	2	428,847
Reduced Medical Care	$0.05	$0.08	$36,466	3	36,466
Reduced Vehicle Crashes	$0.32	$0.55	$241,047	4	241,047
Benefits to Community	$0.37	$0.63	$279,659		
Improved Air Quality	$0.01	$0.02	$9,775	5	9,775
Reduced CO2	$0.02	$0.04	$17,814	6	17,814
Reduced Traffic Congestion	$0.11	$0.19	$82,860	7	82,860
Reduced Lost Productivity	$0.07	$0.12	$54,394	8	54,394
Reduced Workers Compensation	$0.00	$0.00	$1,825	9	1,825
Reduced Road Maintenance Cost	$0.15	$0.26	$112,991	10	112,991

1 $0.608/mile in 2011 x assumed real escalation rate of 2.12%/yr; Average Cost of Owning and Operating an Automobile. 2011 [most recent data year] Bureau of Transportation Statistics. 2012 National Transportation Statistics (Table 3-17: Average Cost of Owning and Operating an Automobile, 2012). Research and Innovative Technology Administration, Bureau of Transportation Statistics. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_17.html

2 $12.98/hr and 6 min savings per vehicle trip replaced by bike trip; no time savings associated with vehicle trips replaced by pedestrian trips

3 $440.90 medical cost reduction per newly active person (Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf); newly active persons = 19% of net new since 2012 baseline daily work and school pedestrian and bicycle trips (State Indicator Report on Physical Activity, 2010 Behavioral Indicators for the State of Washington)

4 $.32/mile x reduced vehicle miles traveled; Crashes vs. Congestion: What's the Cost to Society? AAA, 2008. Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5.

5 ($1700/ton hydrocarbons x .003 lbs/mile + $306,500/ton particulate matter x .00002 lbs/mile + $6,700/ton nitrous oxides x .00209 lbs/mile) x reduced vehicle miles traveled; EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks." 2005.; NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5 (http://www.nhtsa.dot.gov/ portal/site/nhtsa/ menuitem.d0b5a45b55bfbe582f57529 cdba046a0/).

6 $58.14/ton CO2 x .81351 lbs/mile x reduced vehicle miles traveled; $/ton real escalation of 3%/yr; USDOT BCA TIGER Resource Guide (2014)

7 $0.11/mile x reduced vehicle miles travled; Crashes vs. Congestion: What's the Cost to Society? AAA, 2008. Figure ES.2, pg ES-4 and Figure ES.3, pg ES-5.

8 $657.66 lost productivity cost reduction per newly active person (Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf); newly active persons = 19% of net new since 2012 baseline daily work and school pedestrian and bicycle trips (State Indicator Report on Physical Activity, 2010 Behavioral Indicators for the State of Washington)

9 $22.06 workers' compensation cost reduction per newly active person (Chenoweth, D. (2005). The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity. Topline Report. http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf); newly active persons = 19% of net new since 2012 baseline daily work and school pedestrian and bicycle trips (State Indicator Report on Physical Activity, 2010 Behavioral Indicators for the State of Washington)

10 $0.15/mile x reduced vehicle miles travled; Kitamura, R., Zhao, H., and Gubby, A. R. Development of a Pavement Maintenance Cost Allocation Model. Institute of Transportation Studies – University of California, Davis. http://pubs.its.ucdavis.edu/publication_detail.php?id=19

Bike Share Expansion (BSE) Benefit Cost Calculations

Summary of Results

Project Year: -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20

Discounted Benefits	Total	Year: 2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Health Savings	$ 88,885,246			$ 2,754,206	$ 4,046,300	$ 5,192,208	$ 5,111,552	$ 5,032,149	$ 4,953,980	$ 4,877,025	$ 4,801,265	$ 4,726,682	$ 4,653,258	$ 4,580,975	$ 4,509,814	$ 4,439,756	$ 4,370,781	$ 4,302,896	$ 4,236,054	$ 4,170,252	$ 4,105,471	$ 4,041,697	$ 3,978,913
Emissions Reduction	$ 323,728			$ 7,145	$ 10,534	$ 17,322	$ 17,467	$ 17,399	$ 17,329	$ 17,257	$ 17,183	$ 17,099	$ 17,219	$ 17,137	$ 17,053	$ 16,788	$ 16,893	$ 16,793	$ 16,693	$ 16,633	$ 16,021	$ 16,591	$ 16,495
Vehicle Crash Reduction	$ 2,877,318			$ 71,383	$ 103,956	$ 170,950	$ 166,294	$ 165,680	$ 164,106	$ 160,572	$ 154,078	$ 155,823	$ 153,205	$ 150,825	$ 148,482	$ 146,176	$ 143,905	$ 141,670	$ 139,469	$ 137,303	$ 135,170	$ 133,070	$ 131,003
Maintenance Savings	$ 1,345,621			$ 33,375	$ 48,606	$ 79,870	$ 77,689	$ 77,468	$ 76,753	$ 75,078	$ 72,012	$ 72,754	$ 71,634	$ 70,503	$ 69,425	$ 68,387	$ 67,388	$ 66,427	$ 65,503	$ 64,615	$ 63,761	$ 62,939	$ 62,148
Congestion Reduction Savings	$ 597,826			$ 24,502	$ 35,682	$ 58,677	$ 57,706	$ 56,868	$ 53,985	$ 55,115	$ 52,259	$ 53,416	$ 52,587	$ 51,770	$ 50,966	$ 50,174	$ 49,394	$ 50,627	$ 47,872	$ 47,128	$ 46,396	$ 45,675	$ 44,964
Transit Cost Savings	$ 45,514,843			$ 1,144,065	$ 1,666,114	$ 2,739,893	$ 2,697,205	$ 2,655,278	$ 2,614,107	$ 2,573,625	$ 2,533,543	$ 2,494,157	$ 2,455,442	$ 2,417,393	$ 2,379,748	$ 2,342,764	$ 2,306,388	$ 2,270,592	$ 2,235,291	$ 2,200,568	$ 2,166,384	$ 2,132,722	$ 2,099,602
Travel Time Reduction Savings	$ 34,811,715			$ 34,545	$ 137,686	$ 226,418	$ 222,905	$ 219,438	$ 216,029	$ 212,673	$ 209,370	$ 206,117	$ 202,916	$ 199,763	$ 196,660	$ 193,605	$ 190,598	$ 187,637	$ 184,722	$ 181,854	$ 179,028	$ 176,247	$ 173,509
Total Benefits:	**$ 144,356,899**			$ 4,129,222	$ 6,048,878	$ 8,485,340	$ 8,353,943	$ 8,224,377	$ 8,096,820	$ 7,971,241	$ 7,847,610	$ 7,726,088	$ 7,606,260	$ 7,488,290	$ 7,372,149	$ 7,257,630	$ 7,145,244	$ 7,034,424	$ 6,925,323	$ 6,817,914	$ 6,712,171	$ 6,608,231	$ 6,505,740
Discounted Costs																							
Capital	$ 5,703,866		$ 3,086,574	$ 2,617,292																			
Maintenance & Operation	$ 30,939,370			$ 2,019,040	$ 1,960,233	$ 1,903,139	$ 1,847,708	$ 1,793,891	$ 1,741,642	$ 1,690,915	$ 1,641,665	$ 1,593,849	$ 1,547,426	$ 1,502,356	$ 1,458,598	$ 1,416,114	$ 1,374,868	$ 1,334,824	$ 1,295,945	$ 1,258,199	$ 1,221,553	$ 1,185,973	$ 1,151,431
Total Costs:	**$ 36,643,236**																						
Net Discounted Benefits - Costs	**$ 107,713,662**																						
BCA Ratio	**3.94**																						

Primary Inputs

		Year:	-1 2015	0 2016	1 2017	2 2018	3 2019	4 2020	5 2021	6 2022	7 2023	8 2024	9 2025	10 2026	11 2027	12 2028	13 2029	14 2030	15 2031	16 2032	17 2033	18 2034	19 2035	20 2036	
# of Trips			0	0	300,000	450,000	762,201	772,872	783,692	794,664	805,789	817,070	828,509	840,108	851,870	863,796	875,889	888,151	900,586	913,194	925,978	938,942	952,087	965,417	
# of E-Bike Trips	50%				150,000	187,500	381,101	386,436	391,846	397,332	402,894	408,535	414,255	420,054	425,935	431,898	437,944	444,076	450,293	456,597	462,989	469,471	476,044	482,708	
# of Standard Bike Trips	50%				150,000	187,500	381,101	386,436	391,846	397,332	402,894	408,535	414,255	420,054	425,935	431,898	437,944	444,076	450,293	456,597	462,989	469,471	476,044	482,708	
Average E-Bike Trip Length (miles)	2.1																								
Average Bike Trip Length (miles)	2.1																								
Weighted Average Trip Length (miles)	2.1																								
# of Stations	100																								
Unique Bikeshare Users (total)					41,438	62,157	82,876	84,036	85,213	86,406	87,615	88,842	90,086	91,347	92,626	93,923	95,238	96,571	97,923	99,294	100,684	102,094	103,523	104,972	annual casual ratio
annual					3,545	5,814	7,089	7,188	7,289	7,391	7,494	7,599	7,706	7,814	7,923	8,034	8,146	8,260	8,376	8,493	8,612	8,733	8,855	8,979	0.09353847
casual					37,894	56,343	75,787	76,848	77,924	79,015	80,121	81,243	82,380	83,533	84,703	85,889	87,091	88,310	89,547	90,800	92,072	93,361	94,668	95,993	
Bikeshare Mode Shift	Weighted Alternative Mode				Trips Diverted																				
Walk					65,271	97,906	165,832	168,153	170,508	172,895	175,315	177,770	180,258	182,782	185,341	187,936	190,567	193,235	195,940	198,683	201,465	204,285	207,145	210,045	
Personal Bike	10%				29,384	44,076	74,655	75,700	76,760	77,835	78,924	80,029	81,150	82,286	83,438	84,606	85,790	86,991	88,209	89,444	90,696	91,966	93,254	94,559	
Bus & Streetcar	15%				43,996	65,993	111,778	113,343	114,930	116,539	118,171	119,825	121,503	123,204	124,928	126,677	128,451	130,249	132,073	133,922	135,797	137,698	139,626	141,580	
Light Rail	19%				57,885	86,827	147,066	149,125	151,213	153,330	155,476	157,653	159,860	162,098	164,368	166,669	169,002	171,368	173,767	176,200	178,667	181,168	183,704	186,276	
Carsharing	18%				53,790	80,685	136,663	138,577	140,517	142,484	144,479	146,501	148,552	150,632	152,741	154,879	157,048	159,246	161,476	163,736	166,029	168,353	170,710	173,100	
Taxi	7%				21,034.41	31,552	53,441	54,190	54,948	55,718	56,498	57,289	58,091	58,904	59,729	60,565	61,413	62,273	63,144	64,028	64,925	65,834	66,755	67,690	
Personal Car	8%				22,640	33,960	57,521	58,326	59,143	59,971	60,810	61,662	62,525	63,400	64,288	65,188	66,101	67,026	67,964	68,916	69,881	70,859	71,851	72,857	
Discount Rate	3%																								

Impact Model

Health Savings	Year:	-1 2015	0 2016	1 2017	2 2018	3 2019	4 2020	5 2021	6 2022	7 2023	8 2024	9 2025	10 2026	11 2027	12 2028	13 2029	14 2030	15 2031	16 2032	17 2033	18 2034	19 2035	20 2036
Unique Bikeshare Users (total)	41,438			41,438	62,157	82,876	84,036	85,213	86,406	87,615	88,842	90,086	91,347	92,626	93,923	95,238	96,571	97,923	99,294	100,684	102,094	103,523	104,972
annual	3,545			3,545	5,814	7,089	7,188	7,289	7,391	7,494	7,599	7,706	7,814	7,923	8,034	8,146	8,260	8,376	8,493	8,612	8,733	8,855	8,979
casual	37,894			37,894	56,343	75,787	76,848	77,924	79,015	80,121	81,243	82,380	83,533	84,703	85,889	87,091	88,310	89,547	90,800	92,072	93,361	94,668	95,993
Mode Shift from Inactive Mode (Bus, Rail, Carsharing, Taxi, Personal Car)	66%																						
Population Inactivity Rate	19%																						
affected annual users	Annual Users x Mode Shift x Inactivity Rate=			447.50	734	895	908	920	933	946	959	973	986	1,000	1,014	1,028	1,043	1,057	1,072	1,087	1,103	1,118	1,134
affected casual users				7,200	10,705	14,400	14,601	14,806	15,013	15,223	15,436	15,652	15,871	16,094	16,319	16,547	16,779	17,014	17,252	17,494	17,739	17,987	18,239
Savings/Year/User	*May need to address E-Bikes here																						
annual	$ 1,120.62	Savings x Affected Annual Users=		$ 501,477.45	$ 822,577.32	$ 1,002,954.89	$ 1,016,996.26	$ 1,031,234.21	$ 1,045,671.49	$ 1,060,310.89	$ 1,075,155.24	$ 1,090,207.42	$ 1,105,470.32	$ 1,120,946.90	$ 1,136,640.16	$ 1,152,553.12	$ 1,168,688.87	$ 1,185,050.51	$ 1,201,641.22	$ 1,218,464.19	$ 1,235,522.69	$ 1,252,820.01	$ 1,270,359.49
casual (20% of benefit)	$ 336.19	Savings x Affected Casual Users x 30%=		$ 2,420,460.20	$ 3,598,923.77	$ 4,840,920.39	$ 4,908,693.28	$ 4,977,414.98	$ 5,047,098.79	$ 5,117,758.18	$ 5,189,406.79	$ 5,262,058.49	$ 5,335,727.31	$ 5,410,427.49	$ 5,486,173.47	$ 5,562,979.90	$ 5,640,861.62	$ 5,719,833.68	$ 5,799,911.35	$ 5,881,110.11	$ 5,963,445.65	$ 6,046,933.89	$ 6,131,590.97
Total				$ 2,921,937.64	$ 4,421,501.09	$ 5,843,875.29	$ 5,925,689.54	$ 6,008,649.19	$ 6,092,770.28	$ 6,178,069.07	$ 6,264,562.03	$ 6,352,265.90	$ 6,441,197.82	$ 6,531,374.39	$ 6,622,813.63	$ 6,715,533.02	$ 6,809,550.49	$ 6,904,884.19	$ 7,001,552.57	$ 7,099,574.31	$ 7,198,968.35	$ 7,299,753.90	$ 7,401,952.46

VMT	Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
% of Trips Diverted from Single Occupancy Vehicles (Personal Car + Taxi + Carsharing)	32%	*derived from Capital Bikeshare mode shift data																					
VMT Reduction (miles)	% Trips Diverted x Trips x Average Trip Length=			204,676	307,014	520,014	527,294	534,677	542,162	549,752	557,449	565,253	573,167	581,191	589,328	597,578	605,944	614,428	623,030	631,752	640,596	649,565	658,659
Emissions Reduction (pounds)	= VMT Reduction x Pounds Per Mile																						
Hydrocarbons				614	921	1,559	1,581	1,603	1,626	1,648	1,671	1,695	1,719	1,743	1,767	1,792	1,817	1,842	1,868	1,894	1,921	1,948	1,975
Particulate Matter				5	7	12	12	12	12	12	12	13	13	13	13	14	14	14	14	14	14	14	15
Nitrous Oxides				429	643	1,089	1,104	1,120	1,135	1,151	1,168	1,184	1,200	1,217	1,234	1,252	1,269	1,287	1,305	1,323	1,342	1,360	1,379
Carbon Monoxide				5,595	8,393	14,216	14,415	14,617	14,821	15,029	15,239	15,453	15,669	15,888	16,111	16,336	16,565	16,797	17,032	17,270	17,512	17,757	18,006
Carbon Dioxide				166,505	249,758	423,035	428,957	434,962	441,052	447,227	453,488	459,837	466,274	472,802	479,421	486,133	492,939	499,840	506,838	513,934	521,129	528,425	535,823
Emissions Reduction ($ Benefit)	= Pounds Reduction x Savings Per Pound																						
Hydrocarbons				$ 556	$ 834	$ 1,413	$ 1,433	$ 1,453	$ 1,474	$ 1,494	$ 1,515	$ 1,536	$ 1,558	$ 1,580	$ 1,602	$ 1,624	$ 1,647	$ 1,670	$ 1,693	$ 1,717	$ 1,741	$ 1,765	$ 1,790
Particulate Matter				$ 745	$ 1,117	$ 1,893	$ 1,919	$ 1,946	$ 1,973	$ 2,001	$ 2,029	$ 2,057	$ 2,086	$ 2,115	$ 2,145	$ 2,175	$ 2,206	$ 2,236	$ 2,268	$ 2,300	$ 2,332	$ 2,364	$ 2,397
Nitrous Oxides				$ 1,532	$ 2,298	$ 3,892	$ 3,945	$ 4,002	$ 4,058	$ 4,115	$ 4,172	$ 4,231	$ 4,290	$ 4,350	$ 4,411	$ 4,472	$ 4,535	$ 4,599	$ 4,663	$ 4,728	$ 4,794	$ 4,862	$ 4,930
Carbon Dioxide				$ 4,747	$ 7,261	$ 12,298	$ 12,950	$ 13,374	$ 13,808	$ 14,251	$ 14,704	$ 15,424	$ 15,901	$ 16,388	$ 16,885	$ 17,122	$ 17,913	$ 18,443	$ 18,984	$ 19,537	$ 20,102	$ 20,974	$ 21,568
Total				$ 7,580	$ 11,510	$ 19,496	$ 20,249	$ 20,775	$ 21,313	$ 21,861	$ 22,421	$ 23,249	$ 23,835	$ 24,433	$ 25,043	$ 25,393	$ 26,300	$ 26,948	$ 27,608	$ 28,282	$ 28,969	$ 29,966	$ 30,685
Crash Reduction	VMT Reduction x Cost of Crashes Per Mile=			$ 75,730	$ 113,595	$ 192,405	$ 195,099	$ 197,830	$ 200,600	$ 203,408	$ 206,256	$ 209,144	$ 212,072	$ 215,041	$ 218,051	$ 221,104	$ 224,199	$ 227,338	$ 230,521	$ 233,748	$ 237,021	$ 240,339	$ 243,704
Maintenance Savings	VMT Reduction x Cost of Maintenance Per Mile=			$ 35,409	$ 53,113	$ 89,962	$ 91,222	$ 92,499	$ 93,794	$ 95,107	$ 96,439	$ 97,789	$ 99,158	$ 100,546	$ 101,954	$ 103,381	$ 104,828	$ 106,296	$ 107,784	$ 109,293	$ 110,823	$ 112,375	$ 113,948
Congestion Reduction Savings	VMT Reduction x Cost of Congestion Per Mile Travelled=			$ 25,994	$ 38,991	$ 66,042	$ 66,966	$ 67,904	$ 68,855	$ 69,819	$ 70,796	$ 71,787	$ 72,792	$ 73,811	$ 74,845	$ 75,892	$ 76,955	$ 78,032	$ 79,125	$ 80,232	$ 81,356	$ 82,495	$ 83,650

Household Travel Cost Savings	=Trips Diverted x Cost Per Trip	Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Bus & Streetcar					$ 120,988	$ 181,492	$ 307,391	$ 311,694	$ 316,058	$ 320,483	$ 324,969	$ 329,519	$ 334,132	$ 338,810	$ 343,553	$ 348,363	$ 353,240	$ 358,186	$ 363,200	$ 368,285	$ 373,441	$ 378,669	$ 383,970	$ 389,346
Light Rail					$ 159,183	$ 238,775	$ 404,432	$ 410,094	$ 415,835	$ 421,657	$ 427,560	$ 433,546	$ 439,615	$ 445,770	$ 452,011	$ 458,339	$ 464,756	$ 471,262	$ 477,860	$ 484,550	$ 491,334	$ 498,212	$ 505,187	$ 512,260
Carsharing					$ 672,378	$ 1,008,568	$ 1,708,292	$ 1,732,208	$ 1,756,459	$ 1,781,049	$ 1,805,984	$ 1,831,268	$ 1,856,905	$ 1,882,902	$ 1,909,263	$ 1,935,992	$ 1,963,096	$ 1,990,580	$ 2,018,448	$ 2,046,706	$ 2,075,360	$ 2,104,415	$ 2,133,877	$ 2,163,751
Taxi					$ 184,472	$ 276,708	$ 468,662	$ 475,243	$ 481,897	$ 488,643	$ 495,484	$ 502,421	$ 509,455	$ 516,587	$ 523,820	$ 531,153	$ 538,589	$ 546,130	$ 553,775	$ 561,528	$ 569,390	$ 577,361	$ 585,444	$ 593,640
Personal Car					$ 76,717	$ 115,076	$ 194,914	$ 197,649	$ 200,409	$ 203,215	$ 206,056	$ 208,945	$ 211,870	$ 214,836	$ 217,844	$ 220,894	$ 223,986	$ 227,123	$ 230,304	$ 233,526	$ 236,790	$ 240,111	$ 243,474	$ 246,881
Total					$ 1,213,739	$ 1,820,608	$ 3,083,710	$ 3,126,881	$ 3,170,658	$ 3,215,047	$ 3,260,058	$ 3,305,698	$ 3,351,978	$ 3,398,906	$ 3,446,491	$ 3,494,742	$ 3,543,668	$ 3,593,279	$ 3,643,585	$ 3,694,595	$ 3,746,320	$ 3,798,768	$ 3,851,951	$ 3,905,878

Travel Time Savings	=Trips Diverted x (Bikeshare Travel Time - Mode Travel Time)	Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	Average Travel Time in Minutes (over Weighted Average Trip Distance)	Weighted Alternative Mode																						
Weighted Average Bikeshare Travel Time	16.21																							
Walk	46.15	22%			$ 423,474	$ 635,211	$ 1,075,908	$ 1,090,971	$ 1,106,244	$ 1,121,732	$ 1,137,436	$ 1,153,360	$ 1,169,507	$ 1,185,880	$ 1,202,482	$ 1,219,317	$ 1,236,388	$ 1,253,697	$ 1,271,249	$ 1,289,046	$ 1,307,093	$ 1,325,392	$ 1,343,948	$ 1,362,763
Personal Bike	18.43	10%			$ 14,164	$ 21,247	$ 35,987	$ 36,491	$ 37,002	$ 37,520	$ 38,045	$ 38,578	$ 39,118	$ 39,665	$ 40,221	$ 40,784	$ 41,355	$ 41,934	$ 42,521	$ 43,116	$ 43,720	$ 44,332	$ 44,953	$ 45,582
Bus & Streetcar	12.15	15%			$ (68,663)	$ (57,994)	$ (98,229)	$ (99,604)	$ (100,995)	$ (102,413)	$ (103,847)	$ (105,301)	$ (106,775)	$ (108,270)	$ (109,785)	$ (111,321)	$ (112,881)	$ (114,461)	$ (116,064)	$ (117,689)	$ (119,338)	$ (121,007)	$ (122,701)	$ (124,419)
Light Rail	7.04	19%			$ (115,001)	$ (172,501)	$ (292,179)	$ (296,270)	$ (300,417)	$ (304,623)	$ (308,888)	$ (313,212)	$ (317,597)	$ (322,044)	$ (326,552)	$ (331,124)	$ (335,760)	$ (340,460)	$ (345,227)	$ (350,060)	$ (354,961)	$ (359,930)	$ (364,969)	$ (370,079)
Carsharing	7.94	18%			$ (96,338)	$ (144,506)	$ (244,762)	$ (248,188)	$ (251,663)	$ (255,186)	$ (258,759)	$ (262,382)	$ (266,055)	$ (269,780)	$ (273,557)	$ (277,386)	$ (281,270)	$ (285,208)	$ (289,201)	$ (293,249)	$ (297,355)	$ (301,518)	$ (305,739)	$ (310,019)
Taxi	5.94	7%			$ (46,787)	$ (70,181)	$ (118,871)	$ (120,535)	$ (122,222)	$ (123,934)	$ (125,669)	$ (127,428)	$ (129,212)	$ (131,021)	$ (132,855)	$ (134,715)	$ (136,601)	$ (138,514)	$ (140,453)	$ (142,419)	$ (144,413)	$ (146,435)	$ (148,485)	$ (150,564)
Personal Car	7.94	8%			$ (40,948)	$ (60,822)	$ (103,019)	$ (104,461)	$ (105,924)	$ (107,407)	$ (108,911)	$ (110,435)	$ (111,981)	$ (113,549)	$ (115,139)	$ (116,751)	$ (118,385)	$ (120,043)	$ (121,723)	$ (123,427)	$ (125,155)	$ (126,907)	$ (128,684)	$ (130,486)
Total					$ 100,902	$ 150,453	$ 254,835	$ 258,403	$ 262,020	$ 265,689	$ 269,408	$ 273,180	$ 277,004	$ 280,883	$ 284,815	$ 288,802	$ 292,846	$ 296,945	$ 301,103	$ 305,318	$ 309,592	$ 313,927	$ 318,322	$ 322,778

Project Costs

Annual Costs																							
Project Cost 2015 Constant Nominal $		$ 3,640,000.00	$ 3,640,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Maintenance Cost 2015 Constant Nominal $		$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00	$ 5,449,500.00
Discounted Costs		$ 3,086,574	$ 4,636,332	$ 1,960,233	$ 1,903,139	$ 1,847,708	$ 1,793,891	$ 1,741,642	$ 1,690,915	$ 1,641,665	$ 1,593,849	$ 1,547,426	$ 1,502,356	$ 1,458,598	$ 1,416,114	$ 1,374,868	$ 1,334,824	$ 1,295,945	$ 1,258,199	$ 1,221,553	$ 1,185,973	$ 1,151,431

BENEFIT COST ANALYSIS
TIGER FY 2015: NORTHGATE NON-MOTORIZED ACCESS TO TRANSIT AND EDUCATION

BCA Ratio:	**3.21**
Net Discounted Benefits:	**$ 158,337,662**

Summary of Results		
Discounted Benefits		**Total**
Health Savings	$	93,528,246
Emissions Reduction	$	2,223,728
Vehicle Crash Reduction	$	16,685,918
Maintenance Savings	$	7,817,621
Congestion Reduction Savings	$	5,733,826
Travel Cost Savings	$	74,655,843
Travel Time Reduction Savings	$	29,349,715
Total Benefits:	**$**	**229,994,898**
Discounted Costs		
Capital	$	39,929,866
Maintenance & Operation	$	31,727,370
Total Costs:	**$**	**71,657,236**

Net Discounted Benefits - Costs	$	158,337,662
BCA Ratio		3.21
Discount Rate		3%

City of Seattle
Edward B. Murray, Mayor

Department of Transportation
Scott Kubly, Director

CERTIFICATION OF COMPLIANCE WITH FEDERAL WAGE RATE REQUIREMENTS

I certify that the Seattle Department of Transportation will comply with the federal wage rate requirements of subchapter IV of chapter 31, title 40 of the United States Code, as required by the FY 2015 Continuing Appropriations Act.

Sincerely,

Scott Kubly
Director, Seattle Department of Transportation

Seattle Municipal Tower
700 5th Avenue
Suite 3800
PO Box 34996
Seattle, Washington 98124-4996

Tel (206) 684-ROAD / (206) 684-5000
Fax: (206) 684-5180
Hearing Impaired use the Washington Relay Service (7-1-1)
www.seattle.gov/transportation

Appendix C

PROJECT PERFORMANCE EVALUATION

SDOT will collect and analyze a variety of data sets to measure its progress in meeting the stated benefits of the project. These data will also be used to optimize operations of the facilities, and to inform decisions about future bike share expansions or proposed infrastructure projects that could complement the TIGER-funded improvements.

Northgate Pedestrian-Bicycle Bridge and Supporting Infrastructure

- Vehicular traffic counts on all arterial roadways within Northgate
- Pedestrian and bicycle counts on key corridors within Northgate (including N. 92nd St. east of Corliss Ave. N., and on N. Northgate Way at the underpass under I-5)
- Link Light Rail boardings and alightings at Northgate Station and other stations
- Employee travel behavior for large Northgate employers, provided under the Washington State Commute Trip Reduction (CTR) Act

Citywide Bike Share

- Total trips per year
- Average trips per day
- Total bike miles ridden per year
- VMT eliminated per year
- Trips by station
- Total number of annual members and casual members
- Number of low-income and student users receiving reduced-rate memberships

Data will be collected in advance of the project to create a baseline, and then on an annual basis following completion of the project to evaluate project performance. All pedestrian and bicycle counts will be collected and evaluated in accordance with the National Bicycle & Pedestrian Documentation Project (NBPDP) methodology.

MOTION NO. M2015-26

Northgate Pedestrian/Bicycle Bridge Project - Sound Transit Funding Extension

MEETING:	DATE:	TYPE OF ACTION:	STAFF CONTACT:
Capital Committee	03/12/2015	Recommend to Board	Ahmad Fazel, DECM Executive Director
Board	03/26/2015	Final Action	**Ron Endlich, Northgate Link Deputy Project Director**

PROPOSED ACTION

Authorizes the chief executive officer to extend the date of the Northgate Link Extension $5 million funding commitment for the Interstate-5 pedestrian/bicycle bridge at Northgate to February 1, 2016.

KEY FEATURES SUMMARY

- In June 2012, the Board approved Motion No. M2012-42 authorizing a Northgate access improvement study and outlining funding contributions to Northgate pedestrian and bicycle access improvements, including a contribution of up to $5 million towards an Interstate-5 pedestrian/bicycle bridge that would connect with the Northgate light rail station.
- Motion No. M2012-42 established a deadline of July 2015 for the City of Seattle to complete a full funding agreement to secure the remaining funds needed to complete the Northgate I-5 pedestrian/bicycle bridge project. This action would extend the deadline to February 1, 2016, allowing the City more time to complete additional design and environment review work and identify additional funding sources to implement the project.
- Sound Transit has now designed the Northgate Station mezzanine level to accommodate a future bridge connection to the elevated station structure. The I-5 pedestrian/bicycle bridge project must advance its design work and construction sequence planning further to facilitate continued coordination with Sound Transit and other stakeholders' facilities or planned projects and to take advantage of potential cost reductions and avoid construction delays. The City of Seattle also must complete environmental review for the bridge project before Sound Transit can transfer funding to the City to construct the project.
- If a full funding agreement is not in place by February 1, 2016, Sound Transit's $5 million contribution towards the bridge project would be re-programmed for other City priority pedestrian or bicycle facility access improvements in the Northgate area so that they could be completed before the Northgate Station opens in 2021.
- Other commitments contained in Motion No. M2012-42 remain in effect.

BACKGROUND

In June 2012, the Sound Transit Board approved Motion No. M2012-42 which committed $5 million towards the cost of the I-5 pedestrian/bicycle bridge and $5 million towards other priority pedestrian and bicycle access improvements in the Northgate area as part of a larger integrated Northgate Station access plan. Sound Transit's funding commitment was contingent on matching funds from the City of Seattle. The motion also stated that the City must complete appropriate environmental review for the proposed pedestrian and bicycle access improvements and must have full funding agreements in place for the bridge project by July 2015. Under the motion, Sound Transit costs associated with designing and constructing the Northgate Station to accommodate a connection for the I-5 pedestrian/bicycle bridge will be credited against this contribution; Sound Transit would reallocate any unspent bridge funds to other priority pedestrian/bicycle projects identified in the Northgate area if a funding agreement for the implementation of the I-5 pedestrian/bicycle bridge wasn't completed by July 2015.

The City's matching funding commitment was contained in Resolution 31389, adopted by the Seattle City Council on June 25, 2012.

In April 2014, the City submitted a United States Department of Transportation TIGER grant application request for $15 million to complete construction of the I-5 pedestrian/bicycle bridge. Sound Transit supported the City's grant request and Sound Transit funds were identified by the City as part of the local match needed to secure the grant. Nationwide, TIGER grant funding is very competitive with many agencies seeking limited grant funds. Unfortunately the I-5 pedestrian/bicycle project TIGER grant application was not approved by USDOT.

The Seattle Department of Transportation (SDOT) has retained a design consultant team and is proceeding with conceptual design work for the I-5 pedestrian/bicycle bridge. Early design coordination work has begun and environmental documentation work is also proceeding. Further design work and coordination is needed to ensure that the I-5 pedestrian/bicycle bridge is fully compatible with planned projects in the vicinity of the proposed bridge crossing at NE 100th Street, including the Northgate Station, Sound Transit construction staging areas, and replacement parking mitigation sites. Opportunities to coordinate the construction of bridge support structures or other improvements--which may reduce total project costs--can also be further explored.

The design of Sound Transit's Northgate Station and elevated guideway project is currently 90% complete and will be at 100% design completion by December 2015. Sound Transit has submitted master use permit (MUP) and street improvement permit (SIP) applications to the City for Northgate Station site work and they are currently under review. The station construction contractor will begin work in early 2016. Any desired modifications to further accommodate I-5 pedestrian/bicycle bridge project facilities must be identified and coordinated in 2015 to avoid Sound Transit project delays or higher cost change orders after station construction is underway.

In December 2014, the Sound Transit Board received a letter from four local elected officials (including two Sound Transit Boardmembers) and three state legislators requesting that the Sound Transit Board consider extending the funding deadline to allow additional time to secure the remaining funding needed to complete the bridge project. This motion responds to this request and identifies desirable design and construction coordination steps needed to ensure the cost-effective delivery of Sound Transit's Northgate Station project and the City of Seattle's I-5 pedestrian/bicycle bridge project.

This extension would allow the City of Seattle additional time to:

a) complete I-5 bridge preliminary engineering and environmental review work;
b) complete additional design coordination and construction planning work with Sound Transit and other affected stakeholders; and
c) secure a full funding agreement to complete the design and construction of the I-5 bridge at Northgate.

Sound Transit's $5 million bridge funding contribution would be reallocated to other priority pedestrian or bicycle access improvement projects in the Northgate area if the City of Seattle is unable to secure a full funding agreement or complete design coordination and environmental review work, as needed, by February 1, 2016.

FISCAL INFORMATION

Not applicable to this action.

SMALL BUSINESS/DBE PARTICIPATION AND APPRENTICESHIP UTILIZATION

Not applicable to this action.

PUBLIC INVOLVEMENT

The City of Seattle is responsible for public involvement for the I-5 pedestrian/bicycle bridge project.

Many members of the public attending previous Sound Transit open house meetings on Northgate Station design have expressed support for implementing the bridge project and supported a direct connection of the bridge to the mezzanine of the Northgate Station, as currently designed by Sound Transit.

TIME CONSTRAINTS

A one month delay in considering this action would not create a significant impact to the City of Seattle's I-5 pedestrian/bicycle bridge project schedule.

PRIOR BOARD/COMMITTEE ACTIONS

Motion No. M2012-42: Authorized the chief executive officer to complete a Northgate access improvement study to identify potential additional pedestrian and bicycle access improvements to enhance access to the current Northgate Transit Center and future Northgate Station inter-modal transit facility as part of the Northgate Link Extension Project. The Northgate access improvement study would include:

a) A two-step study process that will include a connectivity analysis followed by an access study to identify and prioritize specific improvements that could be funded by Sound Transit in partnership with the City of Seattle, King County Metro, and other local, state, and federal sources.
b) Sound Transit's funding contribution for proposed Northgate pedestrian and bicycle access improvements would be capped at $10 million, which includes credits for current Project commitments as included in the baselined Northgate Link Extension Project budget; and
c) Before Sound Transit dollars will be authorized towards the improvements, the City of Seattle must match Sound Transit's $10 million funding contribution, must complete appropriate environmental review for the proposed pedestrian and bicycle access improvements, and must have full funding partnership agreements in place to complete the improvements by 2021.

ENVIRONMENTAL REVIEW

JI 3/4/2015

LEGAL REVIEW

JB 3/5/2015

SOUNDTRANSIT

MOTION NO. M2015-26

A motion of the Board of the Central Puget Sound Regional Transit Authority authorizing the chief executive officer to extend the date of the Northgate Link Extension $5 million funding commitment for the Interstate-5 pedestrian/bicycle bridge at Northgate to February 1, 2016.

BACKGROUND:

In June 2012, the Sound Transit Board approved Motion No. M2012-42 which committed $5 million towards the cost of the I-5 pedestrian/bicycle bridge and $5 million towards other priority pedestrian and bicycle access improvements in the Northgate area as part of a larger integrated Northgate Station access plan. Sound Transit's funding commitment was contingent on matching funds from the City of Seattle. The motion also stated that the City must complete appropriate environmental review for the proposed pedestrian and bicycle access improvements and must have full funding agreements in place for the bridge project by July 2015. Under the motion, Sound Transit costs associated with designing and constructing the Northgate Station to accommodate a connection for the I-5 pedestrian/bicycle bridge will be credited against this contribution. Sound Transit would reallocate any unspent bridge funds to other priority pedestrian/bicycle projects identified in the Northgate area if a funding agreement for the implementation of the I-5 pedestrian/bicycle bridge wasn't completed by July 2015.

The City's matching funding commitment was contained in Resolution 31389, adopted by the Seattle City Council on June 25, 2012.

In April 2014, the City submitted a United States Department of Transportation TIGER grant application request for $15 million to complete construction of the I-5 pedestrian/bicycle bridge. Sound Transit supported the City's grant request and Sound Transit funds were identified by the City as part of the local match needed to secure the grant. Nationwide, TIGER grant funding is very competitive with many agencies seeking limited grant funds. Unfortunately the I-5 pedestrian/bicycle project TIGER grant application was not approved by USDOT.

The Seattle Department of Transportation (SDOT) has retained a design consultant team and is proceeding with conceptual design work for the I-5 pedestrian/bicycle bridge. Early design coordination work has begun and environmental documentation work is also proceeding. Further design work and coordination is needed to ensure that the I-5 pedestrian/bicycle bridge is fully compatible with planned projects in the vicinity of the proposed bridge crossing at NE 100th Street, including the Northgate Station, Sound Transit construction staging areas, and replacement parking mitigation sites. Opportunities to coordinate the construction of bridge support structures or other improvements--which may reduce total project costs--can also be further explored.

The design of Sound Transit's Northgate Station and elevated guideway project is currently 90% complete and will be at 100% design completion by December 2015. Sound Transit has submitted master use permit (MUP) and street improvement permit (SIP) applications to the City for Northgate Station site work and they are currently under review. The station construction contractor will begin work in early 2016. Any desired modifications to further accommodate I-5 pedestrian/bicycle bridge project facilities must be identified and coordinated in 2015 to avoid Sound Transit project delays or higher cost change orders after station construction is underway.

In December 2014, the Sound Transit Board received a letter from four local elected officials (including two Sound Transit Boardmembers) and three state legislators requesting that the Sound

Transit Board consider extending the funding deadline to allow additional time to secure the remaining funding needed to complete the bridge project. This motion responds to this request and identifies desirable design and construction coordination steps needed to ensure the cost-effective delivery of Sound Transit's Northgate Station project and the City of Seattle's I-5 pedestrian/bicycle bridge project.

This extension would allow the City of Seattle additional time to:

a) complete I-5 bridge preliminary engineering and environmental review work;
b) complete additional design coordination and construction planning work with Sound Transit and other affected stakeholders; and
c) secure a full funding agreement to complete the design and construction of the I-5 bridge at Northgate.

Sound Transit's $5 million bridge funding contribution would be reallocated to other priority pedestrian or bicycle access improvement projects in the Northgate area if the City of Seattle is unable to secure a full funding agreement or complete design coordination and environmental review work, as needed, by February 1, 2016. Other commitments contained in Motion No. M2012-42 remain in effect.

MOTION:

It is hereby moved by the Board of the Central Puget Sound Regional Transit Authority that the chief executive officer is authorized to extend the date of the Northgate Link Extension $5 million funding commitment for the Interstate-5 pedestrian/bicycle bridge at Northgate to February 1, 2016.

APPROVED by the Board of the Central Puget Sound Regional Transit Authority at a regular meeting thereof held on March 26, 2015.

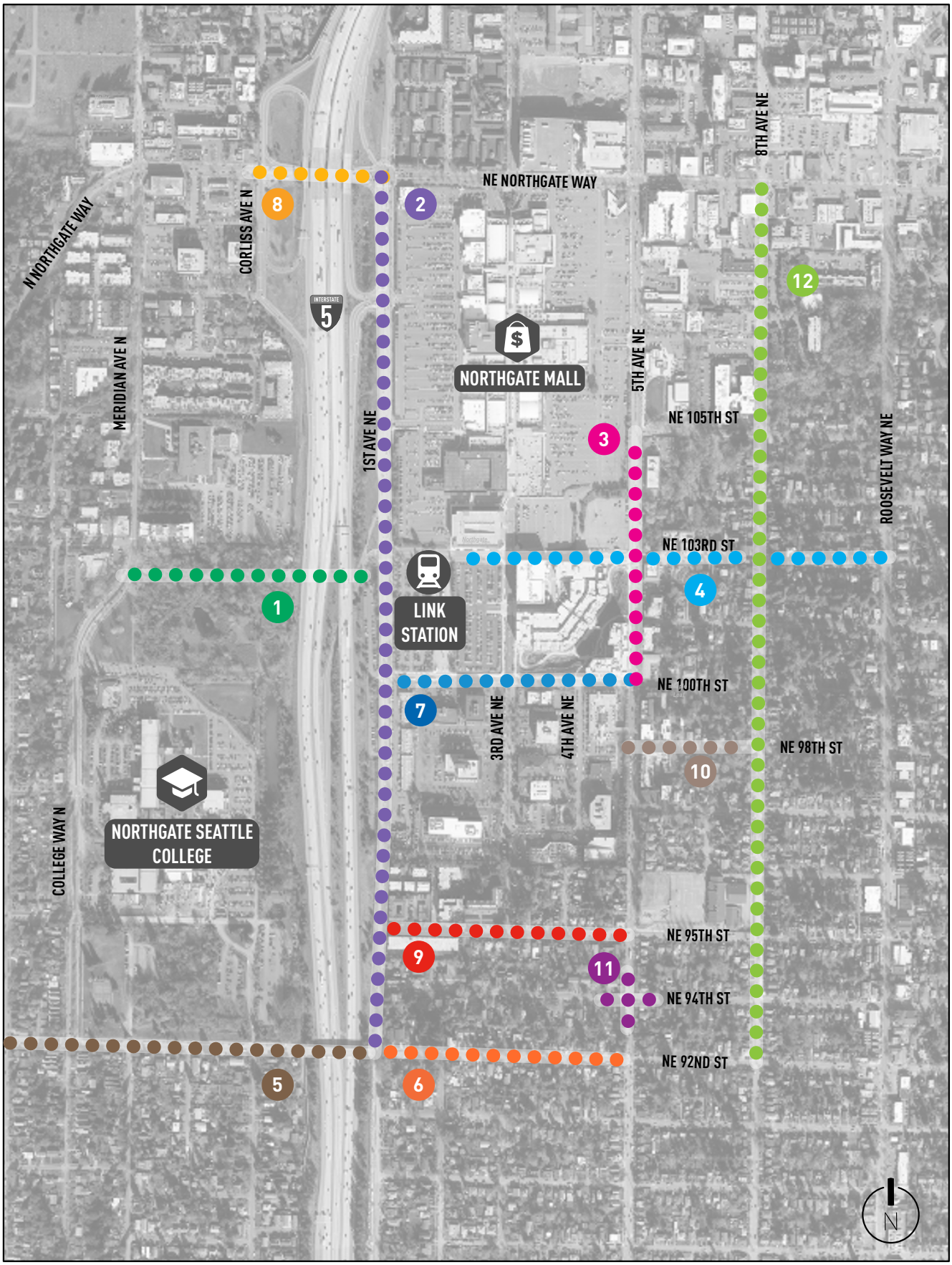
Dow Constantine
Board Chair

ATTEST:

Kathryn Flores
Acting Board Administrator

Appendix E

NORTHGATE STATION AREA IMPROVEMENTS



Design initiated in 2013

1. I-5 bicycle and pedestrian bridge
2. 1st Ave NE cycle track (92nd to 103rd) and shared use path (103rd to Northgate Way)

Design anticipated to start in 2015 (a project manager from the Project Management Division has just assigned to these pr
ects the week of May 11, 2015)

3. Sidewalk upgrades 5th Ave (100th to 105th)
4. Sidewalk improvements Ne 103rd (3rd to Roosevelt)
5. Cycle track 92nd (Wallingford to 1st Ave)
6. Sidewalk 92nd (1st to 5th)
7. Cycle track 100th (1st to 5th)

Design anticipated to start in 2016

8. Sidewalk and bicycle improvements Northgate Way/Corliss and 1st
9. Sidewalk 95th (1st to 5th)
10. Sidewalk 98th (5th to 8th)
11. Crossing improvements 5th Ave/94th
12. Pedestrian improvements along 8th Ave (92nd to Northgate Way)

Appendix F

CHANGES FROM PRE-APPLICATION

Since submittal of the TIGER pre-application, Seattle has reviewed its funding plan to validate cost estimates for all components of the project and also to ensure the eligibility and security of all proposed matching funds. This financial review led to minor modifications in the project budget, as shown below:

Current Funding Plan (as shown in final application)

	Seattle Funds	Sound Transit Funds	Private Funds	Other Federal Funds	TIGER Funds	Total Cost
Northgate Bridge	$5,000,000	$5,000,000	$0	$600,000	$15,000,000	$25,600,000
Northgate Station Access*	$5,000,000	$5,000,000	$0	$718,000	$0	$10,718,000
Bike Share System Expansion	$75,000	$0	$0	$0	$10,000,000	$10,075,000
Bike Share Bike Purchase	$5,125,000	$0	$3,000,000	$0	$0	$8,125,000
Total	$15,200,000	$10,000,000	$3,000,000	$1,318,000	$25,000,000	$54,518,000

Previous Funding Plan (as shown in pre-application)

	TIGER Request	Total Federal Funding	Total Non-federal Funding	Total Project Cost
Summary of All Costs	$25,000,000	$25,000,000	$23,000,000	$48,000,000

City of Seattle

Ed Murray
Mayor

Tim Burges
Council President

May 26, 2015

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

RE: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

The City of Seattle, along with its partners Sound Transit and King County Metro, hereby submit the accompanying request for a FY 2015 US DOT TIGER grant in the amount of $25 million. This funding would complete construction of the Northgate Non-Motorized Bridge over I-5, along with other important elements of the Northgate non-motorized network, and fund a major expansion of Seattle's bike share network from 50 to approximately 250 stations. The proposed project will provide essential first- and last-mile access to jobs and education for people of all ages and abilities.

This project is a direct result of our region's participation in the joint DOT/HUD/EPA Sustainable Communities program. Under that program, the Puget Sound region received a HUD Regional Planning Grant for its Growing Transit Communities planning effort which, in part, funded a broad community engagement identifying several priorities for transforming this regional employment and residential growth center into a sustainable, transit –oriented community. The Northgate neighborhood is anchored by a major redevelopment of the King County Northgate Transit Center, an interim end point for Sound Transit's extension of light rail from the University of Washington north to Snohomish County. TIGER funding would extend the reach of regional light rail investments for people walking and biking, giving them more access to the Sound Transit system and regional bus connections.

Today, the Northgate area is one of the Puget Sound region's major residential and employment centers with 3,600 households and over 11,000 jobs. It is one of Seattle's most affordable communities and has attracted a higher proportion of economically disadvantaged populations than the City as a whole. Ten lanes of I-5 bisect the neighborhood, creating barriers between homes, jobs, schools, transit stops and vital community services. There are only two crossing of I-5 within the urban center, making it difficult to impossible for many people within the standard light rail station area walkshed/bikeshed to reach without a car or bus transfer.

While slated for significant growth as part of both Seattle's Comprehensive Plan and the Puget Sound Regional Council's Vision 2040 plan, growth in Northgate has lagged behind most other designated growth centers due to this auto-oriented built environment. The proposed project greatly expands access to North Seattle College, which is home to Washington State's Opportunity Center for Employment and Education, an innovative pilot combining various state human services, including employment and social services as well as educational services at one location.

Non-motorized access is an important rung on the ladder of opportunity, providing a low-cost, healthy means of transportation for all ages that also builds a sustainable community. As a result, this TIGER

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request also includes an equitable expansion of the bike share system to additional City neighborhoods to provide non-motorized connections between areas of low- and high-opportunity throughout the community. The expanded bike share system will be focused around the light rail line, including Northgate, and bus rapid transit lines. It will also feature electric-assist bikes to allow people of different abilities to gain the benefits of active transportation, and will pursue integration with ORCA, the regional public transportation fare system.

Seattle is committed to completing this package of improvements. The proposed TIGER FY 2015 grant would provide the remaining funds needed, leveraging significant amounts of public and private investment in the regional transit system, workforce development and sustainable infrastructure. It will make it safer and easier for residents, employees and students to get between employment centers, educational institutions, medical facilities, shopping, parks and open space. We hope the U.S. Department of Transportation will consider this request in light of the opportunities these improvements would provide in allowing the City of Seattle and the Puget Sound region to meet our shared vision for a transit-oriented sustainable community.

Sincerely,

Mayor Ed Murray

Council President Tim Burgess

Councilmember Sally Bagshaw

Councilmember John Okamoto

Councilmember Kshama Sawant

Councilmember Jean Godden

Councilmember Bruce Harrell

Councilmember Nick Licata

Councilmember Mike O'Brien

Councilmember Tom Rasmussen

cc: Senator Patty Murray
Senator Maria Cantwell
Congressman Jim McDermott
Governor Jay Inslee

SOUNDTRANSIT

May 29, 2015

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER Application

Dear Secretary Foxx:

Sound Transit is pleased to support a TIGER grant application for the Northgate Non-Motorized Access to Transit and Education Project, including the Northgate Pedestrian and Bicycle Bridge and an expansion of Seattle's bicycle share network.

Approximately 15,000 daily riders will board Link light rail at Northgate Station by 2030 and Sound Transit is committed to providing easy, safe access to the Northgate Station for riders arriving by all modes. That commitment includes contributing $10 million towards pedestrian and bicycle improvements that will connect with the Northgate Link light rail station (per Sound Transit Board Motions - M2012-42 & M2015-26).

The need for this project has been identified in a number of local and regional plans including the Northgate Coordinated Transportation Investment Plan and Seattle's Bicycle Master Plan as a priority facility improvement. Strong community support has been demonstrated through the Puget Sound Regional Council's Growing Transit Communities effort and the project is also identified as a key connection within the Regional Bicycle Network.

The pedestrian and bicycle bridge will provide a safe, convenient and direct connection to Sound Transit's Northgate Link Station from destinations on the west and east side of I-5. With its direct connection to the Northgate Link station, the Northgate Pedestrian and Bicycle Bridge will also provide safe and easy access to regional light rail service for a much greater proportion of North Seattle residents.

CHAIR
Dow Constantine
King County Executive

VICE CHAIRS
Paul Roberts
Everett Councilmember

Marilyn Strickland
Tacoma Mayor

BOARD MEMBERS
Claudia Balducci
Bellevue Mayor

Fred Butler
Issaquah Mayor

Dave Earling
Edmonds Mayor

Dave Enslow
Sumner Mayor

John Lovick
Snohomish County Executive

John Marchione
Redmond Mayor

Pat McCarthy
Pierce County Executive

Joe McDermott
King County Council Vice Chair

Mary Moss
Lakewood Councilmember

Ed Murray
Seattle Mayor

Mike O'Brien
Seattle Councilmember

Lynn Peterson
Washington State Secretary of Transportation

Larry Phillips
King County Council Chair

Dave Upthegrove
King County Councilmember

Peter von Reichbauer
King County Councilmember

CHIEF EXECUTIVE OFFICER
Joni Earl

Central Puget Sound Regional Transit Authority • Union Station
401 S. Jackson St., Seattle, WA 98104-2826 • Reception: (206) 398-5000 • FAX: (206) 398-5499
www.soundtransit.org

Non-motorized access to regional light rail and high frequency bus service is also a recognized need for other areas of the City. The proposed expansion of bike share to other neighborhoods will provide critical first- and last-mile connections to leverage regional transit investments with a wide network of non-motorized travel opportunities. Bike share also provides an important low cost, healthy means of transport with beneficial environmental effects and supports the goal of creating more transit-oriented communities in the region.

A federal partnership on this critical regional project is essential to leverage needed resources to move the project forward. Sound Transit strongly supports the Northgate Non-Motorized Access to Transit and Education project and the benefits it provides for local and regional transit users.

Thank you for your consideration of the City of Seattle's TIGER application.

Sincerely,

Michael Harbour
Acting Chief Executive Officer

cc: The Honorable Patty Murray, United States Senate
The Honorable Maria Cantwell, United States Senate
The Honorable Jim McDermott , United States House of Representatives
Governor Jay Inslee, State of Washington
Mayor Edward B. Murray, City of Seattle



NORTH SEATTLE COLLEGE

One of the Seattle Colleges

June 1, 2015

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

North Seattle College (NSC) would like to voice its strong support for the $25,000,000 application by the City of Seattle for the Northgate Non-Motorized Access to Transit and Education application. The Transportation Investment Generating Economic Recover (TIGER), Discretionary Grant Program is a great opportunity for NSC, the City of Seattle, transit providers and area businesses to come together in support of a sustainable transportation system, workforce development and safer access to medical, educational and economic activities.

The connection to the light rail station and the expanding Seattle bike share will significantly improve student access to the NSC campus, including the Opportunity Center for Employment and Education (OCE&E), a national model for employment and support services. It would also improve patient and medical staff access to the neighboring University of Washington Medicine's Northwest Hospital & Medical Center, a full-service area health provider. Direct, convenient non-motorized connectivity provided by the proposed bike share system will greatly enhance the safety and affordability of the Northgate area for its many students, residents and employees.

On a community scale, the pedestrian/bicycle bridge will reunite two portions of the Northgate regional growth center whose neighborhoods have been disconnected from each other by Interstate 5. This project would create a vital connection to the Northgate Link Light Rail and Transit Center Station area, dramatically improving east-west accessibility and providing direct access to employment, cultural and retail opportunities for the entire Northgate center.

The innovative planning partnership between the City of Seattle and Sound Transit is exemplary of thoughtful collaborative investment and commitment to good transportation and land use planning. North Seattle College is proud to support this effort and be a partner in helping to achieve this vital transportation project.

Respectfully,

Warren J. Brown, Ed.D.
President

cc: Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Congressman Jim McDermott
Mayor Edward B. Murray, City of Seattle

Office of the President
9600 College Way North | Seattle, WA 98103-3599
(206) 934-3601 • Fax: (206) 934-3606
www.northseattle.edu

motivate
get going

June 1, 2015

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education Application

Dear Secretary Foxx:

On behalf of Motivate, the operator for the Seattle bike share system, I want to express our strong support for the City of Seattle's application for TIGER funding. Having operated the Seattle bike share system since its inception, we are thrilled by the City's initiative to dramatically expand the system. Seattle's Pronto bike share launched in 2014 and has 50 stations and 500 bicycles. We are proud of the system's success to date and are focused on the next task: seeing the system grow.

As demonstrated in cities across the United States, as the number of bikes and stations grow, trips and associated benefits increase tremendously. **Motivate plans to support the TIGER bike share expansion by investing $3M of private funding into the system.**

It is exciting that Seattle sees an expanded bike share system as both an important low-cost, healthy travel option and a better opportunity for people to access transit and education services throughout the City.

Growing Seattle's bike share system to upwards of 250 stations, incorporating electric bikes, and integrating it with the regional public transportation fare card will transform Seattle's young bike system into the thriving, sustainable transportation system that we have envisioned from the program's inception.

We hope you will grant this funding and help make Seattle's bike share vision a reality. Thank you for your consideration.

Sincerely,

Jay Walder
CEO

cc:
Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Mayor Edward B. Murray

5202 Third Avenue
Brooklyn NY 11220

motivateco.com

MARIA CANTWELL
WASHINGTON

COMMITTEES:
ENERGY AND NATURAL RESOURCES
COMMERCE, SCIENCE, AND TRANSPORTATION
FINANCE
INDIAN AFFAIRS
SMALL BUSINESS

United States Senate

WASHINGTON, DC 20510–4705

June 1, 2015

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

RE: City of Seattle, Northgate Non-Motorized Access to Transit and Education Project
FOA: Fiscal Year 2015 TIGER Discretionary Funding (TIGER VII)

Dear Secretary Foxx:

I strongly support the City of Seattle's application for funding under the TIGER VII grant program for the Northgate Non-Motorized Access to Transit and Education Project. Under this proposal, the city will engage in a significant expansion of their bike share program, construct a bicycle-pedestrian bridge over Interstate 5 in North Seattle, and provide additional safety improvements for non-motorized access to the Northgate Transit Center.

In October 2014, the city installed 50 bike share stations and 500 bikes in neighborhoods around Seattle, available for use 24 hours a day, as part of the Pronto bike share system. In the first two months of use, riders biked a total of 43,010 miles using Pronto. If awarded, funding for the City's Northgate project will support the installation of 250 bike stations including a significant number of stations in underserved neighborhoods, tripling access to bike share for city residents.

The construction of a bridge for pedestrians and bicyclists over Interstate-5 will provide a direct connection to the existing Northgate Transit Center for 14,000 students at North Seattle College and provide better access to the Opportunity Center for Employment and Education at the college. In addition, the bridge will leverage a Federal Transit Administration New Starts investment in the Northgate Link Light Rail Station when it opens in 2021.

Over the past 15 years, significant social and economic investment has taken place in the Northgate Urban Center, a Metropolitan Planning Organization-designated regional growth center. Northgate has remained one of Seattle's most affordable neighborhoods and is home to a higher proportion of economically disadvantaged populations than the city as a whole.

Improved multi-modal access to the transit center and the neighborhood of Northgate will significantly improve residents' access to regional job centers. I strongly support the City of Seattle's proposal as a key transit priority and I urge you to give their application full and fair consideration.

Sincerely,

Maria Cantwell
United States Senator

EVERETT
2930 Wetmore Avenue
Suite 9B
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Fax: (425) 303–8351

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Richland, WA 99352
(509) 946–8106
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Spokane, WA 99201
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Fax: (509) 353–2547

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Tacoma, WA 98402
(253) 572–2281
Fax: (253) 572–5879

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Marshall House
1313 Officers' Row
First Floor
Vancouver, WA 98661
(360) 696–7838
Fax: (360) 696–7844

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King County

Metropolitan King County Council
King County Courthouse
516 Third Avenue, Room 1200
Seattle, WA 98104-3272

206-296-1000 TTY 206-296-1024
Toll Free: 1-800-325-6165
www.kingcounty.gov/council

May 30, 2015

Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

RE: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

We support the City of Seattle's application for a United States Department of Transportation TIGER grant. This grant would help fund the Northgate Non-Motorized Access to Transit and Education project, including a bicycle and pedestrian bridge and bike share service that will connect the two Districts we represent on the King County Council.

Northwest companies like Amazon, Microsoft, and Boeing are thriving and expanding, bringing new faces to our region each day. In March 2014, the United States Census Bureau announced that King County was the fourth fastest growing large county in the country over the past three years, having added 37,000 new residents or a 1.8% population increase in 2013 alone. This population growth has exacerbated our region's transportation challenges. Today, our transit agencies are seeing near record levels of ridership, our roadways are congested, and our economy is being impacted from the delay in moving people and goods.

That is why the expansion of light rail north along Interstate 5 is such a pivotal project for our region. Our ongoing investments in transportation infrastructure help our region harness the potential that comes with the influx of new residents. But as our population continues to grow, providing access to transportation infrastructure that is quick, reliable, and attractive is vital. Without it, we risk isolating thousands of potential transit users and large swaths of our community.

The proposed Northgate pedestrian and bicycle bridge is a case in point. Residents on the east side of I-5 and those on the west will be able to safely access key community assets on each side of the interstate. These assets include a community center, library, Northwest Hospital & Medical Center, and the Northgate Mall. Without this vital bridge over I-5, most of these facilities will not be able to safely access the light rail station. The bridge combined with bike share will also provide access to regional rail service for a much larger portion of North Seattle. Non-motorized access to Northgate's many bus routes will be a more attractive option for the economically disadvantaged neighborhoods of Licton Springs, Bitter Lake and North Park.

The improvements would also greatly expand access to North Seattle College, with its two-year and four-year degree programs, over 50 certificate programs and over 14,000 students. The college, home to the Opportunity Center for Employment and Education, a one-stop shop for social, educational and employment services, could be reached in a reasonable time from much further away than at present, benefitting students, Center patrons and the region. Non-motorized access presents a low cost, healthy means of transport with beneficial environmental effects.

For these and many other reasons, we urge you and the Department of Transportation to support the City of Seattle's application for TIGER funds for the Northgate Non-Motorized Access to Transit and Education project.

Thank you for your consideration.

Sincerely,

Larry Phillips, Chair
King County Council, District Four

Rod Dembowski, Councilmember
King County Council, District One

King County

Dow Constantine
King County Executive
401 Fifth Avenue, Suite 800
Seattle, WA 98104-1818
206-263-9600 Fax 206-296-0194
TTY Relay: 711
www.kingcounty.gov

May 27, 2015

The Honorable Anthony Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Foxx:

I am writing in support of the City of Seattle's application to the U.S. Department of Transportation's 2015 TIGER Discretionary Grants Program to fund the Northgate Non-Motorized Access to Transit and Education Project, which includes a bicycle and pedestrian bridge crossing Interstate 5 (I-5), other safety improvements near the Northgate Transit Center, and a major expansion of Seattle's bike share network.

King County supports funding for this proposed project, which will provide a safer and more direct connection across Interstate 5 between the community west of the freeway and King County Metro's Northgate Transit Center, and the future Sound Transit Link Light Rail Station. It would also improve pedestrian and bicycle access between the North Seattle Community College campus and the Northgate Urban Center, located on opposite sides of I-5.

