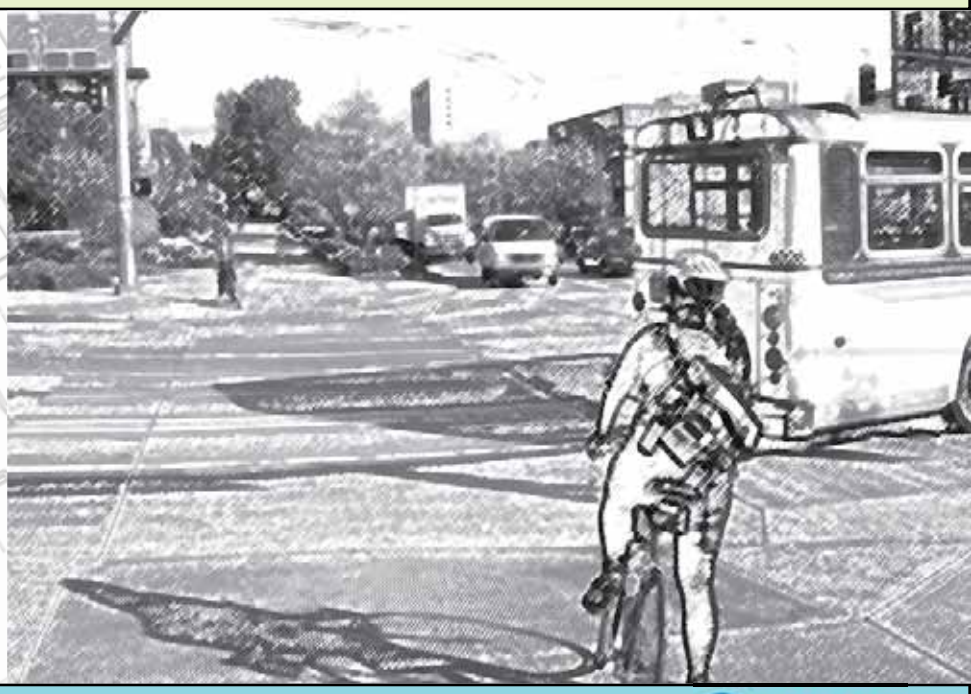
University Area Transportation Action Strategy