This project would reduce interaction between bikers/walkers and the heavy vehicle traffic in the Northgate neighborhood and would encourage transit ridership in the neighborhood east of Interstate 5. It also provides more non-motorized travel options that are affordable and contribute to livability in a community slated to be a regional transit-oriented development center.

By making the use of non-motorized transportation quicker, easier, and safer, this bridge and bike share implementation will result in lower greenhouse gas emission and fossil fuel consumption and reduce parking demand, allowing for the construction of smaller and less expensive parking facilities. It will also improve non-motorized access to the transit center for residents of Seattle's Bitter Lake, Licton Springs, and North Park neighborhoods, which are home to an above-average number of economically disadvantaged residents.

King County is an Equal Opportunity/Affirmative Action Employer and complies with the Americans with Disabilitites Act

1202M

I strongly urge the U.S. Department of Transportation's consideration of this grant proposal.

Sincerely,

Dow Constantine
King County Executive

King County

Department of Transportation
Harold S. Taniguchi, *Director*
KSC-TR-0815
201 South Jackson Street
Seattle, WA 98104-3856
206.477.3800 TTY Relay: 711
www.kingcounty.gov/kcdot

May 28, 2015

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue S.E.
Washington, DC 20590

RE: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER Discretionary Grant Application

Dear Secretary Foxx:

The King County Department of Transportation is pleased to provide this letter of support for the City of Seattle's application for the U.S. Department of Transportation 2015 TIGER Discretionary Grants program. Funding from this grant will help to build a pedestrian and bicycle bridge across Interstate 5 (I-5) and greatly expand Seattle's bike share network.

King County supports the proposed pedestrian bridge that will provide a safer and direct connection across I-5 to King County Metro's Northgate Transit Center and the future Sound Transit Link Light Rail Station, also reducing the walking distance to North Seattle College from 1.2 miles to approximately 0.25 miles.

The expanded bike share network will provide critical last-mile non-motorized connections from area neighborhoods to the transit center and future light rail station, encouraging increased transit ridership on regional light rail and Northgate's many bus routes, and reducing single occupancy vehicle congestion on arterial streets surrounding major transit operation hubs throughout the City.

Additionally, the bridge and bike share network will result in lower emissions of greenhouse gases, fossil fuel consumption, and help to reduce the demand for parking near the transit center and light rail station, further reducing the costs required for construction of parking facilities and advancing City and regional goals to promote transit-oriented development.

King County Department of Transportation supports the City of Seattle's Northgate Non-Motorized Access to Transit and Education TIGER proposal, and would strongly urge the U.S. Department of Transportation's consideration of their application.

Sincerely,

Harold S. Taniguchi, Director
King County Department of Transportation

cc: The Honorable Patty Murray, United States Senate
The Honorable Maria Cantwell, United States Senate
The Honorable Jim McDermott, United States House of Representatives
The Honorable Edward Murray, City of Seattle

Puget Sound Regional Council
PSRC

May 20, 2015

The Honorable Secretary Anthony Foxx
Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

RE: Northgate Non-Motorized Access to Transit and Education TIGER Application

Dear Secretary Foxx:

On behalf of the Puget Sound Regional Council, I am pleased to write in support of the City of Seattle's application for the U.S. Department of Transportation TIGER grant program. Funding from this grant will be dedicated to the Northgate Non-motorized Access Project.

The Northgate Non-motorized Access Project includes a pedestrian and bicycle bridge that will make it safer and easier to get between the community assets on the east side of I-5 (community center, library, rapid transit facilities, the shopping center) and those on the west (the North Seattle College, NW Hospital and medical facilities, parks and neighborhood commercial areas). The bridge, with its direct connection to the Northgate Link station, will provide access to the regional rail service for a much greater proportion of North Seattle.

The expansion of the City's bike share network would also greatly expand access to the North Seattle College, as well as area social, educational and employment services. Bike share would allow these destinations to be reached in a reasonable time from much further away than at present, benefitting Center patrons and the region. Non-motorized access is an important rung on the ladder of opportunity, presenting a low cost, healthy means of transport (with beneficial environmental effects).

This project supports the implementation of PSRC's U.S. Partnership for Sustainable Communities- funded Growing Transit Communities Program by addressing specific mobility needs in several of the station areas identified in that effort. In addition, the project is consistent with the region's long- range metropolitan transportation plan, Transportation 2040, and with the regional investment strategies and policies in VISION 2040. If funding is awarded, PSRC will expedite processing of the funds into the State Transportation Improvement Program.

I am pleased to support the Northgate Link Light Rail Station Non-motorized Access Project, and would strongly urge the U.S. Department of Transportation's consideration of their application.

Sincerely,

J. W. Brown

Josh Brown, Executive Director
Puget Sound Regional Council

Washington State Department of Transportation

Lynn Peterson
Secretary of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300
360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

May 21, 2015

The Honorable Anthony Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Ave SE
Washington, DC 20590

Dear Secretary Foxx:

The Washington State Department of Transportation is pleased to support the City of Seattle's 2015 TIGER grant application for the Northgate Non-Motorized Access to Transit and Education project.

The proposed project will provide a bicycle and pedestrian bridge crossing Interstate-5 and other safety improvements to serve the Northgate Transit Center as well as an expansion of the City's bike share program. A bike share expansion into the Northgate neighborhood has potential to improve healthy and affordable travel options, along with greatly improved bike-ped connections, and is a step toward the City reducing dependence on fossil fuels and reaching regional environmental goals.

I hope you will give this project serious consideration.

Sincerely,



Lynn Peterson
Secretary of Transportation

UNIVERSITY OF WASHINGTON

June 3, 2015

The Honorable Anthony R. Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Foxx:

On behalf of the University of Washington I am pleased to offer the University's enthusiastic and unqualified endorsement of the City of Seattle's 2015 TIGER proposal – Northgate Non-Motorized Access to Transit and Education.

Education is among the most powerful ladders of opportunity that exist. Providing access to that ladder demands removing both the physical barriers and financial barriers associated with student transportation. I am delighted that the City of Seattle's proposal directly addresses both of these challenges. By taking bikesharing to underserved communities within Seattle and constructing the Northgate pedestrian bridge, this project will remove physical mobility barriers. By targeting the active modes, this project reduces transportation costs for students and opens up lower-cost housing opportunities throughout the City – reducing the total cost of an education. Affordable access is the first rung of the educational ladder of opportunity and this proposal strengthens it substantially.

The University of Washington has already gone to great lengths to address the challenge of affordable access. Sixty percent of our undergraduate students receive financial aid and more than twenty percent of students pay no tuition or fees whatsoever. We have invested heavily to ensure that all students have an unlimited right to ride transit pass. However, without the first mile solutions offered by the City's TIGER proposal, these efforts will still fall short of reaching our community where they live. We stand with the City of Seattle in asking you to help us strengthen that first rung by creating affordable access to educational opportunity.

We recognize that the University of Washington cannot meet the educational needs of all our region's students alone. Together with our community college and private university partners, we can help provide students with the right educational opportunity for each student's unique situation and career aspirations. We are excited that this project serves the full breadth of Seattle's post-secondary education community and that it establishes credible, low-cost, multimodal connections among those institutions, allowing us to collaborate more actively in serving the region's students.

This is a stellar project that will have a meaningful impact for our campus and a transformational impact in the communities we serve. I appreciate USDOT's consideration of the City of Seattle's proposal for Northgate Non-Motorized Access to Transit and Education and strongly encourage your support.

Sincerely,

Josh Kavanagh
Director of Transportation
University of Washington

COMMITTEE ON WAYS AND MEANS
RANKING MEMBER, SUBCOMMITTEE ON HEALTH
COMMITTEE ON THE BUDGET

JIM McDERMOTT
7TH DISTRICT, WASHINGTON

CO-CHAIR
CONGRESSIONAL TASK FORCE ON INTERNATIONAL HIV/AIDS

CONGRESSIONAL KIDNEY CAUCUS

CONGRESSIONAL INDONESIA CAUCUS
CONGRESSIONAL MONGOLIA CAUCUS
CONGRESSIONAL CENTRAL AFRICA CAUCUS

Congress of the United States
House of Representatives
Washington, DC 20515

May 28, 2015

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

Dear Secretary Foxx:

I write to express my strong support for the City of Seattle's application for TIGER funding from the U.S. Department of Transportation to fund construction of the Northgate Non-Motorized Access to Transit and Education project. This project includes a bicycle and pedestrian bridge crossing Interstate 5 (I-5) and other safety improvements to serve the Northgate Transit Center as well as a major expansion of the City's bike share program.

Bisecting the neighborhood, I-5 currently hinders potential growth and development around Seattle's Northgate Urban Center, an MPO-designated regional growth center. As I-5 runs north and south through the neighborhood, it inhibits access between the amenities and services on the west and east side of the freeway. North Seattle College and Northwest Hospital are located on the west side of the freeway, while the east side boasts a community center and library, a regional shopping center, medical facilities, and the future home of the Northgate Link Light Rail Station – not to mention residential areas and parks on both sides.

The lack of any reasonable bicycle and pedestrian connection across I-5 limits the potential of both areas and hinders the transit-oriented development that is anticipated to follow the opening of the light rail segment. Likewise, while a planned bike share expansion into the Northgate neighborhood has great potential to improve healthy and affordable travel options, introducing these services without safer and more inviting ped-bike connections would be crippling for bike share operations in this divided neighborhood. Overcoming these difficulties in our designated centers and transit hubs is a critical step toward reducing our dependence on fossil fuels and reaching our region's aggressive environmental goals.

Northgate is one of Seattle's most affordable neighborhoods and it includes a higher proportion of economically disadvantaged populations than the city as a whole. By improving access throughout the neighborhood, we also will help to ensure that this population can have better access to other job centers throughout the region.

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(202) 225-3106

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http://www.facebook.com/CongressmanJimMcDermott
Twitter:@RepJimMcDermott

1809 7TH AVENUE, SUITE 1212
SEATTLE, WA 98101-1399
(206) 553-7170

I urge you to strongly consider the City of Seattle's application for TIGER funding. With proper support, we have an opportunity to transform an auto-oriented neighborhood into a significant mixed-use area that will provide great social and environmental benefits for the community.

Sincerely,

Jim McDermott
Member of Congress

Washington State Legislature

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, D.C. 20509

Re: Northgate Non-Motorized Access to Transit and Education Project

Dear Secretary Foxx:

As state legislators representing Washington State's 46th Legislative District, we are pleased to write in support of the City of Seattle's application for the U.S. Department of Transportation TIGER Grant. Funding from this grant will be dedicated to the construction of a pedestrian-bicycle bridge over Interstate 5 (I-5), related non-motorized access to the future Northgate Light Rail Station, and to expansion of Seattle's bike share network to Northgate and other neighborhoods.

Seattle's Northgate Urban Center (in our district) is designated as a regional growth center in the Puget Sound Regional Council's Vision 2040 Plan. However I-5 hinders the growth and development of this area as it bisects the neighborhood and inhibits access, particularly for bicycles and pedestrians. North Seattle College, UW Medicine's Northwest Hospital, residential areas, and significant parks are located on the west side of the freeway, separated from the current Northgate Transit Center and the future Northgate Link Light Rail Station, scheduled to open in 2021, as well as Northgate's recently built community center, library, employment centers, and regional shopping center. With a pedestrian and bicycle bridge, North Seattle College would be a mere several hundred yards from the transit center, instead of a 25-30-minute bus ride.

The proposed pedestrian and bicycle bridge is also an investment in the economy and community of North Seattle College – reducing commute time for students, faculty, and will increase access to North Seattle College's Opportunity Center for Employment and Education, which helps people who are unemployed and low-income find human service and employment resources. The current lack of any reasonable pedestrian and bicycle connections across I-5 limits the potential regional development of the Northgate neighborhood and limits access to the transit-oriented development that is anticipated to follow the opening of the North Link Light Rail.

The centerpiece of this project – the proposed pedestrian and bicycle bridge – will make it safer and easier to get between the community assets on the east side of I-5 and the multi-modal transit center serving the greater Seattle region on the west. The bridge and expanded bike share network will provide increased access to the regional rail service and make non-motorized access to Northgate Transit Center's many bus routes accessible for the surrounding North Seattle neighborhoods, which have an above-average number of residents from economically disadvantaged populations.

The need for this project has been identified as a priority in a number of city and regional plans. Seattle has created a wide coalition of support amongst neighborhoods, pedestrian and bicycle advocacy groups, North Seattle College, Sound Transit, and King County. The TIGER Grant will ensure already-committed funds remain dedicated to this critical project. We urge your support of the Northgate Non-Motorized Access to Transit and Education Project.

Thank you for your consideration,

Sen. David Frockt | Rep. Jessyn Farrell | Rep. Gerry Pollet

Cc: Mayor Edward B. Murray, City of Seattle

Downtown Seattle Association

Our Mission
To champion a healthy, vibrant urban core

Officers
Mark Barbieri
Chair
Richard Stevenson
Vice Chair
Karen Chang
Secretary/Treasurer
Charles Riley Jr.
General Counsel
Jon Scholes
President & CEO

Board of Directors
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Jim Neal
Blake Nordstrom
Roger Nyhus
Kathy O'Kelley
Denny Onslow
Natalie Price
Charles Royer
Rita Ryder
Craig Schafer
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H. Martin Smith
Tony Stewart
Beth Takekawa
Todd Timberlake
Bart Waldman
William Weisfield
Kathryn Williams
Donald Wise

Emeritus
Bill Bain
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Al Clise
Mike Flynn
Joshua Green III
Matt Griffin
Yogi Hutsen
Stephen Koehler
Jane Rakay Nelson
Richard Redman
J. Michael Rona
H. Jon Runstad
Judith Runstad
Frederic Weiss

To: The Honorable Anthony R. Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

May 29, 2015

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

I am writing in support of The City of Seattle's TIGER grant request to fund bicycle and pedestrian connections and improvements to Seattle's growing Northgate transit hub.

The health of a City is dependent on a diversity and availability of viable transit options. As more people move to our region, connections to and from our transit hubs become a critical link in our transit ecosystem and local economy. A pedestrian and bike bridge would provide critical access for thousands of people who are currently disconnected from this regional transit network by Interstate-5.

We are enthusiastic about supporting this project because it increases connectivity between our expanding job center in Downtown and the growing density of students, residents and employees in Seattle's Northgate neighborhood.

With the help of the broader community, the City of Seattle has made a strong case to fund this project. We encourage you to support the City of Seattle's TIGER grant application.

Sincerely,

Don Blakeney

Vice President of Advocacy &
Economic Development
Downtown Seattle Association

City of Seattle

Seattle Pedestrian Advisory Board

Stewards of the Pedestrian Master Plan

David Goldberg, Chair
Joanne Donohue, Vice Chair
David Amiton
Lydia Heard
Lorena Kaplan
April Kelley
Jeffrey Linn
Catherine Morrison
Paul Muldoon
Gordon Padelford
Bevin Wong

May 21, 2015

The Honorable Anthony Foxx
Secretary, U.S. Dept. of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

RE: City of Seattle Northgate Pedestrian and Bicycle Bridge TIGER Application

Dear Secretary Foxx:

As chair of the Seattle Pedestrian Advisory Board (SPAB), I am writing in strong support of the City of Seattle's TIGER application for construction of the Northgate Pedestrian and Bicycle Bridge with expanded bike-share network.

The SPAB was created to oversee Seattle's pedestrian master plan and advise the Mayor and City Council on issues affecting people on foot, in pursuit of the goal of making the city "the most walkable in the nation". The City's master plan identifies the need for this project, and it has benefited from our input as well as many other stakeholders.

Because TIGER grants are so competitive, past awards have gone to projects that are innovative in addressing more than one problem; that make the most of previous federal and other investment; and that provide ladders of opportunity for people of all incomes.

This project excels in meeting all of those criteria. The bridge and e-bike network will dramatically expand the destinations accessible by the new light rail service, safely and efficiently connecting people to educational opportunities, jobs, medical and other services. As the city promotes transit-oriented development around the station – further maximizing the investment – the pedestrian accessibility improvements are absolutely critical for success. The project benefits will extend beyond the physical bridge and positively impact business, housing, and economic activity in the entire area.

In addition to aligning with TIGER criteria and our pedestrian master plan, the project also fulfills the goals of your Mayors' Challenge for Safer People, Safer Streets. Seattle is a proud partner in this work. The Pedestrian Advisory Board is excited about the possibilities this project will create and strongly urges your consideration and approval of this application.

Sincerely,

David Goldberg, Chair
Seattle Pedestrian Advisory Board

Cc: Sen. Patty Murray, Sen. Maria Cantwell, Gov.Jay Inslee, Rep. Jim McDermott

The Seattle Pedestrian Advisory Board shall advise the City Council, the Mayor and all the offices of the city on matters related to pedestrians and the impacts which actions by the city may have upon the pedestrian environment; and shall have the opportunity to contribute to all aspects of the city's planning insofar as they relate to the pedestrian safety and access.

~City Council Resolution 28791

SMT, 700 Fifth Avenue, Suite 3800
Seattle, WA 98124-4996
www.seattle.gov/spab email: pedboard@seattle.gov
An equal-employment opportunity, affirmative action employer. Accommodations for people with disabilities provided on request.

City of Seattle

Seattle Pedestrian Advisory Board

Stewards of the Pedestrian Master Plan

David Goldberg, Chair
Joanne Donohue, Vice Chair
David Amiton
Lydia Heard
Lorena Kaplan
April Kelley
Jeffrey Linn
Catherine Morrison
Paul Muldoon
Gordon Padelford
Bevin Wong

The Seattle Pedestrian Advisory Board shall advise the City Council, the Mayor and all the offices of the city on matters related to pedestrians and the impacts which actions by the city may have upon the pedestrian environment; and shall have the opportunity to contribute to all aspects of the city's planning insofar as they relate to the pedestrian safety and access.

~City Council Resolution 28791

SMT, 700 Fifth Avenue, Suite 3800
Seattle, WA 98124-4996
www.seattle.gov/spab email: pedboard@seattle.gov
An equal-employment opportunity, affirmative action employer. Accommodations for people with disabilities provided on request.

City of Seattle

Seattle Bicycle Advisory Board

Jeff Aken, Co-Chair
Kristi Rennebohm Franz, Co-Chair
Lara Normand, Secretary

Adam Bartz
Don Brubeck
Leah Curtiss
Steve Kennedy
Riley Kimball
Clint Loper
Merlin Rainwater
Ester Sandoval
Michael Wong

June 2, 2015

The Honorable Anthony Foxx
Secretary, U.S. Dept. of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

RE: City of Seattle Northgate Pedestrian and Bicycle Bridge TIGER Application

Dear Secretary Foxx:

As Co-Chairs of the Seattle Bicycle Advisory Board (SBAB) and on behalf of the full board, we are writing in strong support of the City of Seattle's TIGER application for construction of the Northgate Pedestrian and Bicycle Bridge with expanded bike-share network.

The SBAB was created by a Seattle City Council Resolution to advise the Mayor, City Council and all City Departments on issues, policies and funding affecting people who ride bikes for transportation. We are the stewards of the adopted City of Seattle Bicycle Master Plan. We support this project being funded because it significantly moves Seattle forward in achieving the **Seattle Bicycle Master Plan Goals of Safety, Equity, Connectivity, Ridership and Livability**.

The City's Bicycle Master Plan identifies the need for this project as a critical **safe connection** between the Northgate Link Light Rail Station, North Seattle College, and other key employers. The bridge will also provide **equity of services for all ages and abilities of residents choosing to ride bikes and walk for transportation**. This project is important for **equitable connection** to the light rail system for lower income neighborhoods in the Northgate

The Seattle Bicycle Advisory Board shall advise the City Council, the Mayor, and all departments and offices of the city on matters related to bicycling, and the impact which actions by the city may have upon bicycling; and shall have the opportunity to contribute to all aspects of the city's planing processes insofar as they relate to bicylcing.

- City Council Resolution 25534

Jeff Aken, Co-Chair
Kristi Rennebohm Franz, Co-Chair
Lara Normand, Secretary

Adam Bartz
Don Brubeck
Leah Curtiss
Steve Kennedy
Riley Kimball
Clint Loper
Merlin Rainwater
Ester Sandoval
Michael Wong

The Seattle Bicycle Advisory Board shall advise the City Council, the Mayor, and all departments and offices of the city on matters related to bicycling, and the impact which actions by the city may have upon bicycling; and shall have the opportunity to contribute to all aspects of the city's planing processes insofar as they relate to bicylcing.

- City Council Resolution 25534

communities and where there are significant numbers of immigrant and refugee residents. The project **meets the connectivity goal** of the Bicycle Master Plan by providing the key East-West connections that Seattle is needing to address in the Northgate community.

The safe bicycle infrastructure provided with implementation of this project will significantly **increase bicycle ridership** of residents who previously felt unsafe choosing bicycles for transportation. Having this bridge in place will increase safety for all transportation modes by providing safe physical separation between people who are walking and riding bikes from people who are driving, transit, freight and cars. This translates into decreased collisions, reduced congestion and **increased livability** for all residents and visitors to this area of our city.

Because TIGER grants are so competitive, past awards have gone to projects that are innovative in addressing more than one problem; to projects that make the most of previous federal and other investment; and to projects that provide ladders of opportunity for people of all incomes.

This project excels in meeting all of those criteria. The bridge and bike share network will dramatically expand the destinations accessible by the new light rail service, will safely and efficiently connect people to educational opportunities, jobs, medical, places where they do business and other services. Enhancing and growing the city's bike share system will greatly expand the reach of both the bridge and our transit system.

As the city promotes transit-oriented development around the station – further maximizing the investment – the pedestrian and bicycle accessibility improvements are absolutely critical for success. The project benefits will extend beyond the physical bridge and

Jeff Aken, Co-Chair
Kristi Rennebohm Franz, Co-Chair
Lara Normand, Secretary

Adam Bartz
Don Brubeck
Leah Curtiss
Steve Kennedy
Riley Kimball
Clint Loper
Merlin Rainwater
Ester Sandoval
Michael Wong

positively impact business, housing, and economic activity in the entire area.

In addition to aligning with TIGER criteria and our Bicycle Master Plan, the project also fulfills the goals of your Mayors' Challenge for Safer People, Safer Streets. Seattle is a proud partner in this work. The Seattle Bicycle Advisory Board strongly supports meeting the Challenge for Safer People, Safer Streets, strongly supports Seattle's implementation of Vision Zero goals and is excited about the possibilities this project will create in meeting those challenges and goals. We strongly urge your consideration and approval of this application.

Sincerely,

Kristi Rennebohm Franz, Co-Chair Jeff Aken, Co-Chair

The Seattle Bicycle Advisory Board shall advise the City Council, the Mayor, and all departments and offices of the city on matters related to bicycling, and the impact which actions by the city may have upon bicycling; and shall have the opportunity to contribute to all aspects of the city's planing processes insofar as they relate to bicylcing.

- City Council Resolution 25534

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/

Microsoft

May 29, 2015

The Honorable Anthony R. Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

I am writing to communicate Microsoft Corporation's support for the City of Seattle's application for funding through the U.S. Department of Transportation TIGER grant program to construct bicycle and pedestrian projects in the Northgate area north of downtown.

While our corporate headquarters are located in Redmond, east of Seattle, we do have a significant employee footprint in the City of Seattle as well. Additionally, our 40,000+ Puget Sound-area employees reside throughout the region and many rely on public transportation to commute to their jobs. Improving pedestrian and bicycle access to these facilities will significantly enhance the safety and efficiency of their daily commutes.

These investments also represent another important step in a region-wide effort to expand options for non-single occupancy vehicle traffic. Central Puget Sound faces significant congestion issues and making it easier for commuters to access public transportation is a key strategy in improving commute times, air quality and overall quality of life in the region. In fact, public input was crucial in the decision to make greater investment in bicycle and pedestrian access to the Northgate station and in obtaining commitments from Sound Transit and the City of Seattle to invest in better non-motorized transportation options in the area.

The bridge project would provide critical access to transit — both the Metro Transit center and a future Link light rail station — for thousands of employees, students and other residents who are currently cut off by the I-5 freeway, which prevents transit from being within a reasonable walking distance and a viable option for their travel throughout the Greater Seattle area.

We believe that the City of Seattle has presented a strong case for TIGER funds to build pedestrian and bicycle infrastructure to enhance the effectiveness of public transportation in the Northgate area. We urge you to approve the City of Seattle's application. Thank you for your consideration.

Sincerely,



DeLee Shoemaker
Senior Director, Government Affairs
Microsoft Corporation

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/



CC:
Senator Patty Murray, Senator Maria Cantwell, Congressman Jim McDermott, Mayor Edward B. Murray, Seattle

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Microsoft

May 29, 2015

The Honorable Anthony R. Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

I am writing to communicate Microsoft Corporation's support for the City of Seattle's application for funding through the U.S. Department of Transportation TIGER grant program to construct bicycle and pedestrian projects in the Northgate area north of downtown.

While our corporate headquarters are located in Redmond, east of Seattle, we do have a significant employee footprint in the City of Seattle as well. Additionally, our 40,000+ Puget Sound-area employees reside throughout the region and many rely on public transportation to commute to their jobs. Improving pedestrian and bicycle access to these facilities will significantly enhance the safety and efficiency of their daily commutes.

These investments also represent another important step in a region-wide effort to expand options for non-single occupancy vehicle traffic. Central Puget Sound faces significant congestion issues and making it easier for commuters to access public transportation is a key strategy in improving commute times, air quality and overall quality of life in the region. In fact, public input was crucial in the decision to make greater investment in bicycle and pedestrian access to the Northgate station and in obtaining commitments from Sound Transit and the City of Seattle to invest in better non-motorized transportation options in the area.

The bridge project would provide critical access to transit — both the Metro Transit center and a future Link light rail station — for thousands of employees, students and other residents who are currently cut off by the I-5 freeway, which prevents transit from being within a reasonable walking distance and a viable option for their travel throughout the Greater Seattle area.

We believe that the City of Seattle has presented a strong case for TIGER funds to build pedestrian and bicycle infrastructure to enhance the effectiveness of public transportation in the Northgate area. We urge you to approve the City of Seattle's application. Thank you for your consideration.

Sincerely,



DeLee Shoemaker
Senior Director, Government Affairs
Microsoft Corporation

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One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/



CC:
Senator Patty Murray, Senator Maria Cantwell, Congressman Jim McDermott, Mayor Edward B. Murray, Seattle

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Seattle, Washington 98104

206.332.9900
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Connecting Seattle through Public Space

May 28, 2015

The Honorable Anthony R Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

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Dear Secretary Foxx:

Seattle Parks Foundation strongly supports the application of the City of Seattle for funding through the U.S. Department of Transportation TIGER grant to construct bicycle and pedestrian projects in the Northgate area and expansion of the bike share network.

Seattle Parks Foundation is a 14-year-old independent nonprofit, which raises money and advocates for public realm projects throughout the city. We have a deep and longstanding commitment to a complete network of safe, beautiful pedestrian and bike connections between parks, schools, and neighborhoods throughout the city. We have published "Bands of Green" studies that map out where such connections exist and what the opportunities are for the city moving forward. These documents have guided much public and private sector development in the city. We sponsor Seattle Neighborhood Greenways, a hugely effective advocacy group, working with neighborhood groups around the city who share Bands of Green goals. We are also sponsoring efforts to enhance pedestrian and bike transit access in the Columbia City, Mount Baker, and Beacon Hill neighborhoods.

A bridge at Northgate would provide critical access to transit for transit neighbors and for 14,000 community college students, workers, and residents who are currently cut-off by the I-5 freeway. Expansion of the bike share network will provide a safe and practical option for non-motorized travel.

Seattle is one of the fastest growing cities in America and we need to be making investments for a more urban, dense, greener, and human-scaled future. We urge you to approve the City of Seattle's TIGER VI grant application.

Sincerely,

Thatcher Bailey

Thatcher Bailey
Executive Director

CC: Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Congressman Jim McDermott
Mayor Edward B. Murray, Seattle

SEATTLE PARKS FOUNDATION

May 21, 2015

The Honorable Anthony R. Foxx

Secretary, U.S. Department of Transportation

1200 New Jersey Ave. SE

Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

The Cascade Bicycle Club strongly supports the application of the City of Seattle for funding through the U.S. Department of Transportation TIGER grant to construct bicycle and pedestrian projects in the Northgate area and expansion of the bike share network.

Founded in 1970, Cascade Bicycle Club (Cascade) is the largest regional bicycle advocacy organization in the country with nearly 16,000 members. Our mission is to improve lives through bicycling. Cascade strongly supports leveraging the regional investments of Sound Transit's link light rail system by ensuring that pedestrian and bicycle access to the light rail stations is safe, comfortable and convenient.

In 2012, more than 500 Cascade members and hundreds of neighborhood residents urged Sound Transit to shift station-access investments from building a parking garage toward investing in bicycle and pedestrian infrastructure at the future Northgate Light Rail Station. As a result of the community's advocacy to get a greater investment in bicycle and pedestrian access to the station, Sound Transit and the City of Seattle agreed to each invest in the bicycle/pedestrian bridge and other area non-motorized improvements. Since then, we have continued to push for this important connection by launching a ""Connect Northgate" team of neighbors and businesses to advocate for the project. We are working closely with the City and Sound Transit on securing funding along with working with the legislature in Olympia to communicate the importance of the connection. This crossing is one of Cascade's top priorities.

For those who live, work and shop in the neighborhood, the bridge would provide critical access to transit — whether it's today's Metro Transit Center or the future Link light rail station — thousands of students, workers, and residents are currently cut-off by the I-5 freeway, which prevents transit from being within a reasonable walking distance. Without that connection, both North Seattle college (with its 14,000 students) and the UW's medical center would be beyond a reasonable walking distance of 20 minutes.

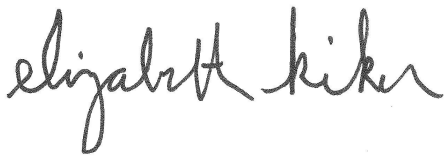
For current and future bicyclists, the expansion of the bike share network will provide a safe and practical option for non-motorized travel. In Seattle overall and in the Northgate urban center area, a robust bike share network will increase bicycle ridership, establish an important infrastructure and service presence in the fabric of each neighborhood, improve equity and offer health and environmental benefits to the region. Leveraging transit investments with the Northgate bike/ped bridge and expanded bike share will give people more choices to get around conveniently without needing a vehicle.

The City of Seattle has presented a strong case for funds to build pedestrian and bicycle infrastructure, such as the bridge and bike share network. This is why neighbors, businesses, and advocacy organizations like Cascade all support this grant application. On behalf of our nearly 16,000 members, we urge you to approve the City of Seattle's TIGER VI

grant application.

If you have any questions about Cascade's support for this project, feel free to contact me at 206- 856-4788 or elizabethk@cascade.org

Sincerely,



Elizabeth Kiker
Executive Director
Cascade Bicycle Club

CC:

Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Congressman Jim McDermott
Mayor Edward B. Murray, Seattle

3709 S. Ferdinand St. / Seattle, WA 98118 206.725.9408 / info@bikeworks.org / bikeworks.org

BIKEWORKS

May 30, 2015

The Honorable Anthony R. Foxx, Secretary
U.S. Department of Transportation 1200 New
Jersey Ave. SE Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education Grant Application

Dear Secretary Foxx:

Please accept this letter in support for the application of the City of Seattle for funding through the U.S. Department of Transportation TIGER grant. Bike Works particularly wants to express our strong interest in expanding Seattle's bike share network to many Seattle neighborhoods, including ours.

Located in the heart of Columbia City community in southeast Seattle, Bike Works provides programs and resources to a richly diverse neighborhood that, compared with Seattle as a whole, has high rates of poverty and poor community health indicators: 30% of Columbia City residents live below the poverty line, and King County Public Health data shows 20% of southeast Seattle residents report no physical activity and 57% are overweight or obese. Southeast Seattle residents experience higher rates of diabetes and asthma than any other King County community. In addition, this area is home to some of the lowest performing schools in the county.

The City of Seattle is actively pursuing bike share program integration with the regional transit fare card, ORCA and its ORCA LIFT reduced fare program. For Bike Works, making bicycling accessible and affordable to people from all walks of life is a core mission. While our bike shop sells affordable recycled bicycles to the greater Seattle community, sometimes ownership is not an immediate goal. The ability to have bike share available to engage residents and promote bicycling – especially for low-income individuals, seniors or college students in need of an occasional working bicycle—offers a real travel option that allows them to participate in the community and in healthy active transportation while it encourages later bike ownership.

Lastly, Bike Works is excited to work with the City of Seattle to incorporate both permanent jobs and internships with area residents to support community engagement and local employment opportunities. This project would provide an important partnership between a public agency and private organization to leverage the strengths and opportunities of both toward a common goal.

Our organization believes that using bicycles for adult education and opportunity-building is key to for healthy individuals and a healthy community. On behalf of Columbia City, we strongly urge your consideration and approval of this application.

Sincerely,

Deb Salls, Executive Director
Bike Works

CC:
Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Congressman Adam Smith
Mayor Edward B. Murray, Seattle

Washington bikes
Growing Bicycling Statewide

314 - 1st Avenue South, Seattle, WA 98104
111 North Post Street, Ste. 301, Spokane, WA 99201
206.224.9252 • WAbikes.org

May 26, 2015

Anthony Foxx Secretary
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Foxx:

I am pleased to write in support of the City of Seattle's application for the U.S. Department of Transportation TIGER grant program. Funding from this grant will be dedicated to the two exciting multimodal opportunities – the build out of biking and walking connections around a new multibillion dollar transit investment in light rail, and a significant expansion of *Pronto* Bike Share to make it more citywide by reaching out to more economically and ethnically diverse parts of the city.

Together, these investments are projects of national significance as the nation looks toward creating resilient and multimodal transportation system that relies on many different transport modes for its success.

The build out of the bicycle and pedestrian network around the Sound Transit Northgate Light Rail Station represents an exciting culmination of years of community input and partnership with multiple transportation agencies (Sound Transit, Seattle Department of Transportation, and King County METRO). It builds on the 2011 Federal Transit Administration policy statement that recognizes the benefits to transit of making investments within a 3-mile bikeshed and 1/2-mile walkshed. It also leverages the opportunity to enhance ridership and access to a significant station area that will anchor North Seattle mobility for generations to come. For this reason, building a complete biking and walking network around the Northgate Station is a no-brainer for mobility and one that will serve as a national model for non-motorized integration with transit.

Significantly expanding bike share in Seattle offers an exciting new opportunity to increase mobility at relatively little cost. Additionally, the proposed expansion extends into numerous neighborhoods that are economically disadvantaged. By providing low-cost biking, bike share will be able to offer new biking opportunities to new populations across Seattle. Finally, this proposal will not only invest in a massive expansion of bike share, but it will invest in electric-assist bicycles to help many address the challenging

topography that abounds in Seattle.

As the statewide voice on behalf of better bicycling, Washington Bikes is pleased to support the City of Seattle's TIGER proposal, and would strongly urge the U.S. Department of Transportation's consideration of their application.

In Washington Bikes' work around the state, staff draws on the best that every community has to offer to share lessons learned, to inspire, and to challenge. The City of Seattle is leading by example with this project and its ongoing emphasis on use of active transportation to provide new mobility opportunities and new options to get to and from transit.

Sincerely,



Barb Chamberlain Executive Director
Washington Bikes (formerly the Bicycle Alliance of Washington)

CC: Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Congressman Jim McDermott
Mayor Edward B. Murray

feet first
promoting walkable communities

314 First Avenue S
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feetfirst.org

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June 2, 2015

The Honorable Anthony Fox
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Mr. Fox:

Since 2001, Feet First has been working to ensure that all communities in Washington are walkable. We are particularly interested in promoting the development of walkable transit-oriented communities. Therefore, we strongly support the City of Seattle's 2014 TIGER grant application for the Northgate Bicycle/Pedestrian Bridge.

The Northgate Bicycle/Pedestrian Bridge will provide a direct pedestrian connection between Sound Transit's future Northgate Link Light Rail station and North Seattle College (NSC), home to 9,000 students, faculty, and staff. The station site and the college are currently divided by the I-5 freeway, creating a barrier to walking between these two important destinations. The nearest pedestrian crossings of the freeway, Northgate Way to the north and NE 92nd Street to the south, are not safe, easy, or inviting; they ultimately do not provide reasonable walking connections.

The proposed Northgate Bicycle/Pedestrian Bridge will greatly increase the number of people walking in the Northgate area. People living and working west of the freeway are currently separated from the Northgate urban center. The bridge will integrate these people into the community, dramatically expanding the fifteen-minute walkshed around Northgate to include NSC, several office buildings along Meridian Avenue N, and a sizable part of the Licton Springs residential neighborhood.

The pedestrian/bicycle bridge will be a win for all concerned: Sound Transit, local businesses, bicyclists, the Licton Springs community, and NSC students, staff, and faculty. Should you have any questions about our support for this project, feel free to contact me directly by calling 206.652.2310 ext. 6 or emailing lisa@feetfirst.org

Sincerely yours,



Lisa Quinn
Executive Director

City of Redmond
WASHINGTON

June 1, 2015

The Honorable Anthony R. Foxx Secretary
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

RE: City of Seattle TIGER VII Application

Dear Secretary Foxx:

The City of Redmond supports the City of Seattle's TIGER VII application to construct bicycle and pedestrian projects in the Northgate area and expand the bike share network.

The Northgate bicycle and pedestrian projects, including the pedestrian-bicycle bridge over I-5, will provide safe and convenient non-motorized access to transit for a much larger portion of the Northgate Urban Center and surrounding neighborhood. These access improvements will increase transit ridership and mobility for everyone who lives, works, attends school and shops in the Northgate area.

The City of Redmond supports expansion of the bike share network in Seattle. The City has been involved in the effort to bring bike share to the central Puget Sound region since its inception. The expansion of bike share in Seattle helps grow regional bicycle ridership and supports ongoing expansion of bike share to other Cities in our region.

Bicycle riders must have a safe way to travel to work or school, run errands or recreate with their families. Redmond has been designated a Bicycle Friendly Community by the League of American Bicyclists and is committed to increasing the number of trips people make by bike in our community and regionally.

The City of Redmond supports the City of Seattle's TIGER VII application because it increases the opportunity for people to walk and bike safely and conveniently in our region. The Northgate vicinity pedestrian and bicycle improvements and expansion of bike share citywide will increase the number of people walking and biking, which has been proven to increase the safety of people using these modes of travel. These improvements benefit the region and I urge you to give this project fair consideration.

Sincerely,

John Marchione
Mayor

Cc: Senator Patty Murray
Senator Maria Cantwell
Governor Jay Inslee
Congresswoman Suzan K. DelBene
Mayor Edward B. Murray, Seattle

The Honorable Anthony R. Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Re: City of Seattle Northgate Non-Motorized Access to Transit and Education TIGER application

Dear Secretary Foxx:

The City of Kirkland wishes to express strong support of the City of Seattle's TIGER grant application to construct bicycle and pedestrian projects in the Northgate area and, in particular, expansion of the bike share network.

As recognized by Money Magazine and others, Kirkland is one of the most livable cities in the US. Kirkland residents have told us that the vision of our transportation system should be green and livable with bicycle trips making up a bigger share of how Kirklanders move around their city. These concepts are reflected in our Transportation Master Plan that is currently nearing completion.

Successful bike share in the Puget Sound region is part of the strategy for fulfilling Kirkland's transportation vision and it begins with a strong program in the City of Seattle. The foundation of bike share has been laid and Seattle's grant proposal will build on that foundation to create a truly comprehensive system of 200 stations delivering a safe and practical means of bicycle travel.

We are proud to join organizations such as Cascade Bicycle Club in support of the strong case presented in Seattle's application for funds to build pedestrian and bicycle infrastructure, and to expand bike share network and we urge your approval of the City of Seattle's TIGER VI grant application.

If you have any questions about the City of Kirkland's support for this project, feel free to contact me at (425) 587-3865 or kbrown@kirklandwa.gov

Sincerely,

Kathy Brown
Public Works Director
City of Kirkland

CC:

Senator Patty Murray
Senator Maria Cantwell
Representative Suzan Delbene
Governor Jay Inslee
Mayor Edward B. Murray, Seattle

Lake City Neighborhood Alliance

http://lcna-seattle.org/

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South Cedar Park Good Neighbors Association
Thornton Creek Alliance
Victory Heights Community Council

June 2, 2015

The Honorable Anthony Fox
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: City of Seattle NORTHGATE PEDESTRIAN AND BICYCLE BRIDGE TIGER application

Dear Secretary Foxx:

The City of Seattle is applying for a US Department of Transportation TIGER grant for the Northgate Link Light Rail Station Non-motorized Access Project, including the Northgate Pedestrian and Bicycle Bridge. The Lake City Neighborhood Alliance, representing 25 Lake City community organizations, strongly endorses this proposal.

Lake City consists of five Seattle neighborhoods (Cedar Park, Matthews Beach, Meadowbrook, Victory Heights, Olympic Hills) and several micro-communities (Douglas Park and Little Brook), all surrounding the Lake City Hub Urban Village (HUV). Many of our residents commute via bicycle or bus. The Northgate Pedestrian and Bicycle Bridge will be a tremendous asset to Lake City residents and businesses. The Northgate community is immediately west of our Lake City community. The Sound Transit Northgate Link Light Rail Station will be our closest Light Rail Station and the Northgate Transit Oriented Development site will be our closest transit site.

This TIGER FY 2015 grant would provide the remaining funds needed to construct these improvements which have been acknowledged in a number of plans including:

- The Northgate Coordinated Transportation Investment Plan (2007)
- Seattle's Bicycle Master Plan (2013)
- Puget Sound Regional Council's Growing Transit Communities effort
- PSRC's Regional Bike Network
- Northgate Urban Design Plan

The centerpiece of this Project—the proposed pedestrian and bicycle bridge—will make it safer and easier to get between the community assets on the east side of I-5 (community center, library, rapid transit facilities, the shopping center) and those on the west (the North Seattle College, NW Hospital and medical facilities, parks and neighborhood commercial areas). The bridge, with its direct connection to the Northgate Link station, will provide access to the regional rail service for a much greater proportion of North Seattle. It will also

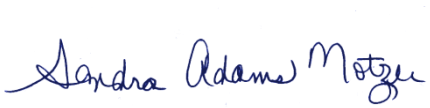
make non-motorized access to Northgate's many bus routes much more attractive for those in Seattle's Lake City, Licton Springs, Bitter Lake, and North Park neighborhoods, which have an above average number of residents from economically disadvantaged populations.

Per the 2010 publically available census data, the Lake City HUV has an ever-increasing population density with a very large percentage (78%) of rental units. Many of these residents do not have cars. The under-served families, youth, and seniors who live in the Lake City HUV and the residents living in the Lake City neighborhoods would benefit from this Non-Motorized Access Project.

The improvements would also greatly expand access to the North Seattle College, with its two-year and four-year degree programs, over 50 certificate programs and over 14,000 students. The college, home to the Opportunity Center for Employment and Education, a one-stop shop for social, educational and employment services could be reached in a reasonable time from much further away than at present, benefitting Center patrons and the region. Non-motorized access is an important rung on the ladder of opportunity, presenting a low cost, healthy means of transport (with beneficial environmental effects).

In summary, LCNA strongly endorses this proposal. If you have any questions, please do not hesitate to contact me.

Very sincerely,



Sandra Adams Motzer
Chair
sandymotzer@aol.com
206.819.8056

Northgate Pedestrian Bridge
Feasibility Study Report

DRAFT

July 2011



King County Department of Transportation
Road Services Division
Bridge and Structural Design Unit

201 South Jackson Street
Seattle, Washington 98104

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Appendix B - Recommended Alignments for Further Considerations

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Appendix D-1 to D-3 - Bridge Rendering (cable-stayed and steel truss)

Appendix E - Typical Bridge Options for Approach Spans & Future Bridge Extension

Appendix F - Typical Wall and/or Fill Sections

Appendix G- Stair and Elevator Options

Appendix H- WSDOT I-5 Corridor Topo Map & Recommended Bridge Pier Locations

Appendix I - Preliminary Northgate Light Rail Station (Sound Transit)

Appendix J - Estimated Project Design and Construction Schedule

Appendix K- Project Cost Estimates

1. EXECUTIVE SUMMARY

The overall objective of this study is to evaluate and recommend alternatives for bridge design and alignment for a new pedestrian and bicycle bridge crossing Interstate 5 (I-5) and linking North Seattle Community College and the surrounding area on the west side of the freeway to a future regional transit center on the east side of the freeway. The first phase of the project will be to construct a bridge that crosses the freeway and extends as far as the parking lot at the east side of the freeway. The second phase will be to extend the bridge to connect to the future Sound Transit North Link station. This study addresses the first phase of the project.

The proposed location for the new bridge is just north of North Seattle Community College on the west end and between Northeast 100th Street and Northeast 103rd Street on the east end. Three alternative alignments were selected for initial study and after scrutiny, two final alignments were chosen for more detailed evaluation. Consideration was given to potential bridge span lengths, horizontal and vertical clearance from I-5 lanes and city streets, Americans with Disabilities Act (ADA) requirements for slopes and landings, impacts to traffic on I-5 during construction, street access via stairways and elevators, aesthetics, economics, environmental impacts, constructability, and durability.

Various bridge structures and configurations have been reviewed and evaluated. For the main bridge spans over I-5, cable-stayed or steel truss structures are feasible. For the approach bridge spans, conventional structures including precast concrete Box girder, I-girder, Bulb-T girder, and steel plate girder are viable and economic solutions. At the earth-filled bridge approach, a flexible retaining wall system or a combination of wall and sloped fill can be considered to minimize project costs.

The recommended bridge cross section has a concrete deck surface with a minimum width of either 14 feet or 12 feet depending on structure type and economics. The minimum clear height for pedestrians and bicycles using the bridge will be ten feet to any overhead structure. The current criteria assumed for this study are handrail heights at 4'-6", and 8’-0” to 10'-0" high screens on each side of the bridge over I-5 lanes.

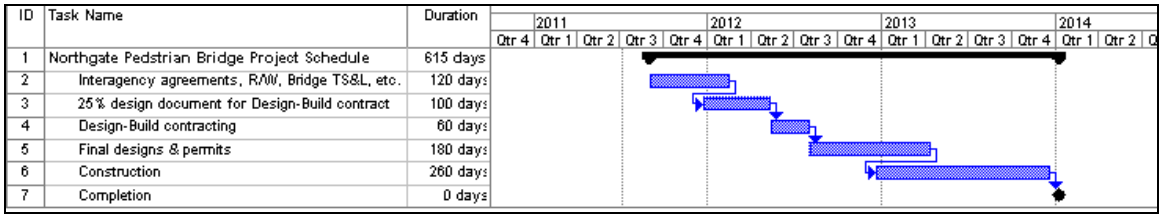
A table that summarizes and compares various bridge alignments, structural types, and other factors, including design, constructability, aesthetics, future maintenance, and traffic and environmental impacts has been included in Section 10 of this report. In addition, the table provides construction and project cost data that should be useful for consideration of an appropriate balance among cost, function, and aesthetics for the project. The estimated cost for the project, including design costs and construction costs, is in the range of $16,300,000 to $18,500,000.

One considerable advantage for this project is the fact that the property for the right-of-way (ROW) is expected to be obtained for no cost. The alignments for the bridge are located on public lands owned either by North Seattle Community College or the State (I-5 ROW). We expect the ROW for the new pedestrian bridge to be donated by these public agencies, with no ROW needing to be obtained from private lands.

In order to minimize the time required for design and construction, an alternative process involving a design-build contract could be considered for this project. The design-build contract is an alternative approach to the conventional design-bid-build process normally used by the County for new projects. The design-build approach can result in a reduction of the overall time required to complete the project since the design engineers and the builder work together allowing critical design decisions to be made with regard to structure configuration and materials in a collaborative environment where all parties participate at the same time. This process often can also result in a reduction of the overall cost to design and construct the project if the design-build contract is properly prepared.

To assist project planning, a preliminary design and construction schedule for either the steel truss bridge or the cable-stayed bridge, based on a design-build approach, is shown below. The schedule incorporates a rough breakdown of tasks and the estimated duration for each task in months:

Items	*Est'd duration (Month)*
Interagency agreements, R/W, Bridge Type, Size & Location	**4 - 6**
25% Design Document for Design-Build Contract	**4 - 6**
Design-Build Contracting	**3**
Project Final Designs & Permits	**8 - 10**
Project Construction	**12 - 16**
Estimated project design and construction	**2.5 - 3.0 yrs**



A more detailed breakdown of the tasks and estimated duration has been included in an appendix.

2. INTRODUCTION AND PROJECT GOAL

King County will implement a transit oriented development plan of regional significance in Seattle's 500-acre Northgate Regional Growth Center, one of 27 designated regional centers intended to accommodate a significant amount of growth. The Northgate Transit Oriented Development (TOD) plan, partially funded by the U.S. Dept. of Housing and Urban Development's Sustainable Communities Regional Planning grant for 2011-2013, will combine workforce TOD housing, enhanced multimodal access for transit users, and pedestrian and bicycle improvements. This will also directly support regionally adopted growth management plans that emphasize high-density, transit-supported mixed-use growth centers.

A new pedestrian bridge, as part of the Northgate TOD Catalyst Investment Strategy, and in partnership with the City of Seattle, Sound Transit, Seattle Housing Authority, North Seattle Community College (NSCC), and other key public agencies is intended to be an integral part of dramatic mobility improvements and regional accessibility benefitting the transit-dependent community college population, the local neighborhoods, and retail/service workers in the Northgate area as well as the public at large. KCDOT has led pre-development and conceptual design work for this project. This effort is aligned with the critical path set by Sound Transit's Northgate Station design completion in the next two to three years with construction to begin in 2016.

A recent study of an overcrossing of I-5 at this location indicates that there would be a 30% reduction in average walking time to the Northgate Transit Center and Light Rail Station and would effectively expand the area walk shed (0.5 miles) to more than 150 buildings and bike shed (3.0 miles) to more than 3,000 additional buildings. This study is to identify favorable alignments for the bridge and to recommend structure types that meet the project requirements with respect to the following criteria:

- Provide pedestrian and bicycle bridge to enhance multimodal access to regional transit center.
- Support city's larger growth strategy for transforming Northgate into a full-fledged urban center.
- Least environmental impact.
- Aesthetics
- Minimal disruption to traffic during construction.
- Sustainability and minimum maintenance.
- Economical
- Public safety

The project is intended to reduce the walking distance from the transit center to the community college from 1.2 miles down to approximately 0.25 miles. The effect will be to reduce single-occupancy vehicle congestion on the surrounding streets, reduce greenhouse gas emissions, and reduce the consumption of fossil fuels. In addition, construction of the pedestrian bridge will result in a lower demand for parking adjacent to the transit center and a reduction in costly investments required for construction of parking facilities.

3. PROJECT LOCATION

The project is located along the I-5 corridor between North Seattle Community College west of I-5 and the Northgate park-and-ride lots on the east side of I-5. The proposed alignments fall in a zone from Northeast 100th Street on the south to Northeast 103rd Street on the north. The attached Figure 1 shows the project location relative to the surrounding roads and streets.

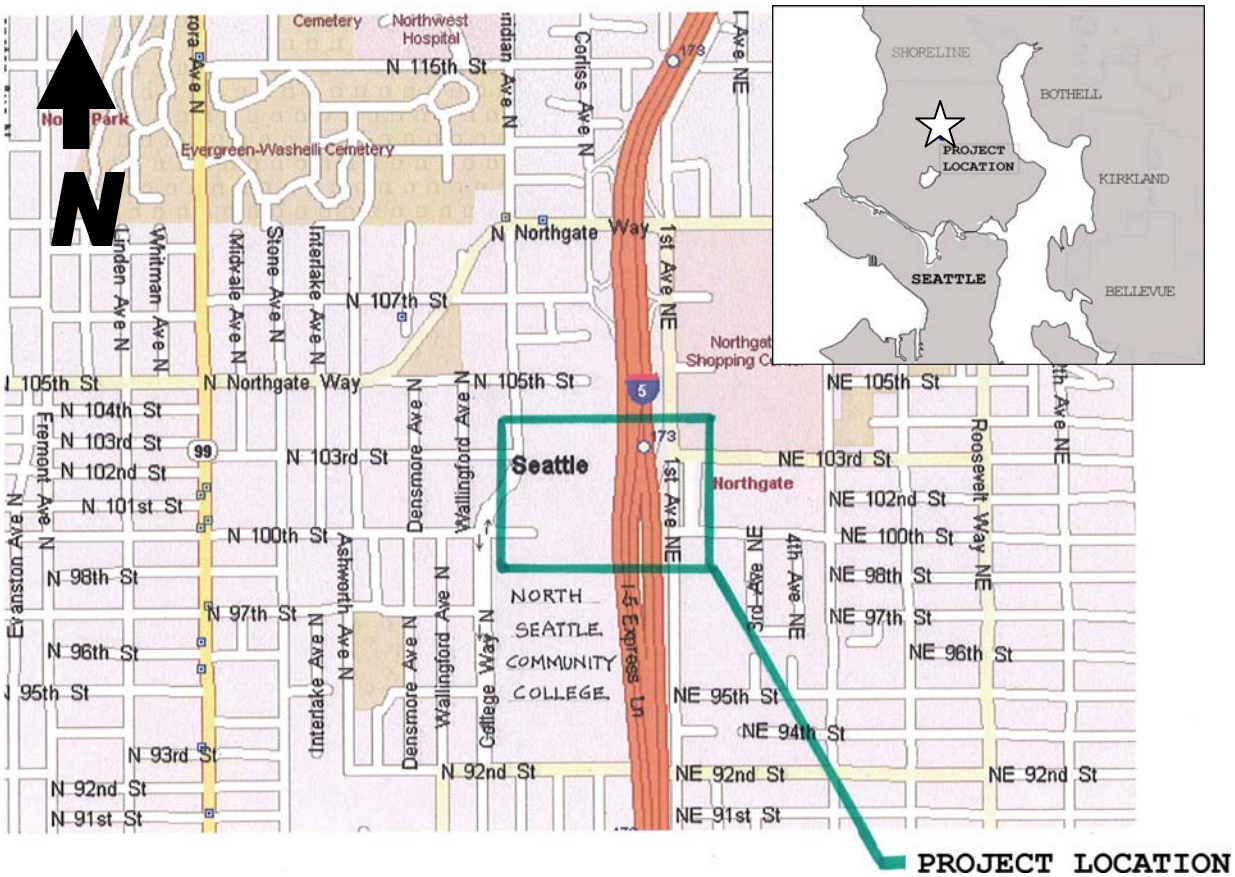


FIGURE 1 – PROJECT LOCATION

4. DATA RESEARCH AND REFERENCES

Information providing the basis of this study was obtained in part from the following sources and/or documents:

4.1 Northgate TOD Catalyst Project Description and Project Diagram

This information was obtained early in the study and shows a conceptual layout for the proposed bridge location and the proposed location for the future Sound Transit North Link station.

4.2 Washington State Department of Transportation (WSDOT)

Right-of-Way Plans for I-5 corridor showing north-bound and south-bound lanes and express lanes. In addition, areas in the landscaped zones located between the lanes are shown where bridge column supports could be considered. In addition, the state has provided the following information and documents:

- Soil boring logs and foundation type for the Northeast 103rd Street over-crossing bridge.
- I-5 corridor topographic map between Northeast 103rd Street and Northeast 100th Street. This map provides information of acceptable new bridge pier locations (see Appendix).
- Northeast Northgate Way Overcrossing No. 5/588 E&W, and First Avenue NE and NE 103rd Street signal structure foundation and soils information.
- Mountlake Terrace Freeway Station plans and cost data.
- WSDOT Design Manual M 22-01.07 regarding design guidelines for Pedestrian Bridge width, vertical clearance, and grade considerations.

4.3 North Seattle Community College (NSCC)

NSCC has provided information regarding potential locations for the west portion of the bridge, including possible wetland locations, approach fills, and the history of the area. NSCC also provided information regarding the extent of soft soils and peat due to the likely presence of a lake sometime in the past.

4.4 City of Seattle

The Seattle Department of Transportation provided the required minimum lateral and vertical clearance dimensions for city streets and obstructions such as light poles along 1st Avenue Northeast relative to potential bridge pier locations. They also provided a copy of the Seattle Right-of-Way Improvement Manual.

4.5 Sound Transit

Preliminary layout plans and elevations for the future Sound Transit North Link station were obtained from Sound Transit. These plans and elevations provided information regarding the location and potential elevation of the future connection between the pedestrian bridge and the station. However, it was decided that the final determination would have to be made in the future when the station plans become more finalized.

4.6 King County

A preliminary site survey was completed by King County survey crews to supplement I-5 corridor data provided by WSDOT and help establish existing elevations along proposed alignments.

4.7 Others

Case Histories, Plans, Specifications, and cost estimates from various past pedestrian bridge projects were obtained to help determine appropriate structure types and relative costs. Some of these references are:

- Sound Transit Canyon Park Pedestrian Bridge Overcrossing from Tetra Tech INCA, including project plans and cost estimates.
- Delta Ponds Pedestrian Bridge, City of Eugene, OR. (OBEC Engineers) (cable-stayed pedestrian bridge).
- I-5 Gateway Pedestrian Bridge, Oregon Dept. of Transportation (OBEC Engineers), including cost data forcable-stayed pedestrian bridge.
- Steel Truss Pedestrian Bridges by Contech Construction Products, Inc. This information included various kinds of truss options for long-span pedestrian bridge structures. The data included fabrication costs and truss plans and sections for their Gateway Truss and Keystone Truss type structures.
- Interurban Trail 124th Street Bicycle/Pedestrian O'Xing bridge plans by ABKJ.

4.8 Design Codes and Guidelines

- American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Guide Specifications for the Design of Pedestrian Bridges, December 2009.
- AASHTO LRFD Bridge Design Specifications, 4th Edition, 2007, with latest interims.
- International Building Code (IBC) latest edition (for the elevator/stair structure).
- National Cooperative Highway Research Program (NCHRP) Synthesis 353, Inspection and Maintenance of Bridge Stay Cable Systems, Transportation Research Board, 2005.
- Federal Highway Administration Technical Advisory 5140.25, Cable Stays of Cable-Stayed Bridges, June 17, 1994.
- Manufacturer's data for prefabricated truss bridges.
- Manufacturer's data for cable stays.
- Washington State Department of Transportation (WSDOT) Bridge Design Manual (2010).

5. PROJECT DESIGN CONSIDERATIONS

5.1 Bridge Design Criteria

The design criteria for the proposed pedestrian bridge include the following:

- Minimum vertical clearance on I-5 lanes shall be 20 feet. Minimum vertical clearance over city streets shall be at least 16’-6”.
- All new bridge piers or abutments shall be located at least 15 feet away from existing traffic lanes and shall consider future additional lane and full shoulder in the south bound I-5 direction and allow for some widening of north bound off ramps.
- Preferable clear width of the walking surface on the bridge shall be 14 feet. A 12-foot width may be acceptable if significant cost reductions and reduced traffic impact during construction can be achieved.
- The bridge shall have screens and handrails with a height approved by the State Architect. Current criteria assumed for this study has handrail heights at 4'-6" and a wire mesh screen height of 8'-0" to 10'-0".
- Design loads should allow for sign structures to be placed on the bridge (details to be discussed during final design stage).
- Bridge shall meet ADA requirements (profile grade and landing, etc.). This includes a maximum 5-percent slope without landings and a maximum 8-percent slope (6.25-percent is preferred) with landings spaced at 30 feet maximum. The length of landings shall be at least 60 inches.
- No construction staging will be allowed on the freeways.
- Night time closure of lanes on the freeway between 10 PM and 5 AM could be considered as long as two lanes each way remain open at all times. For express lanes, closure of one lane may be acceptable. Short term (2 to 4 hours) closures are possible but should be reviewed and approved by State Department of Transportation (DOT).
- Consideration should be given to ease of bridge inspection and inspection frequency.
- Current design study shall include a stairway and elevator at the east end of the bridge near the park-and-ride lot to allow access to and from street level. The design shall also allow for a future connection to the proposed future light rail station. This may entail an extra stop for the elevator and/or an extra landing for the stairway.
- All new bridge piers or abutments to be located adjacent to city streets shall comply with clearances as required by City of Seattle DOT. This includes minimum clearance of 3’-0” from face of curb to face of column, and a minimum clear sidewalk width of 5’-0”.
- Design of the bridge shall allow for a concrete walking surface, and shall allow for access by bicycles.
- Bridge type and aesthetics shall be reviewed and approved by State Architect.
- Design shall minimize environmental impacts to wetlands and sensitive areas.
- Design shall take into account constructability and durability, and shall consider lower cost alternatives as well as “signature type” structures.

- Design shall comply with the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, December 2009. The dynamic response of the bridge structure to pedestrian loads and to wind loads must be considered in the design.
- Where applicable, the design shall comply with the AASHTO LRFD Bridge Design Specifications, 4th Edition 2007, including all current interims. Fatigue and fracture resistance shall be considered, and for cable-stayed bridge types, the most current recommendations from the Federal Highway Administration, Post Tensioning Institute (PTI), and other recognized technical experts shall be considered for the design of the stay cables and for corrosion protection of the stay cables.
- Design shall provide for lighting system along the bridge for public night time access and safety.

5.2 Design Criteria for Alignments

A number of factors were considered as follows:

- Routes providing the shortest clear-span lengths for crossing the freeway. This involved researching potential locations for intermediate piers located on the State ROW.
- Routes providing the shortest over-all length for the elevated sections of the bridge.
- Routes that take advantage of the natural hillside adjacent to North Seattle Community College to gain elevation using a path constructed on grade or on shallow fill. This affected both the horizontal and vertical aspects for the alignment.
- Routes that provide the most direct connection to the desired destination point on the east side of the freeway and to the area that can minimize impacts to the existing road and school parking on the west of the freeway.
- Routes that are on a tangent alignment that could allow erection of long span steel trusses by launching methods.
- Consideration was given to the maximum slope of the walkway per ADA requirements without having intermediate landings. We considered the alignment length versus the length required to meet a prescribed elevation at the connection to the future light rail station given the slope limitation per ADA requirements. The height of the structure required to provide the necessary clearance of twenty feet above the freeway was also considered for several different alignments. The truss superstructures require a somewhat higher vertical alignment than the cable-stayed superstructure due to the depth of the trusses.
- Additional factors included potential changes in the location where the bridge would connect to the future light rail station, possible areas of wetlands, potential staging areas for construction, etc.

5.3 Bridge Types and Approach Fills

Since the span lengths for the main spans over the freeway are quite long compared to the typical approach spans, different bridge sections were studied for the main spans and for the approach spans. The main spans over the freeway vary from about 140 feet to 230 feet depending on the particular alignment chosen. The spans for the approaches were generally assumed to be about 100 feet in length. The typical bridge sections selected for this study for the main spans include steel trusses of various configurations with concrete decks, and cable-stayed structures constructed with segmental precast deck units. The cable-stayed sections include post-tensioning of the segmental deck units that will provide added durability and resistance to cracking. Corrugated steel decking should not be used to support a cast-in-place concrete deck slab due to corrosion concerns after the galvanized coating of the corrugated steel deck loses effectiveness and because of inspection difficulties for the deck slab.

It is recommended that structural steel for the steel truss bridge alternate be coated with a high quality paint system to provide corrosion resistance. As an alternate, the steel truss members could be hot-dipped galvanized and then painted; a double protection system to corrosion that can minimize future maintenance efforts and can increase structural lifespan.

Approach spans could be made continuous for live loads. This will increase the efficiency and eliminate expansion joints which will make the structure more durable and maintenance free.

Walls at the west end of the alignment approaches are shown on the bridge alignment profile views but it could be constructed on fills if grading is acceptable to school. Structural earth walls (SEW walls), gravity block walls, or mechanically reinforced steepened slopes (landscaped slopes) may be considered to support the taller fill sections. Due to a possibility of poor soils (peat) in the area, over-excavation, pre-loading of the soils, light-weight fill material, and/or soil improvements such as rammed-aggregate piers may be evaluated and considered to limit potential settlement of the fills.

Additional information on bridge types and approach fills has been included in Section 6.

5.4 Right-of-Way

The current proposed alignments are located entirely on public property. The west portion of the bridge and the approaches are located on property owned by North Seattle Community College. The remaining portions of the bridge over the freeway and terminating in the parking lot just east of the freeway are located on State-owned property (WSDOT ROW and the park-and-ride lot). We expect the ROW for the new pedestrian bridge to be donated by these public agencies, with no ROW needing to be obtained from private lands. This will result in a considerable cost savings for the project.

5.5 Utilities

Based on information provided by the State DOT, it is expected that no major utilities are located along the proposed bridge alignments or at the proposed locations for pier and abutment foundations. A more thorough investigation for possible utilities should be made during the final design phase.

5.6 Permits and Environmental Impacts

The current proposed alignments are intended to avoid impacts to wetlands. The area just north of the north parking lot for North Seattle Community College contains wetlands. The proposed alignments are intended to skirt these wetland areas. Other environmental impacts that will need to be considered include the following:

- The effect of lighting along the bridge alignment, especially any decorative stay/pylon lighting. This may affect the surrounding residential areas and also the traffic on I-5.
- Potential for increased traffic and parking west of I-5 due to the access provided by the new bridge.
- Safety of aviation and approval due to height of cable-stayed pylons.
- Additional studies and permitting that may be required before project construction include the following list:

SEPA Environmental Review (State Environmental Policy Act of 1971)

ECL (Environmental Checklist)
DNS (Determination of Non Significance)
NAT (Notice of Action Taken)

NEPA Environmental Review (National Environmental Policy Act of 1969)

Documented CE (Catagorical Exclusion)
ESA Evaluation (Endangered Species Act of 1973)
4(f)/6(f)
Cultural (Section 106)
Air
EJ (Environmental Justice)

Permits and Approvals

Ecology NPDES (National Pollutant Discharge Elimination System)
SWPPP (Storm Water Pollution Prevention Plan)
Seattle Building Permit
ROW Permits
Clearing and Grading Permit

Environmental Studies

Aquatic Environment
Wetland
Stream
Geotech Review
Air Quality Review

Noise Review

At the present time environmental studies have not been completed that address the environmental impacts of the proposed alignments. These studies will need to be completed prior to or during the final design phase for the project.

5.7 Bridge Foundation

This study has no detailed soils information at the proposed locations for abutments and piers along the proposed alignments. Geotechnical investigations at the proposed pier locations will need to be completed prior to the final design phase for the project. We have obtained soil boring information from the foundation plans for the existing bridge at Northeast 103rd Street Over-crossing on the north-bound lanes of the I-5 freeway in the immediate vicinity of the north alignment. In addition, based on inputs from North Seattle Community College, we understand that the area located west of the freeway may be underlain with soft soils and peat deposits. Foundation construction activities for some of the buildings at NSCC encountered these peat deposits.

Based on the above limited information, we anticipate the foundations for the bridge piers will require deep foundation elements. Most likely these elements will be drilled shafts that penetrate the soft soil layers and extend into the hard soils below. The shafts will be drilled and cased with steel casing if needed to avoid collapse of the side walls during excavation. After the shafts are completely cleaned of soft material at the bottom of the excavation, a cage of reinforcing steel will be installed and will extend the full depth of each shaft. The shafts will then be filled with concrete to complete the installation. The diameter of the shafts will vary depending on the loading demands of the structure. We anticipate a single shaft can be used for the piers under the approach spans with diameter between 6 and 8 feet. The piers under the long main spans will likely require two drilled shafts under each pier, and the diameter may range from 6 to 10 feet.

5.8 Seismic Hazard Areas

The seismic hazard at the bridge site can be characterized by the acceleration response spectrum for the site and the site factors for the relevant site class. The acceleration response spectrum can be determined per the AASHTO LRFD Bridge Design Specifications by either a General Procedure or a Site-Specific Procedure. A Site-Specific Procedure is required if any of the following conditions exist:

- Site is within 6 miles of an active fault.
- Site is classified as Site Class F (this applies if the depth of peat at the site exceeds 10 feet).
- Long-duration earthquakes are expected at the site.
- If the bridge is an important one requiring a lower probability of exceedance than normally used for typical design.

The General Procedure requires an analysis for earthquake ground motions that have a 7-percent probability of exceedance in 75 years. Bridges that are designed and detailed in accordance with these provisions may suffer damage, but should have a low probability of collapse due to seismically induced ground shaking. The geotechnical investigation will determine the Site Class and if any of the above conditions exist that will require a Site-Specific Procedure. In addition, the investigation will determine if there is a potential for liquefaction to occur during a strong earthquake. The Site-Specific Procedure is more involved and requires the development of ground motions that are more accurate for the local seismic and site conditions than can be obtained from national ground motion maps.

The City of Seattle has mapped the area associated with the Seattle Fault Zone. The location for the proposed pedestrian bridge does not fall within the mapped area of the Seattle Fault Zone. In addition, the City has mapped areas that may be subject to settlement from peat deposits. The proposed location for the bridge does fall within the predicted zone subject to peat settlement.

5.9 Traffic Impact

Impact to traffic on I-5 during construction of the new bridge must be kept to a minimum. Per discussions with WSDOT representatives, the following criteria must be met:

- No construction staging will be allowed on the freeways.
- Night time closure of lanes on the freeway between 10 PM and 5 AM could be considered as long as two lanes each way remain open at all times. For express lanes, closure of one lane may be acceptable. Short term (2 to 4 hours) closures are possible but should be reviewed and approved by State DOT.

5.10 Future Maintenance and Inspections

5.10.1 Maintenance

Maintenance needs will vary depending on the type of structure selected and the materials used to construct the bridge. In general, a steel structure will require more maintenance than a concrete structure. This is particularly true for precast prestressed concrete structures where maintenance requirements are usually minimal due to added prestressing or post-tensioning forces and its serviceability and sustainability have been well documented. Structural steel elements generally require painting at intervals determined by the type of coating system and the environmental conditions at the site. Stay cables may be vulnerable to corrosion unless they are protected. A variety of systems have been developed in recent years by cable suppliers that usually involve multiple barrier systems. One system employs epoxy coated and filled strands where the interstices of the strand are filled with epoxy, and then the strands may be sheathed in high-density polyethylene pipe. Another system uses a corrosion resistant barrier such as grease or wax combined with individually sheathed strands and finally

enclosed in a high-density polyethylene (HDPE) pipe. Cables protected by these multiple barrier systems have shown superior performance over previous single barrier systems.

5.10.2 Inspections

Future bridge inspections after the structure has been completed may disrupt traffic to enable the inspection crews to accomplish their work. The type of bridge superstructure selected for the final design and construction can affect the frequency of required inspections, particularly if the structure is classified as “fracture critical”. A fracture critical structure generally needs to be inspected twice as often as a non-fracture-critical structure. A vehicular bridge with a steel truss superstructure with two main trusses would likely be classified as “fracture critical”, however, since the live loads on a pedestrian bridge are generally smaller relative to the dead loads than for a vehicular bridge, it is unlikely that the steel truss alternate would be considered "fracture critical". A cable-stayed superstructure that has been designed so that one of the stays can be removed without affecting the load-carrying ability of the bridge would not be considered as “fracture critical”.

5.11 Future Light Rail Station and Mezzanine

The proposed future light rail station is being planned at the intersection of 1st Avenue NE and NE 103rd Street with the station extending for some distance south of Northeast 103rd Street. In addition to the platform level, the station may have a mezzanine level midway between the street level and the platform level. Current preliminary plans indicate the mezzanine level to be at about elevation 282’-0”. This elevation locates the mezzanine approximately 22 feet above street level at Northeast 103rd Street.

At the time of this study, it is anticipated the new pedestrian bridge will eventually tie into the mezzanine level of the station at a location some distance south of Northeast 103rd Street. The final location is yet to be determined, and will be the subject of the second phase of construction for the pedestrian bridge. In the interim, the east end of the pedestrian bridge will terminate at an elevator and stair tower near the parking lots to provide street access.

6. BRIDGE ALIGNMENT AND TYPE EVALUATIONS

6.1 Alignments

6.1.1 Alignments Studied

Three trial alignments were initially reviewed as shown on Figure 2.

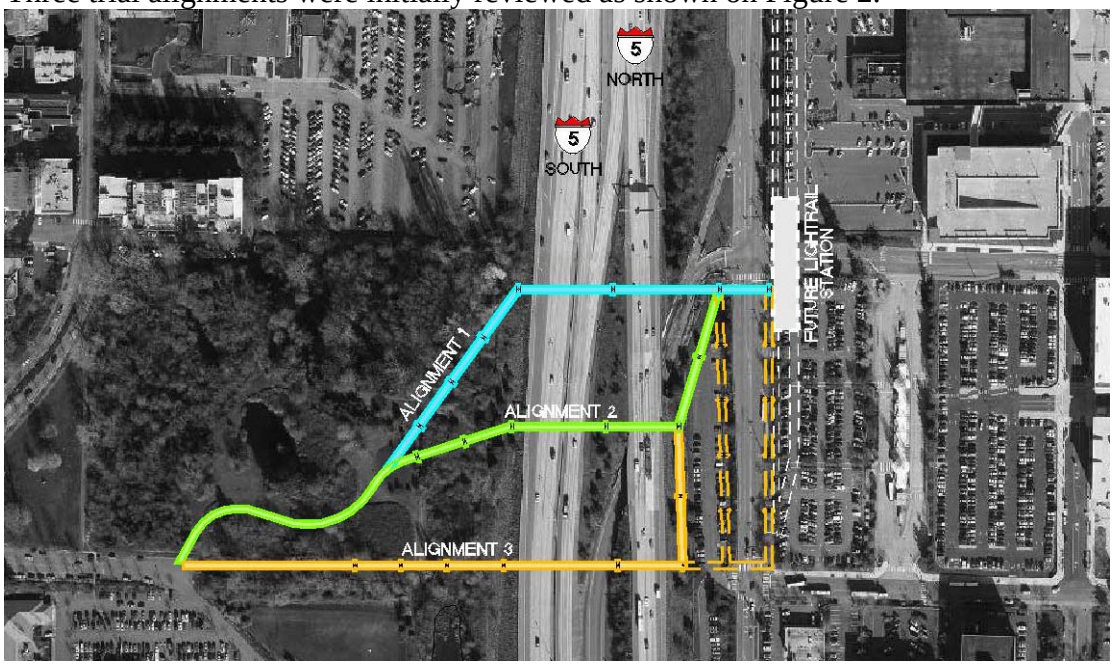


Figure 2 – Initial Alignment Study

The Alignment 1 at the extreme north shown in Figure 2 above allows somewhat shorter spans over the freeway, however the east end of the bridge on this alignment is very close to the location of the future light rail station and there is insufficient length to allow the vertical alignment to slope down to the desired elevation for the connection to the future station. Long ramps would be required to allow for the ADA connection. In addition, there is a difficulty to find a space to place a pier between I-5 lanes and the future connection will more likely be desired farther south and closer to mid-way between Northeast 103rd Street and Northeast 100th Street. For these reasons Alignment 1 was eliminated and the study concentrated on Alignment 2 and Alignment 3. At the south alignment (Alignment 3), three separate locations were considered where the bridge turns north and extends toward the future light rail station. The extension located farthest east parallels the east side of 1st Avenue Northeast. This extension was eliminated from further consideration because it is too close to the light rail line. Another extension was considered along the west side of 1st Avenue Northeast just east of the parking lot along the freeway. However, this location was determined to be a wetland and therefore this extension was eliminated also. The third extension is located between the freeway and the parking lot and this extension has been kept for further study.

6.1.2 Alignments Recommended for Further Consideration

Alignment 2 and Alignment 3 (as shown in Figure 2 above) are recommended for further consideration. For clarity, Alignment 2 has been re-named as the North Alignment and Alignment 3 has been re-named as the South Alignment. This study assumes that during the first phase of construction, the bridge will terminate near the parking lot at the east side of the freeway. The elevated connection from the parking lot to the future light rail station will be accomplished in a second phase of construction. The current study concentrates on the first phase of the project since there are a number of unknown issues regarding the connection for the second phase. It is assumed that the first phase will provide an elevator and stairway at the east terminus for the bridge to enable access to the street level. The North Alignment and the South Alignment are discussed in more detail in the following sections of this report.

a. North Alignment (Option 1)

The North Alignment was called Alignment 2 in the initial study phase. The west end of the North Alignment begins at the east end of North 100th Street (approximate elevation 257.70 ft.) , where the street becomes an approach road for the north parking lot at North Seattle Community College.

The alignment follows a curving path up the gentle hill side to a high point about 200 feet west of the freeway right-of-way (approximate elevation 277.2 ft.). This first section of the alignment is to be built on-grade with minimum fill sections where required. The curving path maintains a maximum grade of 5 percent per ADA requirements. From the high point at the top of the hill, the alignment turns slightly to the right and runs straight over the freeway to terminate at an elevator and stairway structure near the parking lot along the east side of the freeway. This section of the alignment is entirely elevated on the bridge structure. The highest point on the bridge deck occurs at Pier 4 for the cable-stayed and for the steel truss bridge with an elevation of about 307.0 feet. From the high point, the bridge deck slopes downward with a 5-percent grade to a final elevation at the east end of approximately 299.4 feet. The total length of the alignment is approximately 1124 feet for either bridge types. The elevated portion is comprised of four spans. The first two spans of 105 feet each are approach spans. The main spans crossing the freeway are 200 feet and 150 feet in length. Pier No. 4 is located in the landscaped zone between the express lanes and the northbound lanes of the freeway. The attached Figure 3 shows an aerial view of the North Alignment.

Plan, Elevation, and Section views can be found in Appendix C-1 and C-2. Rendering views of North Alignments with Cable-Stayed and Steel Truss Bridge over I-5 can be seen in the Appendix D.



Figure 3 - North Alignment (Option 1)

b. South Alignment (Option 2)

The South Alignment was called Alignment 3 in the initial study. The west end of the South Alignment begins at the same point as the North Alignment. From this beginning point, the alignment proceeds directly east on a tangent alignment for approximately 1024 feet for steel truss and 1008 feet for cable-stayed bridges. The alignment follows North 100th Street, but is offset about seven feet north of the centerline of the street to provide room for a pathway on grade. The same tangent alignment is maintained for crossing the freeway lanes to a point just east of the northbound lanes.

The beginning elevation at the west end of the South Alignment is approximately 258.2 feet. The first 228 to 244 feet of the alignment will be constructed with fill that is retained by structural earth walls on each side. In order to meet ADA requirements and minimize impacts to the existing roads, a maximum 8% slope with 6’ landing spaced 30 feet are considered. The remaining portion of the alignment is all elevated on the bridge structure. The bridge structure consists of six spans of varying length. The slightly longer alignment is required for the truss bridge to account for the depth of the truss and the clearance required above the freeway.

Depending on the type of bridge structure, there will be either three or four approach spans of roughly 100 feet each at the west end of the elevated portion. The main spans over the freeway are approximately 230 feet and 140 feet. Uniform slopes of five percent are maintained for approaches and for the main spans. The high point occurs above Pier 6 which is located in the landscaped area between the express lanes and the northbound lanes of the freeway. The deck elevation at the high point will be

approximately 306.7 feet for the cable-stayed superstructure and 307.7 feet for the steel truss superstructure. The attached Figure 4 shows an aerial view of the South Alignment.

Plan, Elevation, and Section views can be found in Appendix C-3 and C-4. Rendering views of South Alignments with Cable-Stayed and Steel Truss Bridge over I-5 can be seen in the Appendix D.



Figure 4 - South Alignment (Option 2)

6.2 Structure Types

6.2.1 Bridge Types on the North Alignment

6.2.1.1 North Alignment with steel truss bridge over I-5

For the main spans over I-5 on this alignment we investigated a steel truss superstructure fabricated from steel tube sections. There are several companies that specialize in steel truss pedestrian bridge structures, and for this feasibility study we have used information provided to us by CONTECH Construction Products, Inc. This company has recommended their “Gateway” or “Continental” type trusses for the long spans crossing over I-5. The depth to span ratio of the trusses will be approximately 0.05 for structural needs, however it is expected that the shorter truss span height will be controlled by 10’ minimum vertical clearance between the top and the bottom truss bracing members or any light features.

6.2.1.2 North Alignment with cable-stayed bridge over I-5

The second type of structure we investigated for the long spans on this alignment is a precast segmental concrete cable-stayed type bridge. For this structure we contacted OBEC Consulting Engineers in Eugene, Oregon, where they have successfully designed and built at least two similar bridges. One bridge is owned by the Oregon DOT, and the other is owned by the City of Eugene. These bridges use a technology known as a cable-stayed stress ribbon deck which results in a very shallow thickness for the concrete deck. Because of the shallow structure depth, the deck can be located at a lower elevation relative to the freeway beneath the bridge and still provide the required vertical clearance. In addition, the thin deck reduces the dead weight of the structure which in turn reduces the demands on the substructure. The concrete deck segments are erected using a balanced cantilever method that does not require false-work for temporary support during construction since the deck panels are supported by the stays. The deck panels are supplied with adjustable connections that allow relatively quick erection. For the I-5 Pedestrian Bridge in Eugene, the panels were generally 10 feet in length. Approximately 18 panels were erected during three night shifts using a light crane to set the panels. Temporary lane closures were required during the erection of the panels. After the panels have been set, a topping slab is poured and full-length post-tensioning strands are placed in the topping slab. The bridge contains no deck joints, minimizing maintenance requirements.

For the North Alignment, only a single pylon was assumed with two cable-stayed spans, one at each side of the pylon. The span on the west side of the pylon is 200 feet, and the span on the east side of the pylon is 150 feet. Due to the restrictions on where piers can be located because of required clearance from the freeway lanes, the spans are of unequal length. This makes the design and construction slightly more complicated since the loading from the panels will not be symmetric and balanced about the pylon unless additional weight is added on the shorter span to help resist the tension in the stay cables. However, this type of bridge is feasible for this location.

6.2.1.3 North Alignment with cable-stayed truss bridge over I-5

Another option that can be considered for either North or South Alignment would be to provide a cable-stayed truss bridge. The advantage of this type of structure would be to allow the truss to be erected in a single lift instead of segmental construction. This would speed up erection time and minimize disruption to traffic on I-5. In addition, the trusses could be much lighter since they would be supported by the stays for the dead weight of the deck and for live loads. The deck could be constructed after the trusses have been erected and supported by the stays. If enclosure of the bridge with a roof for the long spans over the freeway is desirable, this system would make it very easy to add a roof on top of the bridge truss structure.

6.2.1.4 Structural modeling and verification

In addition to researching the bridges designed by OBEC Engineers, preliminary modeling and investigation has been performed for a cable-stayed segmental concrete bridge. We found the dynamic response of this type of bridge to pedestrian live loads was in a satisfactory range. In addition to the response from pedestrian loads, the dynamic response due to wind and earthquake forces should also be investigated for any bridge alternate that is selected for final design.

Figure 5 below shows the alternate bridge types for the North Alignment.

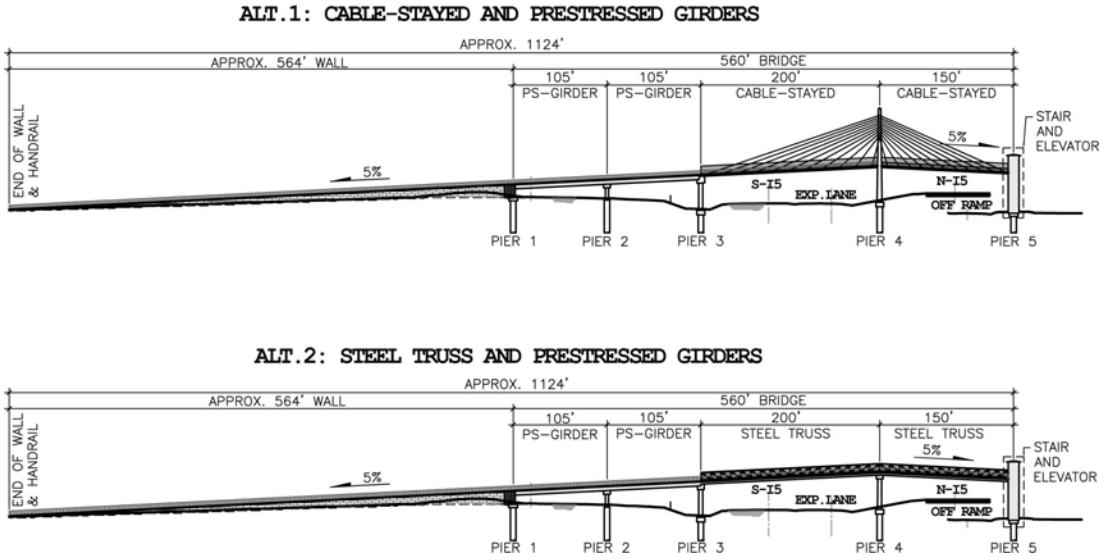


Figure 5 - Bridge Types at North Alignment

6.2.2 Bridge types on the South Alignment

6.2.2.1 South Alignment with steel truss bridge over I-5

For the main spans on this alignment we investigated a steel truss superstructure similar to the one investigated for the North Alignment. The main spans are 230' and 140'. The steel trusses for this alignment will be somewhat deeper and heavier than the trusses at the North Alignment due to the increase in span length. It is expected that the longer span truss and the light features may control the truss height.

6.2.2.2 South Alignment with cable-stayed bridge over I-5

For the main spans on this alignment we investigated a segmental precast concrete cable-stayed bridge similar to the bridge for the North Alignment. For this alignment we were able to achieve a more symmetric arrangement of the spans relative to the pylons. Two pylons are required at this location, with a main span

between the pylons equal to 230 feet, and end spans of 140 feet each. This arrangement allows a more balanced erection of the panels; however the overall number of panels will be larger. Figure 6 below shows the alternate bridge types for the South Alignment.

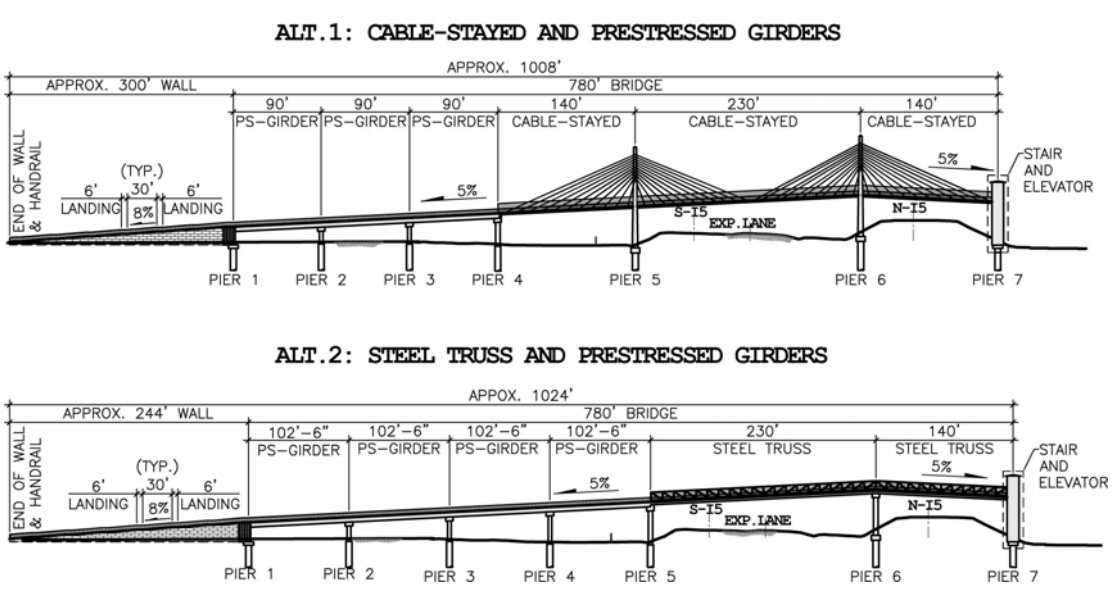


Figure 6 - Bridge Types at South Alignment

6.2.2.3 South Alignment with cable-stayed truss bridge over I-5

As noted above, another option would be a cable-stayed truss bridge on this alignment. All the advantages of this type of structure as described for the North Alignment would also apply for the South Alignment.

6.2.3 Approach bridge spans

The approach bridge spans vary in length from about 90 feet to about 102.5 feet. Our study assumes the approach spans will be constructed from standard WSDOT precast prestressed girders with cast-in-place concrete deck. The type of girder selected and the number of girders in the cross-section will depend on several factors including cost, aesthetics, deck width, continuity, and ease of erection. Standard precast prestressed wide-flange girders or precast prestressed bulb-tee girders will likely provide the most economical solution. However, for aesthetic reasons, precast prestressed trapezoidal tub girders with slightly higher costs may give a more desirable appearance. Any of the above choices can be made continuous for live loads. This will tend to reduce the required depth of the structure and provide a better appearance. In addition, the continuity will eliminate expansion joints and contribute to lower maintenance costs. From an aesthetics standpoint and also from a reduced maintenance standpoint, it will be desirable to set the girders on false-work and cast

the pier cross beams at the same level as the girders. This method also provides for continuity between spans for negative bending over the supports.

Based on a 14-foot wide deck, we anticipate a single trapezoidal tub girder can be used for the approach spans. The number and spacing for wide-flange girders and bulb tee girders can be optimized during final design. For the foundations, we anticipate a single drilled shaft can be used at each pier for the approach spans.

6.3 Approach wall & fill sections and pathway access

Both the north alignment and the south alignment will be constructed on fill sections from the west end of the alignments to a point where the fill approaches a maximum height of about 20 feet or less. The fill will be contained on both sides of the path by a retaining wall. Several wall types can be considered for this application. Possible wall types could include structural earth walls with precast concrete blocks, gravity block walls with or without a facing system that would allow planting (green wall), precast concrete crib-lock walls, and other types. Another couple of options for consideration include maximum 2:1 or steepened slopes on both sides of the approach fill sections if it is acceptable to North Seattle Community College. For the steepened sloped section, the soil fill would be reinforced with geogrid material at both sides of the fill. The steepened slopes can be constructed up to an angle of 70 degrees with respect to the horizontal. All sloped fills can be landscaped with grass or plantings. This approach might work well for the path on the north alignment that is constructed on the existing hillside since the landscaped slope would blend in with the existing hillside.

Due to a possibility of poor soils (peat) in the area, over-excavation, pre-loading of the soils, light-weight fill material (geo-foam fill), and/or soil improvements such as rammed-aggregate piers may be considered to limit potential settlement of the fills. For the alternate using geo-foam fill, the fill could be topped with concrete slab. The various options can be reviewed once soil information is available during final design.

7. CONSTRUCTION ACCESS, STAGING, ERECTION & TRAFFIC IMPACTS

Construction staging areas for crane pads and for on-site assembly of large sections of truss framework are likely to be required on both sides of the freeway. On the east side of the freeway, the most likely location for staging areas includes the parking lot located adjacent to the freeway. On the west side of the freeway, tree covered areas adjacent to the proposed alignments will need to be cleared for crane access and for assembly and lay-down areas. For example, a minimum 50-foot wide area along the north side of the South Alignment would be needed for providing large construction equipment access and staging for drilled shaft construction operation and during erection of the approach span pre-stressed girders on the west end of the bridge. A similar area would be required for approach spans on the North Alignment. For the long span truss structures, it may be possible to field-assemble the sections in the parking lot east of the freeway, then load the truss onto a truck of I-5, and subsequently position the truck on the freeway where two cranes can lift the truss into place during the night.

8. STAIR AND ELEVATOR

8.1 Stair and Elevator at East End of Bridge

For this study we assumed the first phase of construction for the bridge would be to build the portion from North Seattle Community College to a point just east of the I-5 ROW. A future phase will connect the bridge to the future light rail station. The east end of the bridge for the initial phase will terminate at an elevation that will be approximately 45 feet above the street level. An elevator and stairway will be required at this point until such time as the second phase of construction is completed. Several types of stair and elevator can be considered during the project final design phase depending on the space that is available at the east parking lot. Some photos of stair and elevator towers from similar projects are included in the appendix for reference.

8.2 Stair at West End of Bridge

Near the west end of the bridge, a simple stairway will provide access to an on-grade pathway that connects to the parking lot for the Medical Center buildings just north of the Community College.

9. COST ESTIMATES

Construction cost estimates for the various bridge types at both the north and south alignments are shown in the table below. The estimated total project costs are provided to aid project budget planning and preparation.

Refined details for construction cost estimates can be found in the Appendix.

Northgate Pedestrian Bridge Project Cost Estimates Summary

Alignment Options	North Alignment		South Alignment	
Main bridge span over I-5	Cable-Stayed	Gateway Steel Truss	Cable-Stayed	Gateway Steel Truss
Approach bridge span	Precast Box or I-girders	Precast Box or I-girders	Precast Box or I-girders	Precast Box or I-girders
Approach wall structure	Structural Earth Wall	Structural Earth Wall	Structural Earth Wall	Structural Earth Wall
Estimated Construction	$9,514,170	$9,278,182	$10,261,513	$10,104,434
Contingency/Conceptual (30%)	$2,854,251	$2,783,455	$3,078,454	$3,031,330
Inspection (20%)	$1,902,834	$1,855,636	$2,052,303	$2,020,887
Designs (30% Cable-S., 25% Truss)	$2,854,251	$2,319,545	$3,078,454	$2,526,109
Estimated Project Total =	**$17,125,507**	**$16,236,818**	**$18,470,723**	**$17,682,760**

Costs have been assumed based on the following:

1. Drilled shafts supporting bridge & min. soil improvements for walls.
2. No costs for R/W.
3. Future bridge extension to light rail station mezzanine is not included.
4. Estimated in 2011 $.
5. Minimum lighting and architectural features on walls and bridges.
6. No cover or canopy on bridge.
7. No contaminated material along the construction site.

10. COMPARISON OF ALTERNATIVES

Northgate Pedestrian Bridge Option Data Comparisons

Description	North Alignment		South Alignment	
Type of bridge over I-5	Cable-Stayed	Steel Truss	Cable-Stayed	Steel Truss
Approach bridge spans	I or Box Girders	I or Box Girders	I or Box Girders	I or Box Girders
Walls & fills	SEW & fills	SEW & fills	SEW & fills	SEW & fills
Total length/new crossing	1124'	1124'	1008'	1024'
Total bridge length	560'	560'	780'	780'
Total length/walls & fills	564'	564'	228'	244'
Width of bridge	14'	12' - 14'	14'	12' - 14'
Est'd construction costs	$ 9.5 M	$ 9.3 M	$ 10.3 M	$ 10.1 M
Est'd total project costs	$ 17.1 M	$ 16.2 M	$ 18.5 M	$ 17.7 M
Construction duration	12 - 15 months	11 - 14 months	12 - 15 months	11 - 14 months
Bridge designs	Needs specialty for cable-stayed bridge models & designs.	More conventional bridge designs	Needs specialty for cable-stayed bridge models & designs.	More conventional bridge designs
Constructability	Requires special contractor for cable-stayed bridge span construction.	More conventional construction	Requires special contractor for cable-stayed bridge span construction.	More conventional construction
Bridge weight	About 30% to 40% less dead weight; less substructural demands	Heavier	About 30% to 40% less dead weight; less substructural demands	Heavier
Traffic impacts	Slightly higher	Less	Slightly higher	Less
Environmental impacts	About same	About same	About same	About same
Aesthetic	Signature structure	Conventional structure	Signature structure	Conventional structure
Future maintenance and inspection	Expects less maintenance & inspection efforts and less traffic impact during inspection	More inspection & maintenance efforts and more traffic impacts during inspection & painting	Expects less maintenance & inspection efforts and less traffic impact during inspection	More inspection & maintenance efforts and more traffic impacts during inspection & painting

Notes:

1. SEW = Structural Earth Wall system
2. Estimated costs and design and construction durations can be found in the Appendixes

11. CONCLUSIONS

The proposed location for the new bridge is just north of North Seattle Community College on the west end and between NE 100th Street and NE 103rd Street on the east end. Three alternative alignments were initially studied and two of them were chosen for more detailed evaluation. Consideration was given to potential bridge span lengths, horizontal and vertical clearance from I-5 lanes and city streets, ADA requirements for slopes and landings, impacts to traffic on I-5 during construction, street access via stairways and elevators, aesthetics, economics, environmental impacts, constructability, and durability.

Various bridge structures and its configurations have been reviewed and evaluated. For the main bridge spans over I-5, cable-stayed or steel truss structures are feasible for a long span bridge crossing. Steel truss bridge provides more traditional appearance while cable-stayed is a landmark type structure that is visually pleasing and can blend well with the surrounding environment. In addition, the cable-stayed bridge can provide a benefit for sub-structure demand due to its lighter dead weight and can reduce overall bridge span length due to its thin deck. However, higher costs requiring a specialty in cable-stayed bridge designs and construction are expected. Rendering views of these two bridge types along two recommended alignments can be seen in the Appendix.

For the approach bridge spans, more conventional type structures including precast concrete Box girder, I-girder, Bulb-T girder, and steel plate girder are viable and economic solutions. Precast concrete girders in particular can offer good durability and extreme low maintenance over their lifetime. At the bridge approaches, a flexible retaining wall system or a combination of wall and sloped fill can be considered to minimize project construction costs.

It is recommended that the typical bridge cross section have a concrete deck surface with a minimum width of either 14 feet or 12 feet depending on structure type and economics. The minimum clear height for pedestrians and bicycles using the bridge will be ten feet to any overhead structure if a roof is required. The current criteria assumed for this study is 4'-6" handrail height and 8'-0" to 10-0" high screens on each side of the bridge.

A table that summarizes and compares various bridge alignments, structural types, and other aspects including design, constructability, aesthetic, future maintenance, traffic, and environmental impacts has been included in Section 10 of this report. The table provides construction and project cost data that should be useful for consideration of an appropriate balance among cost, function, and aesthetics for the project.

SOUNDTRANSIT

Northgate Station Access Study – Preliminary Results

The Sound Transit Board approved Motion No. M2012-42 in June 2012, which committed $5 million towards the cost of completing the I-5 bridge project and $5 million towards other pedestrian and bicycle improvements (and matched by the City of Seattle) to improve access to the future Northgate light rail station. The Motion also directed Sound Transit staff to conduct a station access study to help evaluate and prioritize potential ped and bike improvement projects in the Northgate area, in collaboration with the City of Seattle and King County Metro staff. Sound Transit retained Kittelson and Associates, a Portland based consultant firm, to conduct the study.

The scope of this access study was two-fold; first, conduct a connectivity analysis to assess the 15 minute walk and bikes sheds around the Northgate Station area and second, assess the access mode share of the station and identify how future improvements within the station area could benefit station access for bicyclists and pedestrians. This is a summary of the preliminary results of the access study.

The 15 minute travel sheds for pedestrians and bike riders accessing the Northgate Station are shown on the attached map. Potential ped and bike improvement projects identified by the City of Seattle and local communities are also identified on the map.

The expected mode share of riders that will access Northgate Station in 2030 and weekday boardings by mode are summarized in Table 1 below. With the construction of the I-5 pedestrian/bicycle bridge, the bike and pedestrian travel sheds expand and the number of walkers increase by 13% and the number of bicycle trips to the station increase by 4%. The increase in station ridership due to other candidate improvement projects is also summarized in Table 1. The number of new walkers and bikers who would travel to the station due to the addition of these combined projects is expected to increase by 870 boardings each weekday, a 6% increase in total new weekday station boardings.

Table 1

Northgate Station Access Mode Share and Station Ridership Benefits (2030)

	Park-and-Ride	**Drop-off**	**Feeder Bus**	**Bicycle**	**Walk**	**TOTAL**
Expected Mode Share	20%	11%	28%	4%	37%	100%
Weekday Boardings	3,000	1,650	4,200	600	5,550	**15,000**
Boarding Increase due to Ped/Bike Bridge				25	740	765
Boarding Increase due to Other Improvements				25	80	105
TOTAL Weekday Boardings				**650**	**6,370**	**15,870**
Percent Change				**+8%**	**+15%**	**+6%**

In addition to creating new station ridership, these candidate ped and bike improvement projects would also improve access to the station for other expected station users. Table 2 summarizes the expected

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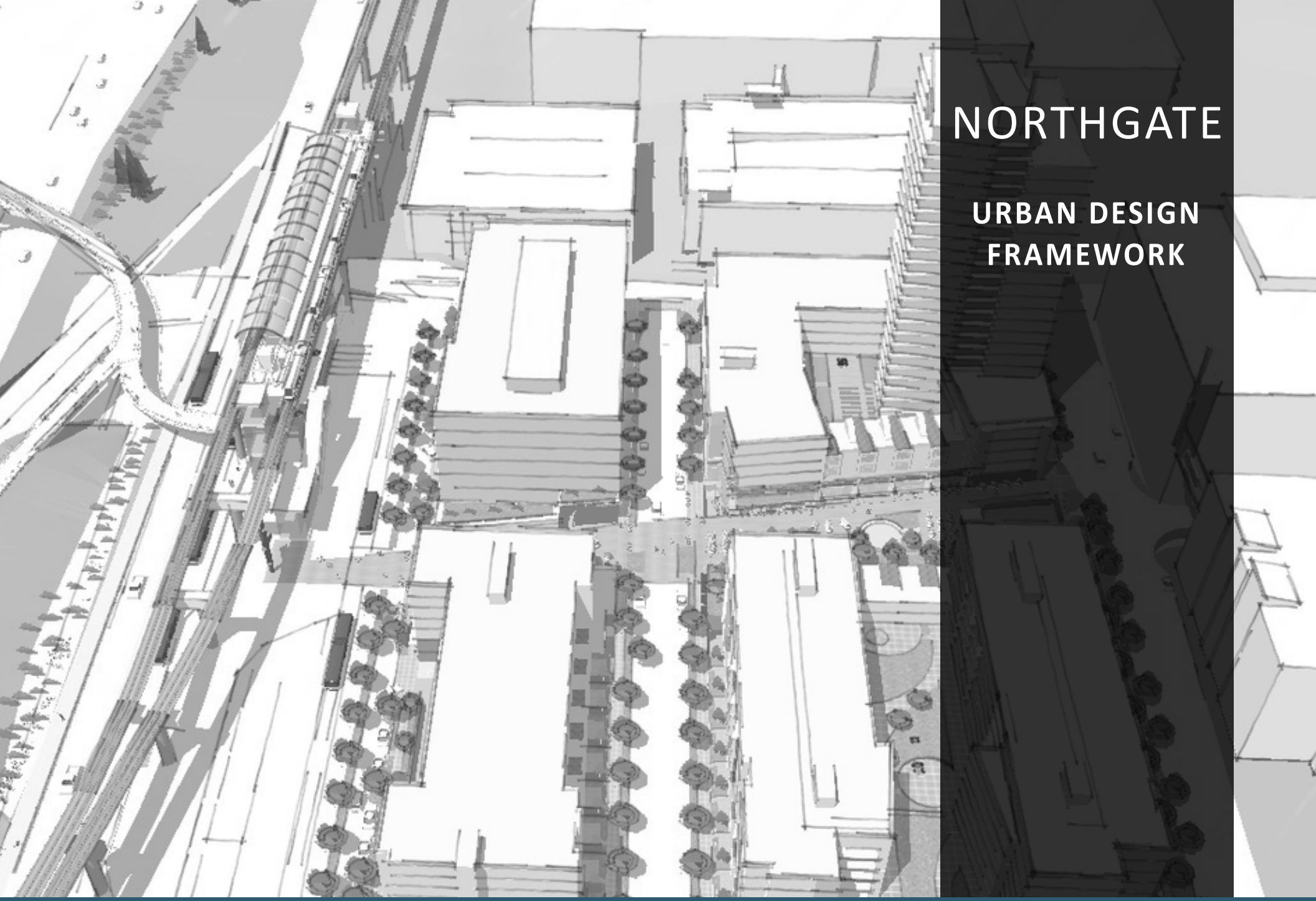
number station riders who would use and benefit from individual proposed bike improvement projects. Table 3 summarizes the number or expected station riders who would benefit from potential pedestrian improvement projects.

Table 2 **Local Bike Improvements**	**2030 Northgate Station Bikers Benefited**
1st Ave NE Cycle Track - NE 92nd St to Northgate Way	447
Buffered bicycle lanes on 5th Ave NE between NE 80th and NE 115th St	293
Bicycle lanes on NE 92nd between Wallingford Ave and 5th Ave NE	241
I-5 Bicycle and Pedestrian Bridge	149
Protected or buffered bicycle facilities on NE 103rd St between 1st Ave NE and 5th Ave NE	82
Protected or buffered bicycle facilities on NE 100th St between 1st Ave NE and 5th Ave NE	67

Table 3 **Local Pedestrian Improvements**	**2030 Northgate Station Walkers Benefited**
I-5 Bicycle and Pedestrian Bridge	1,169
Sidewalk upgrades on 5th Ave between NE 100th St and NE 103rd St	130
Pedestrian Enhancements - NE Northgate way between Corliss Ave N and 1st Ave NE (CTIP Project, C-12)	56
Construct sidewalks on NE 103rd St. between 5th and 8th Ave	53
Curb, gutters and sidewalks both sides of NE 92nd between 1st Ave NE and 5th Ave	46
Construct sidewalks on NE 95th St between 1st and 3rd Ave	37
Construct sidewalks on NE 98th St between 5th and 8th Ave	19
Construct sidewalks on NE 95th St between 4th and 5th Ave	14
Extend walkway along 8th Ave NE to 92nd St	9
Intersection and crossing improvements on 5th Ave and NE 94th St	8

Data Limitations: This analysis is based on light rail ridership forecasts and is limited to only estimating the number of ped and bike users traveling to or from the Northgate Station. This ridership assessment tool is not able to predict the number of non-station users who would also use and benefit from these improvements, once built.

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NORTHGATE

URBAN DESIGN FRAMEWORK

City of Seattle
Department of Planning & Development

December 2013

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i. EXECUTIVE SUMMARY

The future vision for Northgate is as expressed in its 1993 neighborhood plan: to "transform a thriving, but underutilized auto-oriented office/ retail area into a vital, mixed-use center of concentrated development surrounded by healthy single family neighborhoods." The neighborhood plan encompasses all facets of Northgate's future, foreseeing:

- a denser community with many residents and diverse housing opportunities
- a network of parks and recreational amenities
- more community services
- more small local-serving businesses
- a healthy and sustainable setting emphasizing natural environmental values; and
- a transportation system that ideally serves users of all kinds — walkers, bicyclists, transit riders and motorists.

By gaining several new amenities in the last decade – library, community center, parks, streetscape improvements, drainage channel, and improved transit service frequency — Northgate has become a more livable and attractive place for residents and businesses. The City has continued to assist through a number of planning efforts that have defined design guidelines, future transportation investments, and other initiatives supporting future growth and realization of the vision.

This Urban Design Framework (UDF) defines a road map of strategies and recommendations for continued progress toward the Urban Center's transformation. It evaluates the top priorities for future growth and recommends several urban design improvements that will be great amenities promoting livability, a better environment and a well-functioning community. All of these actions will directly support the accomplishing of Northgate's neighborhood plan vision, especially in:

- creating a denser and vibrant mixed-use, mixed-income transit-oriented community near the Sound Transit (ST) Link and Metro Transit station;
- improving mobility and quality of facilities for pedestrians, transit riders, and bicyclists; and
- aiding the transformation from an automobile-oriented district to a better living environment throughout the Urban Center

Among the numerous benefits of a transit-oriented development approach will be:

- Increased transit system ridership and improved personal mobility
- Healthier, more walkable and livable communities supported by focused investments
- Contributes to energy conservation and climate initiatives
- Lower transportation cost burdens on households

This UDF will be used to express the preferred vision and design priorities for the future development of the Link transit station subarea. As well, further discussion and coordination with King County, Sound Transit and other agencies will inform how the vision can be realized, by influencing designs for future development and balancing transportation operational needs.

Findings

This Urban Design Framework (UDF) guides future actions that will help realize the vision identified in Northgate's 1993 neighborhood plan, calling for dramatic growth and transformation of the commercial core into a livable, walkable, dense urban center.

The UDF recommends both general and specific actions that the City will seek to implement, to achieve goals of the City's Comprehensive Plan, the neighborhood plan, and related objectives to improve Northgate as a livable and well-served Urban Center.

These include actions that support: future transit-oriented development (TOD) with high-quality public places, next to the Link transit station; enhanced transit services and operations; and investments to improve pedestrian and bicycling mobility and safety.

These can transform the Urban Center to a better living environment, enhance transit accessibility, and overcome difficulties posed by the presence of Interstate 5 as a barrier within the neighborhood, and the large "superblock" road configurations.

Planning Purpose, Process, and Guiding Principles

In the last 20 years since the Northgate Plan was adopted, much has happened – including a series of investments in public parks, facilities, streets and sidewalks, transit service, and a number of newer commercial investments and residential developments that are gradually transforming the Urban Center. Also, Link light rail is now under construction and service will begin in 2021.

This UDF provides a chance to review the neighborhood planning objectives as they relate to today's circumstances, and better define and illustrate strategies for continuing the transformation. Topics such as how neighborhood environments support public health, livability and social equity – all referenced by the original Northgate planning – are now even more prominent in present-day city planning perspectives. Regional planning efforts and federal funding have helped motivate this current effort, to ensure that everyone is doing as much as we can to achieve high-quality neighborhoods in places that are designated growth centers and will be well-served by major transit systems.

To those ends, the City has conducted a preliminary Urban Design Study in 2011/12, and conducted expanded public outreach in 2012/13 to study options and gain feedback about how future growth can best be shaped.

Land Use Planning and Growth Principles

The most important "big themes" and priorities that have been identified for achieving Northgate's vision, reflected in this UDF, are:

- Defining a compelling vision for the development of the Link station area district with a dense and attractive combination of residential and commercial land uses, and amenities and public spaces that are safe, active and successful.
- Accomplishing a socially diverse community with affordable housing, and amenities and services that better serve residents' needs and make a livable place.
- Accomplishing a targeted set of pedestrian, bicycle-oriented and transit improvements that will enhance mobility, comfort and safety for all users across the Urban Center.
- Ensuring transportation mobility options and transit services are well-integrated and efficiently available to serve the neighborhood.
- Enhancing the main corridors (Northgate Way, 5th Ave NE and Meridian Ave N), and transforming Northgate's "superblocks" throughout the Urban Center to become healthier, human-scaled and livable mixed-use districts.

Urban Design Principles

The most important urban design principles that will help improve the urban environment are:

- Providing landscaping, amenity and accessibility enhancements along key corridors to improve mobility and aesthetic quality.
- Incorporating generous public spaces, amenities and art in future development.
- Accomplishing a network of pedestrian-oriented connections across the Urban Center that will help to break up "superblocks."
- Siting and designing buildings to reinforce the pedestrian realm.
- Including environmental sustainable design features in future development.
- Ensuring and enhancing transit service frequency and reliability.

Conceptual Framework

The UDF design recommendations are organized according to a hierarchy of three geographic scales:

1. Northgate Urban Center:

The Urban Center scale captures area-wide issues, including strategies for linkages between Northgate's subareas, housing and livability.

2. Northgate Subareas:

The Subarea scale explores Northgate's Urban Center in three parts, which allows a closer look at the roles and development patterns in each of these districts.

3. Northgate Superblocks:

The Superblock discussions illustrate existing issues and the future potential within several superblocks across the Urban Center. Similarly, a case study examines the future redevelopment potential within King County's Park and Ride lot south of the mall.

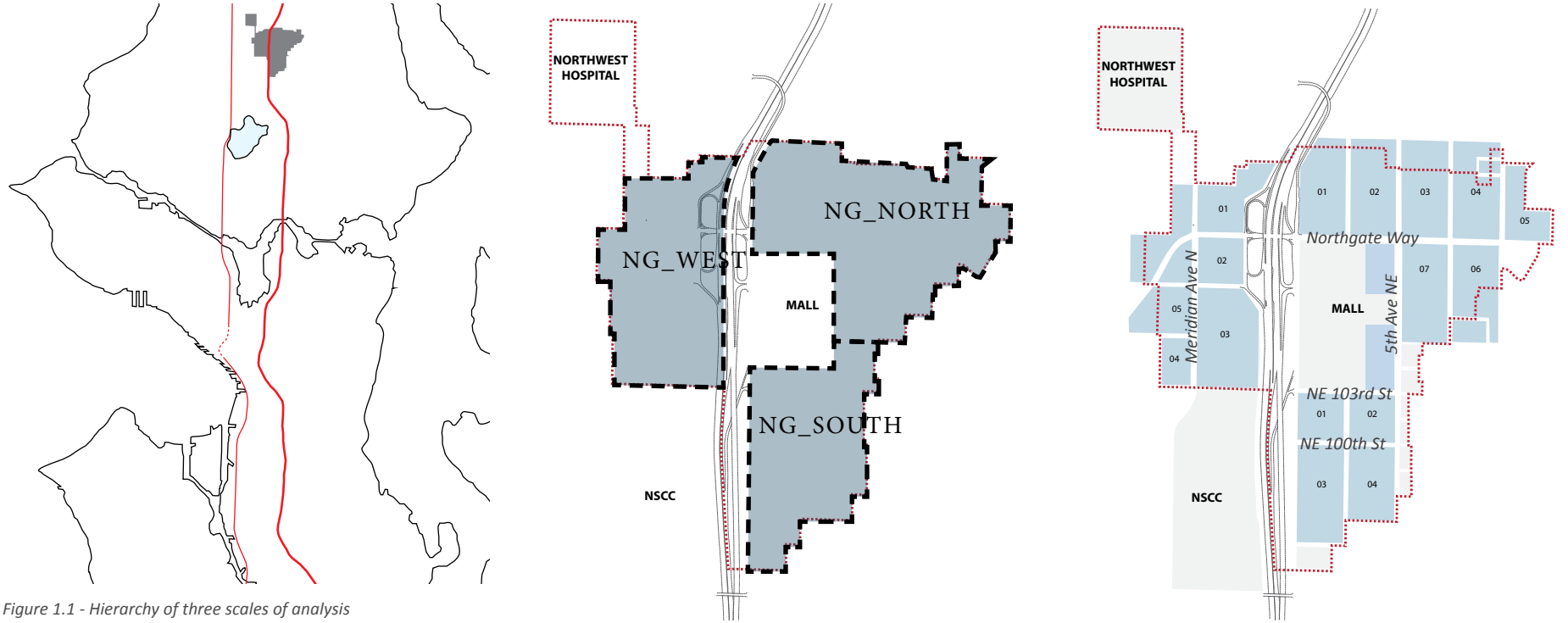


Figure 1.1 - Hierarchy of three scales of analysis



Festivities at the Hubbard Homestead Park

How Northgate Relates to Seattle and the Region

Located six miles north of downtown, Northgate is one of six Urban Centers designated in Seattle's Comprehensive Plan, and one of 27 regional growth centers designated in Puget Sound Regional Council's (PSRC) Vision 2040 regional growth management plan. The Urban Center includes 410 acres on both sides of Interstate 5. The Urban Center is at the conjunction of several surrounding residential neighborhoods, including Licton Springs, Haller Lake, Pinehurst, and Maple Leaf, with others such as Victory Heights, Lake City and Green Lake nearby.

Northgate is one of the City's largest retail, medical and office centers outside of downtown and home to one of the City's largest hospital complexes outside of central Seattle. This reflects its location near Interstate 5 and its history as a traditional automobile-oriented commercial shopping district that also provides a variety of medical and educational services to all of North Seattle. The adjacent North Seattle Community College is a key asset with a mission to provide 21st Century education, training and services to elevate residents' competitiveness in the job market and aid Seattle's economic vitality.

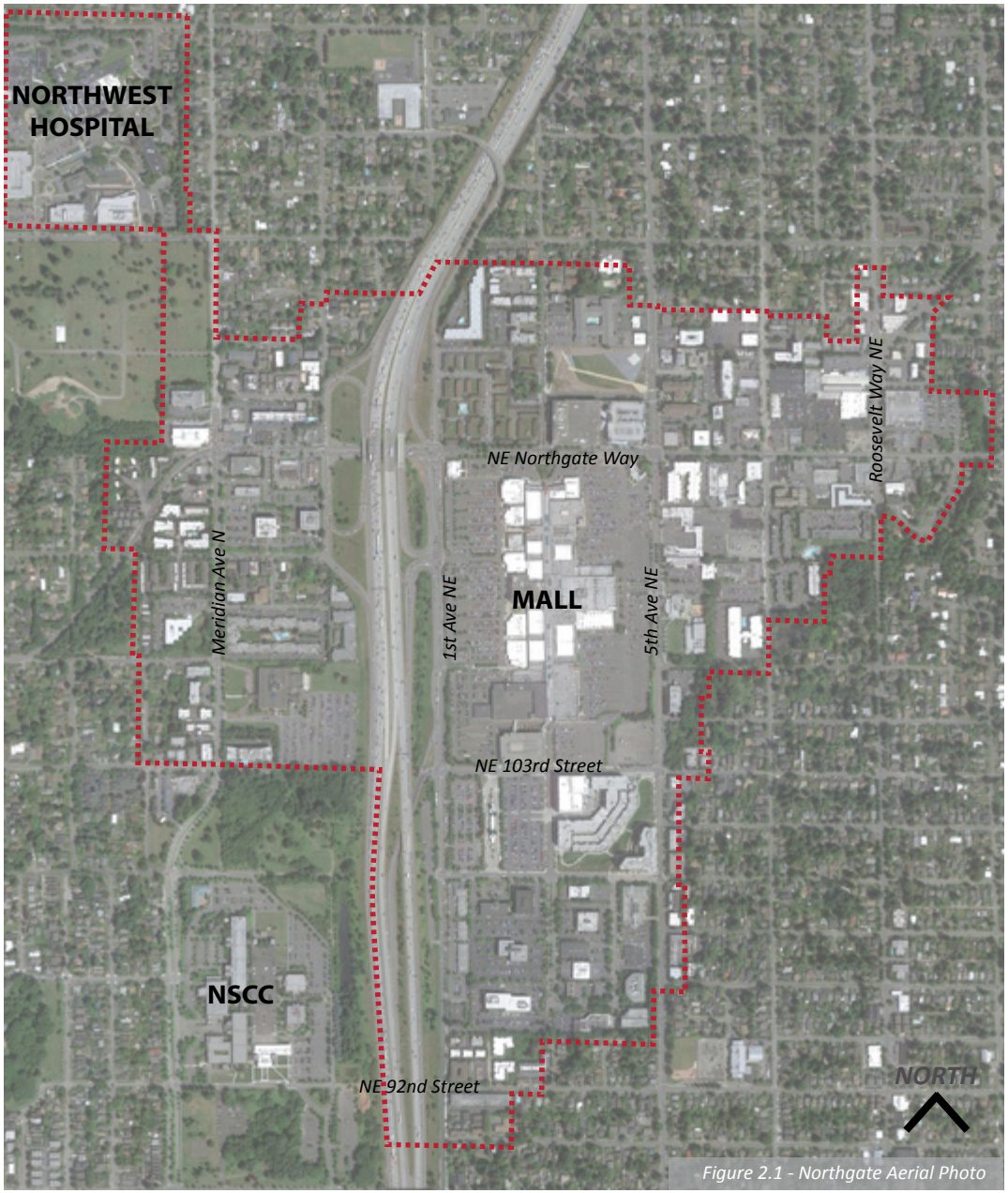


Figure 2.1 - Northgate Aerial Photo

The area includes the Northgate Transit Center, the largest in King County Metro's system, served by thirteen Metro bus routes and two Sound Transit Express bus routes, and providing 1,500 park-and-ride spaces. The new Sound Transit Link station and service, to open in 2021, will increase Northgate's significance to regional and local transit by improving transit service connectivity, speed, frequency and reliability, and is one of the best opportunities to enhance a transit-oriented community near a light rail station that fully leverages this transit investment. For this reason, it was selected as a "catalyst project" site for the PSRC's Growing Transit Communities Partnership, funded through a grant from the federal Partnership for Sustainable Communities.

Seattle's Comprehensive Plan set 20-year growth targets for the Urban Center of 2,500 new housing units and 4,220 net added jobs through 2024. Compared to the other Seattle urban centers, growth has occurred relatively slowly in Northgate: only 30% toward its housing growth target and 19% toward its employment growth target. This amounts to a net gain of 740 dwelling units and 800 jobs since 2004.

Urban Center	2004	2005	2006	2007	2008	2009	2010	2011	2012	Growth	Target	% of Target Met
Downtown	214	277	749	652	508	1,638	541	3	-37	4,331	10,000	**43%**
First Hill/Capitol Hill	74	67	451	127	239	484	682	(8)	1050	3,092	3,500	**88%**
University	5	135	18	139	62	456	(3)	319	205	1,331	2,450	**54%**
Northgate	-	5	22	(1)	1	699	8	3	2	739	2,500	**30%**
South Lake Union	162	151	-	614	97	735	89	-		1,686	8,000	**21%**
Uptown	111	8	212	94	173	320	46	207	105	1,165	1,000	**117%**

Table 2.1 - Northgate Urban Center Housing Growth

Urban Center	2004	2005	2006	2007	2008	2009	2010	2011	Target	% of Target Met	Total jobs Added since 2004
Downtown	143,288	142,757	143,287	145,756	150,995	141,501	136,381	139,956	29,015	**-11%**	(3,332)
First Hill/Capitol Hill	40,015	40,425	40,910	40,699	41,538	42,181	41,637	42,696	4,600	**58%**	2,681
University	32,724	34,375	34,196	34,088	33,489	32,972	32,972	33,469	6,140	**12%**	745
Northgate	11,022	10,605	10,394	10,439	11,065	11,123	11,430	11,827	4,220	**19%**	805
South Lake Union	17,863	19,017	20,340	21,645	22,880	21,427	19,644	26,756	16,000	**56%**	8,893
Uptown	13,740	14,355	14,256	14,558	15,180	13,862	13,911	14,801	1,150	**92%**	1,061

Table 2.2 - Northgate Urban Center Employment Growth

Northgate's Existing Assets and Neighborhood Features

Physical Setting

The Urban Center is located in a valley bounded by the hillsides of Maple Leaf to the east and south, and Licton Springs to the west. Much of the Urban Center land slopes gently down toward the south. Thornton Creek provides natural drainage in ravines toward Lake Washington, including from areas west of I-5 via the wetland complex at the college. Areas such as the mall parking lot and the blocks between NE 100th and 103rd Streets have been filled in the past, covering peat soils in portions of the existing parking lots.

Gateways, Hearts, and Edges

"Gateways" are notable passages into and out of the neighborhood, "hearts" are the centers of community life, and "edges" are linear features that act as physical boundaries of subareas and the whole neighborhood.

Gateways: Northgate's rolling topography and street patterns combine to define the area's gateways on streets including Northgate Way, Pinehurst Way NE, 5th Ave NE and 1st Ave NE. The area's slopes create vistas primarily along north-south street corridors that, combined with the experience of leaving primarily single-family residential areas and entering the commercial district, provide a sense of entry.