A long range plan
for the
University District
transportation system

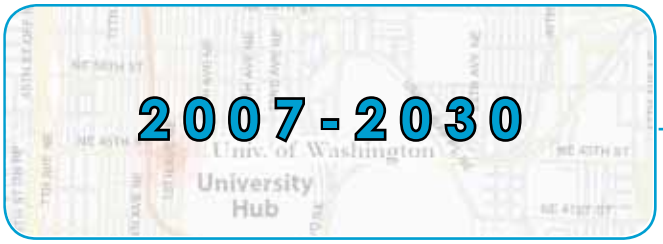
2007 - 2030



SDOT
Seattle Department of Transportation

March 2008

University Area Transportation Action Strategy

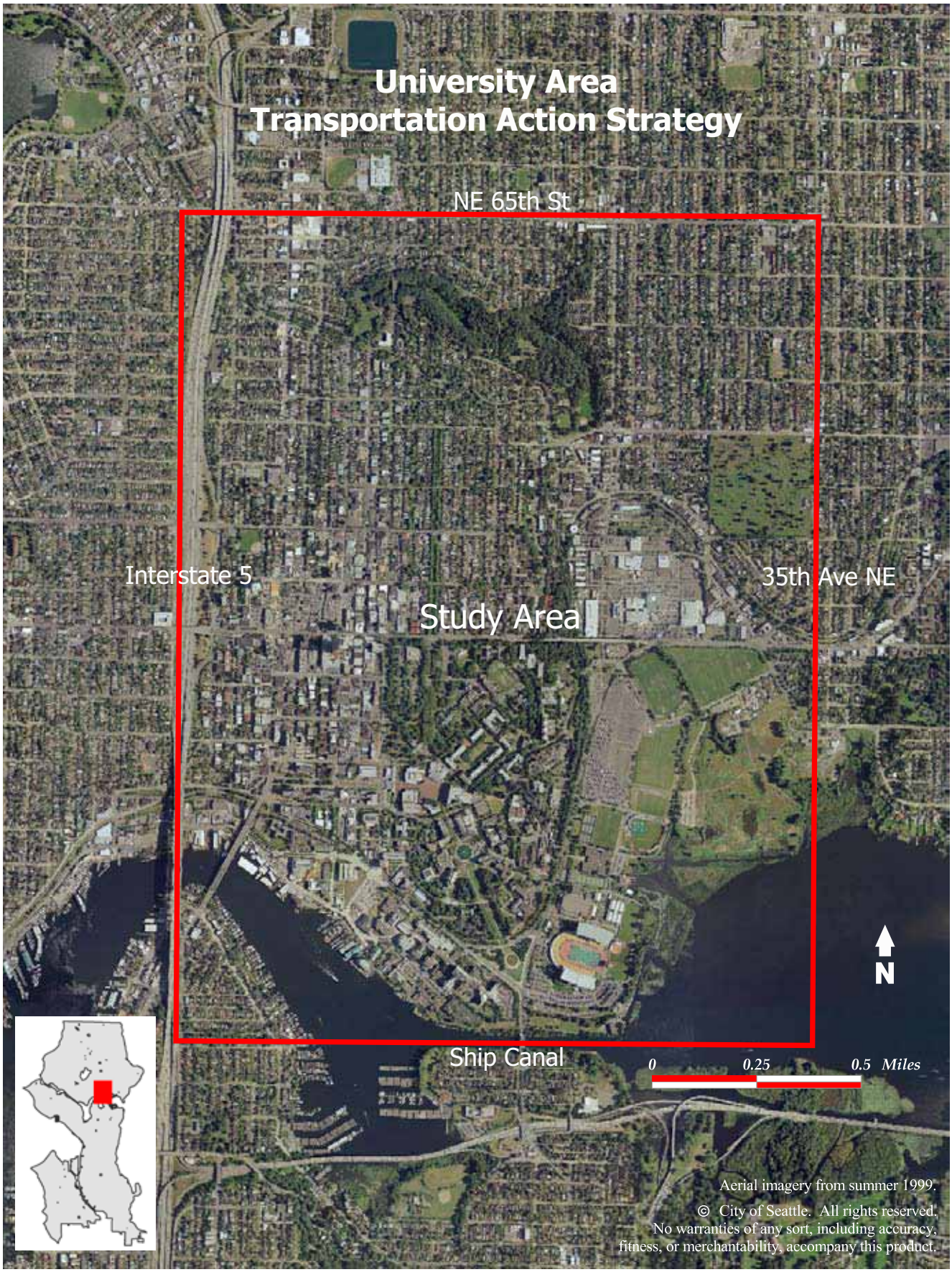


Draft Final Report

Prepared by:

SDOT
Seattle Department of Transportation
Policy & Planning

with
Mirai Associates
&
The Underhill Company


University Area
Transportation Action Strategy
NE 65th St
Interstate 5
35th Ave NE
Study Area
Ship Canal
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Aerial imagery from summer 1999.
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Acknowledgements

Seattle Dept. of Transportation
Grace Crunican, Director
Susan Sanchez, Director, Policy & Planning
Tracy Krawczyk, Manager, Transportation Planning
Tony Mazzella, Project Manager
Casey Hildreth, Project Planning Lead

Staff
Capital Projects & Roadway Structures
Neighborhood Traffic Calming Program
Pedestrian & Bicycle Program
Policy & Planning
Street Maintenance
Traffic & Signal Operations

Department of Planning & Development
Jennifer Pettyjohn
John Shaw
Mike Podowski
Lyle Bicknell

Department of Neighborhoods
Karen Ko

Inter-Agency Team
Liz Gotterer, KC Metro
David Hull, KC Metro
Tracy Reed, Sound Transit
Ron Endlich, Sound Transit
Mark Bandy, WSDOT
Carol Hunter, WSDOT

Consultants

Mirai Associates
Tom Noguchi, Principal, Project Manager
John Davies, Senior Planner
Brad Dain, Graphics Specialist
Robert Sicko, Transportation Modeling Specialist
Howard Wu, Senior Transportation Planner

The Underhill Company
Mary Jo Porter, Principal

Boards & Commissions

Seattle Pedestrian Advisory Board

Seattle Bicycle Advisory Board

Seattle Planning Commission

Community Members & Organizations

The University of Washington
Theresa Doherty
Peter Dewey
Joshua Kavanagh
Celeste Gilman

Greater University Chamber of Commerce
Teresa Lord Hugel, Executive Director

"The Ave" Group
Patty Whistler

University District Community Council
Matt Fox

University Park Community Club
Kent Wills

Ravenna Bryant Community Association
Jody Chatalas

Roosevelt Neighbors' Alliance
Mary Hausladen

Roosevelt Neighborhood Association
Jim O'Haloran
C.J. Liu
Linda Cox

The University Farmers' Market
Chris Curtis

The University Heights Center

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Introduction

In the 1880's, the area bounded by Lake Union to the southwest, Portage Bay to the east, and Ravenna Creek to the north was primarily farmland and rugged forest. Douglas fir trees soared to almost 400 feet and wildlife such as the cougar and bear were visible neighbors. The 'transportation network' for the few who lived there consisted of horse paths, boat docks, and wherever one's own two legs could take them.

By 1891, however, the area was subdivided and annexed into the City of Seattle and the forces of transformation were set in motion. Within just a few short years, new railroad and streetcar connections brought in hundreds of new residents and jobs, and enabled the University of Washington to move its increasingly constrained campus out of downtown Seattle. By the time of the 1909 Alaska-Yukon-Pacific Exposition, the area first called Brooklyn Addition, then University Station, and now known as the University District was on its way to becoming a full-fledged city within a city.

Now more than a century later, these early development patterns and infrastructure decisions still fundamentally influence the way people and goods move about the greater University Area. From inherited street alignments and widths to the man-made ship canal that now physically separates neighborhoods to the south, much of the area's "fabric" that we take for granted was established many years ago by a few key decisions. Today, as the community continues to attract new jobs and residents, and as land becomes increasingly valuable and the streets more crowded, it will be more important than ever to anticipate the long-term implications of transportation investments - whether they be modest or transformational improvements.

The construction of Interstate 5 in the 1950's, and of the Evergreen Point Floating Bridge (State Route 520) in the 1960's, is a telling example of this challenge: these historical decisions have placed impacts on the University Area that are significant, unmistakeable, and will last well into the future. Like the underlaying street grid and general development pattern of the University Area, many now consider these investments as a given part of the community. Yet with these major highways, however, there is growing recognition that the type of mobility these facilities provide must be weighed against their environmental and social costs as well as the local

transportation constraints they impose. In the case of SR 520, a facility that essentially needs full replacement due to its aged condition, the questions are being asked 'What if we don't take this historical decision for granted?' 'What if a viable opportunity has been presented to dramatically improve both the community fabric and the ways in which people and goods move around?'

These questions at the scale of a regional highway are indeed profound, which is why there is a large and focused planning effort between state, local, and neighborhood representatives to reach a preferred alternative on replacing SR 520. But what about other key decisions being looked at today that could potentially affect the University Area transportation system for the next 100 years? What about the kinds of gradual improvements needed to maintain livability and provide a viable transportation system for both now and in the future?

In order to answer these latter questions, and to identify a set of transportation improvements that adequately respond to the specific needs of the area, the Seattle Department of Transportation (SDOT) has developed the *University Area Transportation Action Strategy*.

Key decisions that have shaped the University Area (from l to r): Platting of the "Brooklyn Addition" in 1891; building the Montlake Ship Canal in 1915; construction of I-5 in the 1950's.

Planning & Neighborhood Context

The University Area is composed of the University Community Urban Center, which includes the University of Washington and University District, as well as all or parts of the Roosevelt, Ravenna/Bryant, and Montlake neighborhoods. Containing an especially wide variety of land uses, this area also has a diverse array of transportation users and system demands. As housing and jobs continue to grow over the next several decades, it will take smart investments at a range of scales – from neighborhood sidewalks to regional connections – to meet these diverse needs.