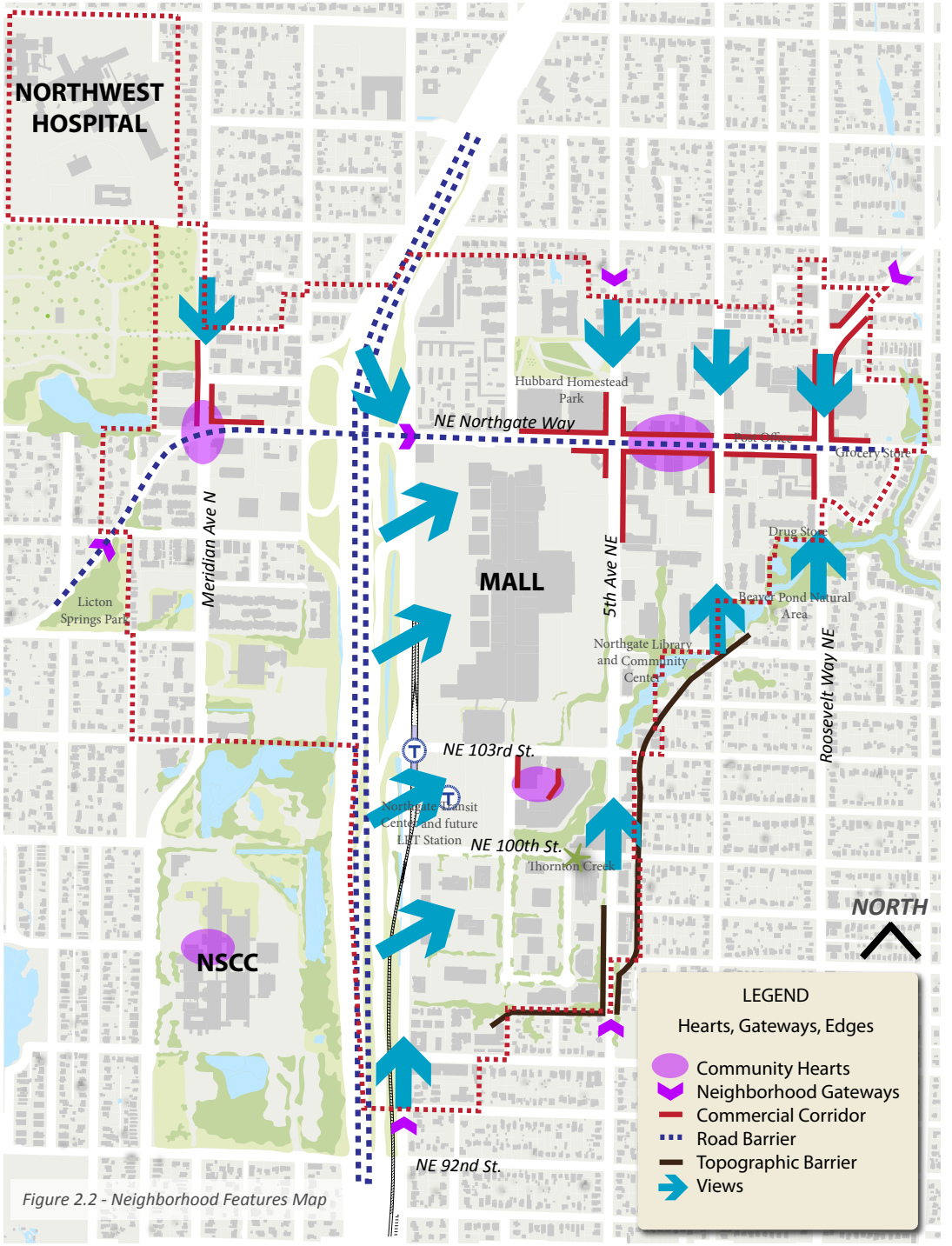


Figure 2.2 - Neighborhood Features Map

A similar experience occurs when street users pass under I-5 on Northgate Way, or exit Interstate 5 at 1st Ave NE and enter the densest shopping district. The existing Transit Center also provides a portal for entry and exit to Northgate, a function that will be emphasized even more greatly when light rail service begins.

Hearts: Heart locations are the centers of commercial and social activity within the neighborhood. They provide anchors for the community and help give form to the neighborhood.

The Northgate Mall, North Seattle Community College, Thornton Place and the commercial district near 5th Ave NE and Northgate Way are the most active centers. Yet most of these places are either internally focused (such as the indoor activities at the mall) or are experienced as primarily automobile-oriented places due to their function as traditional postwar commercial shopping districts. So, lesser overall sidewalk qualities tend to limit the attraction of pedestrians, although certain segments have newer sidewalks, and places such as the library/community center and Hubbard Homestead Park are linked by improved facilities on 5th Avenue NE.

Thornton Place is a newer kind of place that accommodates driving patrons, and has a movie theater complex but also a variety of residential opportunities as well as pedestrian-oriented plazas and open spaces.

Edges: Interstate 5 is the most important edge/barrier because it divides the western and eastern portions of the neighborhood with only a few streets that bridge the divide (N 92nd St., Northgate Way, NE 117th St.). The effects of this edge are significant upon overall traffic congestion and pedestrian accessibility – many Licton Springs residents, though physically close, must choose between only two routes that can be congested, to reach the heart of Northgate. On Northgate Way, the congested traffic itself and the wide street also create a sort of barrier or edge within the core.

Along the south and southeastern edges of the Northgate core, the steep topography of hills in Maple Leaf, and the Thornton Creek drainage, define edges that effectively limit the extent of the Northgate commercial core.

Views

Views in Northgate consist mainly of territorial views north-south along 1st Ave NE, 5th and 8th Avenues NE and Roosevelt Way NE, influenced by the rolling topography. From Maple Leaf, views westward are also possible. On Meridian Ave N., a Downtown skyline view may be seen toward the south. Motorists also experience Northgate from Interstate 5 both northbound and southbound, seeing Thornton Place, the mall, the Transit Center, the college and multifamily buildings as they pass. A southbound view toward Mount Rainier is also possible from Interstate 5.

Parks, Recreation, Open Space

The relatively recent additions of Hubbard Homestead Park, library, community center, and Thornton Creek water quality channel have improved the range of amenities serving the Northgate core.

Active recreation features are sparse, but they include the community center, an outdoor basketball court at Hubbard Homestead Park and a Frisbee golf facility at Mineral Springs Park (west of I-5). There is also a P-Patch created by the community on NE 103rd Street, and other open space such as the Thornton Creek stream ravine with an associated beaver pond marsh that provide unique features with natural values.

The college's periphery also contains several natural tracts that include wetlands that have habitat and educational value. Licton Springs Park and Northacres Park are also located nearby.



Hubbard Homestead Park



Community Center and Library on 5th Avenue NE


Figure 2.3 - Examples of neighborhood assets
Thornton Drainage Channel near 3rd Ave NE

Area Circulation and the "Superblock" Land Use Pattern

Northgate's street circulation pattern consists mainly of a limited number of north-south arterials (Meridian Ave N., 1st and 5th Aves NE, and Roosevelt Way NE) with two east-west arterials (Northgate Way and N 92nd Street) connecting to other neighborhoods. Other east-west streets include a relatively small number of local streets, most with dead-end traffic controls aimed at reducing through traffic in neighborhoods to the north and east of the Urban Center. Given its historically commercial orientation, Northgate's blocks are large, typically ranging from 650 to 1,300 feet in length.

This combination of blocks and limited number of streets creates a "superblock" configuration that tends to constrict mobility for all travel modes, from vehicles to bicycles to pedestrians. This pattern is illustrated to the right and compared to other Seattle neighborhoods that have many more streets for circulation and many more but smaller blocks.

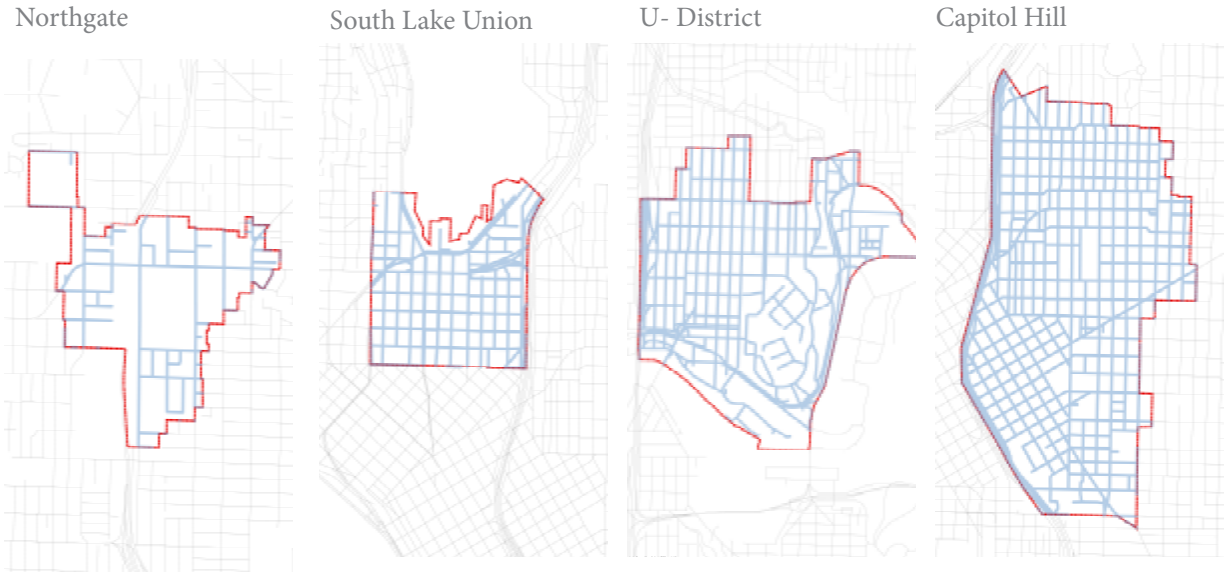


Figure 2.4 - Comparison of Seattle Urban Centers Street Density

	Acres	Block Density	Intersection Density	Typical Block Length
University District	773	12%	17%	240 x 460
Capitol Hill	913	33%	28%	330 x 420
South Lake Union	324	25%	29%	330 x 420
Northgate	410	8%	10%	1280 x 600

Table 2.3 Seattle Urban Centers Connectivity

Existing Pedestrian Facilities

Even though most streets in the Urban Center have sidewalks and some have attractive treatments, the overall quality of the pedestrian experience is affected by limitations in pedestrian facilities. These relate to the width and physical conditions of existing sidewalks, gaps in network completeness, shortfall in landscaping and street furniture, the shortage of off-street pedestrian routes, and in the presence of barriers such as Interstate 5.

Physical condition: Walkable sidewalk widths vary widely and sometimes are narrowed by utility pole placements. Typical widths range to as narrow as 3-6 feet, although most newer sidewalks are wider than 6 feet. Older sidewalks can have uneven surfaces, and intruding landscaping, cracking, and adjacency to vehicle traffic lanes can affect overall comfort and reliability.

Network completeness: Within the Urban Center, only 3rd Ave NE south of NE 100th Street lacks sidewalks entirely, which inconveniences employees in this office district. Due to a series of improvements in recent years, other streets such as 1st Ave NE and 8th Ave NE have improved or extended facilities that provide relatively complete walking opportunities across the Urban Center. However, for the adjacent Maple Leaf and Pinehurst neighborhoods to the east and north, there remain either no sidewalks on most streets or limited older isolated segments north of NE 95th Street.

Off-street Pedestrian Facilities: In the Urban Center, a shortage of defined pedestrian pathways through large lots limits overall pedestrian connectivity through the area's superblocks. The Mall property, however, does have a number of pedestrian paths on its western and southern sides. Given this shortage and a lack of mid-block connections, walkers have to pass through parking lots and otherwise feel secondary to automobile movements.

Interstate 5 Pedestrian Barrier: The I-5 right-of-way creates a significant barrier to pedestrians that hampers connectivity between Licton Springs, the college, and the main core of Northgate, including the transit center. This continues to discourage pedestrian trips. However, existing transit service helps extend the range of pedestrians and can carry them past the I-5 barrier. Three transit routes provide eight trips per weekday hour in both directions to Licton Springs via N 92nd Street, and another route travels via Northgate Way with three trips per hour in each direction. Also, the pedestrian environment along Northgate Way at I-5, including the underpass, is uncomfortable due to the combination of sidewalk quality, lighting quality, nearby vehicles, and the need to cross a number of busy streets.

The City has identified Northgate as a High Priority Area as illustrated in the City's Pedestrian Master Plan. The High Priority Areas Map identifies locations in Seattle where people need to be able to walk the most. These locations are shown as the darker orange areas on the Figure below.

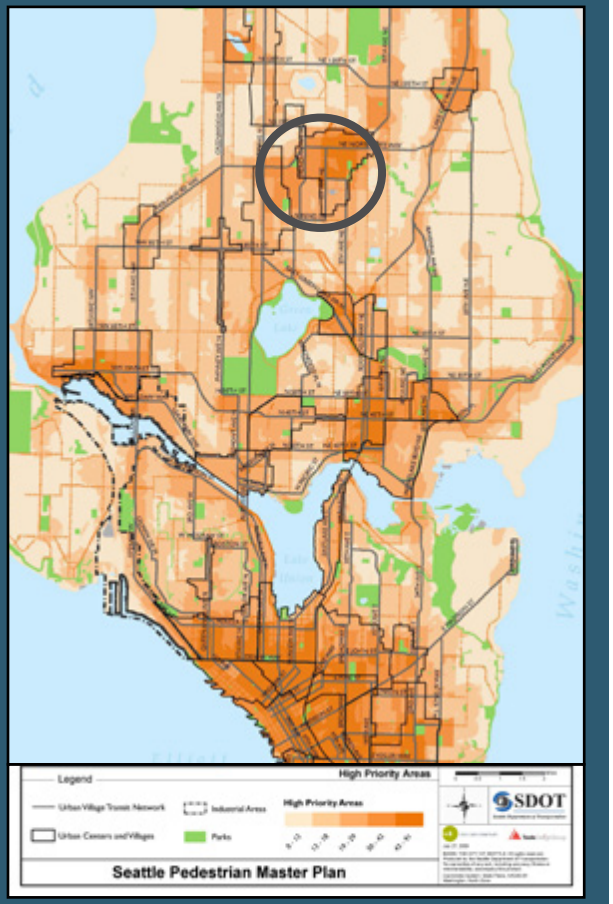


Figure 2.5 - Seattle Pedestrian Master Plan

Existing and Planned Bicycle Facilities

Bicycle connections in Northgate are compromised by the same impediments that affect pedestrian travel. Existing designated bicycle routes offer relatively little coverage for the Urban Center, consisting of "sharrows" on portions of streets including 5th Ave NE, NE 103rd Street and College Way N.

Typical bicycling routes to/from Green Lake may use N. 92nd St. as an east-west connection, and First Ave NE provides a logical routing northward toward an I-5 crossing at N 117th Street that aids connections to/from the north. First Ave NE currently lacks bicycle facilities, but a two-way 'cycle track' is proposed to be built on the west side of 1st Ave NE from N 92nd Street to NE 103rd St. Further to the north, a multi-use path is planned on the east side of 1st Ave NE, reached from the cycle track by crossing the street at NE 103rd St.

Transit Circulation

The Transit Center is the focal point for service in north Seattle and Shoreline, providing robust local and regional transit service options on several Metro and Sound Transit routes, serving places to the north, east and west of Northgate. This includes two-way all-day routes connecting Fremont, Ballard, Crown Hill, Licton Springs (including Northwest Hospital), Bitter Lake, Jackson Park, Lake City, Victory Heights, Maple Leaf, Roosevelt, U-District, Green Lake, Wallingford, and Shoreline. Also, one-way peak-only routes connect the Transit Center with First Hill, Overlake and Bellevue.

A frequent route connects Lake City to Downtown via the Transit Center and I-5. It uses the I-5 reversible lanes when available, providing good speed and reliability, with extra trips in the peak periods' peak direction. Link service will replace the Northgate-to-Downtown connection in 2021. Link will also significantly improve the connection to the U-District given rail's reliability, frequency and speed.

Some transit riders have reported a degree of accessibility challenge due to the impediments presented by Interstate 5, limited arterial street network, topography, and limitations on the quality of pedestrian and bicycle connections. Citizen feedback suggested that bus transfer times for westbound routes from the Transit Center also add extra time to a bus trip. This confirms there are various impediments that make a difference in the choice of travel options; for example, students may choose to drive to the community college even though parking is not free on the campus.

Long-term transit funding and routing choices after light rail service begins are not set, but may increase service frequency between the light rail station and surrounding neighborhoods. This might occur largely along existing routes. However, route adjustments also could occur in the future.

Reliability in future transit service will continue to depend upon agencies making good choices in future arterial street network improvements. These choices for Northgate's streets will need to balance traffic flow and transit accessibility purposes with access and safety needs for pedestrians and bicyclists. This balancing that acknowledges transit functions is important because fostering transit service frequency and minimized wait times are critical to attracting riders, especially those who transfer between routes.

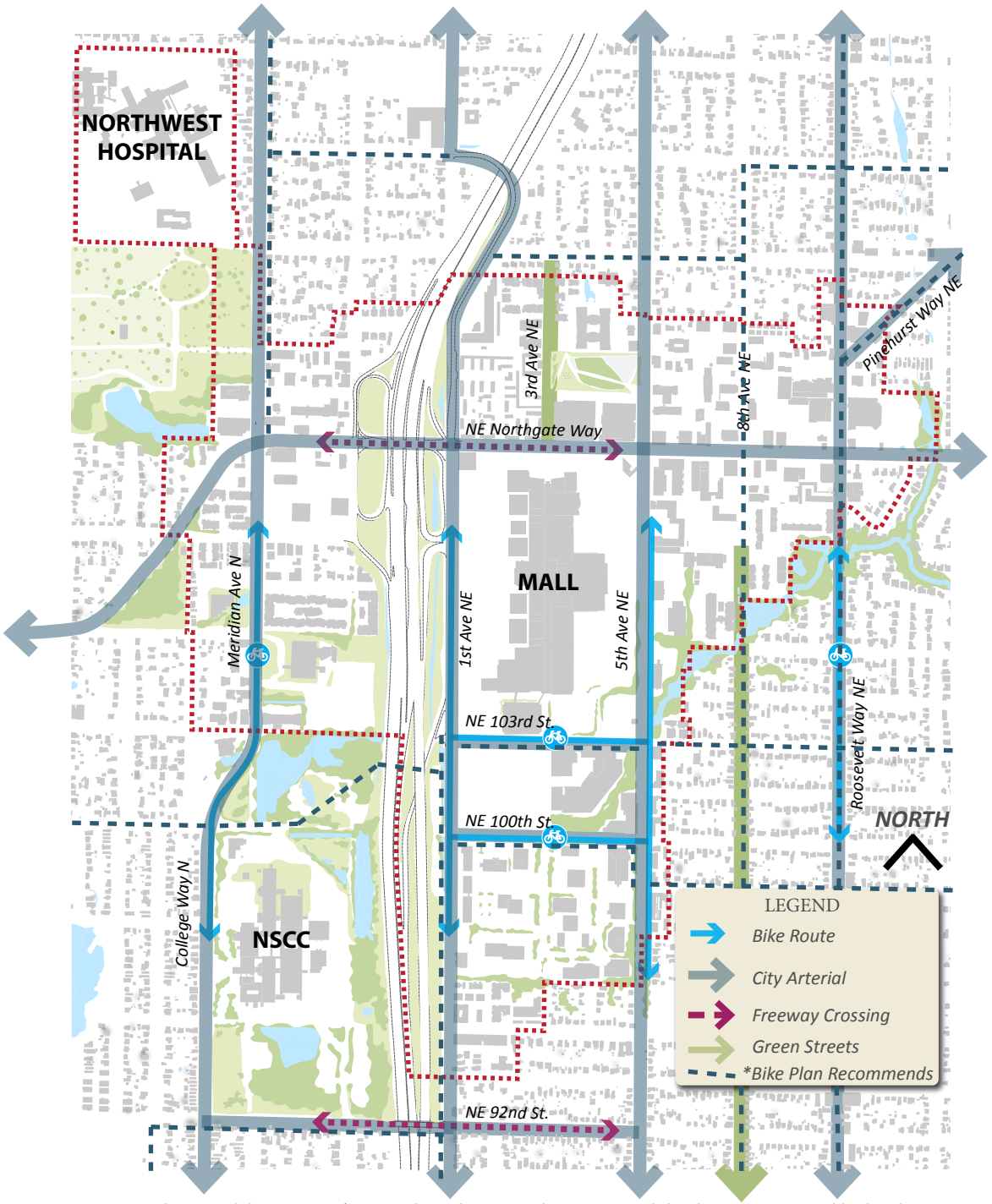


Figure 2.6 - Northgate Mobility Map

**Proposed Bicycle Master Plan recommends local connections, neighborhood greenways, and cycle tracks (1st Ave NE & Roosevelt Way), as future improvements.*

The Urban Center's Development Potential

Past development has followed a couple of general trends in where investments have been made, which may inform likely future development trends:

1. Developments of private and public facilities have clustered along 5th Ave NE. The Thornton Place, Northgate North, 507 Northgate Apartments, Library/Community Center, and Hubbard Homestead Park have occurred in the last decade or so along 5th Ave NE. This may reflect a perceived viability for development immediately surrounding the central mall location that is the heart of the Urban Center.
2. Development has also clustered along Meridian Ave N. This pattern likely reflects a consolidation of medical service and office uses along this corridor, which reinforces the strength of this local center west of I-5.
3. Thornton Place was a "pioneering" development in the southern part of the Urban Center, which has been followed recently by a hotel proposal on 1st Ave NE. Thornton Place has demonstrated the viability of a multifamily residential center in this subarea, along with a small concentration of retail uses and movie theater. This will help the prospects of future development receiving financing and continuing an infill trend.

The area's development potential also relates to the size of properties, the condition of existing buildings, and the potential offered by existing zoning. A development "propensity" analysis prepared for this UDF finds there is moderate to high potential for several properties in the Urban Center to redevelop over the long term, in each of the Center's subareas. Potentially redevelopable properties are larger in the north and south subareas, east of I-5. The overall pattern suggests much future development potential is located along the Northgate Way corridor, and in certain large tracts south of the mall, including the "TOD site" adjacent to the light rail station.

Similar to past development trends, and based on current knowledge about probable developments on certain sites, the likely trend in future infill development will be to grow first in areas surrounding the Link station and mall property, and subsequent redevelopment to be more likely further east and west along Northgate Way and further south in the south subarea of the Urban Center. Other properties, slightly removed from Northgate Way itself, could also see infill development that would continue trends initiated by developments such as the 507 Northgate Way apartment complex. Places such as the mall property's eastern edges (northeast and southeast corners) could also be attractive for long-term infill development, although the mall ownership indicates its main priority is focusing on the mall operations.

In summary, there is potential to continue trends of infill redevelopment that will continue the gradual transition in the Urban Center's land use from a traditional automobile-oriented shopping district to a denser mixed-use center. The future light rail service beginning in 2021 appears to be a significant factor that could increase the long-term prospects for such infill to occur. As the nearest area to the light rail station, the south subarea would most directly experience the locational benefits of light rail service, which should aid long-term future development prospects which would help transform that subarea.

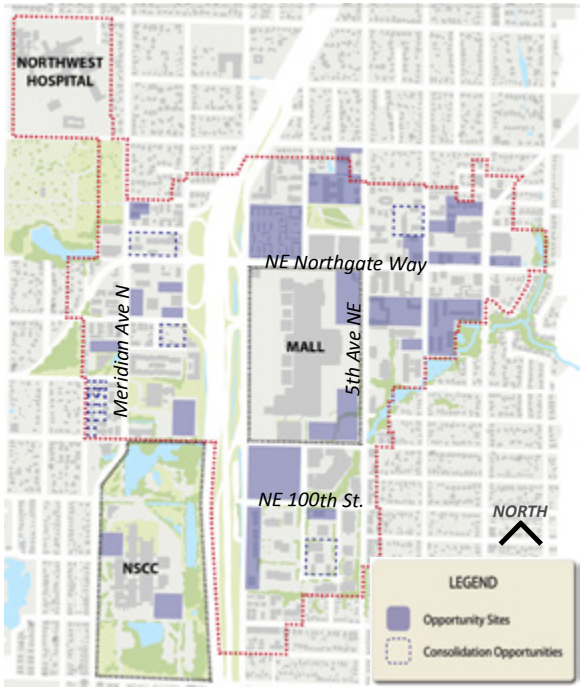


Figure 2.7 - Development Propensity

Conclusions of the Land Use/Design Analysis for Existing Conditions

Although designated as a single Urban Center, the Northgate area actually comprises three separate subareas. Each subarea has clusters of single-use automobile-oriented office, residential, retail and academic (NSCC) buildings (shown on the adjacent diagram) that are relatively independent from one another. Also, the scarcity of options to walk pleasantly within each subarea and between subareas contributes to the sense of three separated districts.

The following Urban Design recommendations are targeted to enhance the character of the three subareas through encouraging land uses that will be supportive of the neighborhood plan vision, and mobility improvements that will help reintegrate the subareas into a cohesive Northgate Urban Center.

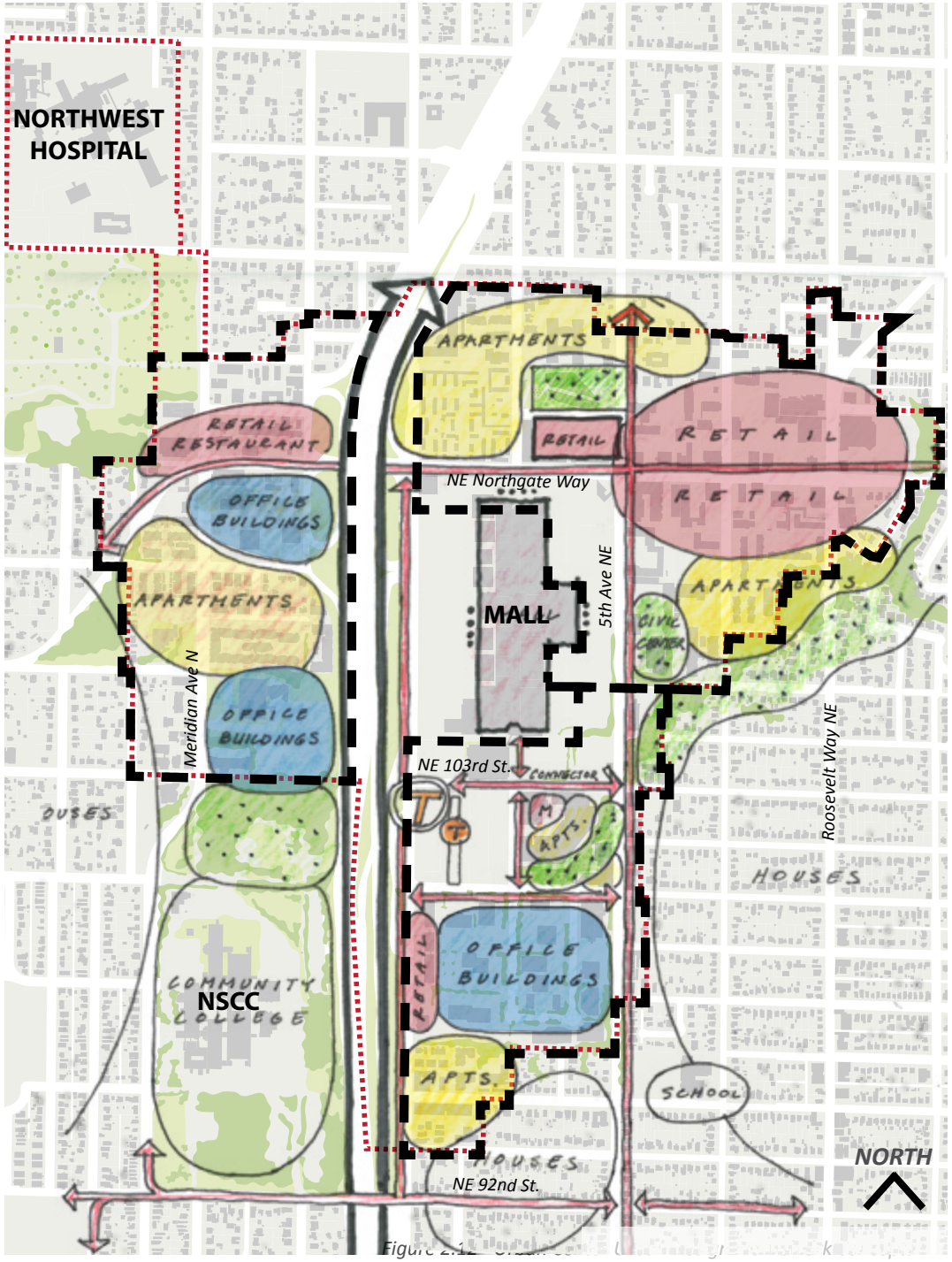


Figure 2.8 - Neighborhood Land-use Analysis Map

URBAN CENTER: Recommendations for healthy, livable, equitable neighborhood development

City staff sought input on priorities for improving Northgate's future in nearly 20 meetings that covered a broad spectrum of neighborhood residents and stakeholders, most of whom had not participated in past planning discussions. Groups included students, seniors, parents and children living in apartment housing, households newly arrived in Seattle, Christian and Muslim faith-based communities, and cultural communities including Eritrean, Somali and American Indian/ Alaska Native. Community councils were also updated, and input from business representatives, developers, and health care providers was gathered.

The product of these discussions is a better understanding that livable and healthy communities rely on neighborhood characteristics that relate to all of the following:

- Maintaining public safety for all
- Good community services and facilities
- Opportunities for improving personal health
- Quality physical environment
- Excellent transportation
- Affordable housing

The relationship of these topics to urban design and Northgate's neighborhood development is summarized as follows. This provides advisory guidance about how future growth and City efforts can effectively pursue improved public health, livability and a neighborhood that equitably serves its residents.

Public Safety

1. Ensure public safety is maintained at the Link station, transit center, I-5 pedestrian/bicycle bridge, public spaces in the TOD site, and parks throughout the Urban Center, through good lighting, sufficient law enforcement presence, enforcing civil behavior in public spaces, and providing features such as emergency call boxes.
2. Pursue design and siting of public spaces and buildings that will provide "eyes on the street" and encourage peoples' presence at most times of day, thereby discouraging uncivil behavior. Encourage environmental design techniques that will assist in crime prevention.
3. Ensure that sidewalks, crosswalks, traffic signals, and bicycle facilities are designed and operated to ensure safe conditions.

Community Services and Facilities

1. Encourage provision of more recreational facilities to support active recreation and activities such as picnicking at existing parks.
2. Encourage provision of more community facilities, such as community meeting rooms, for free or low cost, to ensure everyone can afford and make use of public facilities.
3. Encourage provision of artist studios and other arts/cultural facilities in future Urban Center development, including within the station area. Provision of space to support creative activities, cultural opportunities, and social services activities would add vitality to the mix of uses in growth areas, and would help support community needs. Places such as museums or cultural education centers could also become attractions for tourists and scholars, and would express elements of this area's identity.

Improving Personal Health

1. Encourage future development that provides greater access to fresh food.
2. Encourage future development and public spaces and facilities that support physical activity and greater social connections, through more walkable features and socially engaging places.
3. Encourage development of places that support new economic activity and entrepreneurship, including small businesses, in an equitable manner.

Quality Physical Environment

1. Ensure sidewalks are clean, maintained and passable.
2. Encourage development that avoids excessive exposure of residents to air and noise pollution that threatens healthy living.
3. Encourage inclusion of green and sustainable development features that will enhance the quality of public spaces and environmental protective performance.
4. Encourage development of buildings, facilities and public spaces that are attractive, support healthy social activity, arts/cultural activities, and provide a great sense of place.
5. Encourage inclusion of physical design themes in future development that will reflect elements of this area's identity and character, such as: native American cultural heritage, 19th and 20th Century cultural heritage, natural history and vegetation.

Excellent Transportation

1. Ensure easy transit connections, frequent and reliable bus service, good transit infrastructure, good parking accessibility, and sufficient park-and-ride capacity are available at the light rail station.
2. Ensure traffic operations are sufficiently managed, to maintain and improve mobility across the Urban Center.
3. Provide a diverse range of improvements that will improve safety and quality of facilities for walking and bicycling, including an emphasis on filling gaps and improving substandard conditions in locations serving the neighborhoods within and near the Urban Center.

Affordable Housing

1. The City (supported by citizens' preferences) encourages setting definite performance levels in provision of affordable housing that will equitably support the presence of a diverse population in vicinities near light rail stations and frequent transit service. Set performance levels likely to meet Urban Center goals of: 13% of new dwelling units serving households at 0-30% of area median income; 12% serving households between 30-50% of area median income; and 18% serving households between 50-80% of area median income.
2. Encourage provision of services and amenities that will complement the ability of households of all income levels to choose to live in the Northgate Urban Center.

Online Survey Results: Summer 2013

After the Draft UDF was published, an online survey yielded more than 200 responses. This included opportunities for written input.

The results:

--- The highest expressed priority is to achieve safe, enhanced pedestrian and bicycling conditions between the station area and surrounding neighborhoods.

--- Ensuring affordable housing presence, sufficient amounts of commuter parking, and a well-designed station area core that is safe, comfortable and an engaging 'people place' are also among the highest priorities.

--- There is also significant interest in supporting local-based small businesses, a grocery store, and achieving an attractively greened landscape using sustainable green strategies.

--- The UDF's recommendations for an attractive public realm, including park/plaza, public movement corridors, and street park on 3rd Ave NE received majority support.

Opinion was more divided on whether tall buildings should be encouraged, with a slight majority in favor. But most agreed with the recommended strategies such as tower width controls and preservation of solar access on key public spaces.

URBAN CENTER: Land Use Recommendations

Recommendations for the neighborhood are designed to inform and guide the ongoing redevelopment of the urban center.

Subareas

The recommendations support improvements that will help each subarea fulfill its role in the Urban Center:

1. Northgate North subarea as a dense retail corridor augmented with more residential uses and improved pedestrian characteristics.

2. Northgate West as an office and commercial activity center surrounded by multifamily residential uses and complemented by North Seattle Community College.

3. Northgate South as a significant opportunity area to establish a transit-oriented development district with a vibrant center adjacent to the Northgate Link station. Working together with Thornton Place and potential infill development south of 100th Street, this area will be enhanced as an exciting, people-oriented place and a key transit hub.

Break up the Superblocks

The large-block development and street pattern needs to be broken into more human-scale blocks that will foster an improved walkability. The combination of new buildings and public spaces, including streets and sidewalks will actually redefine the character of the Northgate subareas into more active, walkable and livable places.

Promote Infill Development in Parking Lots to Expand and Create Vital Cores in Each Subarea

Each subarea will be enhanced as infill development is accomplished in key locations, particularly the northeast and southeast corners of the Northgate Mall parking lot. Parking lots on the east side of the Mall contribute greatly to the automobile oriented scale of the Urban Center. To the degree that infill development can occur in areas near 5th/Northgate Way and near the corner of 5th/NE 103rd Street (as well as other parts of the east parking lots), this would create new blocks that form a better-realized core for both the north and south subareas of the Urban Center.

“Turning the corner” with development at 5th/103rd Street would also begin to accomplish a closer physical linkage between the north and south subareas that will also encourage more walking within the neighborhood.

In the South subarea, introduction of denser development with new residential opportunities in parking lots or underdeveloped properties will be important to enhancing livability in the station area.

Realize a Network of Pedestrian Routes and Linked Public Open Spaces

Along with the benefit of breaking up the superblocks, the introduction of more pedestrian routes and small streets within the superblocks will enhance overall mobility.

But just as important will be the benefits provided by a series of public plazas and parks that will be realized within each superblock. This network of amenities and movement corridors will greatly improve the perceived quality and livability of each part of the Urban Center by defining a network that is pleasant and complementary to the larger street system.

URBAN CENTER: Mobility Recommendations

Northgate Loop, Bridges, East-West Connections and Transit

This UDF proposes four primary themes for improving accessibility throughout the Urban Center:

1. The "Loop" concept to improve the continuity of access routes for pedestrians by connecting all of the subareas. Key streets in this concept are Northgate Way, Meridian Ave N., 5th Avenue NE, and NE 103rd Street. Improvements there would provide a continuity and visibility that is lacking today in sidewalk routes.

2. The "Bridges" concept that recognizes there are a handful of key places along a main loop with shortcomings that need improvement in order to support the best movements through the Urban Center. These would allow distinctive design improvements to improve linkages among the subareas, to encourage more walking, bicycling and transit use.

3. Improved quality of east-west pedestrian connections between Roosevelt Way NE and 3rd Ave NE to enhance accessibility to the Link station.

4. Maintain and improve transit service connectivity throughout the Urban Center with short headways and good transit speed and reliability.

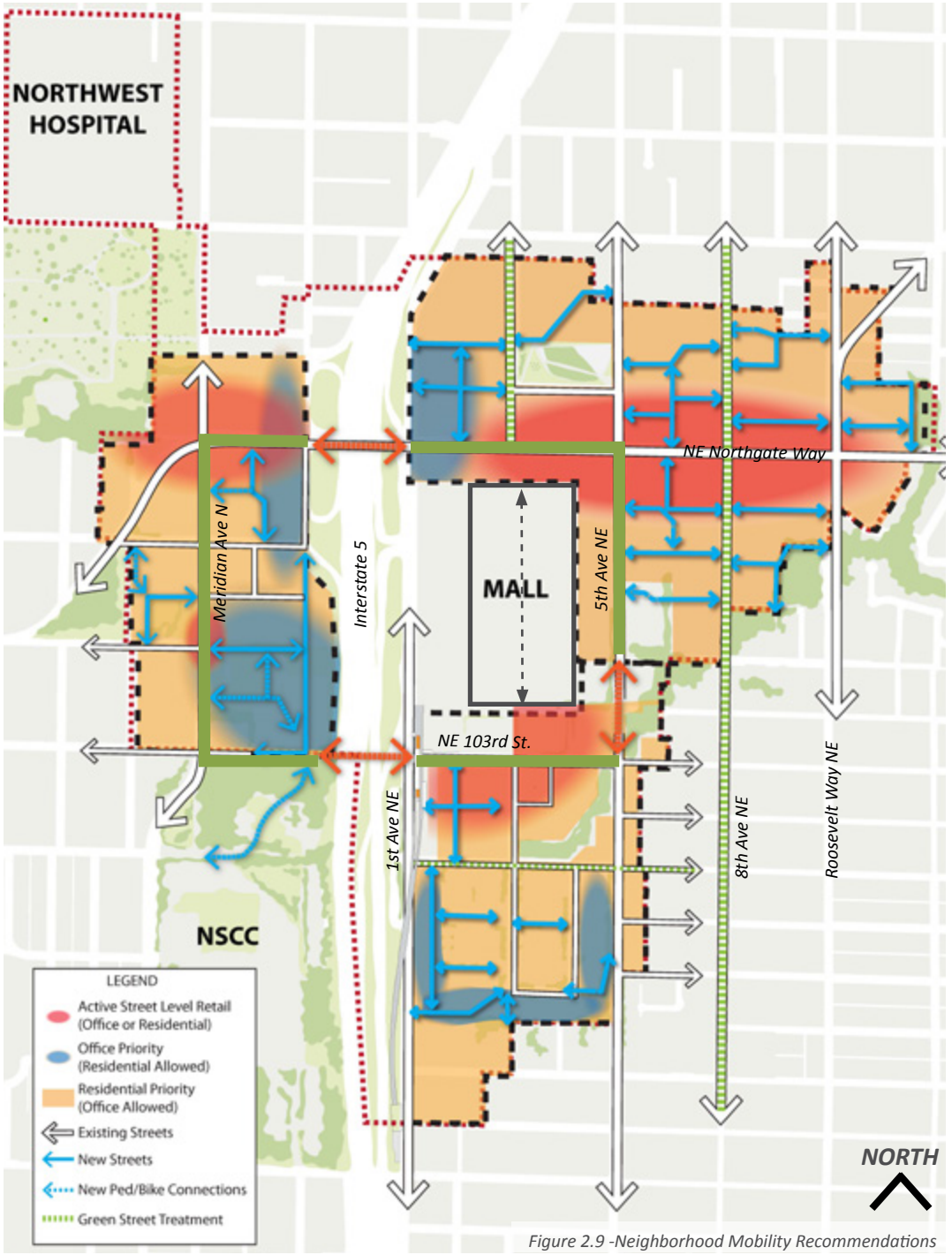


Figure 2.9 -Neighborhood Mobility Recommendations

The Northgate Loop concept

The four streets of the Northgate Loop should be improved to establish a conspicuous and identifiable route that will assist and prioritize pedestrians, bicycles and transit. Wherever possible, these improvements should share consistent design elements to provide visual indications of continuity and improve wayfinding. The following traditional urban "elements of continuity" are recommended:

- Sidewalk improvements with related reallocations of space devoted to other street functions, within the 5th Ave NE and Meridian Ave N rights-of-way
- Pedestrian lighting
- Sidewalk paving features
- Moving utility poles where they are sidewalk impediments
- Benches and trash receptacles
- Information and "wayfinding" signage
- Consistent improvements to transit stop elements
- Crosswalk design and safety features (e.g. lighting)
- Public art



Wayfinding elements



Street Furniture

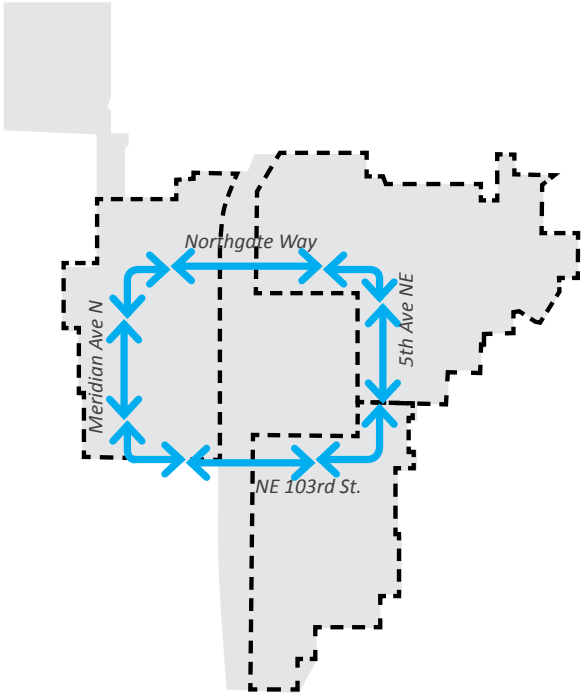


Figure 2.10 - Northgate Loop Diagram



Public space with pedestrian lighting integrated



LED lighting pavers integrated in a pathway



Weather Protection



Crosswalk design



Sidewalk Paving



Wayfinding Elements

The Northgate "Bridges": Elements of Distinction

Three specific locations in the Urban Center present obstacles to easy pedestrian travel. Since these locations occur between each of the three subareas they present a unique opportunity to create improved linkages (which could be thought of as "bridges") between each area. The three locations are:

1. 5th Ave NE between NE 103rd and NE 105th Streets (connecting the North and South Subareas)
2. The Northgate Way freeway underpass (connecting the North and West Subareas)
3. The proposed pedestrian and bicycle bridge across I-5 near NE 103rd St (connecting the South and West Subareas)

Fifth Avenue "Bridge"

Although 5th Ave NE is the primary public sidewalk connection between the North and South subareas, it is not an inviting pedestrian environment.

It presents a long walk (over 1,000 feet) on a narrow sidewalk immediately next to cars, trucks and buses. There is also an adjacent heavy foliage bank on the west side, without storefronts or other activity. The east side is constrained by narrow sidewalks, adjacent travel lanes, and utility poles in the middle of the pedestrian pathway. There is little or no pedestrian lighting, and no benches.

The two blocks between NE 103rd and 105th Streets (and NE 100th - 103rd Streets on the east side of 5th Ave NE) are important to improving the area's overall pedestrian comfort and accessibility.

The following improvements are recommended, in the spirit of completing the previously identified 5th Avenue NE streetscape improvements:

- Narrow the travel lanes to reduce traffic speeds (while still accommodating truck and bus movements)
- Provide sidewalk buffers such as planting strips
- Add pedestrian-scale lighting
- Reduce obstructions in sidewalks
- Require wider sidewalks with future redevelopment and initiate discussion with adjacent property owners to increase access
- Install crosswalks at NE 104th and 105th Streets
- Mark the entire section between NE 105th to 103rd Streets with a special lighting/art project
- Improve landscaping and landscape maintenance on adjacent properties

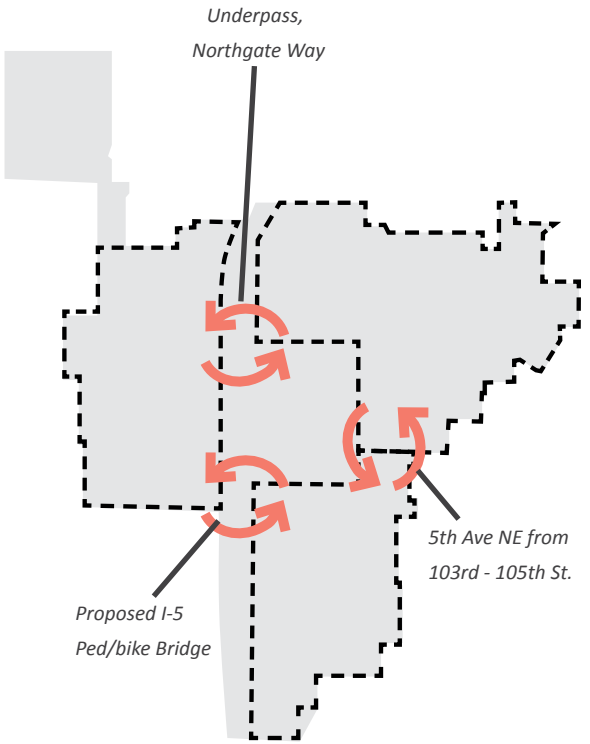


Figure 2.11 - Northgate Bridges Diagram

Northgate Way Freeway Underpass

The Northgate Way underpass is, and may continue to be, the only connection under I-5 between the north and west subareas of the Urban Center. It is currently difficult to comfortably travel by walking or cycling and transit flow is also degraded by traffic congestion. The City's 2004 Northgate Open Space and Pedestrian Connections Report recommended numerous improvements to the underpass including:

- Eliminate unused center lane and widen sidewalks
- Grade-separated sidewalks (3-4' above roadway) with decorative railing
- Reconfigure lane/intersection geometry for better pedestrian safety, appropriate to an urban center setting, including at the eastbound right turn lane from Northgate Way to 1st Ave NE to eliminate double pedestrian crossing
- Aesthetic treatments such as pedestrian lighting, special paving, gateway landscape treatment, ornamental slope improvements under bridge, decorated columns

All of the above recommendations are still relevant today and continue to be recommended by this UDF. Missing from the 2004 recommendations however, was a bicycle connection. This was presumably due to the limited width of the right-of-way. One option that the City should consider is to utilize the space behind the bridge columns.

The City's 2006 Northgate Coordinated Transportation Investment Plan (CTIP) recommended locating the sidewalks behind the bridge columns to allow for a new left turn lane under the bridge for westbound Northgate Way to turn southbound onto Corliss Ave N. This UDF recommends that the City not consider adding more vehicular capacity but rather use the space behind the bridge columns (or other in-street space if desirable) for bicycle lanes. The benefits of improving non-motorized connectivity throughout the Urban Center and to the Transit Center should be carefully understood, considered and evaluated before making further vehicular only improvements. A safe, convenient bicycle connection through the Northgate Way underpass would become a particularly important component of the bicycle network after the planned cycle track on 1st Ave NE is completed.

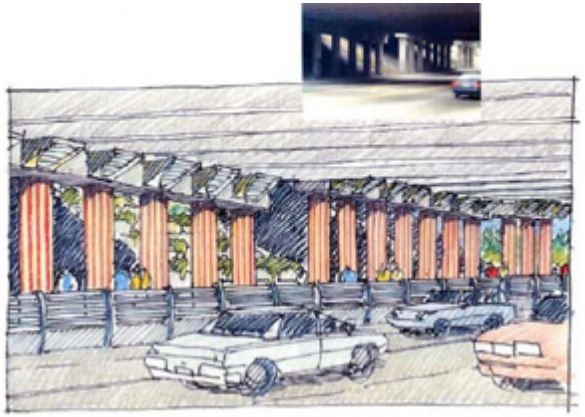


Figure 2.12 - Pedestrian Improvements concept for I-5 Underpass
Source: Northgate Open Space & Pedestrian Connections Plan

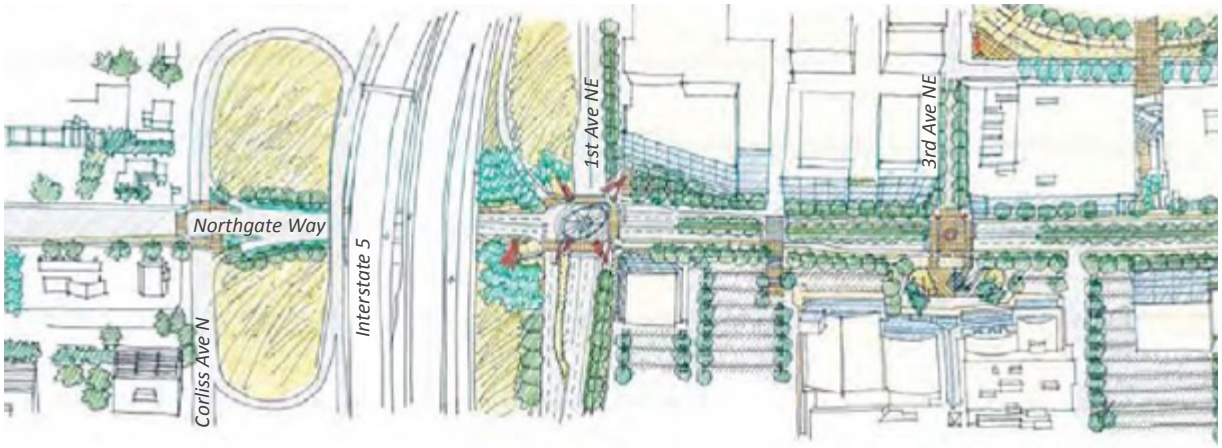


Figure 2.13 - Early Concept Drawing for Northgate Way
Source: Urban Design Workshop - Dec 2006

Northgate Pedestrian/Bicycle Bridge

A bridge across I-5 is the single most important non-motorized connectivity infrastructure investment for the Urban Center. The need for a bridge has been identified in multiple previous planning efforts, including the 2006 Northgate CTIP, which stated the following:

"*The Northgate Stakeholders Group expressed its strong support for a pedestrian and bicycle overpass crossing the freeway from North Seattle Community College to the Northgate Transit Center and future Sound Transit Northgate Link Light Rail Station. The crossing would make it easier for College faculty and students to use bus transit and the future light rail, reducing single-occupant vehicle trips. It would connect neighborhoods west of I-5 to the commercial area and neighborhoods east of I-5, particularly the new Northgate Civic Center and South Lot developments envisioned for Northgate. The project could cost $7–10 million and might come about through collaboration between the City of Seattle, King County, WSDOT, Sound Transit, North Seattle Community College, private property owners, neighborhoods, and others.*"

In 2012, King County DOT completed the Northgate Pedestrian Bridge Feasibility Study Report, which identified opportunities, issues and estimated a range of costs for a bridge. The Report found that a bridge would reduce the walking distance from the transit center to NSCC from 1.2 miles to approximately 0.25 miles. The Report cites a previous study indicating that a bridge would result in a 30% reduction in average walking time to the Northgate Transit Center and Light Rail Station, and would effectively expand the area walk shed (0.5 miles) to more than 150 buildings and bike shed (3.0 miles) to more than 3,000 additional buildings. In 2013, the City of Seattle issued a request for qualifications to complete an analysis of potential pedestrian/bicycle bridge types and alignments.

Similar results were reached by 2013's Sound Transit's Transit Access Study, which has led to a list of recommended improvements to be pursued by the City and Sound Transit.

To fully leverage the potential connectivity that the bridge could provide, this UDF recommends that the bridge entrances on both sides of the freeway be carefully configured to allow for convenient access to the widest range of destinations possible, not just the light rail station and NSCC. For example, on the east side of the freeway, a potential second entrance to the bridge from the planned cycle track on 1st Ave NE could improve connectivity to the south of the Urban Center and the neighborhoods beyond.

On the west side of the freeway, the bridge should provide convenient access to both NSCC and current and future development north of NE 103rd Street.

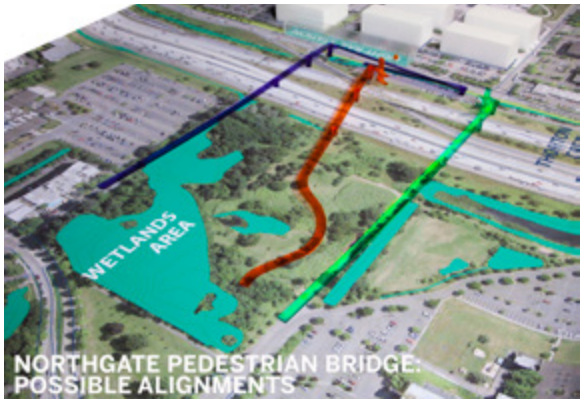


Figure 2.14 - Potential Northgate Interstate 5 Crossing (currently under study) Source: SDOT

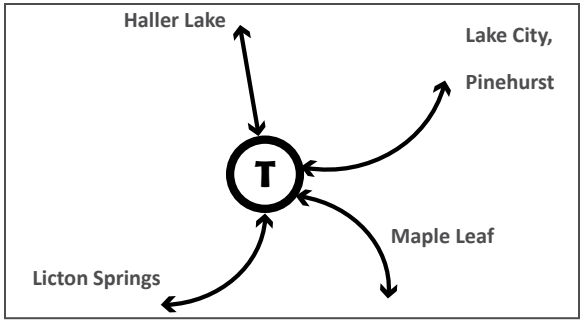
Improve east-west pedestrian connections between Roosevelt Way NE and 3rd Ave NE

To provide better and safer pedestrian connections between Maple Leaf areas to the east and the Link station, a number of pedestrian-oriented improvements are desirable. These should extend between at least Roosevelt Way NE to the east and the South Subarea core property at 3rd Ave NE.

Based on a study by City staff and Sound Transit, the recommended streets for these improvements are NE 103rd Street and NE 98th Street. However, these are not the only streets where improvements should be considered. Residents' input also suggests improvements should be considered for NE 105th Street (and residents have already drafted a design concept). Other streets that should also be considered for pedestrian improvements include 8th Ave NE and NE 100th St.

Maintain and improve transit service, connections, speed and reliability

Urban Center-wide mobility should be better served by: anticipated long-term improvements in transit service; the ability to make connections between transit routes; and maintaining and improving transit movement efficiency and reliability. Given these elements' importance in maintaining transportation system effectiveness, capacity and residents' mobility, they should be a primary consideration when evaluating possible changes in the street environment of the Urban Center.



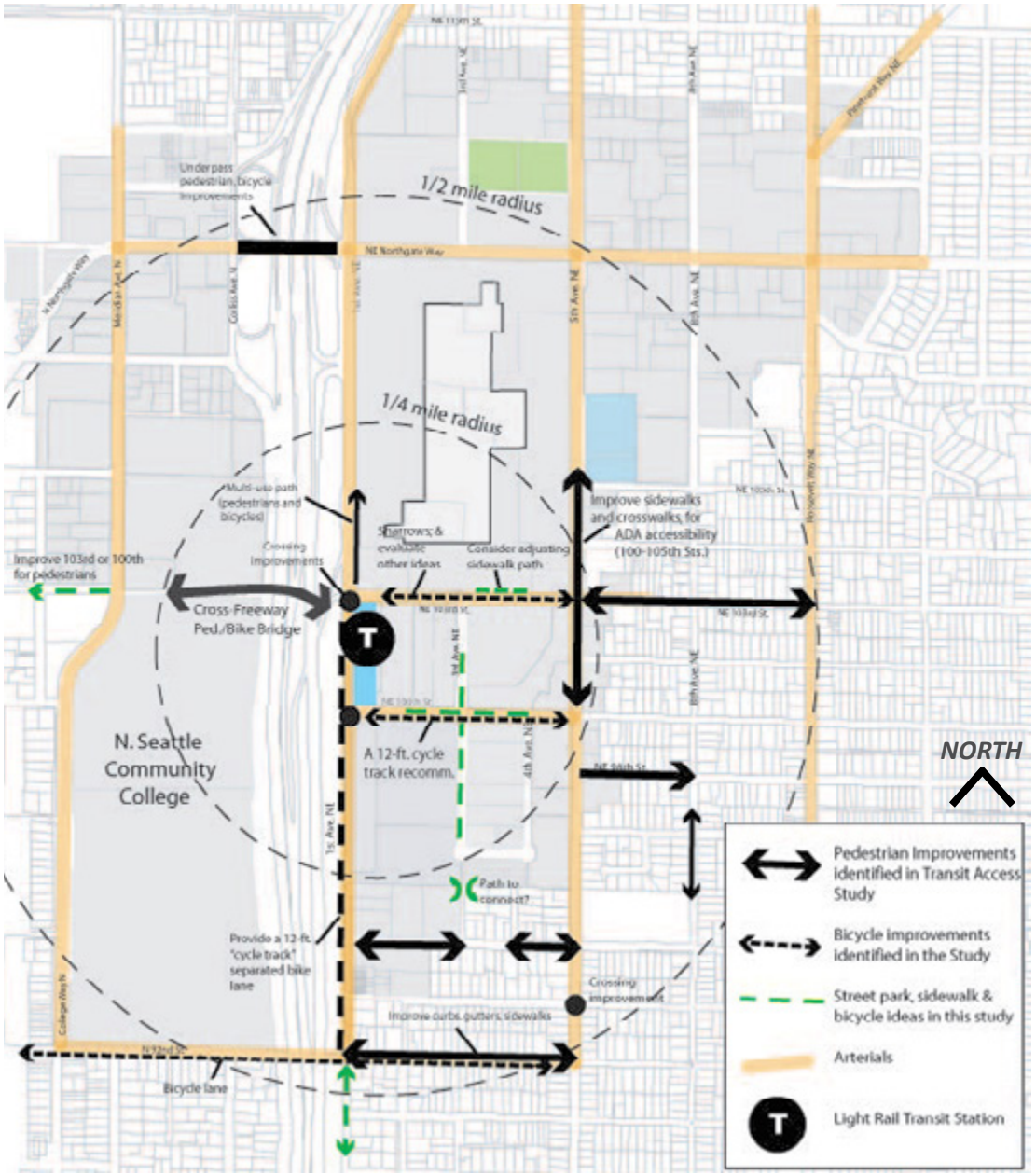


Figure 2.15 - Transit Access Study Findings: Priority Improvements

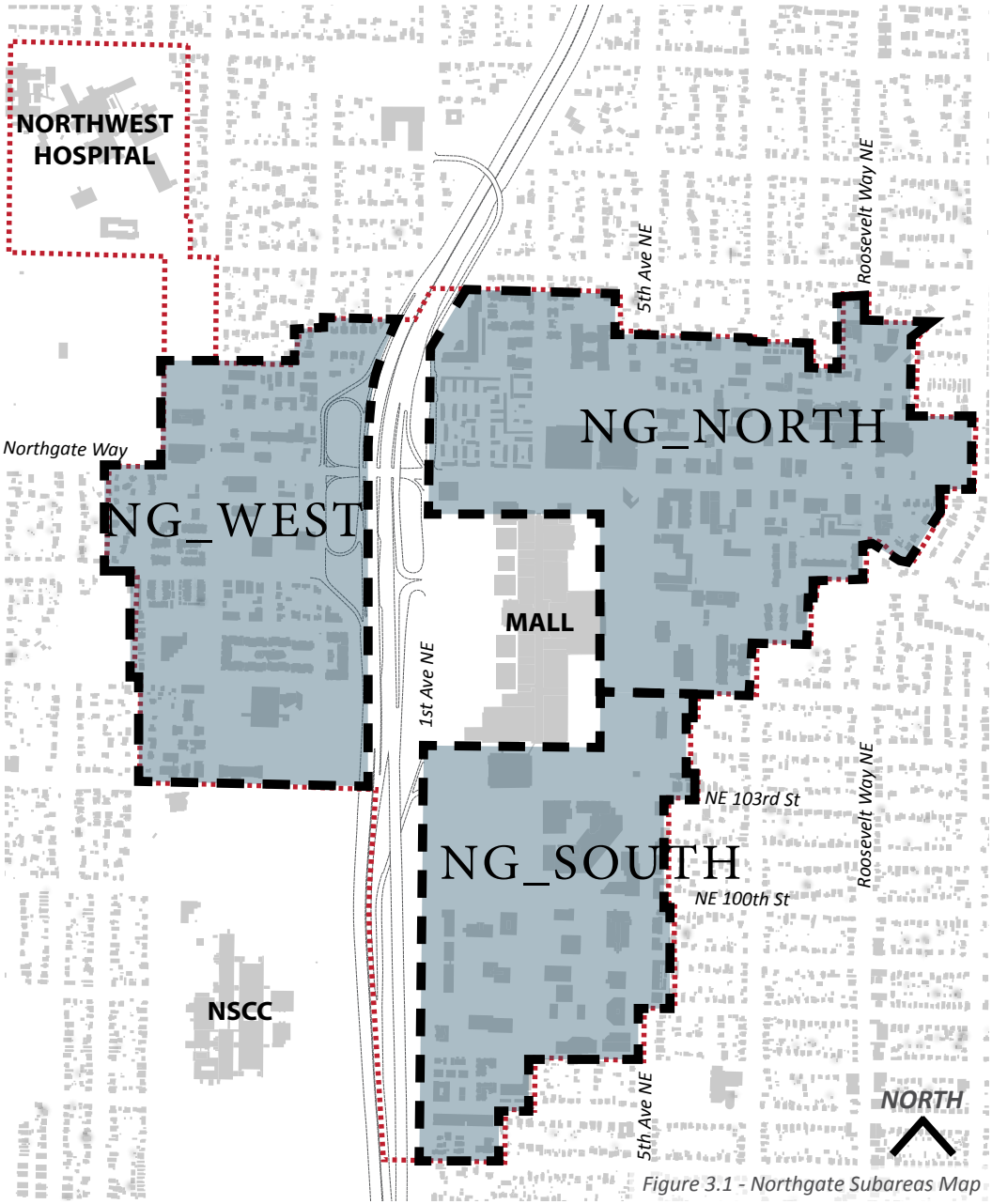


Figure 3.1 - Northgate Subareas Map

3 Northgate Subareas

The Northgate Urban Center essentially functions as three adjacent and separate subareas: North, South and West. Each subarea contains unique and regionally important functions, but none contain all the elements of a complete Urban Center environment.