There are major improvements to the University Area's transportation system that are in the works. Sound Transit is bringing light rail service from downtown to the University of Washington campus by 2016, with the expectation of additional stations extending north as funding becomes available. Meanwhile, WSDOT has been working with regional and community stakeholders to design and construct a replacement for the SR 520 bridge, which is set to include additional HOV lanes and significant new bicycle/pedestrian connections. At the City of Seattle, proposals for improved transit service, new bicycle facilities, pedestrian safety enhancements, and major road maintenance are funded and will begin to hit the ground in 2008.

The *University Area Transportation Action Strategy* (or *Action Strategy*) is a set of project recommendations that build upon these improvements to meet the diverse and growing needs of the area. Guided by the principles of *mobility*, *sustainability*, *safety*, *access*, *and choice*, the *Action Strategy*'s aim is to sharpen the vision for a highly-functioning and responsible transportation network:

Mobility

The *Action Strategy* focuses on efficiently moving people and goods, of which improving "vehicle capacity" is only one of many potential approaches.

Sustainability

The *Action Strategy* considers today's needs as well as the needs and constraints of future residents, businesses, and institutions. All of the projects proposed are in support of Seattle's goals for improving the environment and building strong communities.

Safety

The *Action Strategy* analyzes safety issues and promotes improvements that reduce potential for conflict and injury.

Access The *Action Strategy* recognizes that a good transportation network is not an end in itself, but a means for conducting one's daily life. Retaining and improving access to employment centers, neighborhood services, and recreational facilities plays an important role in this report's recommendations.

Choice The *Action Strategy* works to reduce the historic imbalance in transportation investment by strengthening options for bicycling, walking, and transit to create "real" alternatives to driving alone.

The principle goals of the Action Strategy have been carried over from the 2002 University Area Transportation Study (UATS):

- *Build upon prior planning to provide a comprehensive, multi-modal plan for the area's transportation system*
- *Serve as a blueprint for financing and prioritizing SDOT's capital investments in the University Area for the next several decades*

Updating the 2002 Plan

The *Action Strategy* is an update to the University Area Transportation Study (UATS) completed in 2002. The UATS plan was developed to guide transportation decisions in the University Area to the year 2010 and beyond. It included 47 project recommendations that built on past planning efforts and was designed to implement the vision and goals of the Seattle's Comprehensive Plan, the Transportation Strategic Plan and the University Community Urban Center Plan.

In 2005, SDOT developed the Seattle Transit Plan, which provides a decision-making framework to help prioritize and evaluate transit investments that connect the City's urban centers and urban villages. These prioritization and evaluation measures were not available in the 2002 UATS report but are included in the Action Strategy.

Most of the UATS project recommendations have not been implemented, primarily due to lack of funding from local and state sources. In an attempt to reinvigorate and refine the 2002 study, and to improve the likelihood of implementing key projects, the *Action Strategy* set out the following objectives:

- Update "existing conditions" to the year 2007
- Extend the land use and transportation forecasts to the year 2030
- Respond to new location decisions for future light rail stations and to the ongoing planning for the SR 520 Replacement Project
- Incorporate new SDOT planning tools and funding projections

- Establish a set of prioritized projects that meet City objectives and are supported by the community

Changes since 2002

In November 2006, Seattle voters approved a new levy to help finance **Bridging the Gap**, a nine-year package of transportation projects totaling more than half a billion dollars. Bridging the Gap will allow SDOT to catch up on deferred maintenance, such as paving city streets and repairing old bridges, and to fund new pedestrian, bicycle and transit projects. The levy proceeds, combined with a commercial parking tax and an "employee hours" tax, dramatically increase the potential for SDOT to fund and maintain projects associated with the new *Action Strategy*.

In addition to an improved financial picture, there have been a number of changes in the University Area since the completion of the UATS work. These include:

BRIDGING the GAP
Your Transportation Levy Dollars at Work
- Mayor Greg Nickels

In addition to major increases in funding for bicycle and pedestrian improvements that were not available in 2002, Bridging the Gap also provides funding now for key maintenance projects such as repaving streets and replacing aging bridges.