For the purposes of this UDF, the Urban Center is divided into the following three Subareas, as illustrated in Figure 2.2:

- Northgate North (NGN): north and east of I-5 and the Northgate mall structure, generally between NE 105th and NE 114th Streets, with the eastern edge established by Thornton Creek. This also encompasses the Northgate mall parking lot that borders on 5th Ave NE
- Northgate South (NGS): south and east of I-5 and the Northgate Mall, between NE 95th and NE 105th Streets and extending east of 5th Ave NE
- Northgate West (NGW): west of I-5 from NE 100th to NE 113th Streets, and extending west to approximately Wallingford Ave N

Northwest Hospital and North Seattle Community College (NSCC) are each large and distinct parts of the community that are functionally and geographically separated from the heart of the Urban Center. Northwest Hospital is beyond easy pedestrian access. Accessibility to NSCC and any functional connection to the greater Urban Center is hindered by the barrier of the Interstate 5 corridor.

The Northgate mall structure and the west side of its property near I-5 are central to the Urban Center, providing retail sales attractions, indoor recreation space, and direct north-south walking connections. The Mall has a large structure surrounded by extensive parking lots. Given the Mall's interest in maintaining line-of-sight between the Mall and I-5, as well as its parking needs, these parts of the property are unlikely to change substantially over time. Thus, the Mall structure and its west side parking lots are excluded from this UDF's priority recommendations.

However, parking lots east of the mall structure are included in the North and South subareas because future infill development there would add much to core concentrations of uses in both of these subareas. Especially in the northeast and southeast corner portions, there is clear potential for future development that would activate the subareas.

As well, other UDF recommendations address the edges of the mall property's adjacent public streets.

Format of this Chapter

Subarea recommendations are provided in a consistent format. An overall analysis of both the land use and mobility issues is provided first. This is followed by several specific urban design principles meant to guide future urban design improvements primarily related to streets and mobility. Lastly, specific development and midblock connectivity recommendations are summarized for each super-block within the subarea.

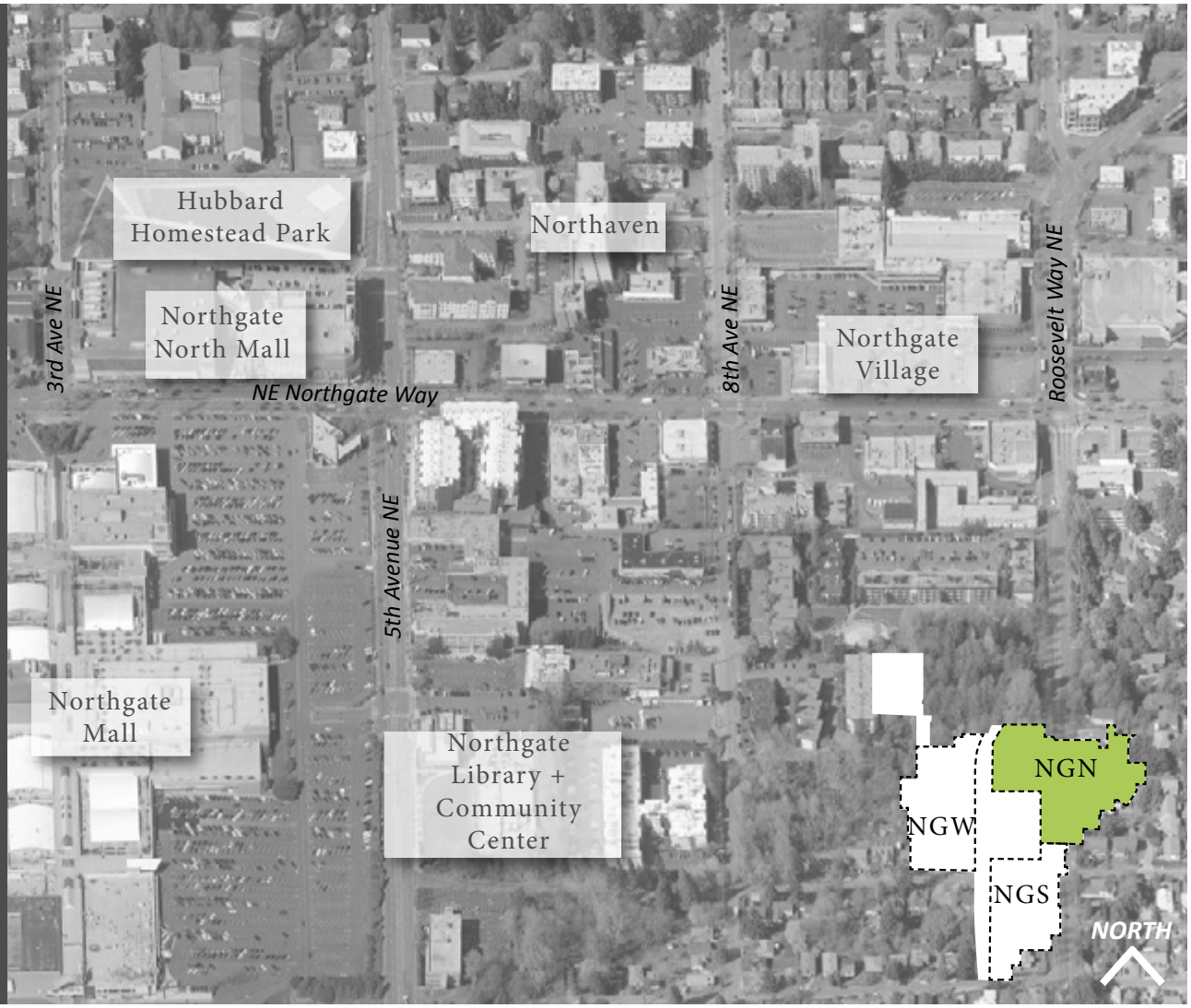
North Subarea (NGN)

Urban Design Analysis

The North Subarea near NE Northgate Way and 5th Ave NE is the most commonly identified heart of Northgate. It is approximately the same size as central Ballard or Capitol Hill. The Mall and the Northgate North retail complex are the central features of the Subarea, containing regional retail destinations and much parking.

The eastern part of the Subarea is characterized by primarily auto-related retail uses, including retail that serves community residents such as a grocery store, a drug store, and small restaurants.

The new Hubbard Homestead Park provides an exceptional new community open space for the Subarea. Residents point out that the park needs improvements to be a better active recreational space. For example, some nearby residents prefer more trees to be planted for shaded resting places, and there is also a lack of a "circuit" walking path. The Northgate Library and Community Center on 5th Ave NE serves as a local civic center and activity hub.



Pedestrian Amenities

The pedestrian environment in the North Subarea is mixed in quality. Some 5th Ave NE and Northgate Way sections have modern improvement levels, and other portions are at least six feet wide with basic amenities but mixed evenness. Also, some side streets have received recent sidewalk and curb improvements. However, a portion of 5th Ave NE south of the community center has notable impediments of utility poles in the center of sidewalks between NE 103rd and 105th Streets. Within the main part of this Subarea the only pedestrian connection to the east across I-5 is the Northgate Way underpass. The nearest alternate I-5 crossing to the south is at N 92nd St, almost a mile south of Northgate Way.

Mobility and Access

Most of the North Subarea is composed of superblocks, with lengths ranging from 650 to 1,300 feet. The I-5 freeway ramps at the western edge of the Subarea provide the primary auto connections to the rest of the City and beyond, and high traffic volumes create frequent congestion at the Northgate Way/1st Ave NE intersection. Three arterials (1st and 5th Avenues NE and Roosevelt Way NE) provide good connectivity to neighborhoods to the north, and two of those (5th Ave NE and Roosevelt Way NE) also provide connectivity to the south. Northgate Way continues east, connecting to Lake City, Kenmore, Bothell and beyond.

Transit access in the North Subarea is adequate but somewhat less frequent than is typical of Seattle's other Urban Centers. The Northgate Transit Center is over a one-half mile walk from the core of this Subarea along routes of limited pedestrian quality. The subarea is currently served by five two-way all-day bus routes providing 12 to 14 trips per hour per direction and connections with Lake City, Jackson Park, Maple Leaf, and the University District.

Development Opportunities

Of the three Subareas, the North has the greatest opportunities for redevelopment, including:

- North side of Northgate Way between 1st Ave NE and 3rd Ave NE
- North of Hubbard Homestead Park
- East of 5th Ave NE and south of Northgate Way

There are also areas with high development propensity in the northeast portion of the Mall's property.

North Subarea Principle #1

Provide Generous and Extensive Pedestrian Amenities

The CTIP identified several sidewalk and pedestrian oriented improvements to the street network. These were generally modest in scope and more extensive improvements are required to support the level of pedestrian activity required in an Urban Center. The priority locations for the following improvements are along NE Northgate Way and on 5th Ave NE. Other north-south arterials should also be evaluated for similar needs.

General improvements include:

- Provide a 5-foot minimum width landscaped buffer for sidewalks where immediately adjacent vehicular travel lanes. Where this would result in too narrow sidewalks, a raised buffer should be considered.
- 8-foot sidewalk widths adjacent any arterial or retail uses
- Pedestrian lighting, benches, trash receptacles and other amenities
- Weather-protective canopies at building edges



Weather Protection Devices



Sidewalk Design



Temporary street furnishings



Landscape Buffer



Street Furnishings



Example of a commercial oriented mid-block connection

North Subarea Principle #2

Establish new mid-block complete streets and pedestrian connections

Because Northgate has substantially fewer public streets than other Urban Centers in Seattle, a combination of new "complete" street connections, along with public and semi-public (limited public hours) pedestrian and bicycle connections are suggested to improve overall access.

Mid-block crossings may be associated with redeveloping sites. Mid-block connections may be designed as particularly attractive urban design interventions to increase pedestrian activity, as well as multiply the number of activity nodes located at corners and intersections.

North Subarea Principle #3

Create a central bus transit "signature" station with complementary enhanced bus stops

A central and primary bus stop station is proposed near the corner of 5th Ave NE and NE Northgate Way.

Station design goals include:

- Offer a unique 'Northgate North' design concept coordinated with the Metro standard as needed, and abundant lighting.
- This central station may be complemented by 'mini' versions of smaller but distinctive bus stops.











Examples of signature bus stations









Examples of surface parking treated with landscape features

North Subarea Principle #4

Define and activate the edges of the mall parking lots

An important characteristic of a pedestrian friendly urban environment is the definition of edges between public and private space. Where retail storefronts or residential frontages are not possible, landscape "fences" can also provide this definition. Since over one third of all the block faces along NE Northgate Way and 5th Ave NE are immediately adjacent surface mall parking, there is an opportunity to better define the pedestrian spaces. Although the ultimate goal is to realize storefront retail and ground related residential frontages, such development may not occur on the mall perimeter for many years. Consequently, it is important to more clearly define the edges. Edges can be defined by landscape fences. Another opportunity to define the edge would be to establish incubator businesses in temporary, but high quality smaller buildings.

The mall should also strive in future improvements to provide designated pedestrian pathways from the sidewalk through the parking lot into the mall. Ideally the entrances to these pathways would be coordinated and aligned with the current street grid pattern to reinforce orientation.

North Subarea Principle #5

Design Northgate Way as a major regional pedestrian-oriented retail street

Currently, pedestrian activity is internally focused within the mall and the NGN shopping complex. In order to support pedestrian activity throughout the neighborhood's streets, Northgate Way should be envisioned and improved as an attractive pedestrian retail street that has attractive design elements contributing toward its qualities as a key retail street and part of the loop that links all parts of the Urban Center. At a minimum, design standards should reflect the following:

- Provide a low landscape buffer between the curb lane traffic and pedestrian areas
- Update development standards to encourage ground level retail with frequent storefront entries from 1st Ave NE to Roosevelt Way NE.
- Update development standards to ensure new developments include translucent or transparent weather-protective canopies for a minimum of 80% of the street frontage.





Cambie Street in Vancouver BC is a major high-density arterial similar in scale to Northgate Way. It provides generous pedestrian amenities and retail fronting uses.

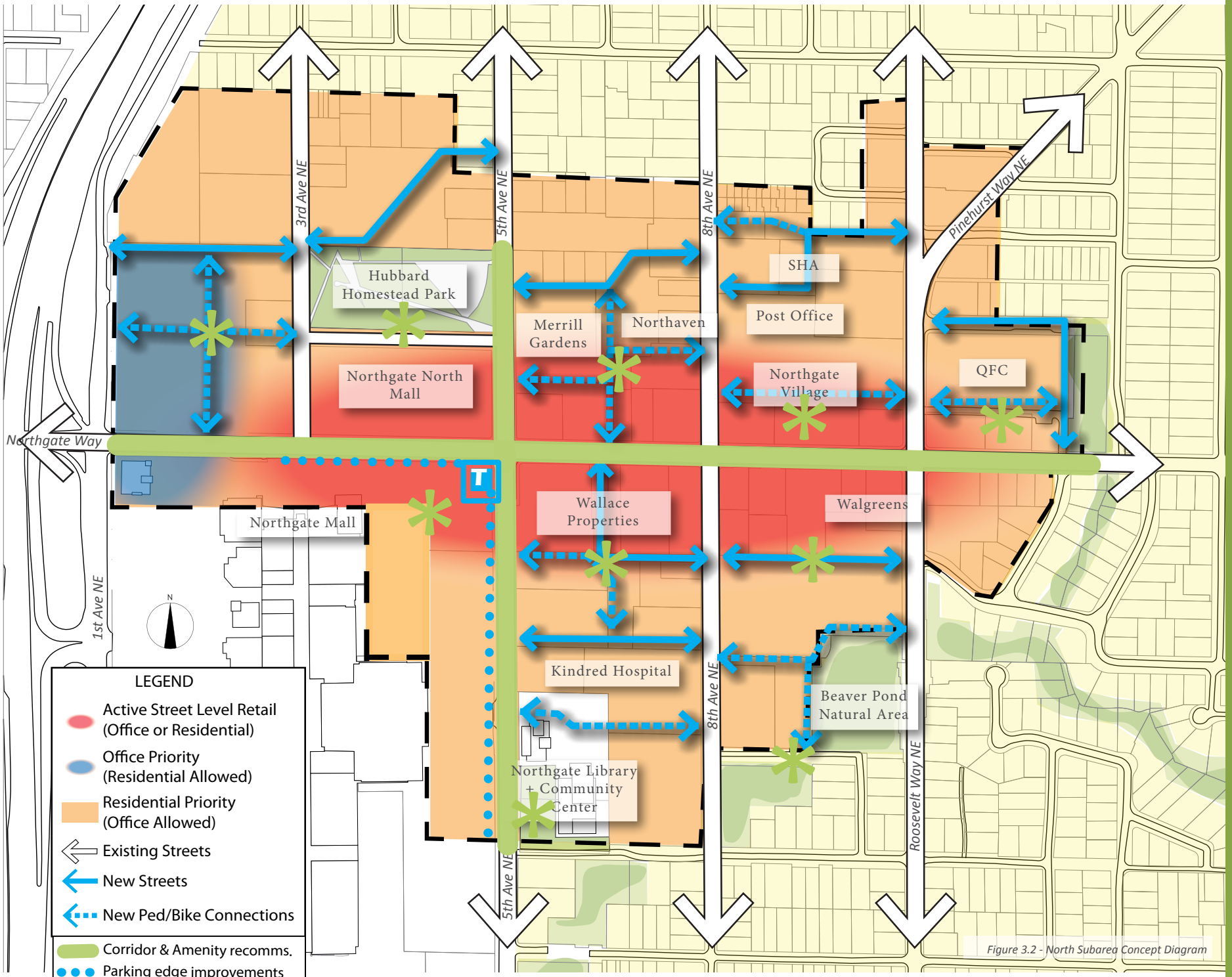


Figure 3.2 - North Subarea Concept Diagram

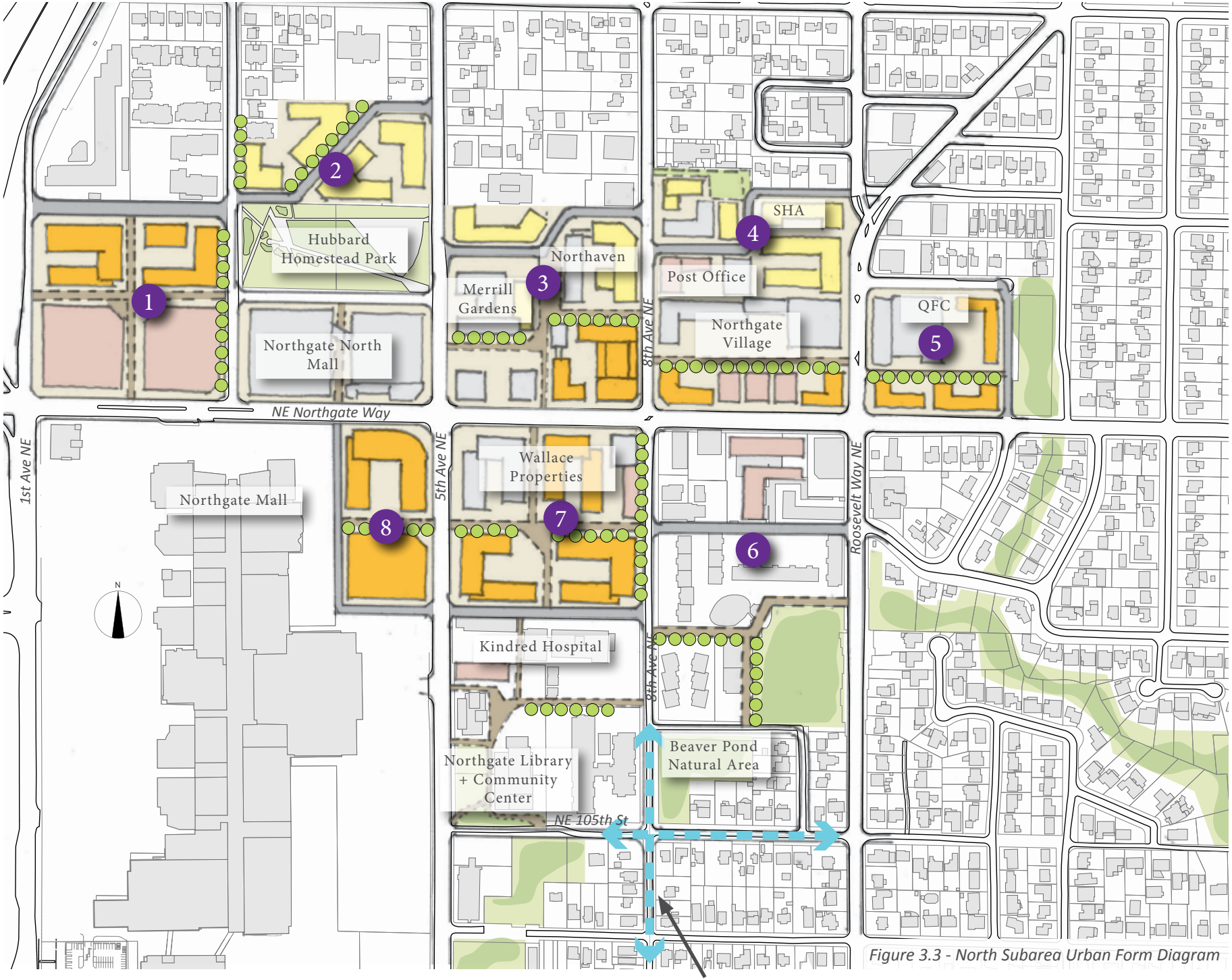


Figure 3.3 - North Subarea Urban Form Diagram

Blue-dashed lines show where possible future pedestrian improvements may occur.

NORTHGATE NORTH SUPERBLOCK RECOMMENDATIONS

1. **Superblock NGN # 1.**
   Potential use: A multi-block site with freeway access, for a mix of regional retail, office and residential uses. Residential uses could be integrated with other uses throughout multiple blocks or focused in certain blocks.
   Connection & amenity opportunities: Local street connecting 1st Ave NE and 3rd Ave NE; and other local pedestrian ways, local plazas, and streets within the property.
2. **Superblock NGN #2.**
   Potential use: Infill residential development adding to existing multifamily buildings; potentially facing Hubbard Homestead Park.
   Connection & amenity opportunities: A potential new local street connection between 3rd and 5th Avenues NE.
3. **Superblock NGN #3.**
   Potential use: Expansion of the Northaven Senior Living complex, and an enlarged commercial/services hub also serving seniors at adjacent Merrill Gardens.
   Connection & amenity opportunities: Could incorporate urban plaza and other recreation spaces and amenities, along with local connector street routed carefully through the block.
4. **Superblock NGN #4.**
   Potential use: Long-term infill or redevelopment of an automobile-oriented shopping center with mixed uses; potential to explore mixed-income housing concepts for Seattle Housing Authority properties.
   Connection & amenity opportunities: East-west street and adjoining park/plaza space one block north of Northgate Way between 8th Ave NE and Roosevelt Way NE; potential to evaluate other connecting street concepts two blocks north of Northgate Way.
5. **Superblock NGN #5.**
   Potential use: Infill mixed use, mid-scale development on parcels fronting NE Northgate Way, next to QFC.
   Connection & amenity opportunities: A north-south street at the east edge of the site, connecting to NE 112th Street.
6. **Superblock NGN #6**
   Potential use: Long-term potential for infill multifamily development with retail or mixed uses fronting Northgate Way.
   Connection & amenity opportunities: Explore new pedestrian connections between 8th Ave NE and Roosevelt Way NE, perhaps feasible at the southern edge of the main multifamily properties.
7. **Superblock NGN #7**
   Potential use: Following 507 Northgate Way multifamily (two phases) with additional mixed use residential buildings in the properties just south, bordering on 5th Ave NE and 8th Ave NE.
   Connection & amenity opportunities: East-west connecting pedestrian ways and/or local street between 5th and 8th Ave NE, with adjoining plaza/park space. Would connect to north-south connection being built.
8. **Superblock NGN #8.**
   Potential use: Infill commercial, retail and/or mixed use development, adding new blocks to the NGN core.
   Connection & amenity opportunities: An improved private or public street at the perimeter, with street-facing commercial uses on at least the arterial block faces.

West Subarea (NGW)

Urban Design Analysis

The West Subarea covers approximately 83 acres and encompasses six superblocks. Isolated from the rest of the Urban Center by I-5, the Subarea has generally lower development intensity and activity levels compared to the east side of I-5. There are numerous multifamily developments, offices, and commercial buildings, and surface parking lots mostly clustered around Northgate Way and Meridian Ave N, but there is no established "Main Street" or community "heart" location. There are a few auto-oriented restaurants on Northgate Way, but no grocery or drug stores within the Subarea. North Seattle Community College (NSCC) is located immediately to the south and outside of the official Northgate Urban Center boundary, but is an important complementary major use near the West Subarea. A Seattle Police station, which will relocate in the future, is located on N 103rd St just south of the Urban Center boundary.



Pedestrian Amenities

The pedestrian environment in the Subarea is generally limited in quality, and lacks sidewalk coverage in many residential blocks except along main arterials. Within the Subarea the only connections to the east across I-5 are the Northgate Way underpass and at N 92nd St, almost a mile south of Northgate Way.

Mobility and Access

Transit service in the Subarea benefits from the presence of the NSCC campus, which is served by five Metro bus routes. Aurora Avenue with Metro Rapid Ride service is about a 0.4-mile walk from the west edge of the Subarea. Community commenters have expressed favor for a high capacity transit connection from NSCC to UW (which will be satisfied by light rail service beginning in 2021).

The I-5 exit at Northgate Way provides good regional vehicular access to the Subarea, but I-5 also limits travel to the east, the only connection being Northgate Way, which is often congested. The bulk of the Subarea's vehicular connectivity is provided to the north and south by Meridian Ave N, and to the east and west by Northgate Way. Most of the local streets are spaced at the superblock scale, reducing connectivity. Noise from I-5 affects the eastern portion of the Subarea.

A striped bike lane on Meridian Ave N and College Way leads into the NSCC campus. Bicycle connection quality via the Northgate Way underpass is poor.

Development Opportunities

Other than a handful of townhouses there has been little recent residential development in the West Subarea. Recent commercial development includes the Northgate Polyclinic (2007) and the Verity Credit Union. Planned development includes a new building at the Public Health property on Meridian Ave N. Given the presence of Northwest Hospital and other facilities, there is potential for further medical office expansion in the area around Northgate Way.

- The West subarea presents several opportunities for redevelopment. There are three sites with high development propensity and two sites where consolidation would produce an opportunity site. When the police precinct operations relocate, the police precinct station may be a candidate site as well.

There are also two significant sites with high development propensity located south of the Urban Center on the North Seattle Community College campus. Potential expansion within the NSCC campus could create development opportunities for new campus buildings, student housing, and services to support the College community, which are currently lacking in the Subarea.

West Subarea Principle #1

Improve pedestrian connection along N 100th St. to Aurora Ave N

Create generous pedestrian and cycling improvements on N 100th St to provide a better connection with Aurora Ave N.

If the I-5 crossing bridge is built, this connection would provide a direct link from the commercial areas on Aurora Ave N all the way to the light rail station. (If the pedestrian bridge alignment ends up closer to N 103rd Street, that street should also be considered for improvements.)

Develop a street concept plan for N 100th Street with a focus on maintaining its residential character. Consider incorporating it as a Greenway.





Examples of a typical residential sidewalk with pedestrian amenities to enhance the character

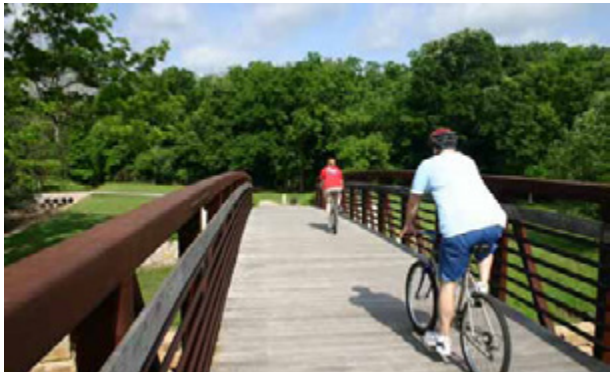
West Subarea Principle #2

Develop N 103rd St to connect to the future I-5 pedestrian bridge

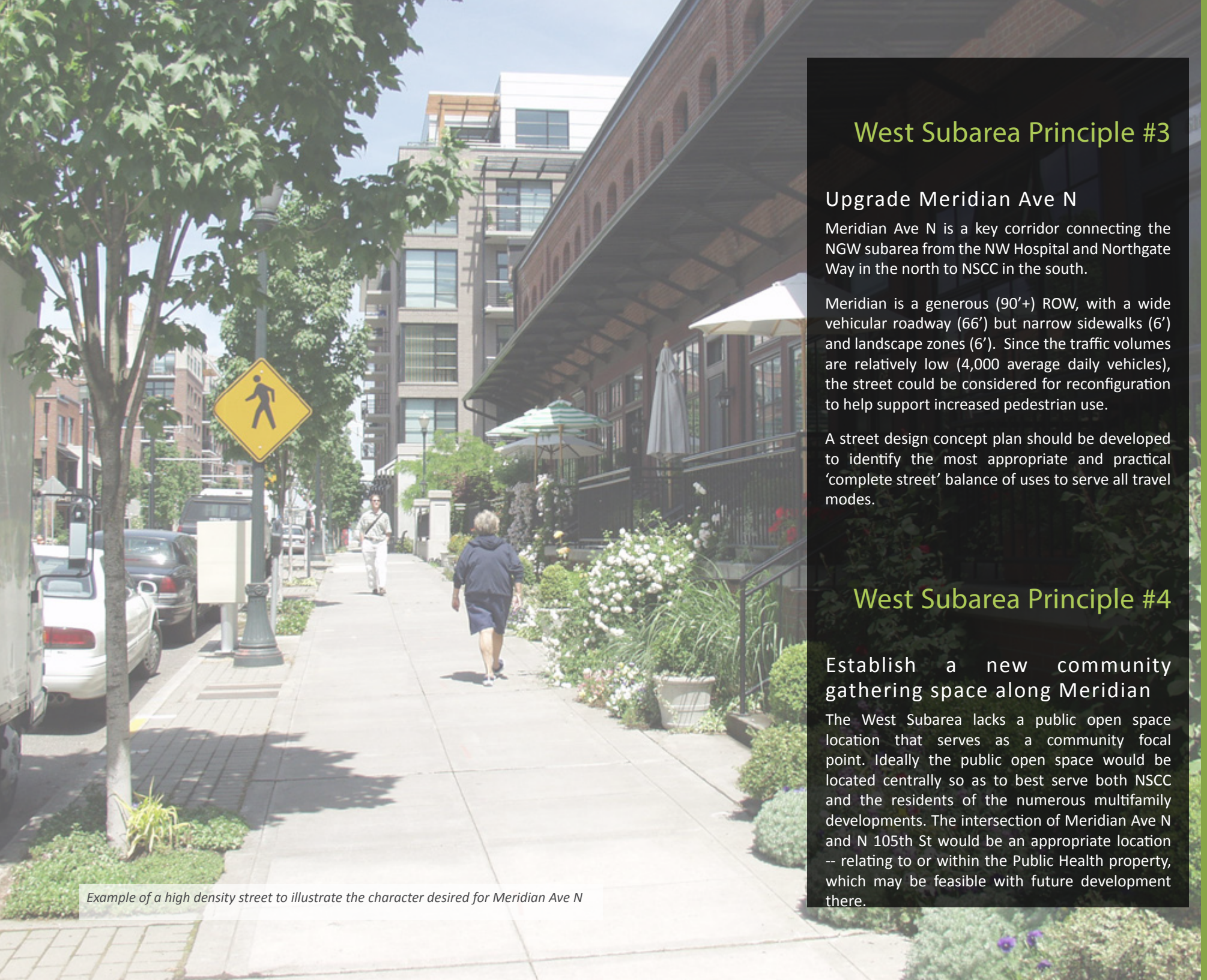
The potential benefit of a pedestrian bridge over I-5 will be better leveraged with good connections not only to NSCC, but also to the neighborhoods to the west.

NE 103rd St is a possible landing alignment of the bridge, and currently it is not fully developed east of Meridian Ave N. A complete street connection between Meridian Ave N and the bridge would create a seamless connection to the west. Special care would have to be taken in relation to wetland areas. This connection should be designed to minimize its impact on the natural areas while providing a high quality design integrated with the natural landscape.





Examples of bike and pedestrian routes along a natural setting. Treatment desired for the natural areas north of the NSCC



Example of a high density street to illustrate the character desired for Meridian Ave N

West Subarea Principle #3

Upgrade Meridian Ave N

Meridian Ave N is a key corridor connecting the NGW subarea from the NW Hospital and Northgate Way in the north to NSCC in the south.

Meridian is a generous (90'+) ROW, with a wide vehicular roadway (66') but narrow sidewalks (6') and landscape zones (6'). Since the traffic volumes are relatively low (4,000 average daily vehicles), the street could be considered for reconfiguration to help support increased pedestrian use.

A street design concept plan should be developed to identify the most appropriate and practical 'complete street' balance of uses to serve all travel modes.

West Subarea Principle #4

Establish a new community gathering space along Meridian

The West Subarea lacks a public open space location that serves as a community focal point. Ideally the public open space would be located centrally so as to best serve both NSCC and the residents of the numerous multifamily developments. The intersection of Meridian Ave N and N 105th St would be an appropriate location -- relating to or within the Public Health property, which may be feasible with future development there.

West Subarea Principle #5

Pedestrian connections through superblocks

The largest superblocks in the West Subarea are located between Meridian Ave N, Corliss Ave N, Northgate Way, and N 103rd St. If and when any of these blocks redevelop, the City should explore options for new mid-block connections, including both semi-private and public, as well as vehicular and non-motorized connections.

The City should continue to promote through-block connections in superblocks when properties are redeveloped. This is already embodied in the neighborhood's design guidelines.





Examples of pedestrian connections at mid-blocks

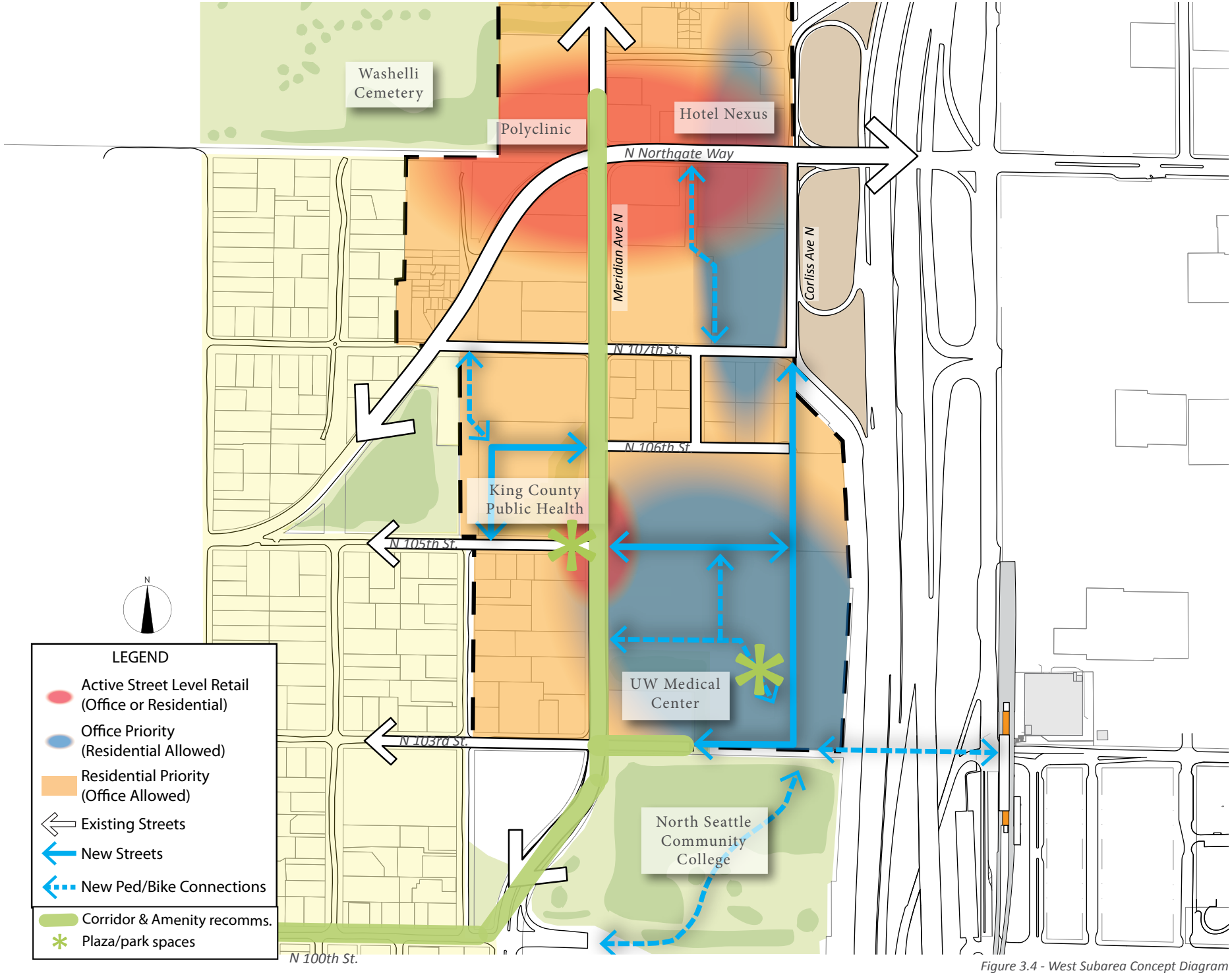


Figure 3.4 - West Subarea Concept Diagram



Figure 3.5 - West Subarea Urban Form Diagram

NORTHGATE WEST SUPERBLOCK RECOMMENDATIONS

1. **Superblock NGW #1.**
   Potential use: Long-term infill or redevelopment with commercial or mixed uses.
   Connection & amenity opportunities: Encourage pedestrian oriented features and streetfront retail uses.
2. **Superblock NGW #2.**
   Potential use: Long-term infill commercial or residential development; possible enhanced campus qualities.
   Connection & amenity opportunities: Encourage north-south pedestrian way or street enhancement with adjoining plaza/public square space.
3. **Superblock NGW #3.**
   Potential use: Conversion of low-density residential uses to higher-density residential uses.
   Connection & amenity opportunities: Encourage or require a public extension of Corliss Ave N to connect N 107th Street with N 106th Street.
4. **Superblock NGW #4.**
   Potential use: Encourage master planning to add medical/commercial buildings near I-5 and other infill of mixed uses, to make use of this area closely linked to the light rail station if the I-5 pedestrian/bicycle bridge crossing is built.
   Connection & amenity opportunities: Encourage new east-west pedestrian linkages to/from the I-5 pedestrian/bicycle bridge with adjoining plazas and civic open space feature(s). Also, encourage or require an extension of Corliss Ave N between N 106th Street and N 103rd Street.
5. **Superblock NGW #5.**
   Potential use: Rebuild the public health building, and consider addition of other mixed-uses at the site.
   Connection & amenity opportunities: Retain a green open space area as a public amenity, and/or other public spaces incorportated in future development phases. Consider providing as much affordable housing in mixed-use development as is practical and feasible.

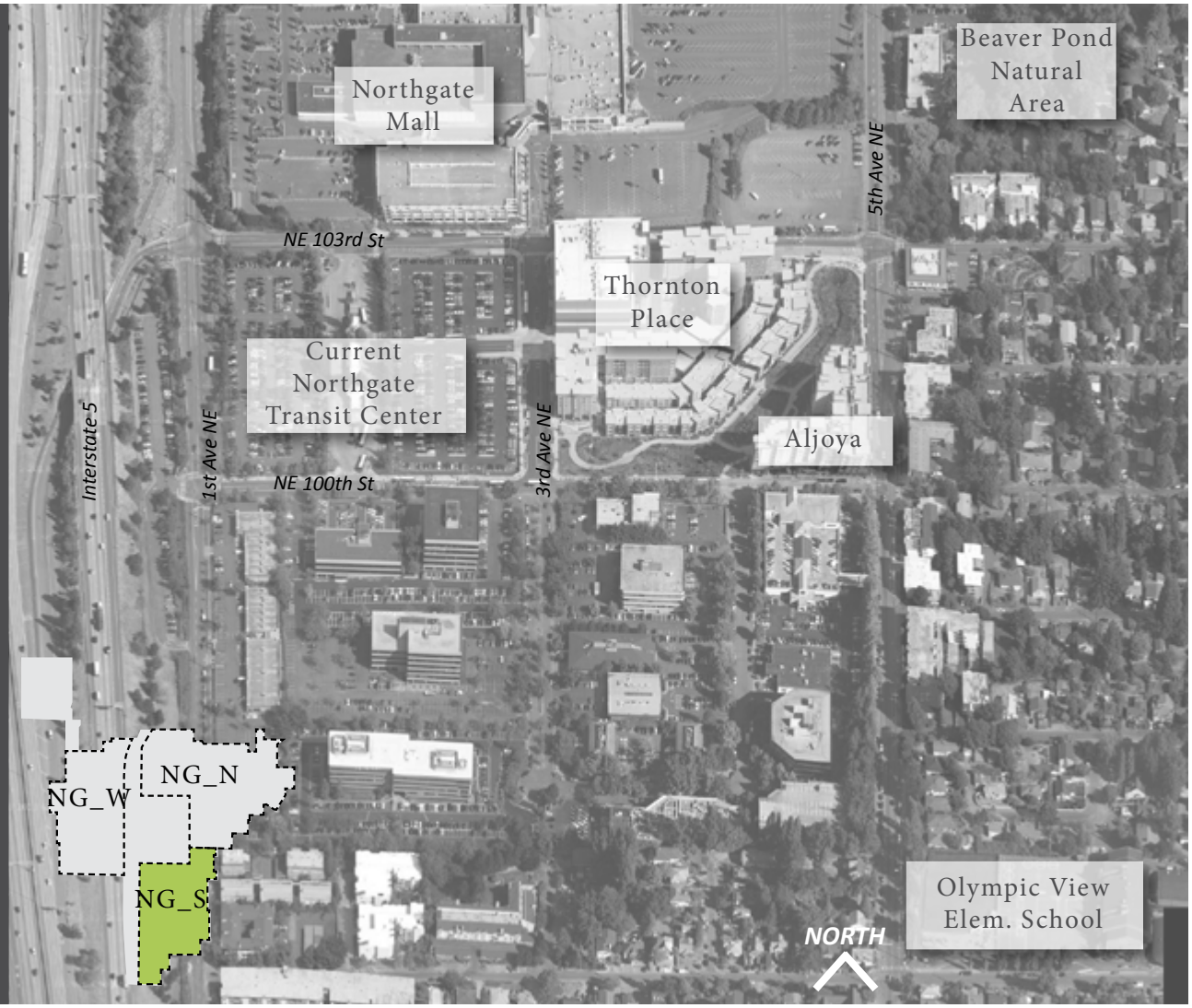
“P” Parking Resources.
Potential strategy: Consider a district wide public parking resource strategy, which could be parking at garage facilities as mapped.

South Subarea (NGS)

Urban Design Analysis

The South Subarea encompasses approximately six superblocks, as shown in the adjacent photo. The two most identifiable elements of the South Subarea are the Northgate Transit Center and the Thornton Place mixed-use and cinema complex. This area is and will continue to serve as a transit hub, where buses and rail service will come together. This combination means that maintaining traffic circulation to support effective bus operations will continue to be an important factor in this area's future.

The Subarea also contains multiple office buildings, strip retail facing I-5 along 1st Ave NE, and large areas of surface parking. The Northgate Library and Community Center are located at the northeast edge of the Subarea, about a 0.4-mile walk from the Transit Center. There are no grocery, drug or hardware stores, and only a few restaurants (within the Thornton Place internal circulation space). The Thornton Creek channel at Thornton Place provides an interesting and attractive open space amenity, with a greened drainage corridor and pedestrian amenities between 5th Ave NE and the Northgate Transit Center. The Olympic View Elementary school is a 15 minute walk (0.6 mile) from the Transit Center, just outside the southeast edge of the Subarea.



Pedestrian Amenities

Pedestrian connections within the South Subarea are available in most places, but are limited by gaps in sidewalk continuity and varying physical condition. The extent of surface parking lots compromises walking comfort in much of the commercial area south of the Mall. There is no sidewalk on 3rd Ave NE south of NE 100th Street. Connections to the south are restricted by a grade change aligned with NE 96th St, where a stairway connects up to 4th Ave NE. Between NE 100th St and NE 95th St a steep slope on the west side of 5th Ave NE is a barrier to pedestrian travel. Pedestrian comfort along parts of 5th Ave NE is compromised by higher speeds of traffic near narrow sidewalks, limited visibility and frequent turning vehicles. Most blocks have no sidewalks past one-third of a block east of 5th Ave NE. Higher quality sidewalks are included as part of the Transit Center and Thornton Place.

As noted in the Urban Center mobility recommendations, there are shortfalls in pedestrian connections to/from Maple Leaf to the east of this Subarea. Recommended improvements between Roosevelt Way NE and 3rd Ave NE would improve mobility to/from the South Subarea.

Mobility and Access

The service focused at the Metro Transit Center, including 13 Metro and two Sound Transit routes, provides excellent transit access for the Subarea, and Link light rail will further improve it in 2021. Although the Subarea is immediately adjacent I-5, access to and from the freeway is relatively challenging. There is a reversible ramp at NE 103rd St. connecting with the I-5 express lanes and a northbound general purpose ramp at NE 107th St., but access to the I-5 southbound general purpose lanes requires traveling up to Northgate Way and crossing below the freeway through frequently congested intersections.

Community vehicular connections to/from the South Subarea are reasonably accessible to and from the north and south (via 1st and 5th Avenues NE) but relatively limited to/from the west (N 92nd St. via 1st Ave NE), and east (certain local streets only, with steep grades and several traffic calming revisions in Maple Leaf -- primarily the prohibition of certain travel directions by automobiles).

Development Opportunities

The South Subarea is dominated by large surface parking lots, including the commuter parking next to the Northgate Transit Center, the Mall perimeter lots, and multiple lots surrounding office buildings in the southern portion of the Subarea. Four vacant mall block ‘edges’ exist along NE 103rd St. and 5th Ave NE. The corner of NE 103rd St. and 5th Ave NE is a potential future development site.

The properties east of 1st Ave NE south of NE 100th St. are a group of large and consolidated parcels with ample surface parking lots surrounding office buildings and strip retail. These are potential redevelopment opportunities due to property size and the aging conditions of the existing improvements.

The King County Metro transit center and surface park and ride lots have been identified as a catalyst project site, and with the arrival of the Link station and redevelopment of the bus transit island, prime property will be available for redevelopment. This site is presented in Chapter 4 of this UDF as a case study for the character and type of development and adjacent public amenities desired in the urban center.



South Subarea Principle #1

Create two great neighborhood-scale public open spaces

The South subarea lacks a civic/community gathering space. In order to encourage private investment, establish two distinct and complementary public spaces to support the growth of an urban residential neighborhood.

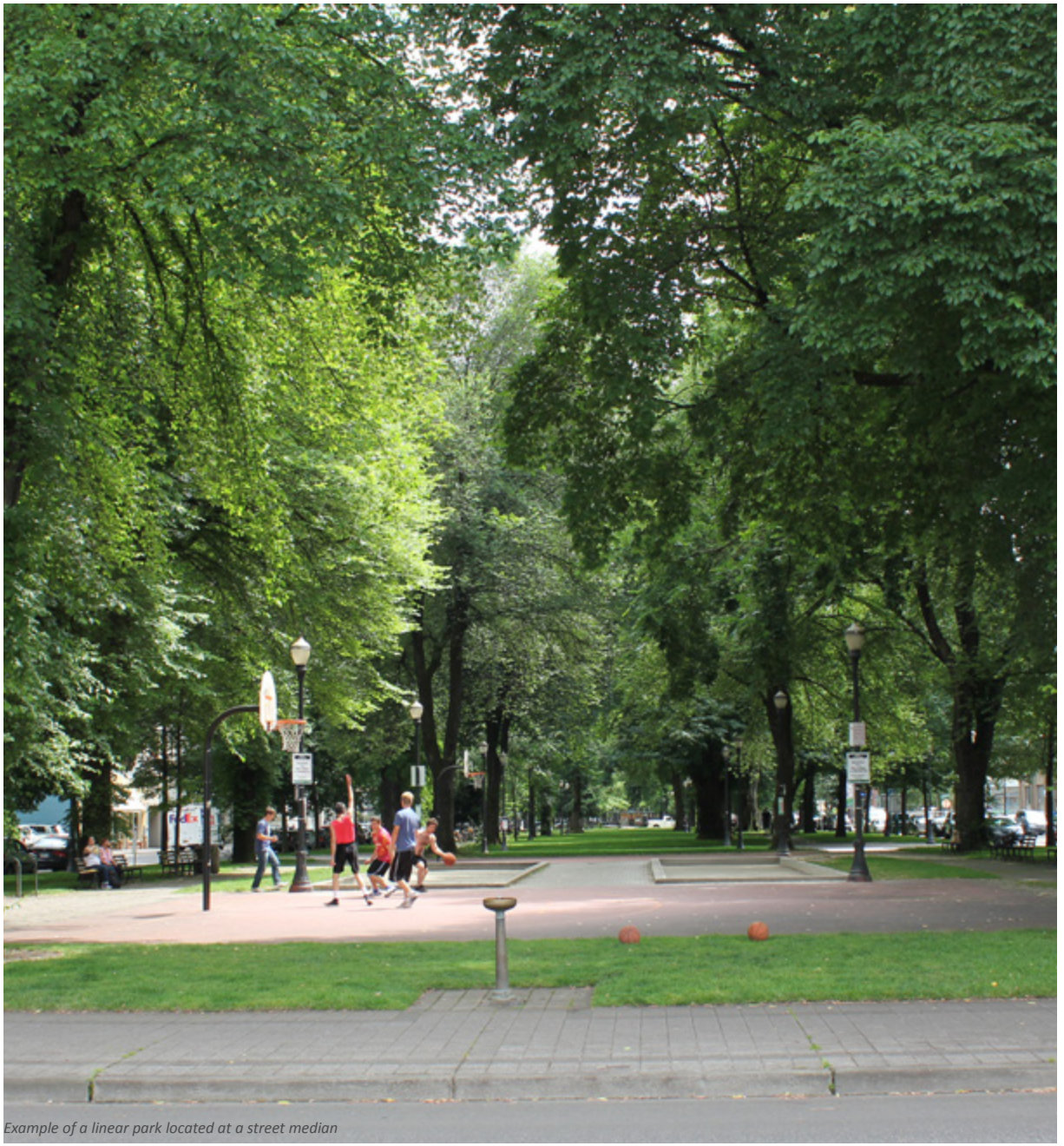
- A "Town Square" public open space is recommended to be located between 3rd Ave NE and the new Northgate Transit Center. A preferred location for the park is adjacent to or visible from 3rd Ave NE. It should also be close to, but not immediately adjacent to the future light rail station. See the recommendations for the Metro TOD property in Chapter 4.
- A small "Village Green" that includes spaces designed for both young and older surrounding residents. This space should be located south of NE 100th St, and could be integrated/coordinated with adjacent mixed-use residential development.

South Subarea Principle #2

Establish Third Avenue NE as a central linear park street

Third Avenue NE is located between Thornton Place and the King County Metro Transit Center. The City should consider actions to create a central neighborhood promenade street that provides orientation as an organizing feature for the subarea. The design of this street should include:

- Generous 15-20-foot linear park space on the west side of the street, plus complementary 8-foot sidewalks. Where feasible, expand the public realm into the curb parking zone for special street furnishings, art and other pedestrian features such as water features.
- Incorporation of complementary aesthetic street features demonstrating sustainable landscaping qualities appropriate for an urban "main street."
- Encourage adjacent building frontages as ground-related residential.
- Encourage a landscaped buffer 'fence' where the linear park street will be adjacent to surface parking lots.
- Encourage retail storefronts north of NE 102nd Street (e.g., the recommended E-W pedestrian connection), and allow such uses anywhere along the street.
- Update development standards to include blank wall restrictions.



Example of a linear park located at a street median



Location of potential infill locations at parking lots in the south subarea

South Subarea Principle #3

Convert surface parking lots into infill development

Encourage the infill redevelopment of surface parking lots, with a focus on the following priority locations:

- The Metro Transit Center TOD Site
- The Mall edge along NE 103rd Street and 5th Ave NE
- Several locations south of NE 100th Street
  - West of 3rd Ave NE – office use is most likely
  - Between 3rd and 4th Ave NE – multifamily use is desirable, but may need incentives
  - East side of 1st Ave NE – commercial use is most likely

South Subarea Principle #4

Buffer freeway noise with office/ commercial buildings

Large buildings with uses that are not overly sensitive to noise can help block freeway noise from penetrating the Urban Center and reducing comfort for area users.

- Between NE 97th and 100th Streets, office and hotel uses are the most likely development opportunities that would be tall enough to create a good buffer in the western portion of the TOD site – encourage this type of development.
- Other structures, such as the future light rail station structure, and Sound Transit parking garage north of NE 103rd Street will also provide a degree of freeway noise buffering.







Locating commercial/office buildings adjacent to transit or high traffic arterials

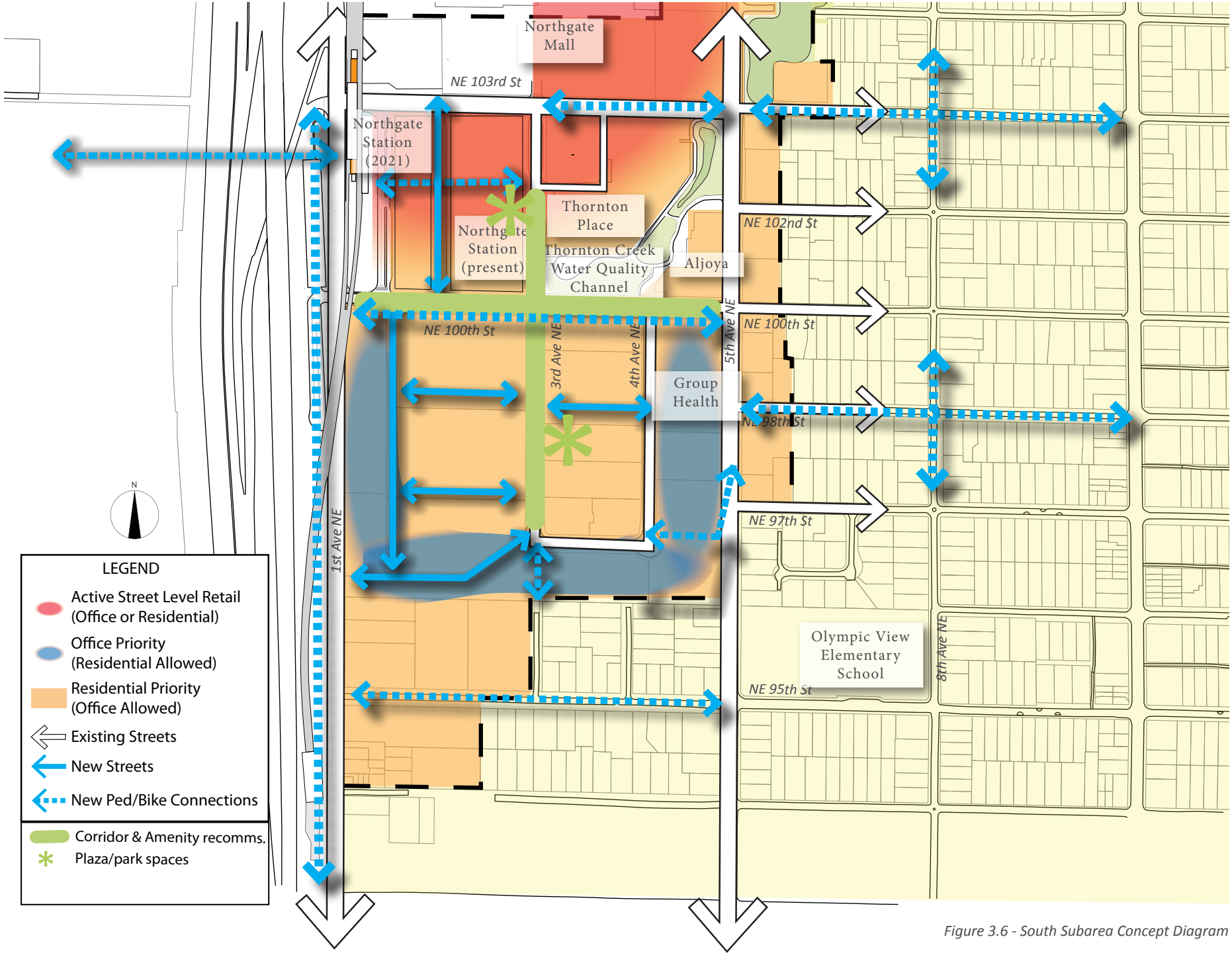


Figure 3.6 - South Subarea Concept Diagram



Figure 3.7 - South Subarea Urban Form Diagram

NORTHGATE SOUTH SUPERBLOCK RECOMMENDATIONS

1. **Superblock NGS #1.**
   Potential use: A parking garage adjacent to the north end of the light rail station will accommodate parking that replaces stalls to be lost during rail construction.
   Connection opportunities: Based on analyses in 2013, a garage connection to/from 1st Ave NE was included in planning, as well as vehicle access to/from NE 103rd St.

2. **Superblock NGS #2.**
   Potential use: A major opportunity to establish a dense mixed-use core for this South subarea with a significant presence of residential and commercial uses in a future transit-oriented development (TOD). See Chapter 4 of this UDF for more information about recommended guidance for future TOD development. The west edge of this block will serve as a key transit hub for rail and feeder bus routes linking to several North Seattle neighborhoods.
   Connections & Amenity Opportunities: Numerous opportunities to provide complementary streets, pedestrian ways, town square/open space, and encouraged indoor amenities. See Chapter 4 of this UDF for more information.

3. **Superblocks NGS #3 and NGS#4.**
   Potential use: As the nearest properties to the rail station, south of NE 100th Street, these existing retail and office use blocks have potential for denser redevelopment or infill development that could include denser office buildings, perhaps most likely near I-5. Additional residential development could be added opportunistically in some properties that have large underused surface parking lots.
   Connection & amenity opportunities: Green street improvements on NE 100th St. and 3rd Ave NE will require setbacks or acquisitions on certain edges of these properties. Also, design concepts should include public plaza spaces, and additional north-south and east-west pedestrian ways and/or local streets (between 1st and 3rd Avenues NE) to redefine more walkable block patterns in these parcels as they are infilled or redeveloped.

4. **Superblock NGS #5.**
   Potential use: This superblock between 3rd and 4th Avenues NE could be redeveloped with high-density residential or mixed uses. If property consolidation is possible, these parcels could provide sites large enough to establish a meaningful new residential presence.
   Connection & amenity opportunities: A public park space amenity is encouraged near 3rd Ave NE to provide breathing space and amenities for future residents. A recommended new street between 3rd and 4th Ave NE would also provide for better vehicle and pedestrian circulation.

5. **Superblock NGS #6.**
   Potential use: The broad southeast vicinity of the Northgate Mall property (including at the intersection of NE 103rd St and 5th Ave NE) could accommodate a diverse mix of infill development over the long term that may include retail, office and residential uses. This would help round out the South Subarea and bring a denser urban character closer toward the library and community center Redevelopment should be encouraged to include a large-scale mixed-use building or complex with enough space to include large retail and commercial development. This may also need a parking garage to provide sufficient parking for overall needs, but this should be designed using “right-size parking” principles.
   Connection & amenity opportunities: Plazas and pedestrian ways in future development will enhance north-south walking connections, and outdoor amenities will add a more livable and human-scaled setting.

NORTHGATE SOUTH STREETSCAPE CONCEPT PLAN

The existing and new proposed streets in the Northgate South Subarea will share some commonalities but also have varying distinct functions. Some streets need to accommodate broad uses including regional through access, transit, trucks, autos, bicycles and pedestrians. Other streets should be limited to local access only, with only minor and occasional use by lighter service trucks and buses. This street design concept plan outlines and illustrates recommended designations for two key streets in the South Subarea:

- NE 100th St.
- 3rd Ave NE

NE 100th St.: A Great Green Street

NE 100th St. will serve as one of the subarea's principal Green Streets with "complete street" elements including landscaping and possible drainage features, pedestrian and bicycle infrastructure while continuing to function as one of the neighborhood's transit streets (including continuing bus layover functions). In contrast to NE 103rd St., which is fed by the I-5 offramps and busier in terms of automobile traffic, NE 100th St. will provide an east-west connection that is focused on mixed modes of transportation.

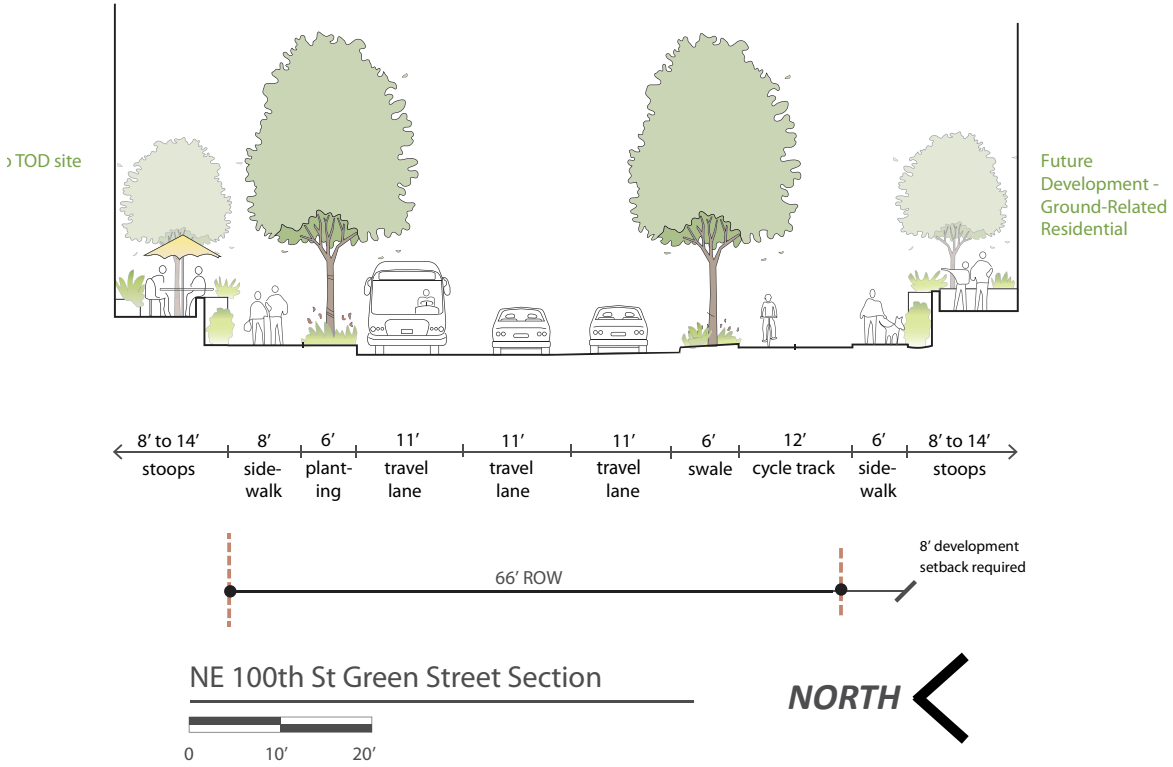
A new cycle track on the south side of the street will be a local bicycling connection between 1st and 5th Avenues NE, with prioritized pedestrian/bicycle paving over general street paving at 3rd and 4th Avenues NE.