- Changes in location and advancements in design of Sound Transit's three stations planned for the study area
- Completion of the 2005 **Seattle Transit Plan**, which designates priority transit arterials throughout the City and develops specific targets for improving transit speed, frequency, reliability, and span of service
- Advancement towards a Preferred Alternative for the SR 520 Replacement Project
- Lifting of the University of Washington's lease 'lid' in the University District, which had restricted the purchase of land for long-term facilities off-campus. An early result of the new agreement was the sale of the Safeco Insurance tower to UW in 2006
- Completion of the **Seattle Bicycle Master Plan** which will add over 380 miles of new bicycle facilities city-wide, and the launching of the **Seattle Pedestrian Master Plan**, intended to make Seattle the most walkable city in the nation.

The new *Action Strategy* incorporates these changes, which are reflected in project recommendations.

Planning horizon now 2030

Since the original study was completed in 2002, the Puget Sound Regional Council has prepared new demographic and transportation forecasts for the year 2030. The 2010 traffic forecasts prepared for UATS were updated to 2030, and recommended projects were evaluated based on projected traffic conditions in 2030.

Transportation Mitigation Program

Seattle has recently utilized a voluntary Transportation Mitigation Payment program as a means to help off-set the added strain placed by new development on the City's transportation system. Currently in place in South Lake Union and planned for the Northgate area, this program is intended to strategically pool contributions from developers to help fund previously identified transportation projects. By extending the transportation analysis and updating the recommended project list, the *Action Strategy* provides the planning framework needed to create such a program. For more information on the developer mitigation program, a Client Assistance Memo (CAM) is available at the Department of Planning & Development's website: www.seattle.gov/dpd/publications/cam/CAM243.pdf

The University Area Today

At the heart of the University Area is the University Community Urban Center, one of only five "urban center villages" designated by Seattle's Comprehensive Plan. Urban centers are intended to attract the the greatest share of Seattle's commercial and residential growth, which is reflected in their intense commercial zoning and relative lack of single-family housing. In the case of the University Urban Center, a large institution (the University of Washington) and a regional shopping mall (the University Village Shopping Center) play critical roles in supporting this capacity for urban growth. Two residential neighborhoods, however - University Park and University Heights - are also within the urban center and add significant housing variety and pockets of lower intensity uses.

Neighborhoods & Urban Villages

In addition to the urban center, the University Area also includes the southern portion of the Roosevelt Residential Urban Village, a neighborhood with a compact mix of land uses supporting transit and pedestrian activity but that is primarily residential in overall character. Together with the Ravenna/Bryant neighborhood to the east, this northern portion of the study area is predominantly single-family with small-scale retail along key arterial streets.

Mixed-use developments with housing above retail are increasingly common in the University Area, in large part to policies that direct growth to urban centers and urban villages.

There are three mixed-use 'residential urban villages' that lie just outside the study area: Green Lake to the northwest, Wallingford across I-5 to the west, and the Eastlake neighborhood to the south - all influential contributors to University Area traffic patterns and home to many University students and employees.