The NE 100th St. roadway section will be rechannelized to three automobile travel lanes: two general purpose travel lanes and one curbside lane (north side) for bus layover. A retained sidewalk on the north side of the street will accommodate the majority of pedestrian trips to and from the light rail station. A greened landscaping edge is also recommended on the north side of this sidewalk.

On the south side of NE 100th St., the pedestrian zone will consist of a six-foot wide sidewalk, buffered from the automobile lanes by a six-foot wide landscaped swale and 12-foot wide, two-way cycle track. There will be no curb parking on the south side of this street.

Bus layover will continue to be accommodated on NE 100th St. as well as a portion of WSDOT right-of-way between 1st Ave NE and I-5. This layover will help maintain the area's function as a large transit hub, improving service reliability while maintaining operational cost efficiencies. If built, a bicycle lane on the south side of NE 100th St. would displace one layover space just west of 5th Ave NE.

Section A - NE 100th St west of 3rd Ave NE





A greened residential sidewalk edge



A 'cycle track' with in-street green buffer

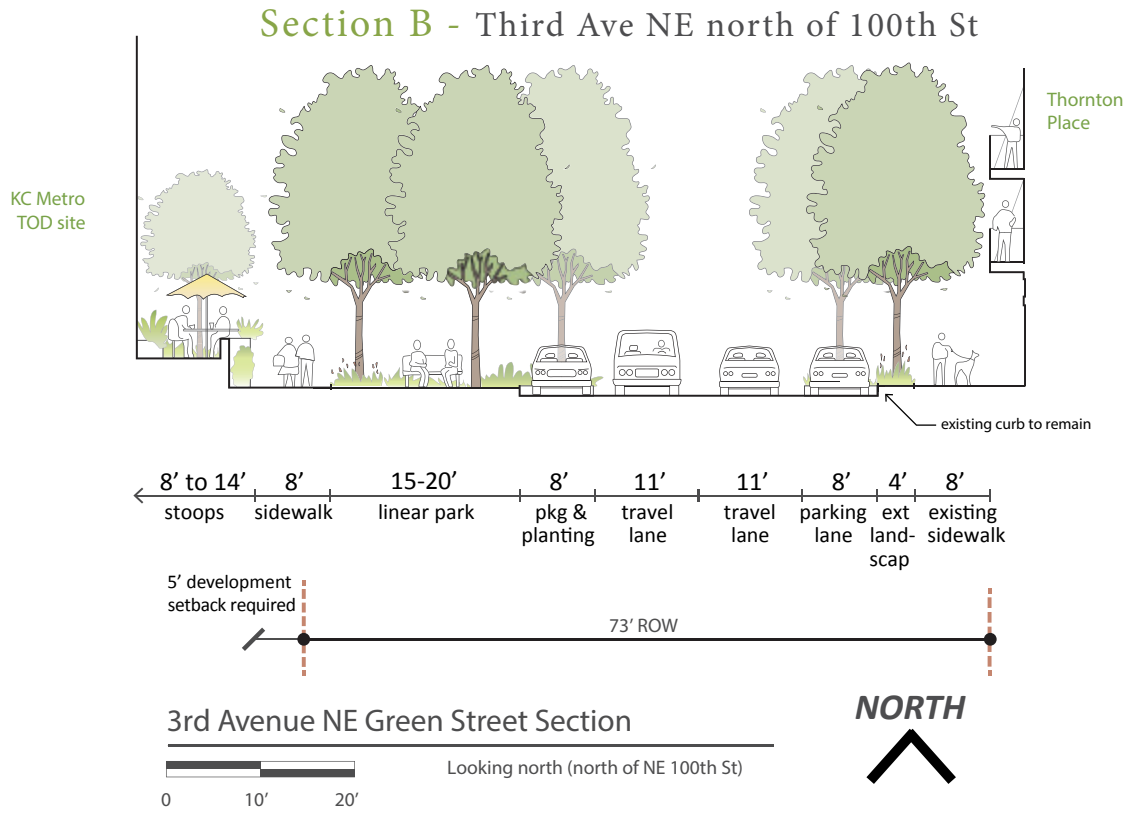
Third Ave NE: A Linear Park Street

Third Ave NE will be both a central "Main Street" and a linear park street, providing an important pedestrian connection and greened space to link the neighborhood subareas north and south of NE 100th St.

Generous sidewalks and green street features will reinforce and unify the neighborhood street character of 3rd Ave NE while providing a buffer to adjacent surface parking areas. In order to help complete the neighborhood pedestrian network, sidewalks will be added to the 3rd Ave NE right-of-way south of NE 100th Street, where they currently do not exist.

Configured in the form of a linear park 15-20 feet wide plus an additional 8 feet given to sidewalks, this corridor will create a strong pedestrian pathway that serves and connects the Northgate South subarea.

North of NE 100th St., this design (if 15 feet in width) could be accomplished within the right-of-way without overlapping private property, if a left-turn lane through the middle of this block is eliminated south of Thornton Place's entry to 3rd Ave NE. A right-turn pocket on 3rd Ave NE, and adding a traffic signal at NE 100th St./3rd Ave NE will help maintain vehicle traffic movement efficiencies.



Third Ave NE south of NE 100th Street

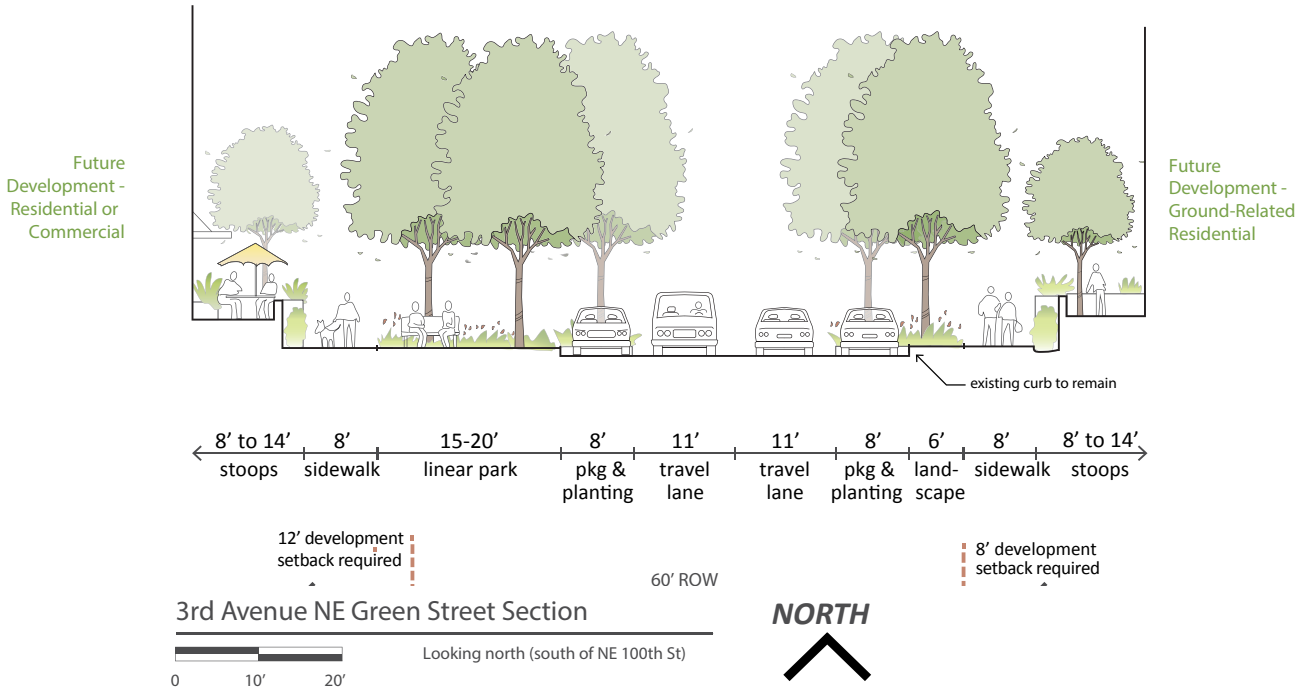
The 3rd Ave NE right of way south of NE 100th St. may be reconfigured to eliminate the existing vegetated median in exchange for usable public green space directly adjacent to the sidewalk. Alternatively, eliminating parking on one side of the street would enable a linear park corridor while also keeping the existing vegetated median.

South of NE 100th St., this street section would overlap with private properties by approximately 8-9 feet on both sides of the street. This overlap, either retained in private property or in future acquired right-of-way, would be used to enhance the public realm in anticipation of adjacent redevelopment with street-related uses.

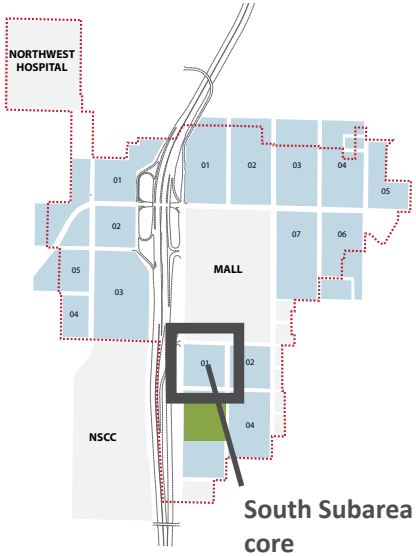


A linear park street with commercial uses at its edge

Section C - Third Ave NE south of 100th St







Context

A transit-oriented development (TOD) is encouraged to occur between 1st and 3rd Avenues NE at the core of the South Subarea next to the future Link station (shown above). The South Subarea currently consists of a few superblocks with: the Thornton Place mixed use complex; Aljoya senior housing; several low-to-moderate scaled medical-dental office and clinic buildings; a few larger multi-tenant office buildings; limited presence of retail uses; and a dominating presence of surface-parking lots reflecting a suburban approach for commercial office development.

FIVE ASSETS: There are five assets of the South Subarea that will help support TOD goals:

1. Activity generated by transit riders

Transit riders will use local services and patronize restaurants, and some will choose to live in this subarea. The future TOD will facilitate pedestrians passing through the heart of the site on their way to and from the east.

2. The Northgate Mall as an adjacent draw for customers and activity

Northgate Mall is a major regional shopping destination with over one million square feet of retail, attracting thousands of shoppers and hundreds of employees to the area every day. The South Subarea and the King County property can be expected to attract future customers from the mall, due to proximity, transit ridership, good pedestrian connections, opportunities for complementary retail uses, and the provision of other welcoming place-making urban design amenities.

3. The nearby office district's potential to support future infill development and as a source of local service customers and town square users.

The subarea south of NE 100th Street has substantial medical and office employment and other nearby residential base. It also has a substantial potential to support future infill development that may occur in response to transit station proximity. The area lacks sufficient public gathering spaces, and so the King County property would offer a place for local services and a central community 'town square' gathering place for these users.

4. Thornton Place as an established resident base with complementary retail & public places.

Thornton Place's residential base of 530 apartments, movie and retail businesses, nearly 1,000 parking stalls, and green space provide an existing resident and visitor population. This helps lower risks for future development, and provides an opportunity to strengthen overall activity levels for the whole subarea. Ensuring there are direct pedestrian connections between the Link station and Thornton Place's amenities will naturally improve local circulation and beneficial levels of activity in public places.

5. North Seattle Community College as a potential draw with improved accessibility.

The 7,000+ college population of students and staff bring activity through the day to the campus west of I-5. With more convenient pedestrian/bicycle connections to the station area via a pedestrian/bicycle bridge across I-5, there is great potential to increase overall economic activity in the South Subarea, and increase the convenience and frequency of mass transit ridership for school commuting. This will also help "reunify" the Northgate Urban Center's two parts on either side of I-5, which will also benefit local residents west of I-5.



Northgate Mall



Thornton Place



Northgate Washington Dental Service



North Seattle Community College

Overall Development Goals

The City's goal for development of the King County property and the South Subarea is to ensure that a future development will result in a publicly accessible urban community that fully realizes its potential as a transit-oriented community. This goal synthesizes the objectives of regional and city planning policies as well as the preferences and priorities expressed in many community comments.

The King County property provides a significant opportunity to build upon the precedent established by Thornton Place to create an attractive and safe environment that is accessible and inviting to the surrounding community. King County's large publicly owned site provides a unique opportunity to realize a broad range of community development, environmental sustainability, livability, public health and social equity objectives.

Developing the King County Site

The King County Metro Northgate site has been North Seattle's primary bus transit center and commuter park and ride lot for decades. The construction of the Link station by 2021 provides an opportunity to redevelop this site with higher-density land uses that will be transit-supportive and important to the creation of a more walkable, vibrant and environmentally sustainable activity center in this part of the Urban Center. This will build upon the population base at the adjacent Thornton Place.

Benefits of TOD: Transit-oriented development promotes cleaner ways to travel than driving alone. By redeveloping the Northgate parking lot into a transit village, we will preserve precious farmland and open space elsewhere in the county, and will reduce air pollution. Households who live in this transit village will be more income-diverse than households in other multifamily housing communities, and will own fewer cars, and drive less often. They will generate fewer greenhouse gas emissions than other residents of the region.

This UDF explores ways to realize its full development potential while also adhering to strategies promoting public health, an excellent natural and built environment, and community economic growth.

At the same time, this UDF encourages a broader transformation of the South Subarea to be a mixed-use district that will also take advantage of proximity to mass transit service.

What qualities do we want to see in the TOD site development?

-A combination of public places and amenities that become an active "heart" of Northgate, attracting daily activity as a popular gathering place

--A walkable environment

--A safe place that is well-lit, secure, populated and supports healthy activities

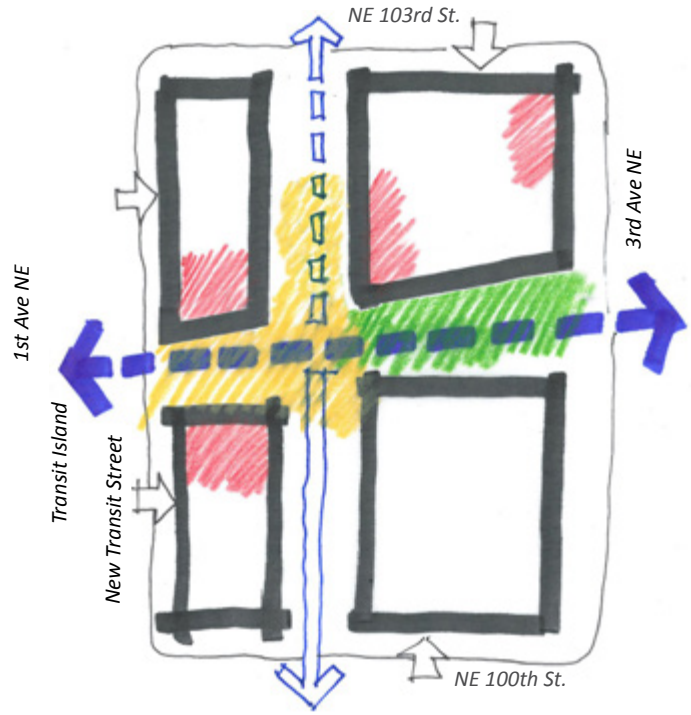
--Efficient development to maximize its potential as a transit-oriented activity center while still being a pleasant, livable setting

--Ground-level uses in key locations on the site that create an engaging and activated atmosphere

--Uses that support, integrate and blend well with the transit functions on the site and in the vicinity

--Uses that support an equitable mixed-income community with community amenities and economic opportunities that support the Northgate neighborhood

PREFERRED SITE DEVELOPMENT CONCEPT



URBAN FORM CONCEPT DIAGRAM

Building perimeter
Ground-floor retail/services
Public plaza
Green open space
Parking and loading access
Primary circulation
Secondary circulation

NORTH

The preferred site development concept emphasizes pedestrian connections, greened public spaces, activated streetfronts through the center of the site, and extensive presence of residential uses to accomplish a transit-oriented community.

Key features include:

- A primary pedestrian-oriented east-west corridor through the center of the property, linking the transit station with Thornton Place;
- Generous public greened town square and plaza open spaces located along the east-west corridor;
- Block sizes and future mix of uses that are flexible for development in phases
- North-south access for vehicles and pedestrians
- Ground-floor commercial uses and a variety of housing types, including affordable housing
- Transit island designed to ease transit connections between bus and rail, and fit within the area's street network

Development Guidelines

The following guidelines articulate the most important and desirable characteristics of future development at the Northgate Metro TOD site.

The guidelines will influence future buildings, streets and amenities in ways to meet the goals discussed in this UDF.

There is an intentional flexibility in how these recommendations can affect future development. There are many possibilities for the development of this TOD, and the City does not wish to prevent creative and efficient arrangements that will result in a great transit-oriented community.

The guidelines are organized into four main categories:

1. Defining Blocks and Major Pathways Within the Site
2. Parks and Public Amenities
3. Land Uses and Building Design
4. Other Supporting Features and Qualities



The illustration above shows three buildings with roughly the same capacity (in floor area) distributed with different heights and massing. This suggests the benefits that taller tower forms can bring in allowing other portions to be lower-scaled.

DEFINING BLOCKS AND MAJOR PATHWAYS WITHIN THE SITE

The recommended TOD concept is to divide the site into four rectangular blocks that will serve as future building development blocks. This would occur through:

- A central east-west corridor for predominantly pedestrian and bicycle movements between Thornton Place to the east and the transit station to the west; and

- A north-south street or pedestrian corridor that would provide access to parking and complementary public spaces; and

- Other complementary indoor or outdoor pedestrian connections within the development blocks, to increase overall pedestrian circulation and achieve an urban form with a finer grain.

East-West Corridor

The east-west corridor is recommended to include an open space that will be a multipurpose 'town square' public gathering space.

The corridor should provide an approximate line-of-sight between the transit station and Thornton Place's entry on 3rd Ave NE.

Recommended features of the corridor:

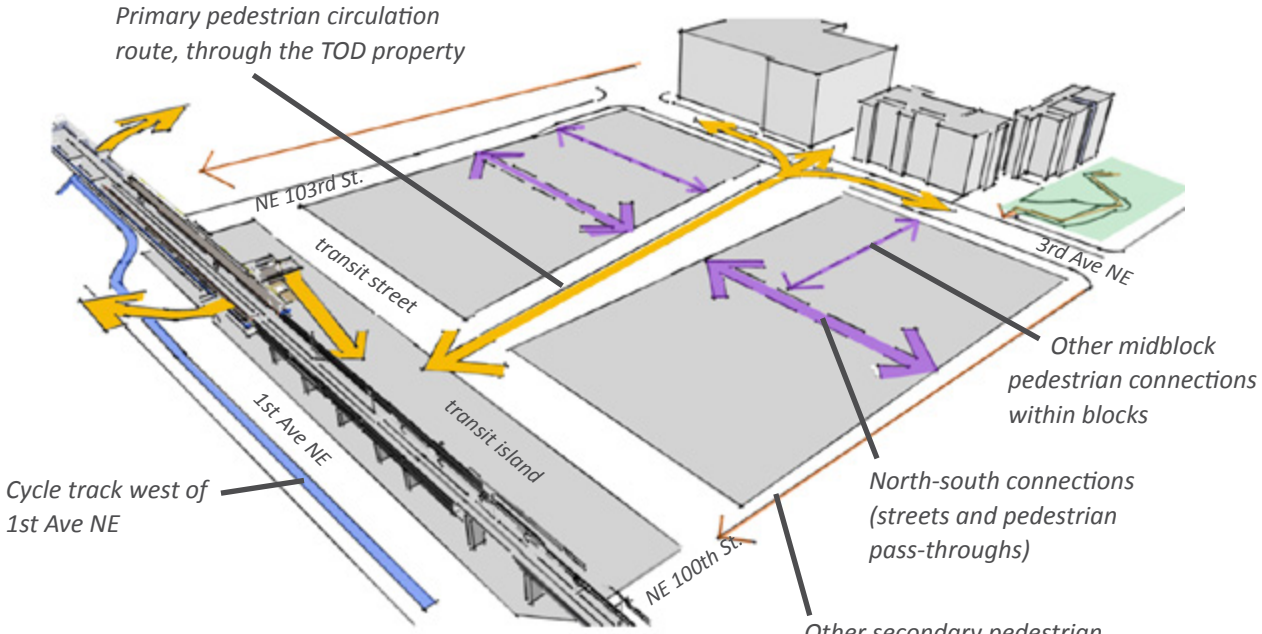
An average corridor width of approximately 40 feet, allowing for considerable flexibility in width in different parts of the corridor -- to accommodate the town square and other plazas.

Prioritizing pedestrian movement over vehicles. The corridor may contain a one-way automobile access street if designed as a pedestrian prioritized and curbless environment with special paving, and the ability to restrict vehicular access during special events.

High quality pedestrian amenities and lighting along with engaging street-level uses and other design features that will create an attractive and safe environment.

Appropriate paving material and other street design features promoting safety and aesthetic quality at the major crossing of the transit street (east edge of the transit island).

Weather protection features such as canopies on adjacent buildings for at least 50% of the east-west corridor.



A desire to accommodate east-west major pedestrian circulation, and north-south circulation for vehicles and pedestrians within the TOD site. Other circulation routes also recommended within each smaller block.

DEFINING BLOCKS AND MAJOR PATHWAYS WITHIN THE SITE (Continued)

Blocks

There is no recommended fixed block size, but blockface lengths of at least 120 feet will provide for sufficient spacing of streets and intersections and will provide building sites that are well sized for individual building and parking construction.

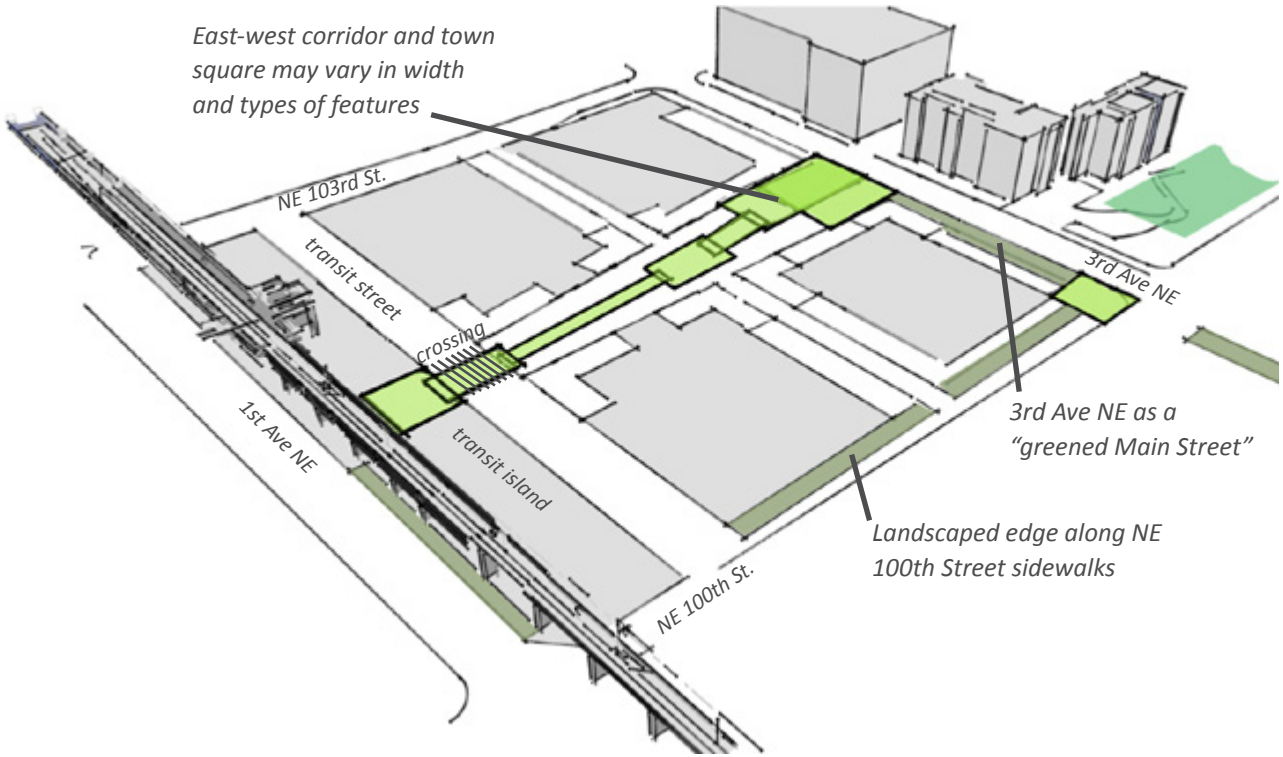
North-South Corridor

The north-south corridor may consist of a two-way automobile street with accompanying sidewalks and parking lanes across the entire site, or may consist of a primarily pedestrian-oriented corridor along part or all of its length. On-street parking may be provided in this corridor. This corridor is expected to accommodate vehicle access to underground parking for at least some of the future building sites.

PARKS AND PUBLIC AMENITIES

Parks, public amenities and open space features should complement and connect to the network of open spaces around the site. This includes designs that acknowledge and relate to the Thornton Drainage Channel corridor just east of 3rd Ave NE at Thornton Place. Open space amenities also should:

- Emphasize 3rd Ave NE as a greened "Main Street" helping unify the Northgate South subarea;
- Reconfigure NE 100th St. with more green design features
- Locate a community town square park/plaza feature in proximity to 3rd Ave NE to be a comfortable, activated and successful "people place."
- Include a plaza or other treatment at the junction of the transit-street pedestrian crossing and the beginning of the east-west connection.



Locate and link open spaces along the major east-west circulation route, including a large community 'town square' oriented closer to 3rd Ave NE. Also, a linear street park recommended for part of 3rd Ave NE and greening of the NE 100th St. corridor.

Recommended Features

Community Park/Plaza Space(s) and Open Space

- A community park or plaza approximately 10,000 square feet in size as part of the east-west corridor that will function as a town square and open space amenity for local residents and visitors.
- The development should provide for a minimum of 15% of the site's area in outdoor open spaces. This amount could be phased in over time as the site develops.

The park/plaza should be:

- Located on or near the east-west corridor.
- A suitable community gathering place, with a combination of both hardscape and durable landscaped areas to soften and enhance the spaces.
- Designed to integrate public artworks, as well as green features such as raingardens or similar features, and sculptural water features.
- Configured to provide a sense of an "outdoor room" in an urban setting.

PARKS AND PUBLIC AMENITIES (Continued)

- Located to complement and enhance viability of ground-level non-residential uses; for example, designed with edges and amenity features that will encourage restaurants with outdoor dining spaces.

- Designed to accommodate a single-level small building and/or multiple kiosks for cafes or similar activating uses to stimulate activity within the corridor and help define edges of the public space.

- Configured to gain most advantage from solar exposure, particularly in afternoon hours.

- Fully accessible to the general public for all daytime and evening hours, to provide gathering place(s) that are designed to accommodate multiple functions and uses, such as farmers markets, book fairs, and daytime concerts.

Sidewalks

- Provide sidewalks and streetscape improvements at the site perimeter as shown in the street section drawings included in this UDF.

Other Community Amenities

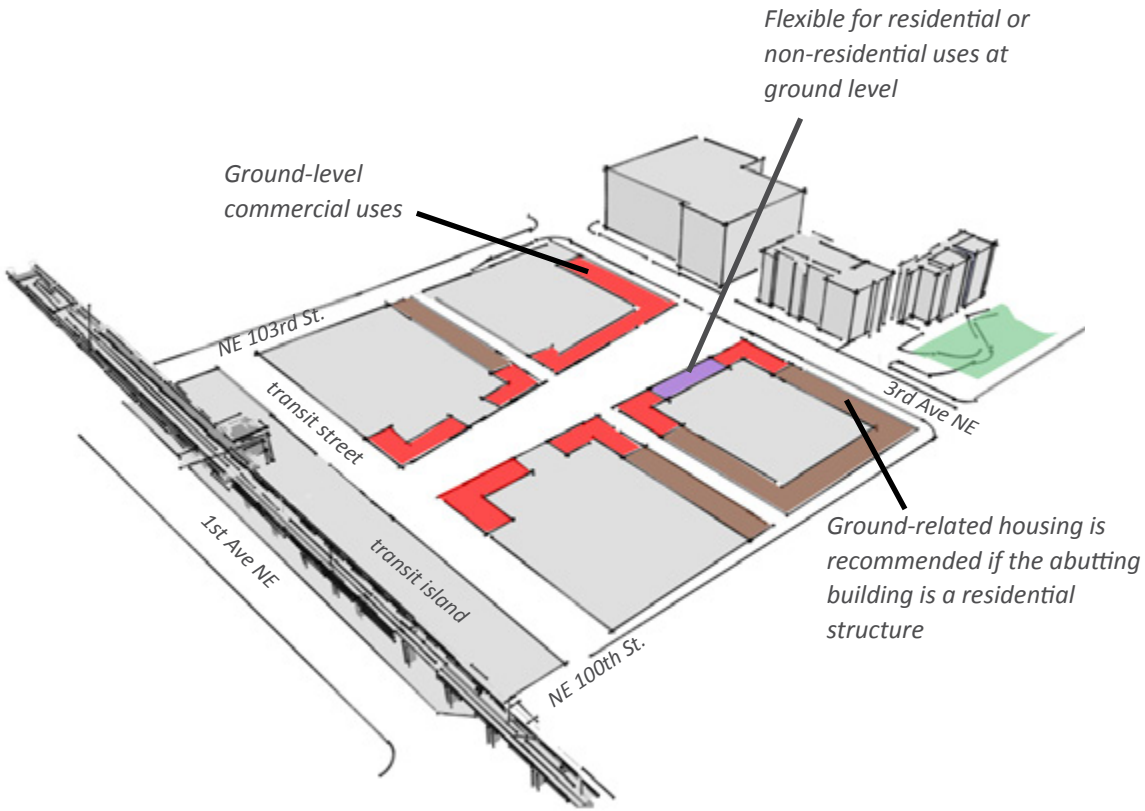
- Encourage provision of indoor community amenity features, including community meeting rooms, space for recreational activities, accessory spaces such as shopping atriums, and artist/cultural facilities as tenants.

LAND USES AND BUILDING DESIGN

The intent is to encourage efficient use of land on this TOD site while providing public amenities and serving community needs with affordable housing, services and community facilities. These recommendations provide guidance to shape the future development and ensure that the arrangement, sizing and combinations of uses will lead to an active and vibrant urban community at the Northgate transit station.

Possible Development Agreement

- To allow flexibility in application of development standards and to achieve high-quality design in the transit-oriented community, a development agreement is encouraged.



A desire to concentrate ground floor commercial uses (in red) along the east-west circulation corridor. Also, a desire to include ground-related housing with stoops (in brown) on north-south corridors where residential buildings are present.

Recommended Features

- The TOD site should host a combination of uses that are built in response to market forces. Expected uses will primarily be residential, retail, and office development.

Site Density

- This UDF recommends that future development use as much of the available development capacity as possible, to most efficiently use this key transit center core property. The density limit is 6 FAR (total floor area can equal 6 times the site's total land area). City zoning allows this density limit to be exceeded if it will enable more residential housing to occur.

- A recommended minimum density of 2 FAR per building site or defined "block" on the TOD site.

Height Limits

- Structures that exceed the current 125-foot height limit could provide a distinct identity for this station area and allow for sufficient development potential to make this a successful TOD.

- Strategies such as site coverage limits could help taller buildings make positive contributions to the function and design of the area.

Transfer of Development Density

- To provide flexibility for the most efficient development outcomes, allow the transfer of development capacity among individual properties across the TOD site.

LAND USES AND BUILDING DESIGN (Continued)

Ground-Floor Commercial Uses

- Ground-floor retail uses are encouraged along at least one side of the east-west pedestrian corridor, and along the edges of the recommended town square open space. Ground-level retail uses are also encouraged along the west side of 3rd Ave NE, at a minimum to include locations north of the east-west pedestrian corridor. (See the illustration on page 69).

- Convenience retail uses are encouraged to occur adjacent to or on the transit island's main pedestrian plaza, to provide visible and convenient goods and services for transit users.

Amount of Retail Uses

- For the whole TOD site, provision of an approximate minimum of 40,000 square feet of ground-level retail uses is recommended, to ensure availability of services and activation of the main east-west corridor.

- The development is encouraged to provide a medium sized grocery store or urban market and a drug store as resident-supportive uses and convenience uses to commuters.

Residential Development

- Residential uses will be permitted throughout the TOD site, although ambient noise levels may discourage location of residential uses facing the light rail facilities and Interstate 5.

- To establish an engaging residential presence along streets, encourage ground-level, ground-related housing with stoops on block faces of predominantly residential buildings that border on the north-south streets, including 3rd Ave NE south of the east-west pedestrian corridor.

Affordable Housing

- The TOD site development will be required to include affordable housing targeted to provide new affordable dwelling units serving a range of household incomes.

- The TOD site development will contribute toward achieving the Growing Transit Communities TOD Compact goals for affordable housing production, which are:
  - 13% of dwelling units serving households from 0-30% area median income
  - 12% of dwelling units serving households between 30-50% area median income
  - 18% of dwelling units serving households between 50-80% area median income

The development agreement will specify levels of affordability.

Tower Size Limits

- Define a maximum size limit of 10,000-12,000 square feet per floor for residential tower floors.

Locations of Towers

- Portions of the TOD site north of the east-west pedestrian corridor are preferred as locations for the tallest building towers, in order to avoid shading the primary public spaces.

Upper-Level Building Setbacks

- Define upper-level building setbacks for towers in the range of 5-15 feet above a building's base, to allow more light into sidewalk and pedestrian corridors.

Limits on Uses

To encourage efficient use of the site:

- Prohibit surface parking on building sites or restrict it to accessory short-term spaces.

- Limit individual ground-level retail/commercial spaces located on the TOD site to approximately 25,000 square feet.

- Prohibit presence of drive-in businesses.

OTHER SUPPORTING FEATURES AND QUALITIES

Recommended Features

Green Performance Levels

- Meet a high level of environmental performance for buildings, to a minimum of LEED Gold or Built Green 4-Star standards.

- Meet City Green Factor for landscaping at a minimum performance level of 0.3. This will afford flexibility in the selection of strategies for accomplishing greened conditions in future development.

- Encourage inclusion of raingardens and distinctive landscaping and water features.

Transit "Busway" Street

- Accommodate a vegetated median within the transit street that discourages jaywalking.

- Ensure a well-marked crossing at the east-west pedestrian corridor.

- Ensure sufficient safety for pedestrians and bicyclists for the busway crossing locations at the north and south ends of the transit island.

- Require that the northbound lane is available for general purpose traffic, and that two southbound lanes are reserved only for transit use. Require curbside parking spaces next to the northbound lane (east side of transit street).

- Accommodate street design flexibility and relief from code standards, if it will help avoid bus service operational conflicts.

Parking

- Encourage parking provision that will be "right-sized," meaning that future development will avoid parking in excess of its needs. The recommended performance guideline is to achieve site-wide parking rates that are less than one parking space per dwelling unit and one space per 1,000 square feet of nonresidential floor area. However, for the non-residential uses' parking guideline consider flexibility for retail-uses' parking to exceed a rate of one space per 1,000 square feet.

- Recommended parking should be located underground and not on the surface of any building site.

- Accommodate on-street parking for the site's internal streets.

- Accommodate above-ground structured parking for up to 30 feet above grade, if intervening uses or full screening of parking areas from view is accomplished.

Vehicle Access

- Recommend parking accesses be located on the internal north-south street when possible.

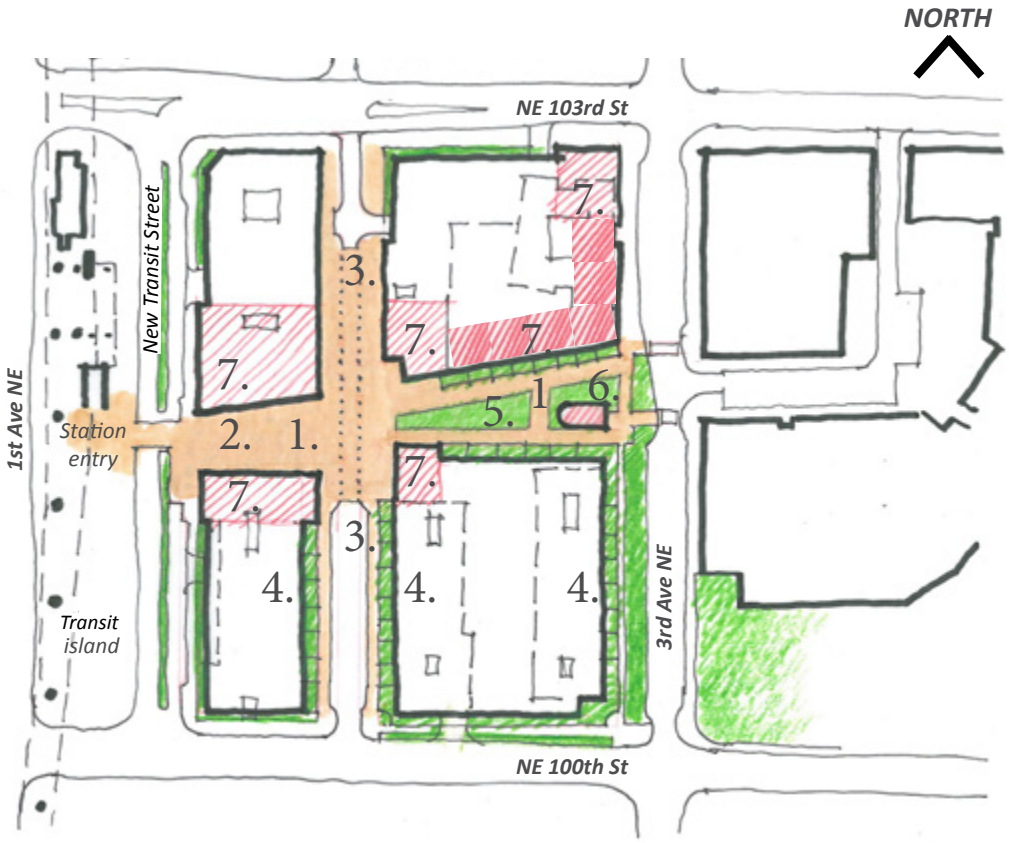
- Accommodate parking accesses from 3rd Ave NE, NE 100th St., and the transit street; parking accesses may also occur from NE 103rd St. as long as the City concurs that safety and operational efficiencies can be maintained.

- Allow parking accesses at other locations if necessary to meet other City design goals.

Development Concept Using the UDF Guidance

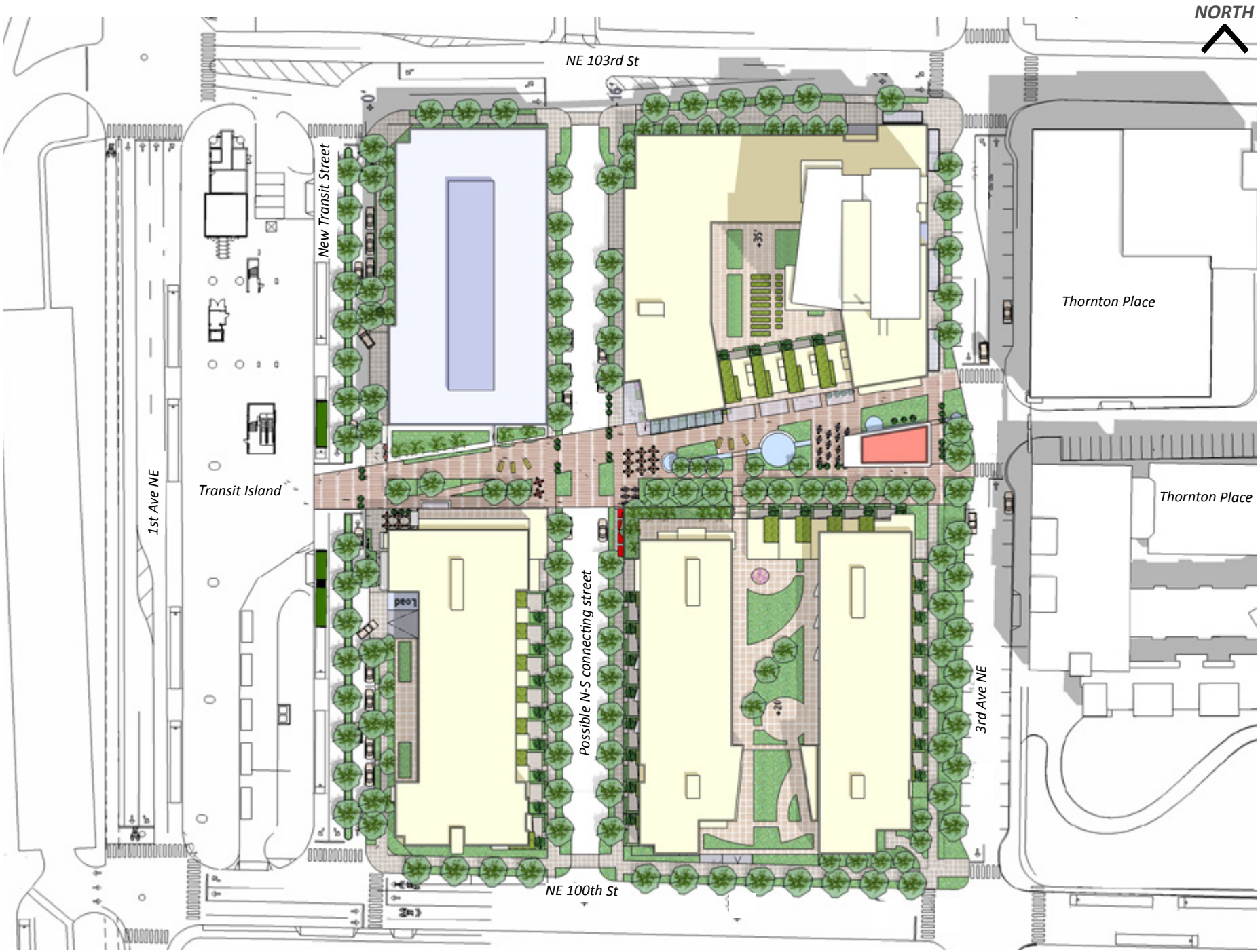
The following illustrations show one conceptual site plan that would be consistent with the City's proposed guidelines. However, this is not meant to show the only acceptable development outcome. Also see Appendix 1 for other alternative siting possibilities.

Development on the site should fit well within the recommended off-site improvements to the South subarea. These include the proposed street parks and related streetscape improvements on 3rd Ave NE and NE 100th Street. As well, the TOD would help area pedestrian circulation by providing attractive pathways for transit users, to and from Maple Leaf.

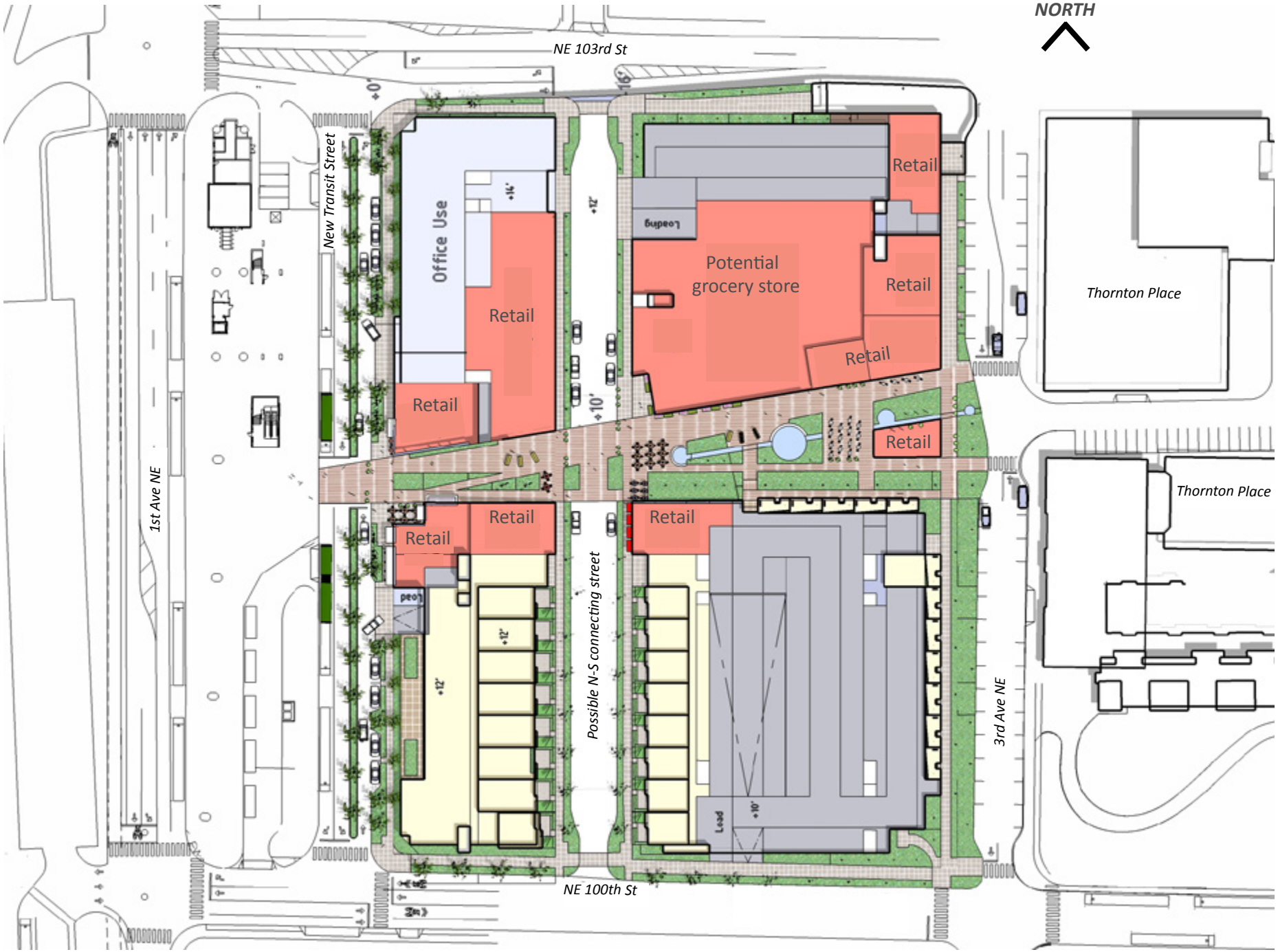


CONCEPTUAL SITE PLAN

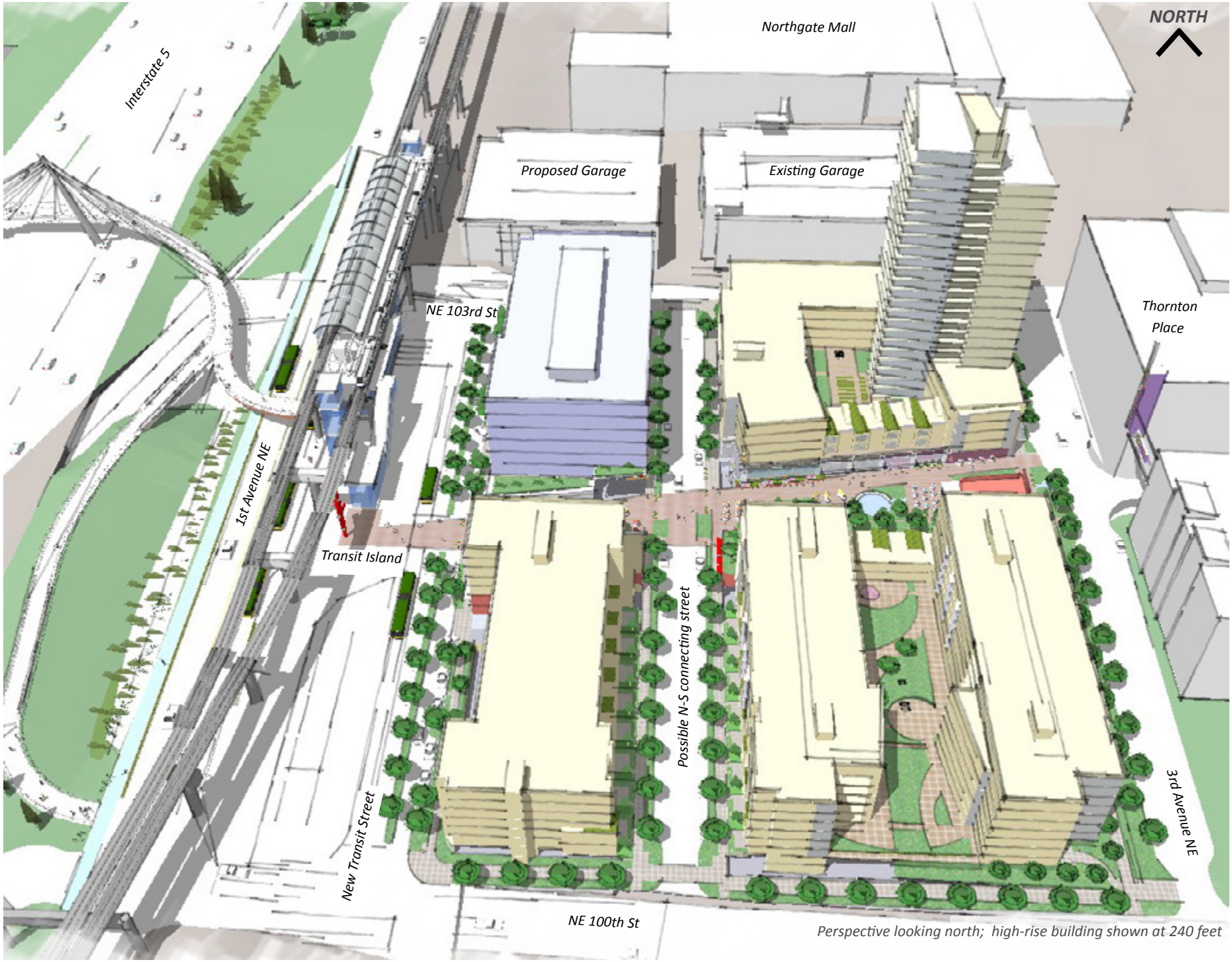
1. Town Square plaza
2. Primary pedestrian access from station to 3rd Ave NE
3. Access and service routes through site, becoming a textured *woonerf* at the town square
4. Townhomes or work lofts with ground-related entrances and landscaped stoops
5. Common green space for recreation, playgrounds, and/or rain gardens
6. One-story kiosk retail
7. Encouraged ground-floor commercial retail uses



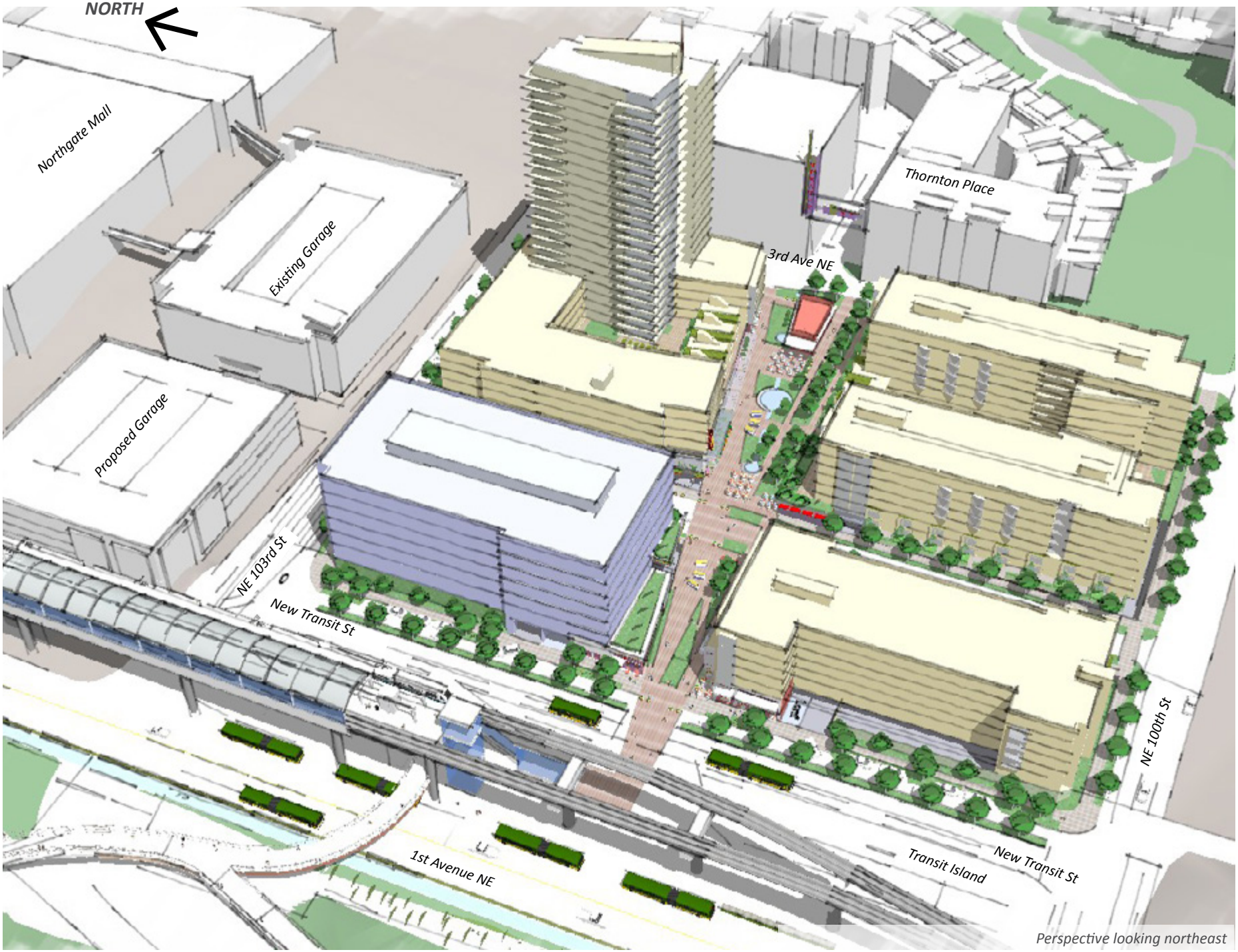
Illustrative Site Plan



Ground Level Plan to illustrate desired uses and active edges



Perspective looking north; high-rise building shown at 240 feet



Perspective looking northeast

NORTHGATE URBAN DESIGN FRAMEWORK | 76

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5 IMPLEMENTATION

Transforming the Northgate Urban Center into a more livable and walkable community will require actions by multiple departments of the City of Seattle in collaboration with partner public agencies such as Washington Department of Transportation, King County and Sound Transit. More detailed evaluation and recommendations will be required to resolve issues comprehensively. However, several general implementation steps are recommended below. These actions are designed to leverage current investments and general market development patterns. The City Departments of Planning and Development (DPD) and Transportation (SDOT) are suggested to lead the relevant actions listed below related to each subarea.

Northgate North Subarea

DPD should lead efforts related to development opportunities. Actions should include meetings with property owners to present and discuss City goals and objectives of the UDF. Both individual and group meetings should be considered to elicit the most useful information. Based upon meetings, develop strategies and tools to better catalyze and coordinate future development opportunities consistent with UDF goals.

SDOT should lead efforts to further evaluate recommendations for improving streets and mobility connections. Actions should include:

- Develop street concept plans for 5th Ave NE, and NE Northgate Way.
- As needed, assist appropriate community organizations to sponsor Neighborhood Street Fund grant applications for street improvements on 5th Ave NE.
- Coordinate with King County Metro to determine how to further evaluate and realize recommended improvements to the transit facilities.
- As part of ongoing transportation planning, develop strategies (including multi-agency collaborative strategies) to realize the recommended new street and pedestrian/bike connections.
- Facilitate community application for Neighborhood Matching Funds for Hubbard Homestead Park improvements and connections to nearby senior housing.

Also consider future funding such as the new Parks Levy, Future Bridging the Gap transportation improvements levy, and other collaborative funding strategies for all street improvements.

Northgate South Subarea

DPD should address development opportunities on both the King County Metro TOD site as well as other development opportunities in the Northgate South Subarea.

The TOD site may be the first catalyst for redevelopment and for street improvements. For the Metro TOD site, DPD should refine and incorporate the proposed development guidelines into a development agreement with King County that allows it to solicit for development services. DPD and SDOT should coordinate commitment of capital funding for infrastructure and right-of-way improvements with a possible Request for Proposals and as part of the future development agreement for the site.

For all other development areas, DPD should meet with property owners to present and discuss City intentions and objectives of the UDF. Both individual and group meetings should be considered to elicit the most useful information. Based upon meetings, develop strategies and tools to better catalyze and coordinate future development opportunities consistent with UDF goals.

The design and funding for the new cross I-5 bridge at NE 103rd St. is a significant second catalyst for change. SDOT should:

- Continue coordination of the proposed pedestrian and bicycle bridge evaluation across I-5, connecting the Transit Center and surrounding Northgate South subarea to NSCC, the Northgate West subarea and the overall North Seattle bicycle infrastructure network.
- Develop street concept plans for the green street and cycle track for NE 100th St. and 3rd Ave NE in coordination with SPU.

- The new bridge can catalyze funding for new pedestrian and bike connections to the bridge along NE 100th St. and from NE Northgate Way. SDOT should include these pedestrian and bike connections in their project descriptions as they pursue potential funding sources.
- Assist the appropriate community organizations to sponsor Neighborhood Matching Fund grant applications for street improvements.

Northgate West Subarea

DPD should:

- Continue to monitor opportunities that could arise with future development to include a new active public space.
- Meet with property owners to present and discuss City intentions and objectives of the UDF. Both individual and group meetings should be considered to elicit the most useful information. Based upon meetings, develop strategies and tools to better catalyze and coordinate future development opportunities consistent with UDF goals.

SDOT should:

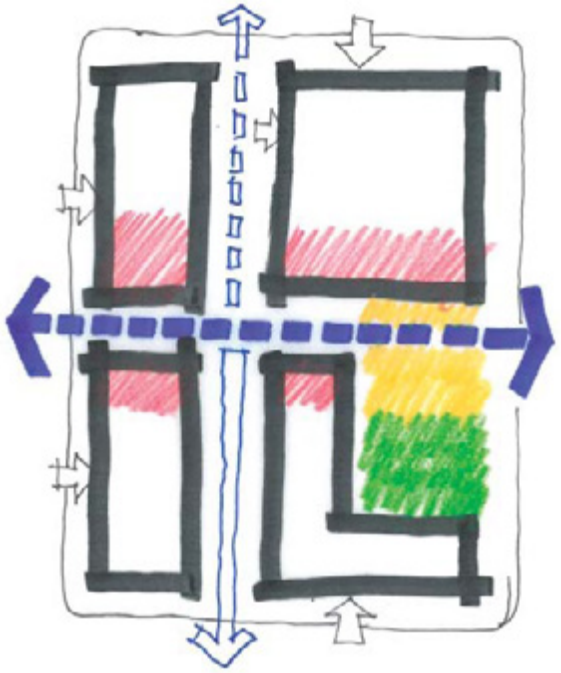
- Develop a street concept plan for Meridian Ave N
- Develop strategies to realize recommended new street and pedestrian/bike connections.

APPENDICES

1. TOD Site Design Alternatives

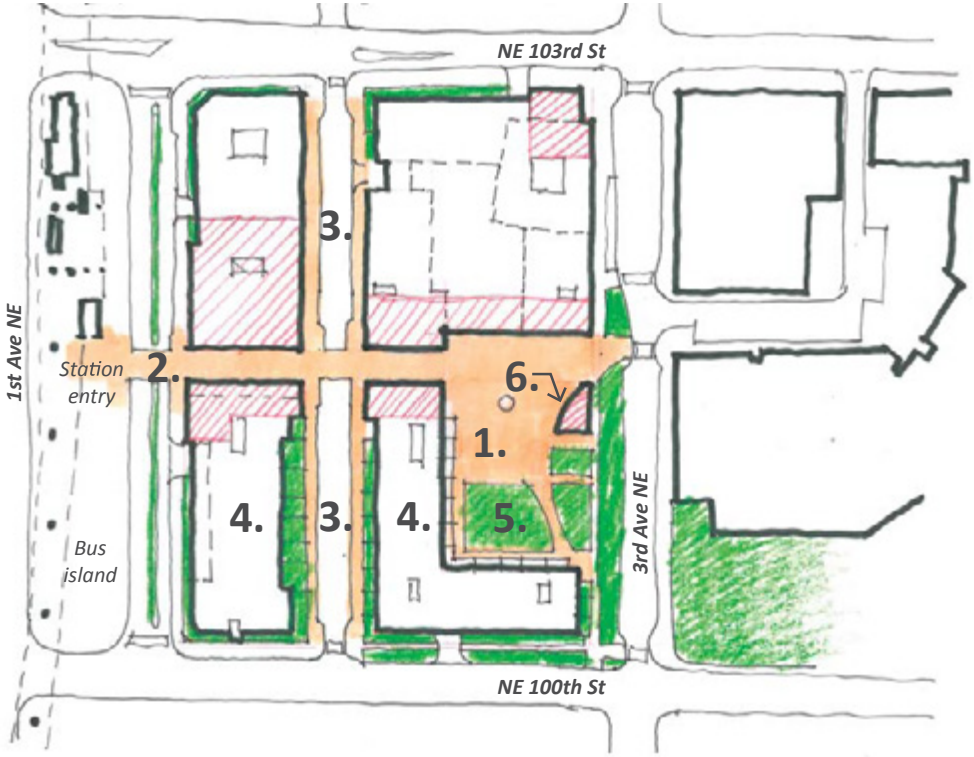
APPENDIX 1: TOD Site Design Alternatives

A DEVELOPMENT OPTION



URBAN FORM CONCEPT DIAGRAM

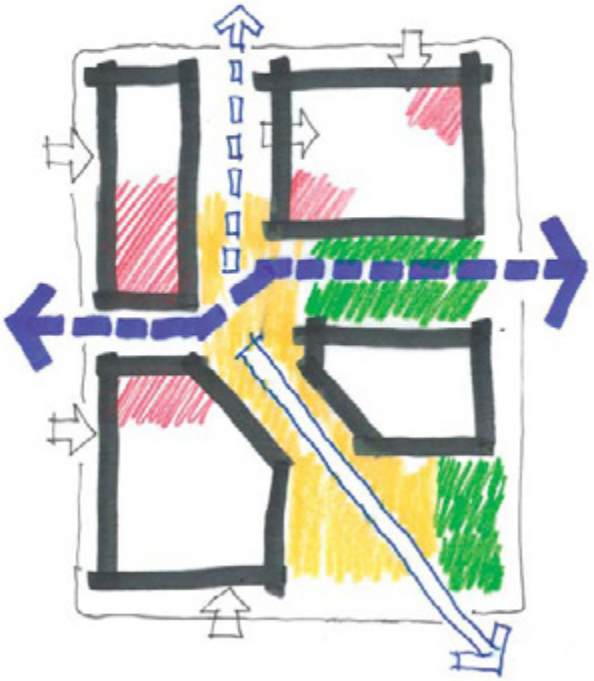
- Building perimeter
- Ground- oor retail/services
- Public plaza
- Green open space
- Parking and loading access
- Primary circulation
- Secondary circulation



CONCEPTUAL SITE PLAN

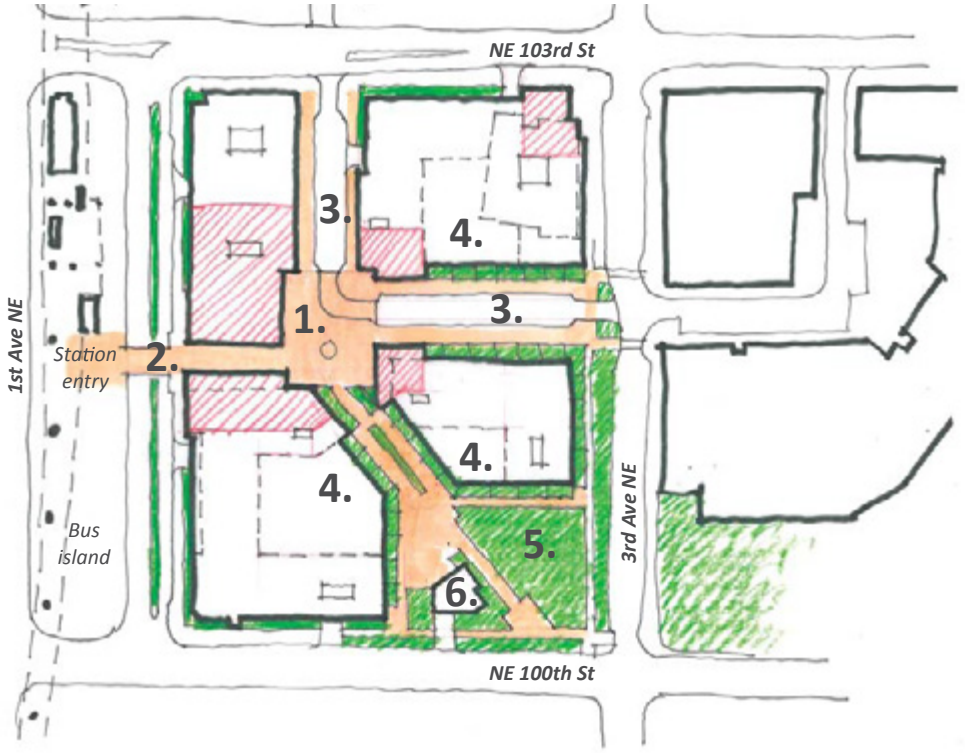
1. Town Square plaza framed by residential portion of Thornton Place development; opens up to 3rd Avenue NE
2. Primary pedestrian access from station to 3rd Ave. NE
3. Access and service lane divides the block into multiple development sites; provides some short-term parking
4. Townhomes or work lofts with ground-related entrances and landscaped stoops
5. Common green space for recreation, playgrounds, and/or raingardens
6. One-story kiosk retail

DEVELOPMENT OPTION B



URBAN FORM CONCEPT DIAGRAM

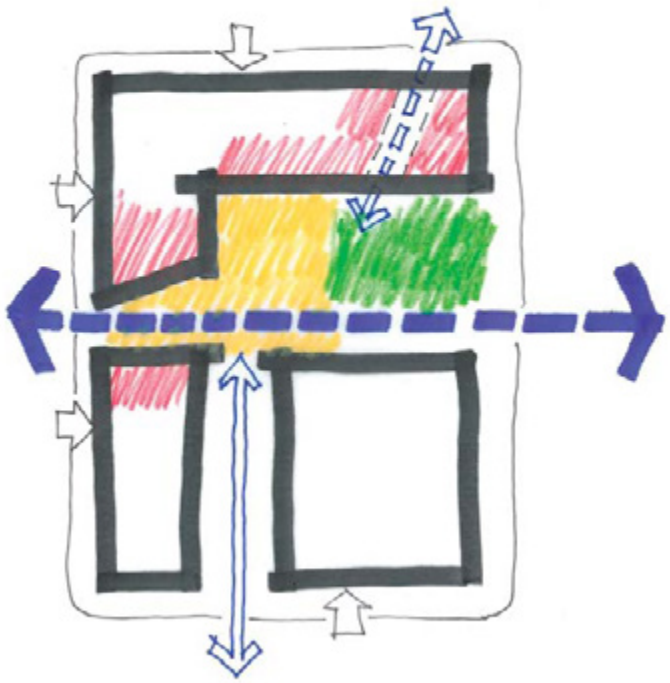
- Building perimeter
- Ground- oor retail/services
- Public plaza
- Green open space
- Parking and loading access
- Primary circulation
- Secondary circulation



CONCEPTUAL SITE PLAN

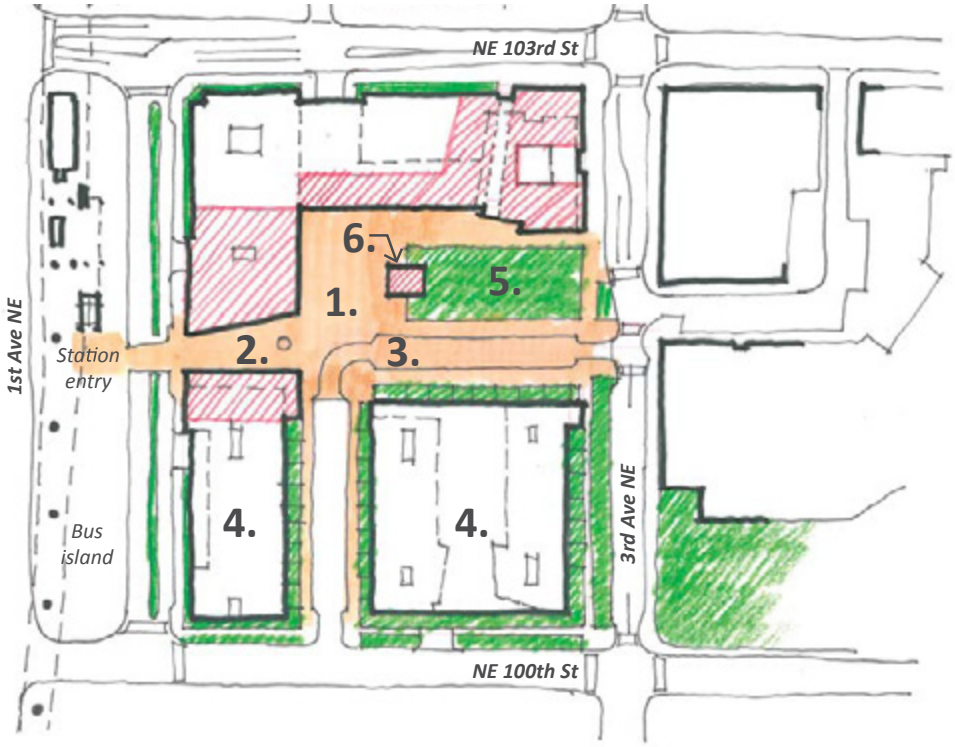
1. Town Square plaza
2. Primary pedestrian access from station to 3rd Ave. NE
3. Access and service lane divides the block into multiple development sites; provides some short-term parking
4. Townhomes or work lofts with ground-related entrances and landscaped stoops
5. Common green space for recreation, playgrounds, and/or rain gardens
6. One-story kiosk retail

C DEVELOPMENT OPTION



URBAN FORM CONCEPT DIAGRAM

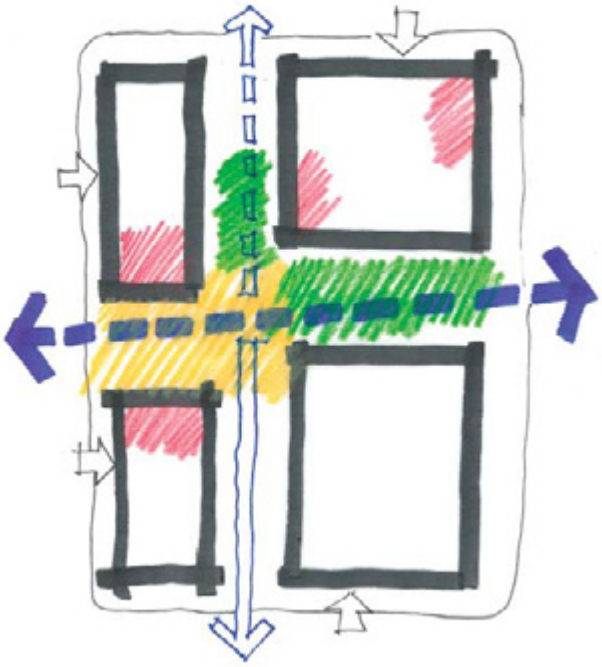
- Building perimeter
- Ground- oor retail/services
- Public plaza
- Green open space
- Parking and loading access
- Primary circulation
- Secondary circulation



CONCEPTUAL SITE PLAN

1. Town Square plaza
2. Primary pedestrian access from station to 3rd Ave. NE
3. Access and service lane divides the block into multiple development sites; provides some short-term parking
4. Townhomes or work lofts with ground-related entrances and landscaped stoops
5. Common green space for recreation, playgrounds, and/or rain gardens
6. One-story kiosk retail

DEVELOPMENT OPTION D



URBAN FORM CONCEPT DIAGRAM

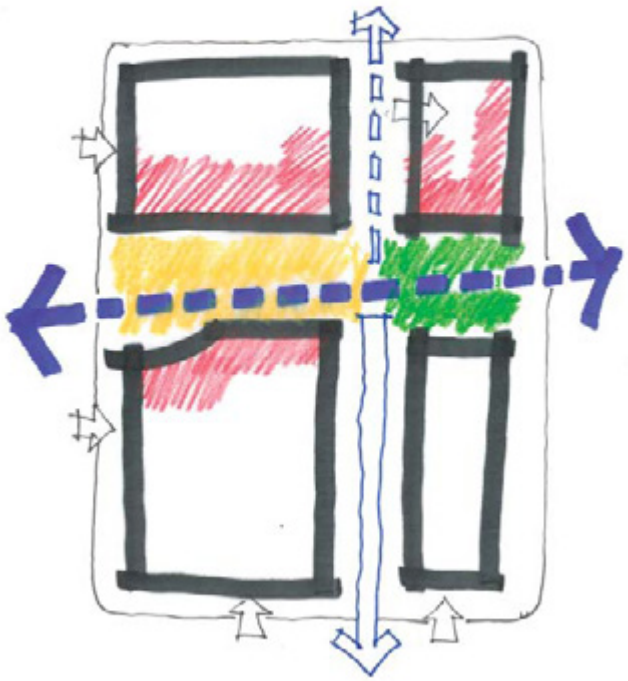
- Building perimeter
- Ground- oor retail/services
- Public plaza
- Green open space
- Parking and loading access
- Primary circulation
- Secondary circulation



CONCEPTUAL SITE PLAN

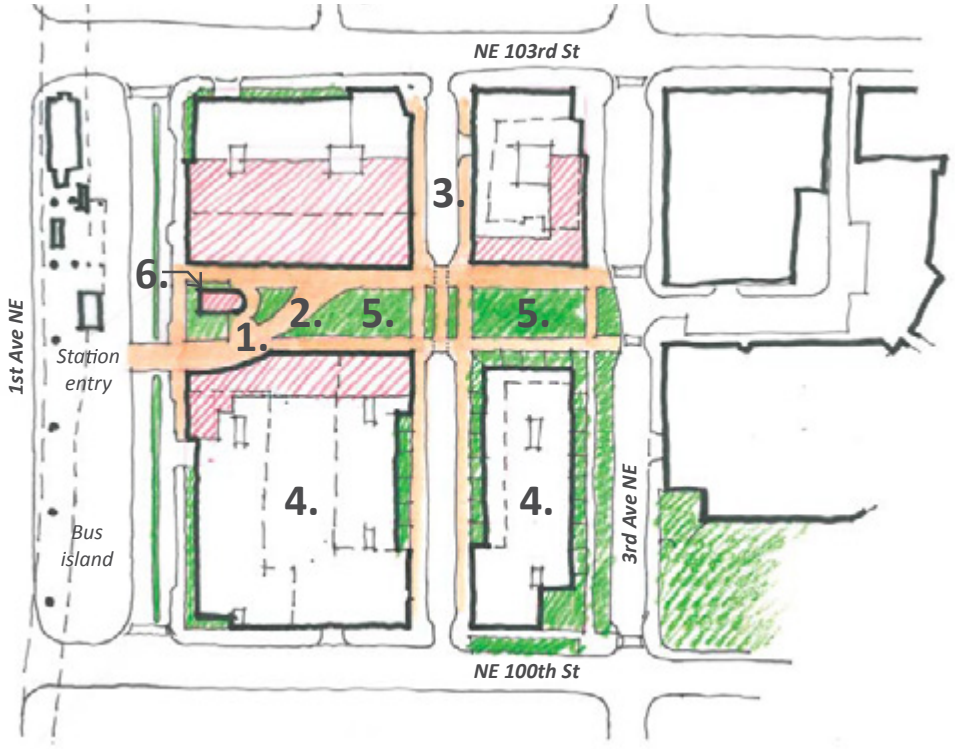
1. Town Square plaza
2. Primary pedestrian access from station to 3rd Ave. NE
3. Access and service lane loops through site and becomes a textured *woonerf* at the town square
4. Townhomes or work lofts with ground-related entrances and landscaped stoops
5. Common green space for recreation, playgrounds, and/or rain gardens
6. Dead-end service lane to access loading and parking

E DEVELOPMENT OPTION



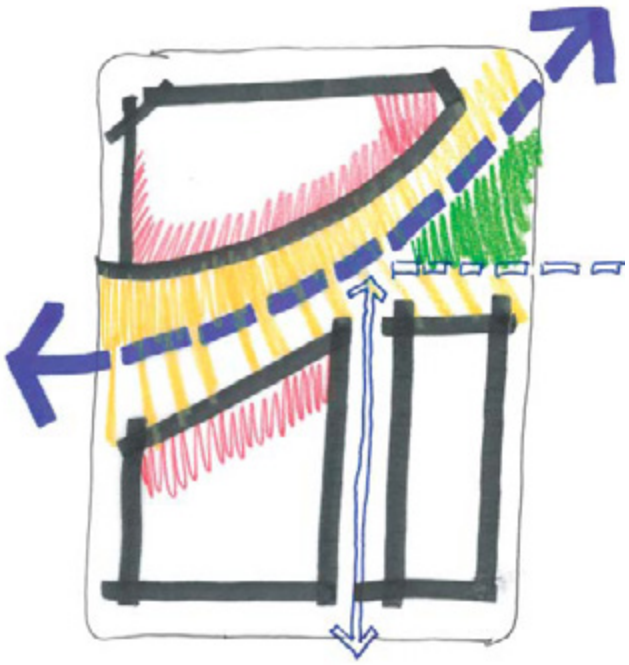
URBAN FORM CONCEPT DIAGRAM

- Building perimeter
- Ground- oor retail/services
- Public plaza
- Green open space
- Parking and loading access
- Primary circulation
- Secondary circulation



CONCEPTUAL SITE PLAN

1. Town Square plaza
2. Primary pedestrian access from station to 3rd Ave. NE
3. Access and service lane divides the block into multiple development sites; provides some short-term parking
4. Townhomes or work lofts with ground-related entrances and landscaped stoops
5. Generous common green space for recreation, playgrounds, and/or rain gardens creates a continuous public “mews”
6. One-story kiosk retail



URBAN FORM CONCEPT DIAGRAM

- Building perimeter
- Ground- oor retail/services
- Public plaza
- Green open space
- Parking and loading access
- Primary circulation
- Secondary circulation



CONCEPTUAL SITE PLAN

1. Town Square plaza
2. Primary pedestrian access from station to 3rd Ave. NE
3. Access and service lane divides the block into multiple development sites; provides some short-term parking
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5. Common green space for recreation, playgrounds, and/or rain gardens
6. One-story kiosk retail

NORTHGATE OUTREACH

Report on Focus Group Findings

For Seattle Department of Planning and Development

April 2013

Tu Consulting
Judy De Barros

In the fall of 2012, the City of Seattle Department of Planning and Development (DPD), in collaboration with Public Health Seattle King County and the Growing Transit Communities project of the Puget Sound Regional Council, launched a focused outreach effort in Seattle's Northgate neighborhood. DPD contracted with a consultant team of Tu Consulting and Judy de Barros to design and facilitate the outreach activities. This report describes the results of the project. It includes three sections:

- Purpose and Planning
- Who Participated
- What was Learned

This report provides more detail to a companion Powerpoint presentation titled, "Northgate Targeted Outreach Summary." Additionally, a complementary document titled "Process Summary & Lessons" reviews the project process and outreach model, and lessons learned from it.

1. PURPOSE AND PLANNING

Outreach Purpose and Topics. The overall purpose of the project was to reach out to and receive input from neighborhood stakeholders underrepresented in broader planning efforts and events. Participants were asked their thoughts about community-wide Health and Livability, with focus on two specific topics: urban design and the light rail station.

On the topic of urban design, questions centered on two areas:

- How to achieve the Northgate Neighborhood Plan vision for the Urban Center, and
- How the Northgate Urban Center can grow in ways that support health and livability

On the topic of the light rail station, discussion focused on two general issues:

- How the station area can become a vital and attractive heart of the Northgate district, and
- How the station area can contribute to a high quality "people place."

Outreach Sponsors and Approach. The lead agency sponsor of the outreach project was the City of Seattle Department of Planning and Development. Additionally, Public Health Seattle King County and the Puget Sound Regional Council's Growing Transit Communities project collaborated and participated. The project was carried out from November 2012 through February 2013.

The outreach was designed around an approach that invited neighborhood-based groups to facilitate small discussion groups within their own communities or stakeholders. Where there was no community-based host available, discussion groups were organized directly by project consultants and agency staff.

2. WHO PARTICIPATED

14 focus groups were held from December 2012 through February 2013, and included a total of 152 participants who represented a diverse range of ages, race and ethnicities, gender, and backgrounds. The table below describes groups and participants.

Stakeholder Group	Neighborhood Facilitator/Host	#	Group Composition & Characteristics
Apartment residents	507 Northgate Residence	8	8 apartment residents, including 7 men/1 woman, mostly professionals, all recent residents of the neighborhood
Business & property owners	Consultant-organized	4	4 participants: 2 major property owners and 1 Chamber of Commerce representative
Eritrean community	HOPE Eritrean Social Services	13	13 men, women & elders, English-Tigrinyan discussion, after church
Health service employees	Group Health Cooperative & staff	3	3 Group Health employees
Faith-based community	Idris Mosque	15	15 Mosque members from throughout Seattle
Apartment residents/youth	Lake City Court/North Seattle Family Center (2 groups)	24	15 residents, including 9 East African immigrants, 1 Native American, 1 African American, 1 Caucasian, 1 Chinese, 1 Bosnian 9 youth, including 5 East African, 3 African American, 1 mixed race
Students	Middle College High School	10	10 students, 4 women/6 men; 3 African American, 2 Native American, 5 Caucasian
Native American community	Urban Native Education Alliance	10	10 Native American community members, 7 women/3 men, ages 30 to 70
Senior residents	Northaven Senior Community	16	16 residents of Northaven Senior Community
Students	North Seattle Community College	10	10 students and staff, residing in Northgate and throughout Seattle
Faith-based community	Olympic View Church	5	5 church members and local residents, 2 women/3 men, ages 50s to 80s
Young students/families	Olympic View Elementary	12	12 elementary school alumni and parents
Somali community	Techno Formation Vocational Services, Inc.	12	12 community members, 8 women/3 men, most live in Northgate or Lake City
Apartment residents	Thornton Place Residence	10	10 apartment residents, 6 men/4 women, most car-less, recent residents
	Total number of participants	**152**	

3. WHAT WAS LEARNED

This section describes input across all the discussion groups, and is organized into several sub-sections. **Neighborhood Activities** highlights the ways in which participants interact with or are active in the Northgate neighborhood currently. **Community-wide Health and Livability** includes five elements: Public Transportation, the Physical Environment, Affordable Housing, Personal Safety, and Community Services. For each element, participant input about strengths and areas for improvement are described.

Neighborhood Activities. Participants described different ways they are active in or interact with the neighborhood today.

Tiers of activities**.** Many participants described having a range of activities, which fall into two "tiers." One level includes broader-scale or neighborhood-level activities that connect to and across many stakeholders groups. The most frequent of these types of activities include:

- Mall and shopping
- Public transit use
- Public/community facilities
    - Parks
    - Library
    - Community Center

At the same time, many said they participate in activities specific to their community or stakeholder group. For example, the Idris Mosque draws over 500 members to its services and activities on a weekly basis. Native American community members are active in numerous activities that take place at the Wilson Pacific School. Somali residents take part in a range of programs and services offered by community organization Techno Formation Vocational Services, Inc. Similarly, Eritrean community members frequently interact with HOPE Eritrean Social Services.

Links and activities beyond Northgate**.** In addition to activities in and around Northgate, many participants spoke of links to communities and activities beyond the neighborhood. These included:

- Refugee & immigrant communities : Eritrean and Somali participants whose communities are spread across Seattle and beyond
- Lake City: an adjacent neighborhood to which Northgate stakeholders are connected as residents, business owners, and business patrons, and users of community facilities
- Native American communities: links to Native communities beyond the area
- Faith-based communities: places of worship such as the Idris Mosque, whose members come from beyond the immediate neighborhood
- Commuters
    - Students and employees coming to neighborhood
    - Residents going to jobs beyond neighborhood

Community-wide Health and Livability. Groups identified several important elements of community livability.



Neighborhood strengths**.** Across these elements, participants repeatedly cited several important strengths or assets that the Northgate neighborhood currently has. These included:

1. Excellent public transportation. Northgate is a major transit hub, with numerous bus routes to destinations in all directions and significant transit facilities.

2. Quality physical environment. The current physical environment is a mix of diverse uses with both an urban and suburban feel. There are several newer buildings/development that contribute positively to neighborhood activities and physical space.

3. Affordable housing. Housing is available for people and families with a range of different incomes.

5. Community services and amenities for everyone. Participants cited the numerous shopping options available in the neighborhood, inside and around the Northgate Mall.

Areas for Improvement**.** Participants cited several areas of concern, summarized below and discussed in the following sub-sections.

1. Excellent public transportation. It is essential to build a great light rail station, and improve transit service and accessibility.

2. Quality physical environment. Creating more of a sense of place, and improving cleanliness and maintenance in the neighborhood are important.

3. Affordable housing. There is a need to ensure adequate housing for future needs

4. **Personal safety**. An increased sense of safety, particularly in key areas, is needed.

5. Community services and amenities for everyone. Some services have shortfalls, and overall equity and City responsiveness in some services could be improved.

1. Excellent Public Transportation

Discussion about public transportation centered on three topics: light rail station area development, light rail station design, and transit services accessibility.

Light rail station area development. Most participants see the light rail development as positive, with a strong shared interest in avoiding negative effects.

Generally, participants wish to see a light rail station area that is safe, attractive, comfortable and offering desired services and amenities. Specific items cited included:

- A strong sense of place, station area feels and is "tied into" the neighborhood
- Amenities including plazas, green features, cafes, local retail, food vendors, 'social commons'
- Affordable fares and fare system that is integrated across all transit systems
- Seamless bus transfers (coordinated times)
- Safe, secure, well-lit, inhabited areas in and around the light rail station
- Adequate park-&-ride capacity especially given the increase in volume of transit users

Groups described numerous things they want to avoid in relation to the new light rail.

- Increased traffic congestion. For example, one participant described, and others in one group agreed, how, *"…on weekend evenings, people come for movies and parking is saturated. On game days (i.e. of Seattle professional sports teams), parking is saturated. The special event day buses are full."* There was concern about inadequate parking when light rail is added. Many participants worried that congestion will be particularly difficult as the Northgate station will be the end of the line until the light rail extends further north.

- Crime and security problems
- Poorly lit areas
- Lack of cleanliness, and proliferation of garbage
- An un-inviting pedestrian environment
- Noise pollution

Participants also wanted to be informed about construction. Said one group member, *"If I know stuff is coming, I can organize and plan around it. Otherwise, folks get annoyed real fast."*

Light rail station area design. Participants shared many ideas for the physical design of the light rail station itself. These included design themes and qualities such as:

- Northwest Native American themes to signify cultural heritage and local identity
- Attention to native vegetation choices and complementary materials (stone), local character
- Water, wildlife, and glacial history themes
- European town square, main street, concerts in the park feel
- "New urban feel" - a modern setting

There were also design ideas about specific uses and features. These included:

- Sculpture garden, fountains that can be played in
- 'Social commons' – comfortable outdoor and indoor places for interaction (family-friendly)
- Features for healthy lifestyles, for example, walking
- Pubs, places for live performances
- Farmers market space
- Artist, social & community spaces; Native American museum/cultural center
- Places for start-up businesses, including ethnic or immigrant businesses
- Heated station, and shelter from the wind and rain

Improve transit services and accessibility. Public transit is an essential transportation link for many participants, who want to ensure service quality and safe accessibility. Prevalent concerns included:

- Need for more streamlined and efficient bus service and connections to other parts of the city
- More service on major bus routes
- A more direct routing to North Seattle Community College (such as the pedestrian bridge) would make it easier for students and college staff to choose light rail.
- Improve accessibility and service timing, to overcome the lost time and inconvenience of transferring buses. Many still choose driving over transit despite added cost to the driver.

Stated one North Seattle Community College student, "*I live in the U-District, but I find a 45-minute to 1 hour bus trip too much time wasted to use transit to NSCC, even though NSCC daily parking is not free.*"

2. Quality Physical Environment

Participant thoughts about the physical environment primarily related to two aspects: creating or improving "sense of place" in the area, and improving cleanliness and maintenance.

Creating a "sense of place." Most group members want to improve Northgate's "sense of place" by adding activities and attractions to enhance character and destination. Their ideas included:

- Improve the physical environment to create places people want to be. Specific suggestions included parks and green spaces, grassy areas, streets that are lively and exciting, gathering spots and/or tourist destinations like a mini Pike Place Market, benches, buffering the freeway.

- More activities geared for families and youth. Examples mentioned included parks, creek trails, connecting all areas for foot traffic, more community center and library hours and space.

- Encourage local businesses, including: more lunch spots, coffee shops, street level stores, Trader Joe's, dry cleaners, Hobby Lobby, small restaurants, pubs

- Strengthen distinct identity of Northgate. Ideas included better signage, creek trails, strengthening "pride of place" and sense of destination.

Below is a selection of quotes from participants that captures the flavor of their thoughts and suggestions for improving the physical environment.

- *"When I take my kids to the park, we always go elsewhere, like Green Lake or Alki."*
- *"Because it is geared to large retailers, Northgate feels less homey. I would rather see a collection of mom and pop shops added as the neighborhood grows."*
- *"Change the area's focus from business to people."*
- *"I think of downtown Bellevue's old Main Street and that big city park there near the mall. That area has walkable streets and shops, and is clean, which makes it a destination spot."*
- *"You should be able to say, 'Northgate – that's the place with _____ [a special place or quality] where I like to go and visit.'"*
- *"My dream would be a distinctly Native American cultural center at Licton Springs that would be a great attraction for scholars, tourists, and members of all tribes."*
- *"A feeling of getting between Point A and Point B without much in between."*

Improve cleanliness and maintenance. Participants mentioned a number of public areas that need improved cleanliness and/or maintenance.

- Streets and sidewalks that are clean and safely passable
    - Sidewalks modernized – wide enough, smooth, ADA compliant
    - Any gaps in sidewalk network filled
    - Fix tripping hazards
    - Aesthetic streetscape improvements
    - Landscape maintenance
    - Traffic signals timed well for pedestrian crossing (including seniors) and vehicle traffic

- More attention to improving area's appearance and neatness
    - The City should be more responsive to street cleaning, ditch/utility cleaning issues
    - Improve litter cleanup, parks appearance and civil behavior
    - More garbage cans along high traffic areas
    - Consider native landscaping treatments along streets

3. Affordable Housing

Focus group participants had one main concern related to housing: to e**nsure adequate housing to meet future needs**. They wanted to know what the City of Seattle plans to do to retain existing affordable housing or encourage more of it as the Northgate Urban Center grows. Participants asserted that:

- Housing is important for active, people-friendly, destination-oriented places.
- Encourage affordable housing that serves workers in the area earning below median income.
- Affordable housing options would allow more people to enjoy a more socially connected and physically healthy lifestyle.

4. Personal Safety

Ensuring personal safety is a high priority and includes dimensions related to both traffic and transportation safety and personal security and crime.

Traffic and transportation safety. Related to traffic and transportation, participants primarily discussed pedestrian and bicycle safety. Groups wish to see more and better pedestrian connections to build a complete network that meets today's needs. They cited specific locations where sidewalk and/or other pedestrian improvements are needed. These include:

- Pinehurst Way NE and 15th Avenue NE
- NE 92nd St and I-5
- 5th Avenue NE and NE 100th Street, 5th Avenue NE and NE 95th Street (missing sidewalk)
- 5th Avenue NE and NE 105th Street (broken sidewalk)
- Expand signal timing to allow adequate time for seniors and children to cross
- 5th Avenue NE and NE Northgate Way (steep ramp)
- Midblock crossing from Northaven Retirement Community to post office
- NE 92nd Street and 1st Avenue NE (pedestrian safety)
- 5th Avenue NE and NE 95th Street (speeding vehicle traffic)
- NE Northgate Way crossings in general (More pedestrian circulation and scale)
- North of NE 85th Street generally (more sidewalks)
- Pedestrian overpass from Northgate Mall to Target
- Along 5th Avenue NE and Roosevelt Way NE (crossing safety)
- NE Northgate Way (need median to stop illegal lefts onto 5th Avenue NE)
- 1-way streets in Maple Leaf are a pedestrian hazard, need to open up NE 103rd Street
- Northbound left turn from 5th Avenue NE to NE Northgate Way (congestion)
- 3rd Avenue NE (need crosswalk to get to transit center)
- Safer walking areas crossing over I-5
- Along Thornton Creek east of 5th Avenue NE (improve corridor for safety and amenity value)

Suggestions for improving bicycle routes and rider safety included looking at 1st Avenue NE north of NE Northgate Way, and creating a bike pathway around Thornton Creek and north to Hubbard Park using internal streets.

Personal security and crime. Comments about personal security related to a general concern about improving overall sense of safety and security. Specific dimensions of this included:

- Need a special focus on ensuring safety in and around transit station
- Prune overgrown shrubs next to sidewalks, including overgrown shrubs on the west side of 5th Avenue NE on the way to target, and eliminating ivy and other invasive plants.
- Ensure adequate street lighting, with specific citation of need for lighting along 3rd Avenue NE going to Target and at the Beaver Pond.
- Address uncivil behavior on streets and in parks

- Drug activity
- Improve cultural competence in police response

Below are several quotes from participants reflecting some of their concerns about safety and security.

- *"We moved from the South End and want to make this community good for our families. But we have a problem now with police. They don't respond to calls from refugees and immigrants… now we don't feel so safe."*

- *"Northgate's been known for so long as a big parking lot with needles."*

- *"People who come to shop at Christmas drive like maniacs."*

5. Community Services and Amenities

Address shortfalls in services. Many participants expressed a need for key public services and facilities to be more available. Specific needs cited included the following:

- Libraries and community center: more hours, easier and free or affordable ways to use community center and library rooms, for personal or social service needs, year-round availability of community center programs for children (no seasonal shutdowns)

- Need more affordable or subsidized recreational programs for youth, such as:
    - Swimming, dance, day camps, mentoring
    - Expanded Teen Center (dance parties, computer lab, swimming), after school activities
    - Indoor play fields, sports venue, multipurpose gym – to get out of poor weather
    - More youth-oriented stores
    - Park space
    - Indoor sports facility/fields, places for youth to play sports
    - Arcade separate from mall

- Parks: picnic/barbecue spaces,
- More places for families to go. There were concerns about adequate facilities for diverse community activities and family-oriented gathering spaces.
- Food banks
- Daycare
- More availability of community support services
- Ways to bring together and engage youth and seniors
- Overall strong desire for a Somali Community Center in the area

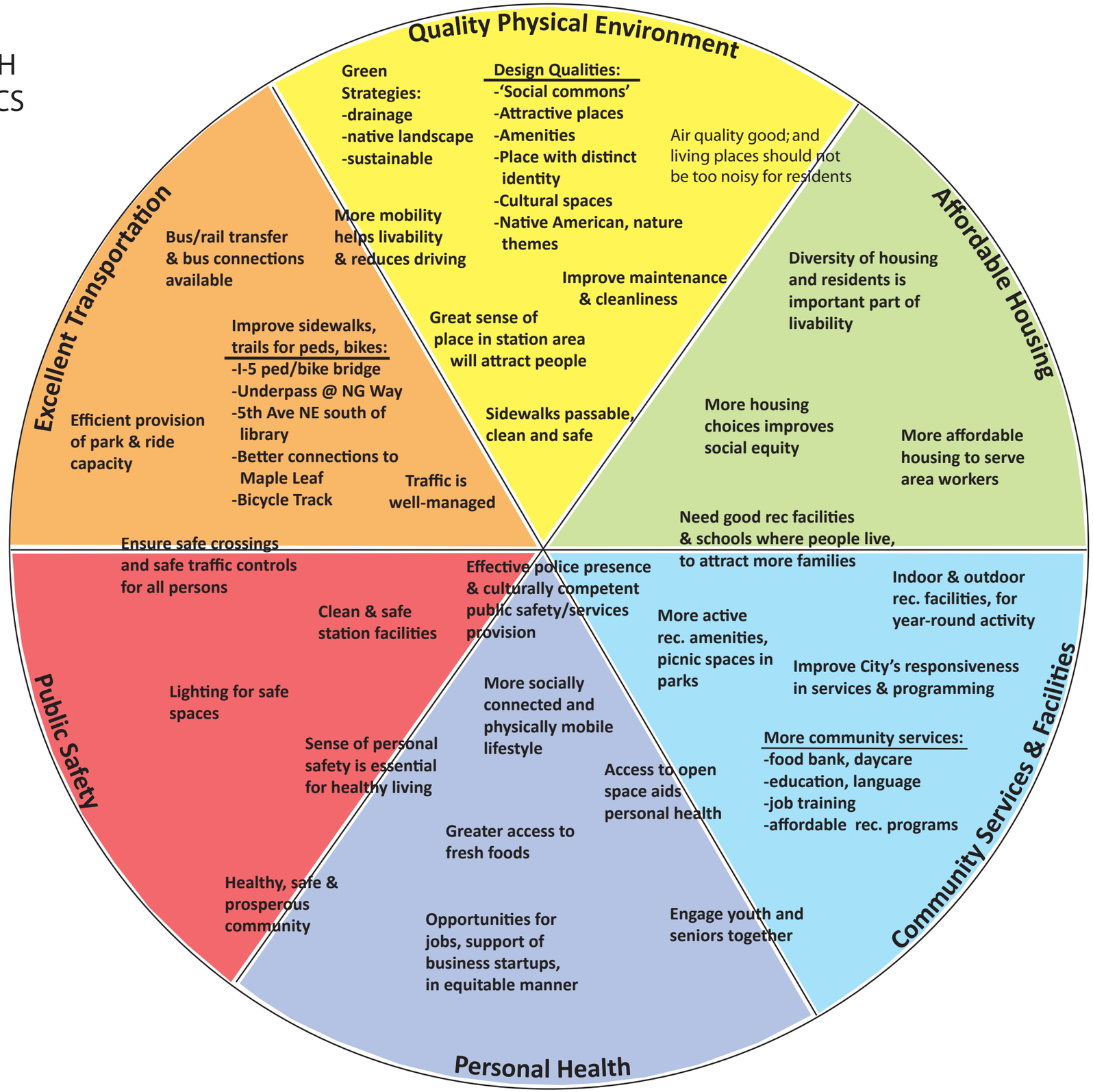
Preserve affordability of housing and support services. Many participants, particularly refugee and immigrant community members, want to ensure affordability and equity in housing and support services. Their concerns included:

- Community services and programs
    - Need more affordable services for immigrant families
    - Adequate services: childcare, disabled services, other social services, immigrant support resources
    - More social services, especially on west side of I-5
    - Resources for parents in all languages
    - After school programs including Somali classes
    - YMCA or Boys and Girls Club
    - Senior activities
- Cultural competence in services (e.g. in police response, parent resources, after school programs)
- Affordability of housing and daycare

Below are several participant quotes related to community services and programs.

- *"A facility that would be able to accommodate several families with spaces for child care, after-school tutoring, youth center, and ESL."*
- *"We hope that when it [Northgate] grows, it won't become so nice and expensive that we will need to move because we can't afford it anymore."*
- *"There's a huge homeless population, but there are no food banks, no shelters, no youth center, and no public restrooms."*
- *"The combination of breaking the language barrier and developing job skills are vital for more persons to be able to effectively enter into community life."*

SPECTRUM OF HEALTH AND LIVABILITY TOPICS IN NORTHGATE PLANNING



-- DRAFT --

NORTHGATE OUTREACH

Summary of Focus Groups

For Seattle Department of Planning and Development

April 2013

Tu Consulting

Judy De Barros

OUTLINE

1. Purpose and Planning
2. Who Participated
3. What Was Learned

1. PURPOSE AND PLANNING

<u>Purpose:</u> targeted outreach to neighborhood stakeholders underrepresented in broader planning efforts and events.

Participants were asked their thoughts about community-wide health and livability, with focus on two specific topics: urban design and the light rail station.

Health and Livability

Urban Center Neighborhood Design

- How to achieve Neighborhood Plan vision for Urban Center
- How Urban Center can grow in ways that support health and livability

Light Rail Station Area Urban Design

- How station area can become a vital and attractive heart of the district
- How station area can contribute to a high quality “people place”

Who sponsored the outreach and when and how was it done?

Lead agency: City of Seattle Department of Planning and Development

Timeframe: Nov 2012 – Feb 2013

Approach: invited neighborhood-based groups to facilitate small discussion groups within their own communities or stakeholders; directly organize d discussion groups when no host was available

2. WHO PARTICIPATED

Discussion groups were held from Dec 2012 – Feb 2013 and included the following stakeholder groups and participants.

Stakeholder Group	Neighborhood Facilitator/Host	# Participants
Apartment residents	507 Northgate Residence	8
Business & property owners	Consultant-organized	4
Eritrean community	HOPE Eritrean Social Services	13
Health service employees	Group Health Cooperative/project staff	3
Faith-based community	Idris Mosque	15
Apartment residents/youth	Lake City Court/North Seattle Family Center (2 groups)	24
Students	Middle College High School	10
Native American community	Urban Native Education Alliance	10
Senior residents	Northaven Senior Community	16
Students	North Seattle Community College	10
Faith-based community	Olympic View Church	5
Young students/families	Olympic View Elementary	12
Somali community	Techno Formation Vocational Services, Inc.	12
Apartment residents	Thornton Place Residence	10

Participants represented a diverse range of ages, race and ethnicities, gender and backgrounds.

13 men, women, and elders
English-Tigrinyan discussion, came after church

3 Group Health employees, 1 grew up in the area

15 Mosque members, from throughout Seattle

15 residents of Lake City Court, including 9 East African immigrants, 1 Native American, 1 African American, 1 Caucasian, 1 Chinese, 1 Bosnian

9 youth, including 5 East African, 3 African American, 1 mixed race

10 high school students including 4 women/6 men; 3 African American, 2 Native American, 5 Caucasian

16 senior residents of Northaven Senior Community

10 students and staff, residing in Northgate and throughout Seattle

5 church members and local residents, 2 women/3 men, ages 50s to 80s

12 former elementary school alumni and parents

8 apartment residents, including 7 men/1 woman, mostly professionals, all recent residents of the neighborhood

10 apartment residents, 6 men/4 women, most car-less, recent residents

4 participants, including 2 major property owners and 1 Chamber of Commerce representative

12 Somali community members, 8 women/3 men, mostly residing in Northgate or Lake City

10 Native American community members, 7 women/3 men, ages 30 to 70

3. WHAT WAS LEARNED

Neighborhood activities. Participants described different ways they are active in or interact with the neighborhood today.

Tiers of activities

- Within specific communities or stakeholder groups
- Neighborhood-level activities

Most frequent neighborhood activities

- Mall and shopping
- Public transit use
- Public/community facilities
  - Parks
  - Library
  - Community Center

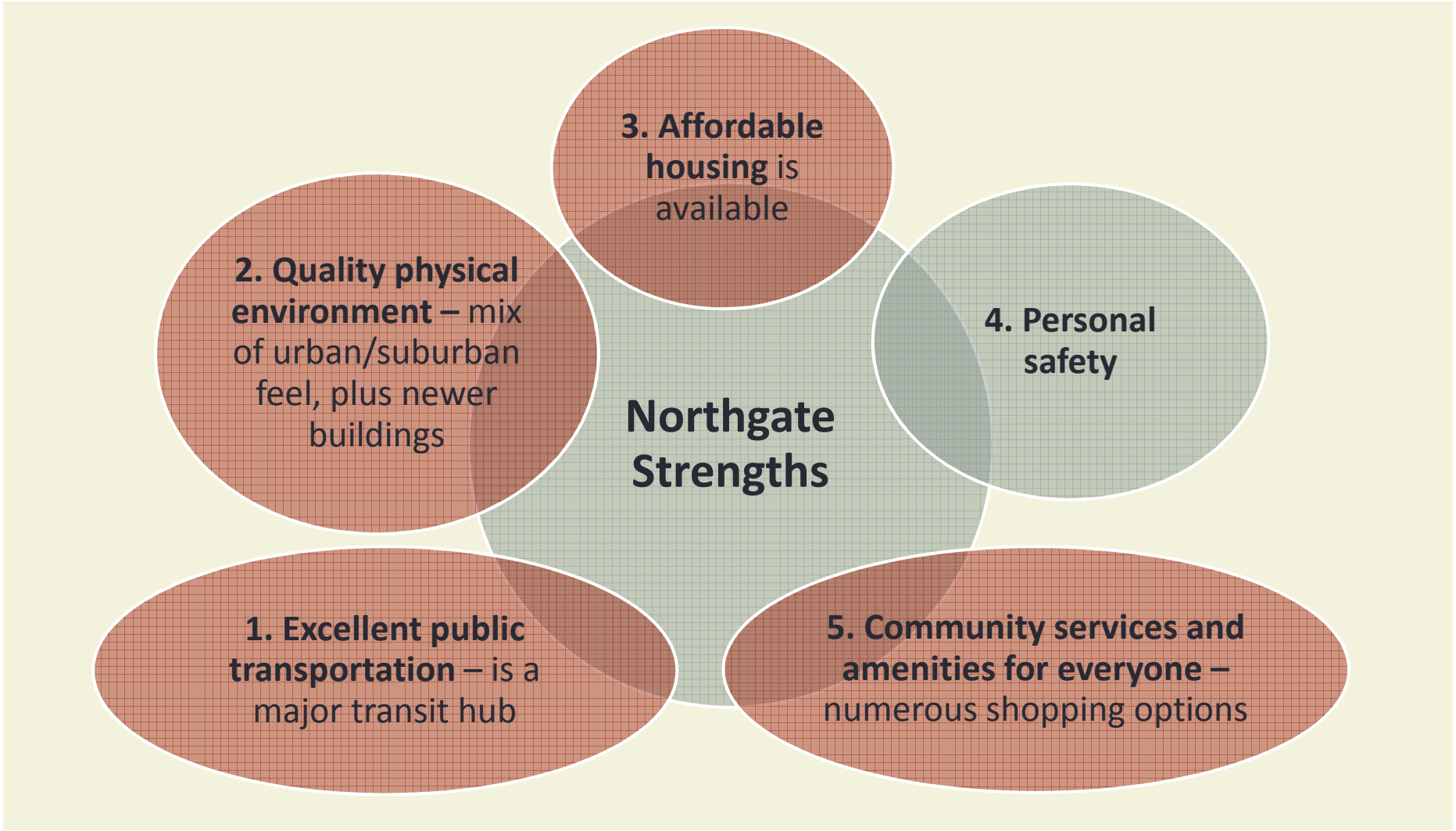
Links and activities beyond Northgate

- Refugee & immigrant communities
- Lake City
- Native American communities
- Faith-based communities
- Commuters
  - Students and employees coming to neighborhood
  - Residents going to jobs beyond neighborhood

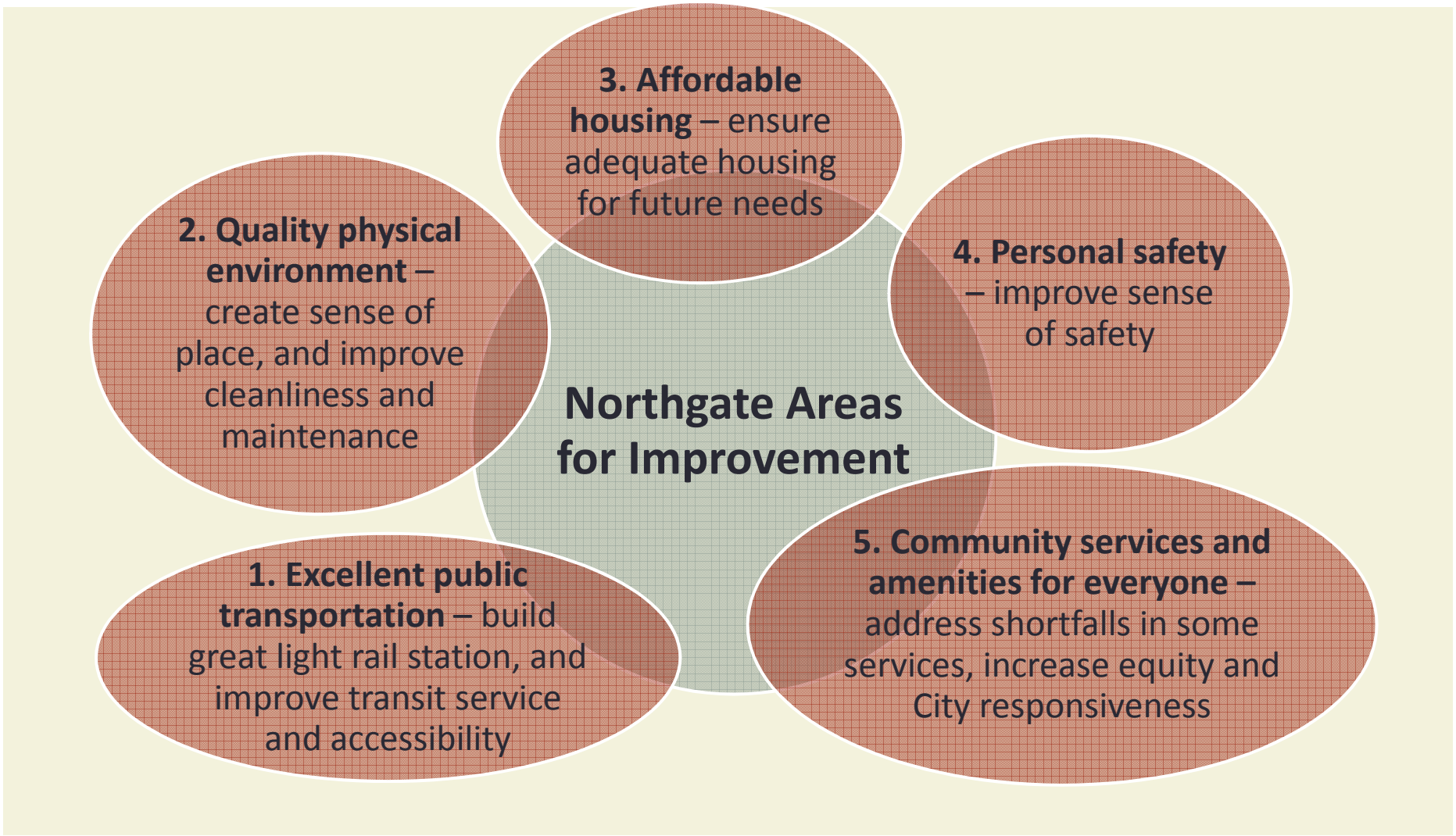
Community-wide Health and Livability. Groups identified several important elements of neighborhood livability.



Neighborhood strengths. Several important strengths or assets of the Northgate neighborhood were described.



Areas for improvement. Participants cited a range of concerns, summarized below with additional details on the following slides.



1. **Excellent public transportation - light rail station area development.** Most participants see the light rail development as positive, with a shared interest in avoiding negative effects.

Want to see around light rail

- A strong sense of place, and tied into the neighborhood
- Amenities (plazas, green features, cafes, local retail, food vendors, 'social commons')
- Affordable fares, integrated fare for all transit
- Seamless bus transfers
- Safe, secure, well-lit, inhabited areas in and around station
- Adequate park-&-ride capacity
- Heated station, shelter from the wind and rain

Want to avoid

- Increased traffic congestion
- Crime, security problems
- Poorly lit areas
- Lack of cleanliness, garbage
- Un-inviting pedestrian environment
- Noise pollution

Inform the public about construction:
"If I know stuff is coming, I can organize and plan around it. Otherwise, folks get annoyed real fast."

1. **Excellent public transportation - light rail station area design.** Participants shared many ideas for the physical design of the light rail station area.

Design themes and qualities

- Northwest Native American themes in public spaces to signify cultural heritage and local identity
- Attention to native vegetation choices and complementary materials (stone), to enhance a distinct local character
- Water, wildlife, and glacial history themes
- Features for healthy lifestyles – walking
- Clean and safe
- European town square, main street, concerts in the park feel
- "New urban feel" - a modern setting

Uses and features

- Sculpture garden, fountains that can be played in
- 'Social commons' – comfortable outdoor and indoor places for interaction (family-friendly)
- Pubs, places for live performances
- Farmers market space
- Artist, social & community spaces; Native American museum/cultural center
- Places for start-up businesses, including ethnic or immigrant businesses

1. **Excellent public transportation – improve transit services and accessibility.** Public transit is an essential transportation link for many, who want to ensure service quality and safe accessibility.

Transit concerns

- Need more streamlined and efficient bus service and connections to other parts of the city
- More service on major bus routes
- Improve overall accessibility and service timing, to overcome the lost time and inconvenience of transferring buses. Otherwise, the automobile will continue to be chosen despite the added cost to the driver.
- A more direct routing to North Seattle Community College (such as the pedestrian bridge) would make it easier for students and college staff to choose light rail.

A student says, *"I live in the U-District, but I find a 45-minute to 1 hour bus trip too much time wasted to use transit to NSCC, even though NSCC daily parking is not free."*

2. Quality Physical Environment – create a "sense of place."

Improve sense of place by adding activities and attractions that will enhance local character and destination.

"When I take my kids to the park, we always go elsewhere, like Green Lake or Alki."

"Because it is geared to large retailers, Northgate feels less homey. I would rather see a collection of mom and pop shops added as the neighborhood grows."

"Change the area's focus from business to people."

Thoughts about creating a sense of place

- Improve the physical environment to create places people want to be
- More activities geared for families and youth
- Encourage local businesses
- Strengthen distinct identity of Northgate

"I think of downtown Bellevue's old Main Street and that big city park there near the mall. That area has walkable streets and shops, and is clean, which makes it a destination spot."

"You should be able to say, 'Northgate – that's the place with _____ [a special place or quality] where I like to go and visit.'"

"My dream would be a distinctly Native American cultural center at Licton Springs, that would be a great attraction for scholars, tourists, and members of all tribes."

2. **Quality Physical Environment – improve cleanliness and maintenance.** Participants mentioned a number of public areas that need improved cleanliness and/or maintenance.

Streets and sidewalks that are clean and safely passable

- Sidewalks modernized – wide enough, smooth, ADA compliant
- Any gaps in sidewalk network filled
- Fix tripping hazards
- Aesthetic streetscape improvements
- Landscape maintenance
- Traffic signals timed well for pedestrian crossing (including seniors) and vehicle traffic

More attention to improving area's appearance and neatness

- The City should be more responsive to street cleaning, ditch/utility cleaning issues
- Improve litter cleanup, parks appearance and civil behavior

Consider native landscaping treatments along streets

Improve corridors for safer walking and amenity value

- Thornton Creek east of 5th Ave NE

3. **Affordable Housing – ensure adequate housing to meet future needs.** It is important to have adequate affordable housing as Northgate grows.

What will the City of Seattle do to retain existing affordable housing or encourage more of it as the Northgate Urban Center grows?

Housing is important for active, people-friendly, destination-oriented places.

Encourage affordable housing that serves workers in the area earning below median income.

Affordable housing options would allow more people to enjoy a more socially connected and physically health lifestyle.

4. **Personal Safety.** Ensuring personal sense of safety is a high priority.

Traffic and transportation safety

- Pedestrian safety – sidewalks and well-marked crosswalks
- Improve bicycle routes and rider safety
- More and better pedestrian connections to build a complete network that meets today's needs

Personal security and crime

- Special focus on ensuring safety in and around transit station
- Prune overgrown shrubs next to sidewalks
- Ensure adequate street lighting
- Address uncivil behavior on streets and in parks
- Drug activity
- Cultural competence in police response

"We moved from the South End and want to make this community good for our families. But we have a problem now with police. They don't respond to calls from refugees and immigrants. So now we don't feel so safe."

"Northgate's been known for so long as a big parking lot with needles."

"People who come to shop at Christmas drive like maniacs."

5. **Community Services and Amenities – address shortfalls in some services.** Many expressed a need for key public services and facilities to be more available.

- More library hours
- Continuous community center programs for kids – (no seasonal shutdowns)
- Easier and free or affordable ways to use community center and library rooms, for personal or social service needs (or reassign some existing City space?)
- Food banks
- Affordable/subsidized recreational programs for youth (swimming, dance, day camps, mentoring, etc.)
- Picnic/barbecue spaces in parks
- Daycare
- More availability of community support services
- Ways to bring together and engage youth and seniors

"There's a huge homeless population, but there are no food banks, no shelters, no youth center, and no public restrooms."

"All of the Somali Services are in South Seattle, there are none here and it is a long way to go for families."

5. Community Services and Amenities. Many participants, particularly refugee and immigrant community members, wish to preserve affordability (e.g. housing) and support services.

Concerns about services and equity

- Facilities with community services
- Cultural competence in services (e.g. police response, parent resources, after school programs)
- Affordability of living in Northgate (housing, daycare)

"A facility that would be able to accommodate several families with spaces for child care, after-school tutoring, youth center, and ESL."

"We hope that when it [Northgate] grows, it won't become so nice and expensive that we will need to move because we can't afford it any more."

"The combination of breaking the language barrier and developing job skills are vital for more persons to be able to effectively enter into community life."

Northgate Urban Center & Overlay District | **Design Guidelines**



City of Seattle
Department of Planning & Development

Acknowledgments

Northgate Urban Center and Overlay District Design Guidelines were first created in 2003 with significant input and support from the following Northgate community member:

Jim Zweigle

Michelle Rupp

Sue Geving

Velva Maye

Bill Lawrence

Barbara Maxwell

Bunny Hirschmann

Jeff Luth

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Sue Geving

Velva Maye

Shaiza Damji

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Marilyn Firlotte

Jerry Owens

Renee Staton

Colleen Mills

City of Seattle:

Department of Planning and Development (DPD)

Department of Neighborhoods

Seattle Department of Transportation

Seattle Planning Commission

Office of Policy and Management

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I. Design Review in Seattle's Neighborhoods

What is Design Review?

Design Review is a component of the Master Use Permit (MUP) application and is required for most new commercial, mixed-use and multifamily developments. It provides a forum through which developers and citizens can work together to ensure that new developments contribute positively to Seattle's neighborhoods.

Design Review has three principal objectives:

1. Encourage better design and site planning to enhance the character of the city and ensure that new development fits sensitively into neighborhoods;

2. Provide flexibility in the application of development standards; and

3. Improve communication and participation among developers, neighbors and the City early in the design and siting of new development.

Design Review, as with other components of a MUP application, is administered by the Department of Planning and Development (DPD). Design Review applications require public notice and an opportunity for comment. Projects are brought before a Design Review Board for its recommendations or, alternatively, to DPD staff in what is referred to as Administrative Design Review. The final decision on Design Review recommendations is made by the DPD Director, and is appealable to the Hearing Examiner.

What are Neighborhood-Specific Design Guidelines?

In reviewing development proposals in neighborhoods with City Council-adopted neighborhood-specific design guidelines, the Design Review Board consults two sets of guidelines. The Citywide Design Guidelines are of a general nature and apply throughout the city, whereas the Neighborhood-Specific Design Guidelines address more specific design concerns that have historical, cultural or architectural significance to a particular neighborhood.

The Northgate Urban Center and Overlay District Design Guidelines augment the existing Citywide Design Guidelines.

The Northgate Urban Center and Overlay District Design Guidelines carry forward the urban design objectives of the 1993 Northgate Area Comprehensive Plan. Thus, the Northgate Urban Center and Overlay District Design Guidelines, in conjunction with the Citywide Design Guidelines, can increase overall awareness of good design and involvement in the development review process.

More About Design Review

More information about Design Review can be found in the Citywide Design Guidelines, Client Assistance Memo #238, and in the Seattle Municipal Code (SMC 23.41). Information includes:

- Projects Subject to Design Review
- How Design Guidelines are Applied
- Who Serves on the Design Review Board
- Development Standards Departures

II. Northgate Area Context and Priority Design Issues

Building on urban design-related goals and recommendations included in the 1993 Northgate Area Comprehensive Plan, the Northgate Urban Center and Overlay District Design Guidelines are intended to provide methods and identify opportunities for how new developments can make a positive contribution to the neighborhood. The guidelines are intended to help ensure that good urban design will be achieved whenever new development is proposed.

While a few urban infill development projects have occurred in the past few years, the Northgate area is primarily characterized by a "suburban" pattern of commercial development and its role as a regional shopping and employment center. Northgate area residents would prefer new growth to create an environment that is more conducive to pedestrians and include wider sidewalks, extensive landscaping, interesting and permeable facades, decreased and screened surface parking lots, screened parking garages, below grade parking, parking behind buildings, and pedestrian amenities consistent with an urban pattern and character of development. Unlike more established neighborhoods, the Northgate area does not have much in the way of noteworthy building character and patterns of urban form to which new developments should respond.

What its residents have, however, is an overall vision of a vibrant and attractive urban center, with a mix of uses and a pedestrian orientation in terms of character, function and scale. This vision is the result of an extensive planning process involving Northgate area citizens. Since 2003, this vision has continued to come into focus with respect to the preferred open space and pedestrian network that comprises the "public realm." Northgate's success as an Urban Center will rely upon the continued improvement of pedestrian and open space networks that will provide new amenities, improve overall accessibility and walkability, define the urban form by "breaking up the superblocks," and define an identity and "sense of place" for Northgate. This underscores the critical importance of achieving pedestrian-supportive streetscapes and open spaces in future infill development, and the important role of design review processes.

Recent efforts also show interest in environmental sustainability. This encompasses not only support for protecting and enhancing natural features such as Thornton Creek, but also encouraging walking, biking and transit as alternatives to car trips. Reinforcing Northgate's role as a dense Urban Center that is well-served by transit also will support environmental sustainability objectives.

Goals and Objectives Related to the Design Guidelines

The goals and objectives supporting the Northgate vision provide context and clarity for the design guidelines. Four key goals broadly define the community vision and provide the framework for the Northgate Urban Center and Overlay District Design Guidelines:

1. **Provide direct and convenient pathways, comfort, visual interest and activity for pedestrians.**

2. **Design identity should be defined block-by-block.**

3. **Increase publicly accessible open spaces and connections between them.**

4. **Landscape design to enhance the site or address special site conditions.**

As concepts, these goals apply to all components of a well-designed urban environment, including streets, sidewalks, open spaces and buildings. The Northgate Urban Center and Overlay District Design Guidelines further articulate these broad goals by developing specific objectives that new developments should meet. These objectives form the basis for specific design guidelines to be used in combination with the Citywide Design Guidelines.

These design guidelines will apply to new development proposals, along with Northgate Area regulations that include development standards outlined in the Northgate Overlay District (Section 23.71 of Seattle's Land Use Code). These regulations include a Major Pedestrian Street Designation for portions of 5th Avenue NE and NE Northgate Way and Green Street Designation for portions of 3rd Ave NE, which prescribe streetscape standards such as sidewalk width, street trees and minimum commercial storefront transparency. The Northgate Urban Center and Overlay District Design Guidelines are intended to augment these existing regulations with more descriptive recommendations aimed at improving the quality of the urban environment.

As part of a larger, long-range planning strategy, the design guidelines promote: development that enhances the neighborhood's visual character, function and identity; pedestrian linkages between uses, properties and streets; and high quality design of individual sites. The guidelines are not, however, intended to restrict innovation, imagination or variety in design that further enhances the pedestrian environment or the goals and objectives of the Northgate Area Comprehensive Plan. If an alternative design can be demonstrated to achieve the desired character while still meeting the basic intent of the design criteria, the design review board may consider the proposal.

Sub-Area Existing Conditions

The Northgate area is characterized by sub-areas, as defined by both existing physical conditions and redevelopment potential. New developments should respond to specific conditions particular to each of these areas.

Super Blocks

The properties surrounding 1st, 5th, 8th Avenues NE and NE Northgate Way exhibit a "super block" character in scale and automobile orientation. They are large, uninterrupted properties (some with lengths exceeding 800 feet, compared to 240-foot long blocks downtown) that are unfriendly or intimidating to the pedestrian, with expanses of parking separating structures from the sidewalk. This area was the subject of a Rezone study and Environmental Impact Statement.



Super Blocks

Mid and Low Density Residential

Midrise zones and lower density multifamily zones provide a transition from larger and more dense neighborhood commercial zones in the Urban Center core to the single family areas prevalent on the edges of the Northgate area.



Mid and Low Density Residential

Zone Edges

While zoning designations are intended to provide transitions from higher intensity to lower intensity developments, there are places within the Northgate area where abrupt edges between high density and very low-scale buildings exist. These areas require particular attention in mitigating height, bulk and scale impacts on single family houses and smaller multifamily structures.



Zone Edges

Mixed-Use Redevelopment

There are many properties within the area's retail core zoned Neighborhood Commercial where opportunities for interconnected, walkable mixed-use redevelopment exist.

High Density Residential

Several high density, multifamily developments surround the retail core. With improved sidewalks and other desirable street elements as planned in the 5th Avenue Streetscape Design Project, and neighborhood goods and services within walking distance, pedestrian activity should increase considerably. Zoning allows for higher density residential development to occur in proximity to the retail core.



High Density Residential

South of the Mall

The area south of Northgate Mall currently supports the Metro Transit Center with significant local and regional bus service and park and ride capacity. Regional voters have approved funding for Sound Transit's design and construction of a Light Rail line connecting Northgate to downtown, SeaTac Airport, Snohomish County and centers east of Lake Washington. The Northgate Station will be located in this area south of the Mall.

Design Guidelines

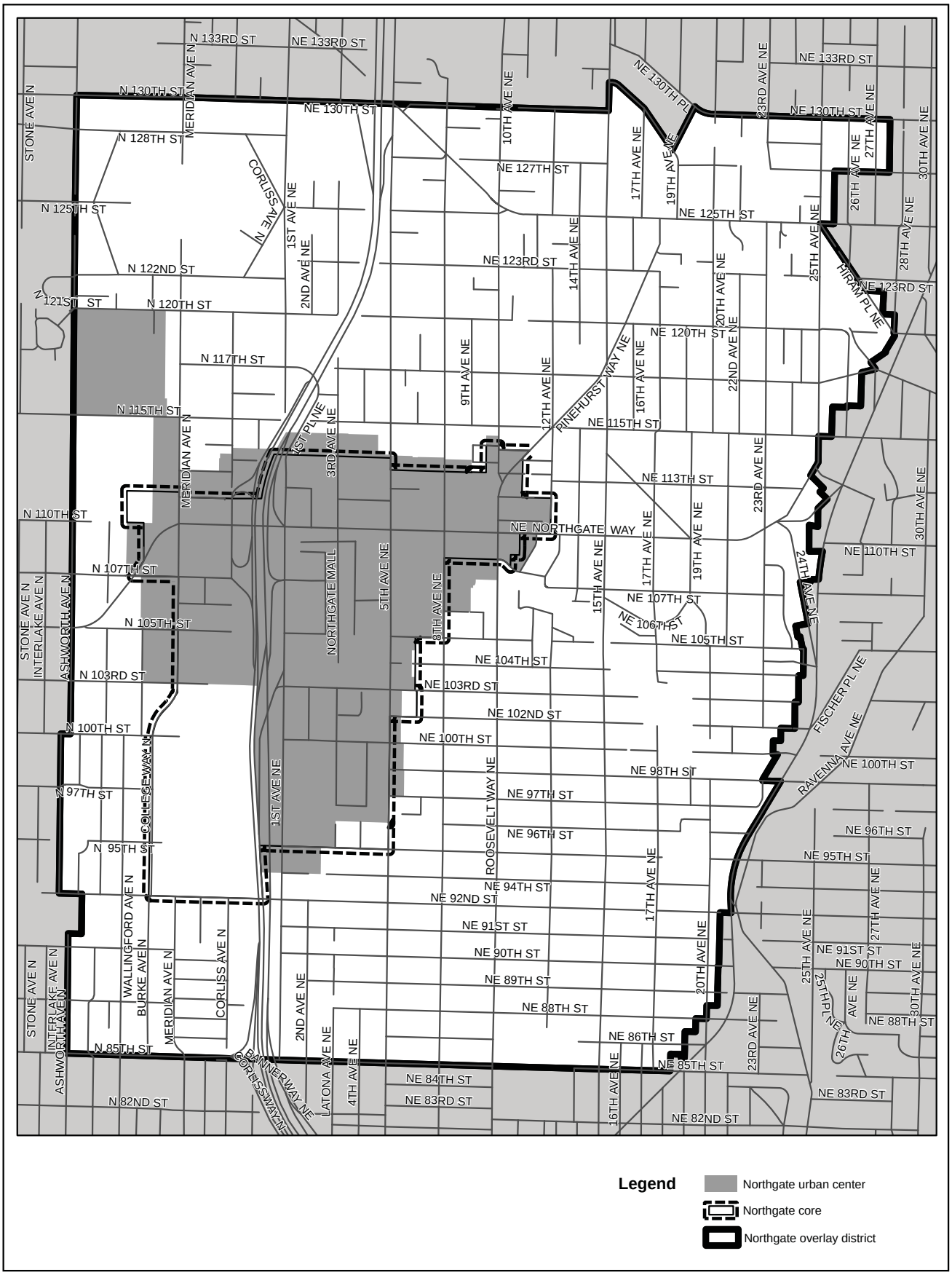


Introduction

These neighborhood design guidelines supplement the *Citywide Design Guidelines*, for projects requiring design review within the area depicted in **Figure 1** (opposite).

The guidelines for Northgate support the acheivement of major **Community Goals**. The guidelines are numbered for the convenience of the reader (**1.1**, **1.2**, **1.3**, etc.). Some guidelines have multiple parts, often shown as "bulleted" items.

Figure 1: Northgate Urban Center and Overlay District



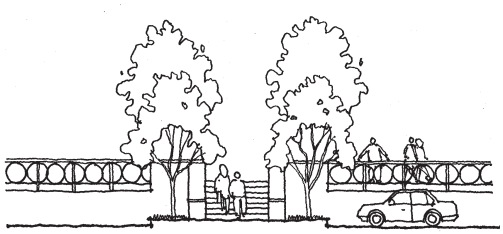
Community Goal 1:

Provide Direct and Convenient Pathways, Comfort, Visual Interest and Activity for Pedestrians

Objective: Pedestrian connectivity encourages pedestrian activity and makes it possible for people to make some of their trips on foot rather than by vehicle. Livelier street edges make for safer streets. Ensure that buildings have visual interest and quality at street level, at a human scale, with accessible, comfortable spaces that encourage pedestrian activity.

1.1 Respond to Site Characteristics

Try to match the grade of abutting public rights-of-way where properties meet. If there is a significant grade difference, create an attractive transition, using creative grading and landscaping. Be sure to incorporate pedestrian access, including walkways, stairs or similar features that can help build greater pedestrian connectivity (also see guideline 3.1).



Where a grade change is unavoidable, consider, where appropriate, incorporating pedestrian access into the design of the project.



Grade change on 5th Ave NE



Example of a dedicated bike lane

1.2 Streetscape Compatibility

Streetscape Design

Northgate's character as an urban place is influenced by the quality of its pedestrian environments, and therefore achieving high-quality design of streetscapes is essential. The community's vision of an enhanced, pedestrian-oriented urban center environment can only be achieved by improving pedestrian network connectivity throughout the neighborhood along specially designated streets including Major Pedestrian Streets, Special Landscaped Arterials and Green Streets, as well as other access streets, and pedestrian connections across private property.

The designated streets warrant special attention when designing landscaping, paving and pedestrian amenities. Detailed guidance is provided in the Overlay District, or in some cases Streetscape Plans have been incorporated into the City's Street *Right of Way Improvements Manual*, providing more detailed design guidance.

The general intent for streetscape improvements throughout the Northgate Area is to:

- Create an interconnected system of streets and open spaces to optimize neighborhood permeability (walkability) consistent with a typical urban block pattern;
- Encourage and enhance transit/multi-modal use;
- Emphasize pedestrian and bicycle safety, in part by controlling vehicle traffic speeds and managing volumes;

- Support increased use of designated crossings; and
- Increase urban green space/open space within the public realm by achieving surface treatments that are “more green and less gray.”







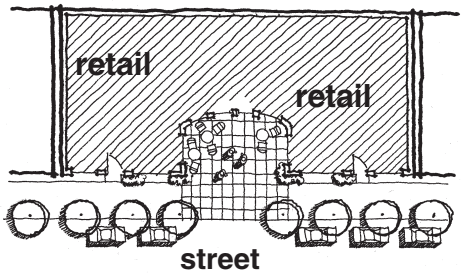


Commercial and Mixed-Use Buildings

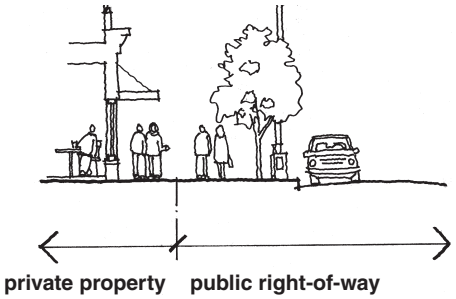
- The ground floors of buildings should appear inviting to the public by containing commercial uses and open spaces with direct entry from the sidewalk. Vary these features in size, width and depth to accommodate a variety of appropriate uses and activities for the site and vicinity. This includes providing multiple entries at the street.
- For corridors between commercial spaces, open-air passageways are generally more visible and more inviting than interior hallways. This can be an attractive, successful location for store entries, store windows and restaurant/cafe seating.
- Further articulate the street level facade to provide a comfortable pedestrian experience with placement of street trees, exterior lighting on buildings, planters and overhead weather protection.

1.3 Promote Pedestrian Interaction





Design for uses that are accessible to the general public, generate walk-in business and contribute to a high level of pedestrian activity at street level. Consider extending street-level spaces out to the sidewalk with multiple entrances and open spaces featuring decorative paving, street furniture and artwork. Retail uses should front such spaces.



Setting a building back can create more space for pedestrians and street-level activity.

This area is unique in that the two main commercial corridors, 5th Avenue NE and NE Northgate Way, are designated as Major Pedestrian Streets and intersect at the northeast corner of the mall. The Major Pedestrian Street designation is intended to increase pedestrian circulation with an improved street level environment by creating a public realm that is safe, interesting and comfortable.*

New developments in these designated areas must comply with standards for types, dimensions and orientation of street level uses, and provide streetscape amenities such as overhead weather protection, seating, street trees and street lights. The guidelines in sections 1.3 and 1.4 are of highest priority in helping to meet this objective.

**See SMC 23.71.008 and Map A in 23.71.The Major Pedestrian Street designation occurs on Northgate Way and 5th Avenue NE, including the complete intersections of 3rd Avenue NE and 11th Avenue NE with NE Northgate Way, and the complete intersections of NE 105th Street and NE 113th Street with 5th Avenue NE.*

Human Activity

Sidewalks are the principal place of pedestrian movement and casual social interaction. Designs and uses should complement this function.

- Consider setting portions of the building back to create spaces at street level for pedestrian-oriented activities. Take the “indoors” outdoors by spilling interior space (e.g. dining areas, merchandise displays) onto plazas and walkways and bring the “outdoors” into the building by opening interior spaces to sunlight and views of sidewalk activity.
- Sidewalk widths throughout the Northgate area are less than ideal, and wider sidewalks will allow for more pedestrian circulation and activity. Within active retail areas, proposed developments are encouraged to set back from the street-fronting property line to provide additional space abutting the sidewalk. The Major Pedestrian Street designation calls for 12-foot sidewalks. However, 16-foot sidewalks are preferred in commercial areas, where appropriate.

Superblock Development

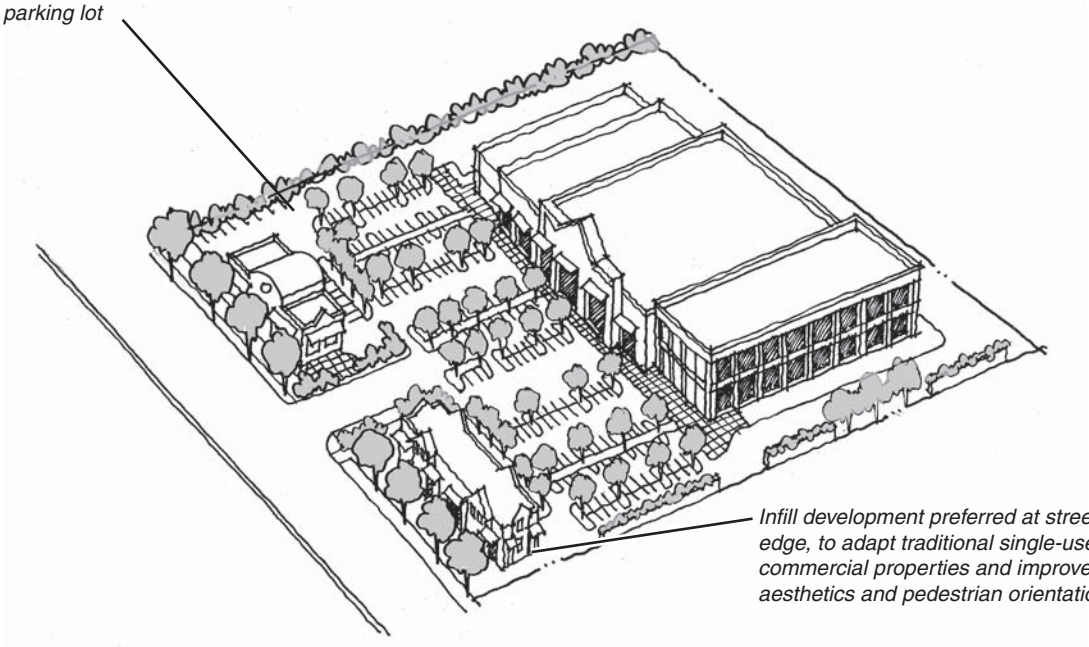
One of the most important design considerations in meeting the goal of a pedestrian-friendly urban environment is to site and design street-level commercial uses that present a welcoming public face to buildings and to encourage human activity on the street.

- Superblock developments on Major Pedestrian Streets are expected to be built up to the edge of the sidewalk and meet the other pedestrian street designation standards.
- Where superblock developments are not along designated Major Pedestrian Streets, they should achieve a pedestrian-friendly environment within the internal layout of a superblock site, where commercial buildings may be separated from the public right-of-way by parking.
- Every attempt should be made to link large sites to the greater community by creating lively, interesting pedestrian connections within the site, and also between the site and its surroundings.

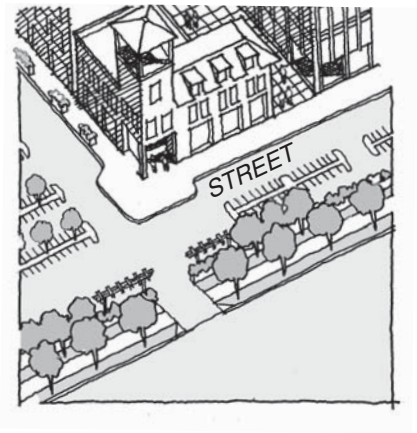


Building to edge of sidewalk is expected on Major Pedestrian Streets

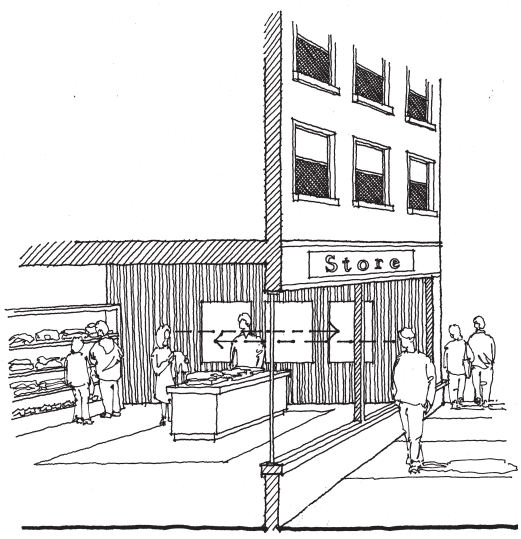
Multiple walkways through parking lot and landscaping connect the site to the neighborhood and create smaller parking areas in place of one large parking lot



Infill development preferred at street edge, to adapt traditional single-use commercial properties and improve aesthetics and pedestrian orientation



Street trees, landscaping and architectural elements such as trellises can present a human-scaled street edge and comfortable pedestrian environment in the public realm. The commercial buildings, when set back from the street, create an internal "streetscape", with open storefronts, special paving and other amenities to create usable and welcoming spaces for people entering the stores from parking areas or surrounding streets.



example of intended function of street level building transparency

- Key internal at-grade passageways accommodating pedestrian and vehicular circulation on large sites should not be ignored as locations for pleasant pedestrian places.
- Developments should have internal drives and walkways adjacent to buildings designed with the basic elements of a good pedestrian-oriented shopping street: buildings oriented close to walkways, landscaping, pedestrian-scale lighting, walkways of sufficient width to encourage social interactions without impeding pedestrian movement, and other similar enhancements.
- Usable pedestrian spaces, such as a plaza or extra-wide sidewalk near entrances to buildings with pedestrian enhancements, are encouraged either at the street or within the site adjacent to a private drive.
- Parking Lots - Surface parking areas located between primary buildings and the public right-of-way should include walkways, landscaping and lighting to delineate safe and comfortable pedestrian circulation within the site.

Street Level Transparency

The intention of transparency in the street level facades of commercial and civic buildings is to provide for interaction between people in the interior of a building and people near the exterior of a building—particularly on the sidewalk––through a direct visual connection. The following are examples of less desirable design treatments that should be discouraged:

- windowless walls;
- mirrored or non-transparent glass;
- glass block;
- display cases;
- narrow windows not meeting the intent above;
- windows located above waist level to persons outside the building on the sidewalk;
- windows into areas that are too small, shallow, or narrow to support normal human activity (e.g. the back of a tall display case, a narrow hallway); and
- any interior wall, equipment, or functional layout that hampers the intent of transparency stated above.

Parking and Vehicle Access

Mnimize Pedestrian/Vehicle Conflicts

Site and design driveways to minimize conflicts between vehicles and pedestrians. This is especially important along Northgate Way, 1st Avenue NE, 5th Avenue NE, Roosevelt Way NE, 15th Avenue NE, NE 100th Street, NE 103rd Street, and NE 125th Street. Minimize the number of curb cuts and width of driveways and curb cuts along these streets.

Locate Parking to the Rear

Where feasible, parking areas should be located to the rear of buildings that face NE Northgate Way, 1st Avenue NE, 5th Avenue NE, Roosevelt Way NE, 15th Avenue NE, NE 100th Street and NE 103rd Street. Where surface parking must be located to the side of structures, the following is recommended:

- Place surface parking away from the corners of blocks fronting on NE Northgate Way, 5th Avenue NE, 8th Avenue NE, Roosevelt Way NE, 15th Avenue NE, NE 100th Street, NE 103rd Street and NE 125th Street.
- Limit the frontage of surface parking areas that face NE Northgate Way and 5th Avenue NE (outside the Major Pedestrian Street designations).

Encourage the Creation of Multi-Purpose Parking Areas

These areas can provide parking as well as public open space, such as places for special neighborhood functions (markets, gatherings), cultural events (outdoor theater, music), and recreational activities. Examples of elements for public open spaces include: special surface treatments, art, fountains and seating, locations for removable bollards of other elements to restrict automobile access to public spaces when not used for parking, use lighting to create a safe environment while minimizing glare onto adjacent properties and sidewalks.



Bicycle Parking

When providing bicycle parking, consider incorporating features such as storage and wayfinding for bicycle users into the overall site plan and building design.

1.4 Foster Human Scale (Architectural Materials and Elements)

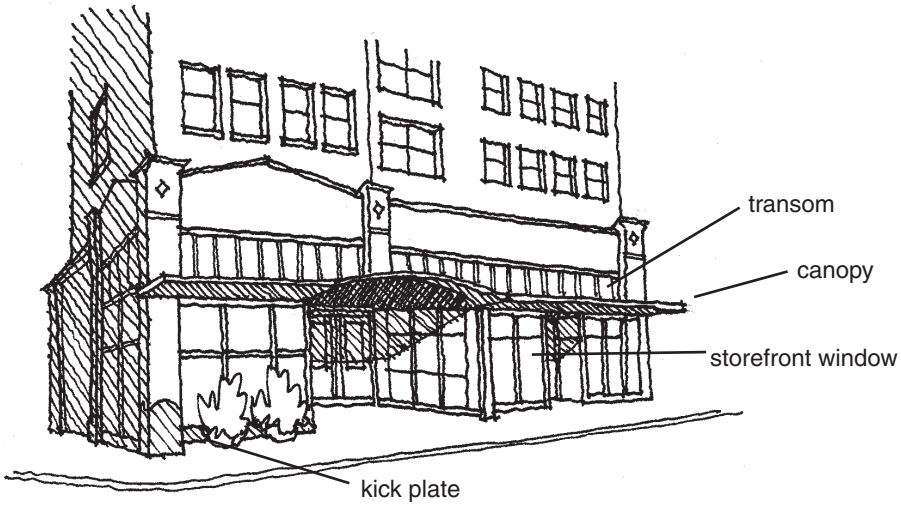
Commercial and Mixed-Use Buildings

The ground level of the building must offer pedestrian interest along sidewalks. This includes windows, entrances, and architectural details. Signs, overhead weather protection and ornamentation are encouraged.



All New Developments

Exterior building materials should have a human scale; this helps people relate to the size of the building. Good examples include stone and brick. Non-modular exterior materials, such as stucco, and those in large modules, such as concrete panels, will need finer details to reduce the perceived bulk and create human scale.



Examples of How Materials are Used to Establish Human Scale

Example of desirable scale and proportion in the facade composition of a large building achieved by its fenestration patterns and detailing, and variegated exterior finish materials and detailing.



Human scale elements include:



bays;

Vertically proportioned elements, including windows and porches, articulate the building into intervals.





roof forms; and

Example of a residential building articulated into intervals by its multiple roof line and building elements.





entrances.

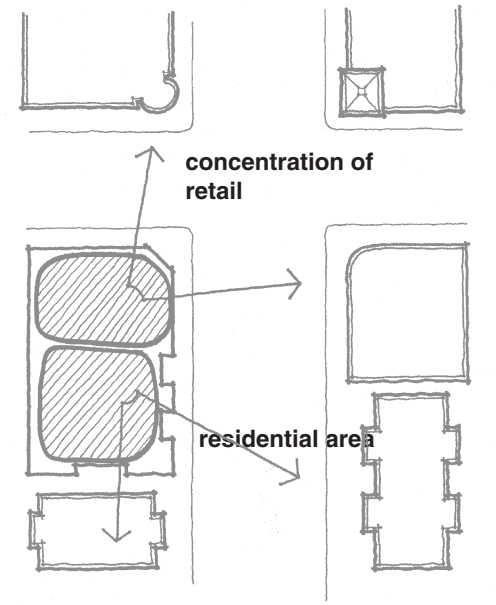
Community Goal 2:

Design Identity Should be Defined Block by Block

Objective: Design the character, form and function of the building in an appropriate manner, responding to the immediate surrounding context - both existing and as envisioned through neighborhood planning documents and concepts supported by the community.



Commercial buildings can blend into a residential corridor providing the overall design is sensitive to the surrounding conditions



break the building down into smaller volumes to relate in similarity to the scale, height and configuration of nearby residential structures.

2.1 Streetscape Compatibility

The architecture of individual buildings should relate to their surroundings. This does not necessarily mean a historical approach, but rather one that is sensitive to the surrounding urban, built and natural environments. In areas zoned for mixed-use development outside the retail core area, orient and design the commercial facade at street level to be compatible with the streetscape of the surrounding residential neighborhood. Compatibility can be accomplished through a combination of the following:

- The overall proportion of the facade:
- Building setbacks;
- Placement of windows and bays;
- Location of entries; and
- Exterior materials.

2.2 Corner Lots Treatments



New buildings should reinforce street corners and enhance the street level environment at these key pedestrian areas. Street corners are common areas for informal interaction, and the building's relationship to the street and related elements should promote comfort and interest within the public realm. Provide a building entry and additional building mass at the corner; and provide space for movement and activity.

The following streetscape elements are encouraged to help meet this objective:

- Special paving or surface treatments;
- Art;
- Water features;
- Landscaping;
- Seating; and
- Kiosks.



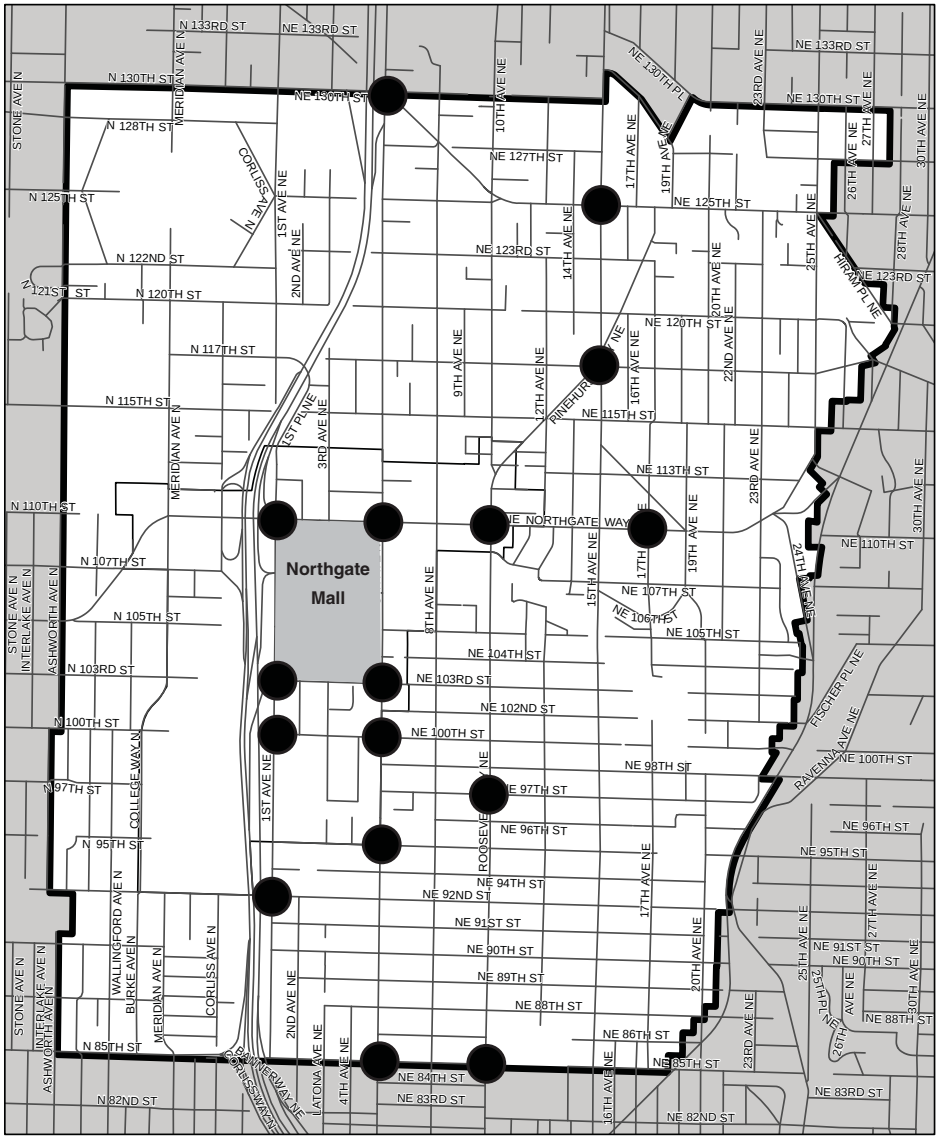
Building form and architectural expression can reinforce the street corner.





Corner Lots as Gateways

New developments on corner lots can aid significantly in marking entry and defining an intersection by "announcing the block" through building forms and features that are visually stimulating and inviting. A gateway can have many forms: a literal gateway expressed through a building form or by the placement of features such as those outlined above. The areas surrounding the following intersections are encouraged to pay particular attention to these guidelines:



NE Northgate Way & 1st Avenue

NE Northgate Way & 5th Avenue
(both Major Pedestrian Streets)

NE 103rd Street & 1st Avenue NE

NE 103rd Street & 5th Avenue NE

NE 100th Street & 1st Avenue NE

NE 100th Street & 5th Avenue NE

NE 92nd Street & 1st Avenue NE

NE Northgate Way & Roosevelt Way NE

NE Northgate Way & 15th Avenue NE

NE 85th Street & Roosevelt Way NE

NE 97th Street & Roosevelt Way NE

NE 85th Street & 5th Avenue NE

NE 95th Street & 5th Avenue NE

15th Avenue NE & Pinehurst Way NE & NE 117th Street

15th Avenue NE & NE 125th Street

Roosevelt Way NE & NE 130th Street

2.3 Height, Bulk and Scale Compatibility

There are several important zone edges within the Northgate Overlay District that warrant special consideration in creating sensitive transitions in height, bulk and scale. Consistent with the 1993 Northgate Area Comprehensive Plan, the following are methods to establish compatible relationships between different scales of development. These methods are intended to augment building setbacks similar to those specified in the Land Use Code for zone edges where a proposed development project within a more intensive zone abuts a less intensive zone; and techniques specified in Citywide Design Guidelines.



Example of a building stepping back away from smaller adjacent structures in the neighborhood.

Lowrise 4, Midrise, or Highrise development abutting a Single Family, Lowrise Duplex/Triplex, Lowrise 1 or 2 zone:

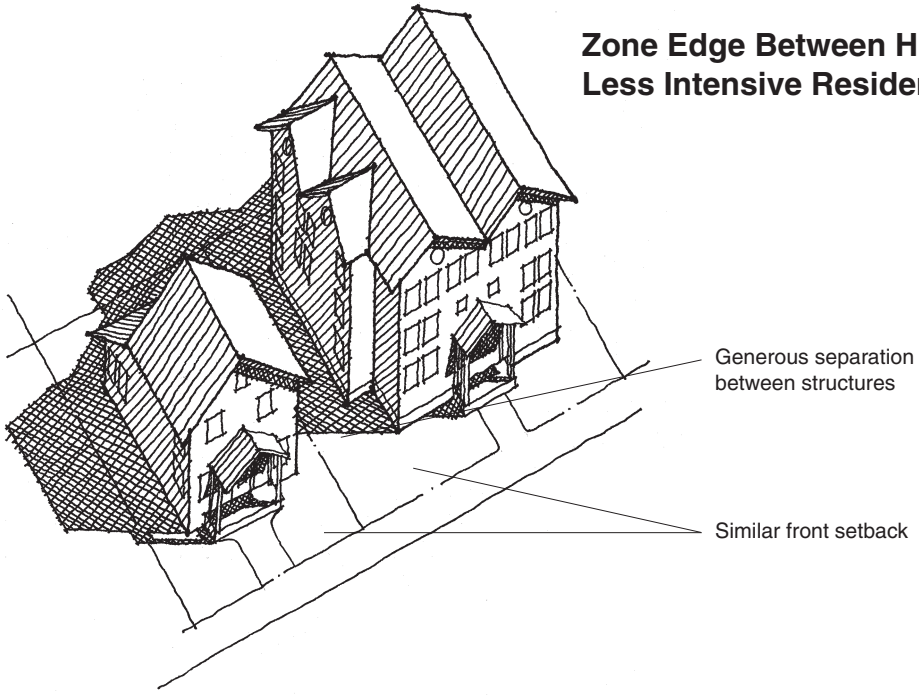
- Multifamily developments should maintain the established front setback pattern of the subject block.
- Pay particular attention to structure depth on the abutting lot lines. Orient the massing of the structure away from less intensive zones to the greatest extent possible.

NC2-40', NC3-40' and higher abutting Single Family, Lowrise Duplex/Triplex, Lowrise 1 or 2:

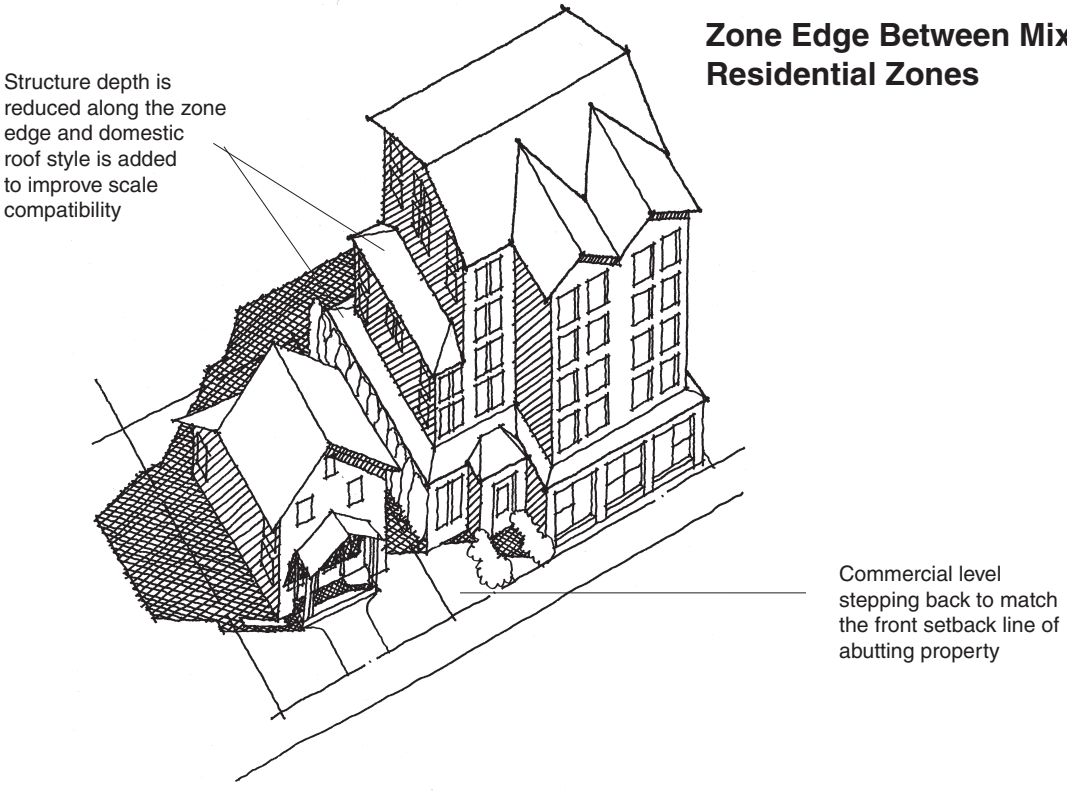
- Step back the ground-level commercial space to match the established front setback pattern on the subject block.
- Pay particular attention to the depth of the commercial level and upper residential levels along the abutting lot line. Orient the massing away from the lot line of an abutting less intensive zone to the greatest extent possible.
- Soften the commercial facade on the abutting lot line with elements such as dense landscaping.
- Repeat residential architectural elements of surrounding buildings on portions of the commercial facade adjacent to such buildings. Examples include roof lines and window styles and proportions.

Along a zone edge without an alley, consider additional setbacks, softening elements, and architectural compatibility to help reduce the potential 'looming effect' of a much larger structure in proximity to smaller existing buildings.

Zone Edge Between Higher and Less Intensive Residential Zones



Zone Edge Between Mixed Use and Residential Zones

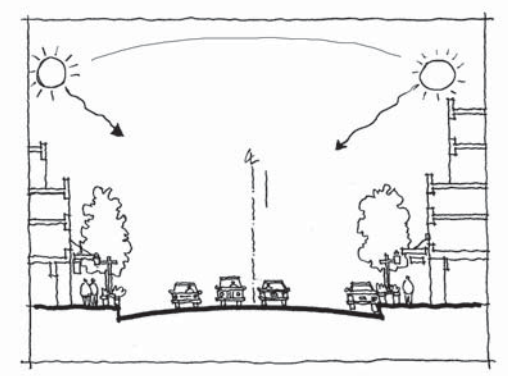


2.3 Super Block Development

A large site should pay particular attention to massing and scale both in terms of its relationship to the surrounding area and within the site itself. Large monolithic structures are discouraged.

Ideally, development on a large, super block-scale site should be arranged into multiple buildings that lend a human scale and provide for pedestrian permeability (see guideline 1.3).

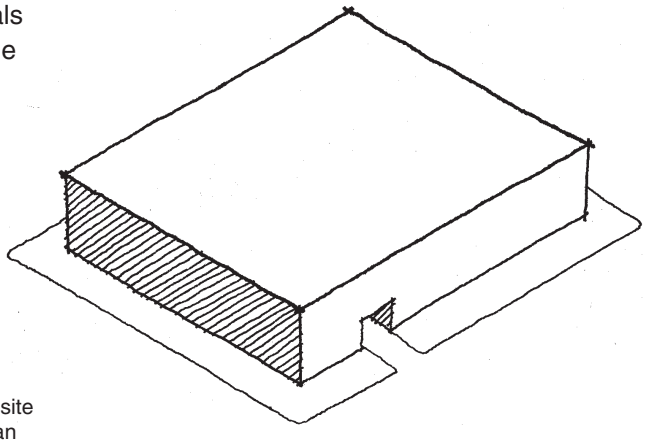
If multiple buildings are not feasible, break down the mass of the building, horizontally and vertically, into a hierarchy of volumes. Within each volume the windows, doors and architectural elements should help define the scale of the structure.



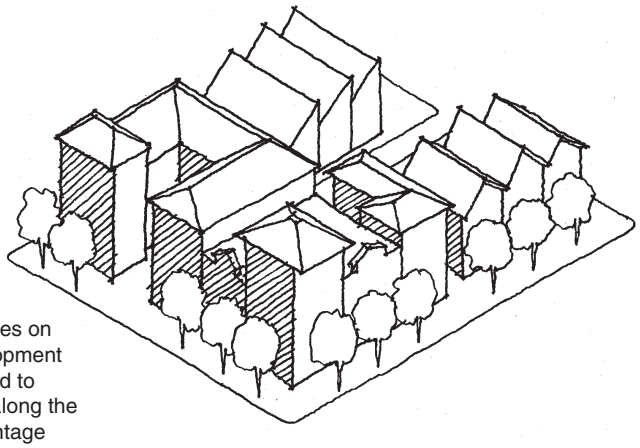
More sunlight at street level with upper level recesses

2.3 Upper Stories

Recessing the upper stories of developments on arterials allows sunlight to pass onto the street and minimizes the impact of height on pedestrians.



Effect of a large site developed with an unarticulated structure devoid of entrances.



Multiple structures on this large development site are designed to create interest along the entire street frontage and within the interior of the site.



Signs that hang underneath awnings and canopies...



add interest to the pedestrian environment.





Signs that are integrated into the building facade are also encouraged.

2.4 Design Signage Compatible with Human Scale and Consistent with Architectural Concept

Signage should be designed so that it is appropriate for the scale and character desired in the area. Signs should be oriented and scaled for both pedestrians on sidewalks and persons in vehicles on streets within the immediate neighborhood. Signs should add interest to the street level environment. They can help unify the overall architectural concept of the building, or provide a unique identity for an individual business within the larger structure. While regulatory sign review is not in the purview of design review, integration with the overall architectural expression of a building and appropriate scale and orientation are important design considerations. Franchises should not be given exceptions to these guidelines.

The following types of signs are encouraged:

- pedestrian-oriented blade signs; and
- Signs integrated into the design of the building: along a sign band, on canopies and marquees, located in windows.

These types of signs are discouraged:

- Large illuminated box signs (backlit “can” signs); and
- Post-mounted signs.

Community Goal 3:

Increase Publicly Accessible Open Spaces and Connections Between Them

Objective: Improve pedestrian movement throughout the Northgate area by creating quality spaces and pathways through and within development sites connecting to the street system and, where appropriate, public open spaces and parks.



Many streets in the Northgate area are composed of "superblocks" at a scale oriented to the movement of vehicles, rather than pedestrians. North-south streets through the Urban Center create uninterrupted corridors with very few opportunities for movement east to west. The simulation of an urban street grid through sites is an important urban design consideration, and creating interior block pedestrian connections through sites and to the surrounding street system (particularly east-west) is a critical element of an improved pedestrian environment.

3.1 Incorporate Open Space

The Northgate Plan places a high priority on open space, especially public spaces that are accessible, comfortable, and in proximity to or on routes to high activity areas. The Northgate Overlay District (Ch.23.71 of the Seattle Municipal Code) includes detailed and specific open space requirements, defining "usable open space" that are open to the public and abutting a sidewalk. The overlay categorizes such spaces by scale and function, ranging from small courtyard spaces to urban plazas and town squares.* The following guidelines augment the open space requirements for some of the categories by providing additional guidance on scale, character and relationship to the public realm.



Open spaces (including parking areas) can also help improve site and project sustainability. Refer to guidelines in Section 4 below as well as the Leadership in Energy and Environmental Design (LEED).** Examples include sustainable landscaping and stormwater run-off, detention and filtration systems.



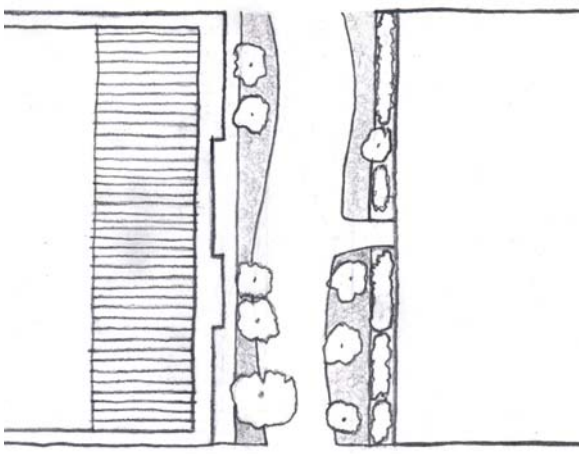
** Refer to SMC 23.71.014 for specific Northgate Overlay District open space standards.*

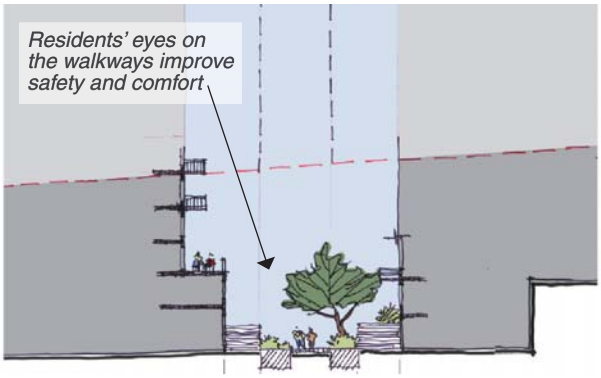
*** The LEED Green Building Rating System™ is a program of the US Green Building Council. It is a rating system for what constitutes a "green building." Visit www.usgbc.org for more information.*











Typical interior block pedestrian connection with landscaping, activated street level environment, and upper-level setbacks for light and air

Interior Block Pedestrian Connections

Larger development sites are encouraged to incorporate pedestrian walkways and open spaces to create breaks in the street wall and encourage movement through the site and to the surrounding area. Such walkways, which could be for pedestrians only, for pedestrians and bikes or adjacent to vehicular access through the site, should meet the sidewalk of key pedestrian streets in an engaging and identifiable manner.

Short blocks encourage people to walk. Locating interior block pedestrian connections that create 200 – 300 foot long blocks are optimal. In siting such street level interior block pedestrian connections, designers should analyze the subject site, and the relationship to surrounding properties, streets and activity areas.

Several key community amenities are of particular significance regarding pedestrian movement through the area. The Northgate Transit Center/future light rail station and the adjacent mixed-use transit-oriented development (TOD) with its urban plaza and access to the Thornton Creek Water Quality Channel are important pedestrian destinations. The Northgate Civic Center, Hubbard Homestead Park, the natural areas along Thornton Creek and North Seattle Community College are also important neighborhood amenities that should inform the location and site design of new open space and interior block pedestrian connections in large lot developments.

Consider Interior Block Pedestrian Connections that:

- Optimize neighborhood connectivity;
- Promote a variety of pedestrian uses such as walking, exercise and relaxing;
- Minimize pavement, and provide an equitable balance between pavement and planting areas;
- Use pervious/pedestrian scaled paving for walking surfaces (minimize standard concrete, discourage use of asphalt);
- Accommodate vehicular access only for emergency vehicles;

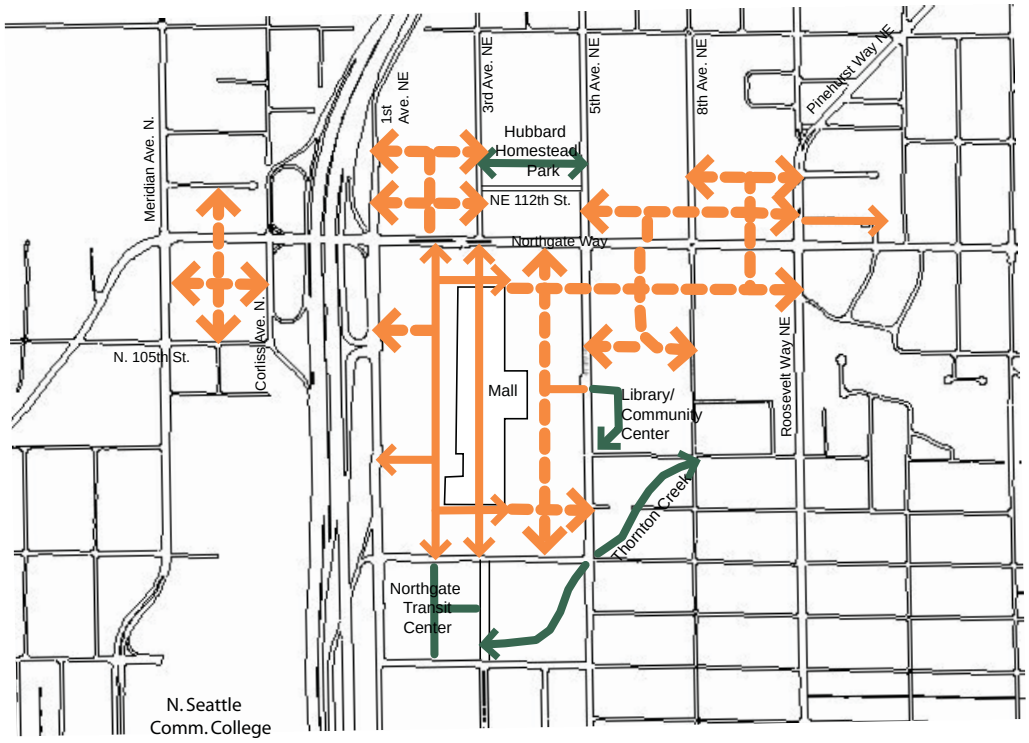
- Develop integrated rainwater strategies such as rain gardens, natural drainage collection, building water collection and art;
- Provide "garden entries" for townhomes at the base of larger residential buildings; and
- Incorporate built-in and movable seating to optimize flexibility of use.



Walkway with water feature

The illustration below depicts existing and potential future pedestrian routes in the heart of the Northgate Urban Center. When development occurs, designers should consider the opportunities to incorporate interior block pedestrian pathways that add to the network.

Concept: Existing and Potential Future Network of Interior Block Pedestrian Connections



Existing Pedestrian Routes on Private Properties

Potential Future Pedestrian Routes on Private Properties

Existing Pedestrian Routes on Public Properties

Lots adjoining public open spaces

Strive for transitions between public, semi-public, semi-private and private space in the design of new development abutting public open space. The following can help accomplish this goal:

- Where appropriate, site commercial uses facing the public space with outdoor seating to enliven the space.
- For ground floor residential uses, locate residential stoops with a grade separation to provide a transition between the residences and the public space.



Active park with landscaped edge



Commercial uses facing park edge are encouraged, with pedestrian walkways and/or shared pedestrian/vehicle access



Residential uses facing park edge are encouraged, with stoops for transition to public spaces



An effective transition from retail use to park edge

The following are examples of less desirable design treatments that should be discouraged:

- windowless walls;
- fences and/or tall, dense plantings that create areas that are invisible to passers-by.

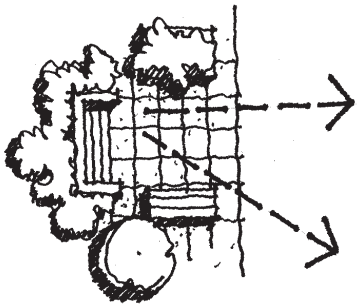
Consider upper story balconies, terraces and windows to provide visual interest and eyes and ears on the public open spaces for greater public safety.

Hierarchy of Open Spaces

Urban Gardens

- New public spaces should provide as many seating opportunities as possible;
- Planter walls should be set at a height that allows for their use as seating; and
- Moveable chairs and tables are strongly encouraged.

Urban Garden

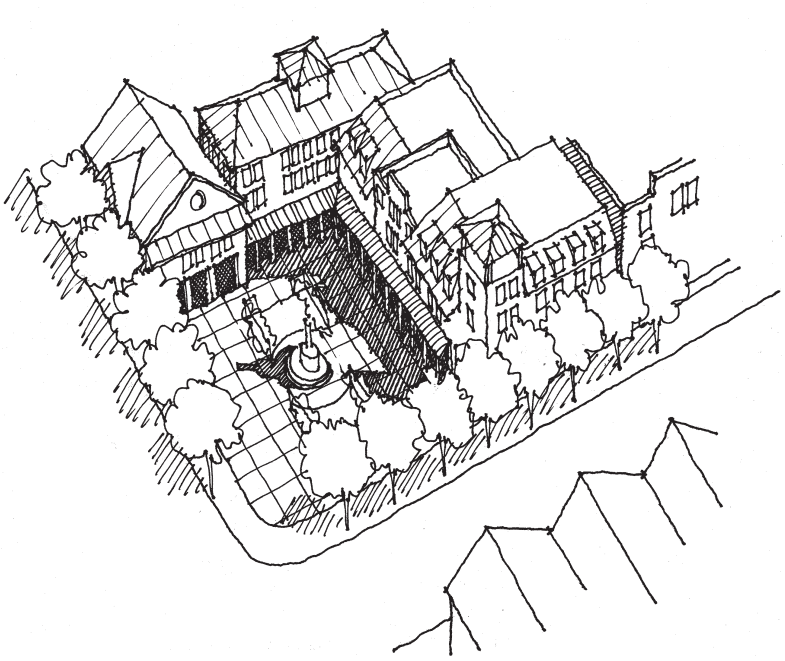


Courtyards

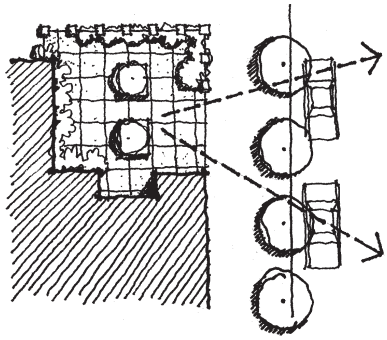
Elements such as planters, benches and steps can be sited to break down the scale of an open space, and provide comfortable seating and opportunities for viewing. Courtyards should be integrated with the scale, character and function of the adjoining building.



A comfortable, intimate space with a visual and physical connection to the public realm



Courtyard



Urban Plazas and Town Squares





Urban Plazas and Town Squares

Public space should be enclosed by active buildings around the perimeter to encourage its use and maintain its safety. Plazas and squares should be surrounded by pockets of activity: shops, stands, benches, displays, gardens. These various pockets of activity should all be next to paths and entrances to facilitate constant movement. The ultimate goal should be to gather enough people in and around these spaces so that they will overlap and spill in toward the center of the square.

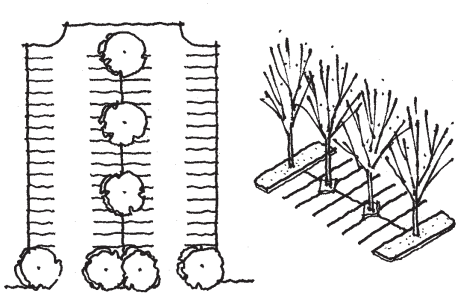
The following can help accomplish this goal:

- Arrange open space elements in a manner that reduces the scale of the larger plaza into smaller spaces more suitable for pedestrian use.
- Design retail spaces that will comfortably “spill out” and enliven public space.
- Provide landscaping that enhances the space and architecture.
- Provide visual and pedestrian access (including barrier-free access) into the site from the public sidewalk.
- Site furniture, art work.
- Pedestrian-scaled lighting and other amenities such as fountains, seating (steps provide excellent seating) and kiosks.
- Design landscaping to enhance the space and architecture and assist in absorbing run-off from paved plaza areas.

3.2 Design of Parking Lots Near Sidewalks

Interior landscaping, in addition to perimeter landscaping, should be installed to help soften the visual impact of surface parking and enhance natural site drainage. To meet this objective, consider the following:

- Interior landscaping: Use landscaping to break large areas into a series of smaller areas. Plant low landscaping in left over portions of parking areas (e.g., turning radii);
- Site landscaping strategically to minimize stormwater run-off;
- Innovative drainage control measures such as swales or treatment islands or pervious pavements;
- Plant enough trees, which at maturity form a canopy over large portions of the parking area with trees interspersed between parking spaces;
- Select tree species that do not obscure signage, amenity features, or opportunities for surveillance;
- Plant a mixture of evergreen and deciduous trees for year-round greenery. Select types of trees, such as sapless trees, that do not impact parked cars.

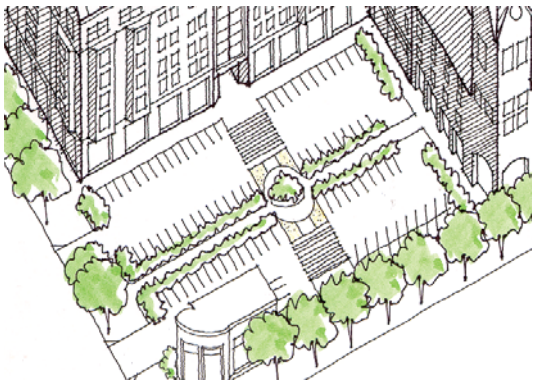


Four foot tree cutouts can be accommodated without losing parking spaces

Large Scale, "Super Block" Development

Surface parking areas should be seen as a resource for the creation of public space. There are many site planning techniques and elements that can help create pedestrian-oriented space.

- The parking area should be laid out as an urban block, at a scale that promotes walking within.
- A network of clearly defined pedestrian walkways should serve as a "grid", connecting these walkways to uses within the site and to the larger street network in a safe and comfortable manner. The necessary elements—lighting, pavement and plantings—should be placed to support those pedestrian objectives.
- The space should be defined by buildings, and secondary structures such as shelters and small retail spaces (placed at corners) should further define the scale.



Thoughtful design provides attractive walkways and connects to sidewalks at street edges



Example of retail fronting the street with parking set back







Landscaping examples in commercial settings

3.3 Parking Structures

Parking structures merit the same quality materials and finishes as the principal buildings in a development.

- Site parking structures away from Major Pedestrian Streets.
- Design a well-proportioned and unified parking structure. Consider techniques specified in Citywide Design Guidelines – those relating to height, bulk and scale compatibility; architectural concept and consistency; and fostering a human scale – to achieve good scale and architectural design quality.
- Consider placing retail at the ground level of a parking structure along the primary facade, where appropriate.
- Parking structure facades should be treated with high quality materials and given vertical articulation and emphasis similar to the principal structure. The facade should be designed to visually screen cars.
- Pedestrian entries should be clearly visible and architecturally expressed on the exterior of the building.

3.4 Landscaping

Landscaping to Reinforce Design Continuity with Adjacent Sites

Consistent placement of the same types of street trees creates a unified theme in a pedestrian environment. Consider trees on surrounding sites and consult the City Arborist's recommended list when selecting street tree species.

Landscaping to Enhance the Building and/or Site

Quality landscaping is an essential component of the built urban form. Good use of existing and new landscaping adds considerable value to the design of new development and blends new development with surrounding areas, and reduces stormwater runoff.

- The corners of street intersections should be distinguished by special landscape treatments: special paving, low planters and flower displays, sculpture, and decorative lighting.

- Mark and define pedestrian crossing and walkways with specimen trees and shrubs.
- Ease of maintenance and durability should help guide the selection of plant species and landscape materials such as paving, seating and other site materials. Use native, drought tolerant species of plants and avoid invasive plant species.

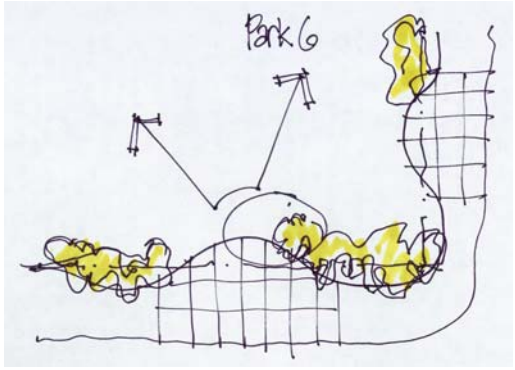
Landscape Design to Address Special Site Conditions

The natural area east of 5th Avenue NE from NE 103rd to NE 105th and east of 8th Avenue NE from NE 105th Street to Roosevelt Way NE will be developed as per the Thornton Creek Park 6 Long Range Plan prepared by Seattle Public Utilities and Seattle Parks and Recreation. New development adjacent to the natural area should consider:

- Retaining natural greenbelt vegetation, where possible.
- Incorporating gathering areas and lookout points along the edge of the natural area into the design of the project.
- Incorporating native plants into the landscape design to provide the feeling of an extension of the natural area into the project site.
- Providing linkages to the natural area that direct people to designated pathways and away from protected areas.
- The plant list developed for the Thornton Creek Park 6 Long Range Plan can help guide the selection of plant species. Native plants provide ease of maintenance and durability, and are usually drought tolerant.



Thornton Creek natural area



New development adjacent to Park 6 can take advantage of the natural area as an amenity

Community Goal 4:

Landscape Design to Enhance the Site or Address Special Site Conditions

Objective: Incorporate existing natural features into the site design and consider including new landscaping that could provide areas of interest and enhance the site.



In the Northgate Urban Center, opportunities for sustainable design are enhanced through the presence of Thornton Creek and its tributaries and the considerable transit investment including light rail and bus service. The neighborhood is challenged by its proximity to Interstate 5 and a history of site design in the Northgate Way corridor emphasizing auto-oriented commercial activity with limited emphasis on the pedestrian environment and landscaping.

4.1 Retain Existing Natural Systems and Site Features as Landscaping



Consider design strategies to preserve existing on-site natural habitats, significant vegetation or other natural features including drainage features that can be incorporated into the site design. For example, consider retaining natural features such as existing vegetation and wetlands that are aesthetically pleasing, would emphasize natural features like that of Thornton Creek and its tributaries and can create a pedestrian friendly environment by providing natural areas of interest. Also, features such as larger planting strips located adjacent to sidewalks can be used for landscaping to enhance the site and can effectively separate pedestrians from the impacts of traffic.

4.2 Use Landscaping Design to Enhance the Site



Consider design strategies to create natural features or systems that can be incorporated into the site design. For example, consider incorporating rain gardens or drainage swales that are aesthetically pleasing, would emphasize natural features and can create a pedestrian friendly environment by providing landscape designed features or areas of interest. Landscaping features such as larger planting strips can enhance the site and can effectively separate pedestrians from the impacts of traffic.

For more information about Design Review in Northgate and citywide, please visit:

www.seattle.gov/dpd/designreview