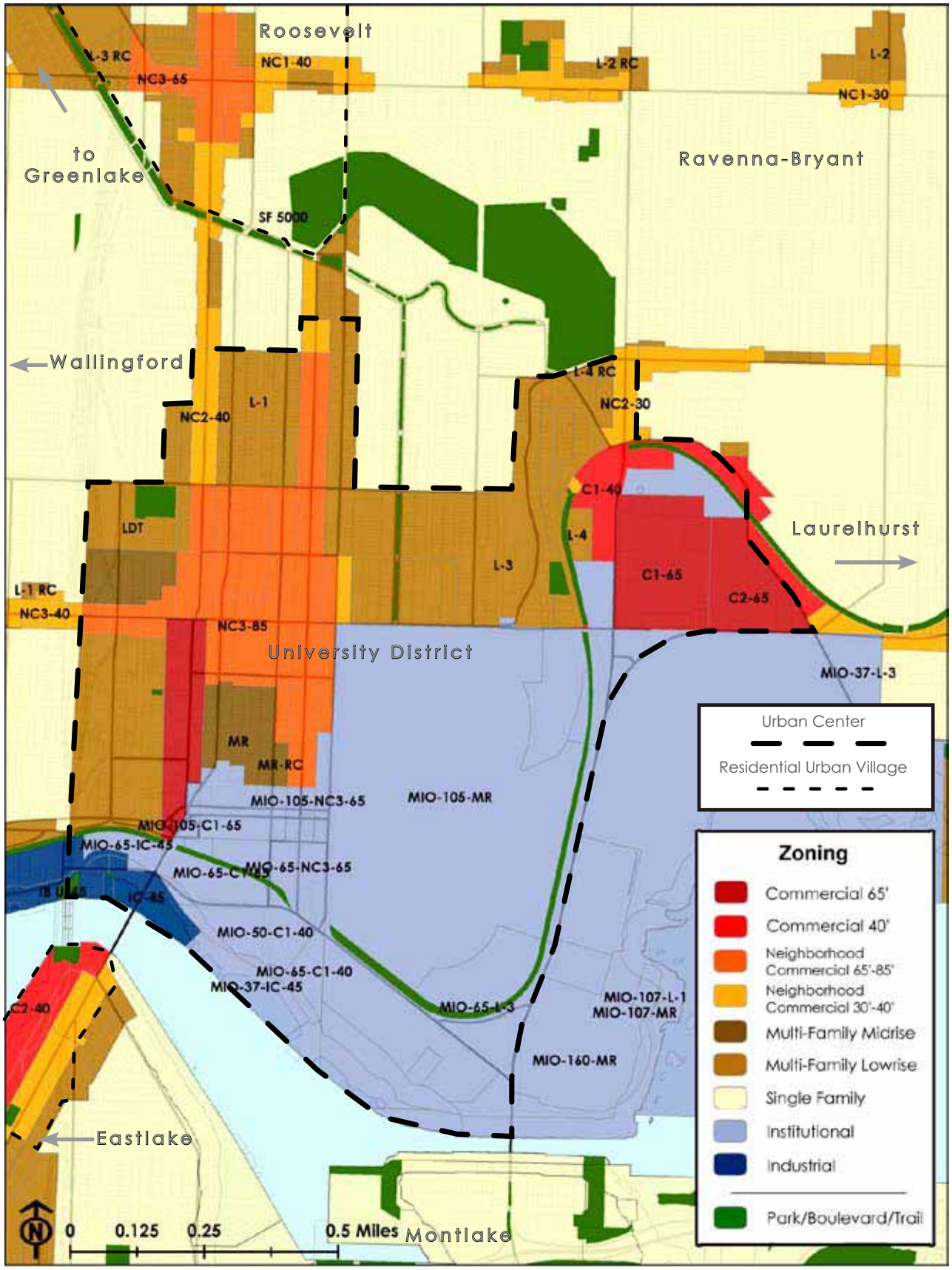
To the south and east of the study area are the single-family neighborhoods of Montlake and Laurelhurst. Both include small pockets of local retail and community services, while Laurelhurst is also home to another major institution: Children's Hospital Medical Center. With 220,000 patient visits per year, 3,600 staff, and plans for significant expansion, Children's Hospital contributes significantly to University Area traffic and activity.

Figure 1 provides a map of the study area's zoning, urban village classifications, and neighborhood locations.

Land Uses

University of Washington. Approximately one-third of the study area is taken up by the University of Washington, with 17,000 staff and an enrollment of 39,000 students. The "UW" strongly influences transportation demand throughout the study area. The City and University have worked together closely to address University-related traffic issues while ensuring that the University can grow to meet its needs. In 1983, the City and the University signed an agreement to allow development in the southeast portion of campus, with the

Figure 1: Zoning, Urban Villages and Neighborhoods



condition that no additional 'peak hour' trips crossed the Montlake Bridge. In 1992, the City's condition for approval of the University's 2001-2010 General Physical Development Plan changed the peak-hour trip requirement from a single location to address University Area-wide transportation issues.

Small-scale businesses in older 1-2 story buildings are common in the University Area, such as along Roosevelt Way at NE 64th St (above). From a transportation perspective, these buildings are notable in that most do not have parking garages or require 'curb cuts' along sidewalks - important factors in providing transit and pedestrian-friendly environments.

Business Districts are well-defined and range from regional (University Village), to local (University District), to neighborhood (Ravenna and Roosevelt), each providing a variety of retail and commercial services. Many stores and restaurants are locally-owned, with unique and diverse products and foods that attract patrons from throughout the City. The bulk of these commercial establishments are in older 1-2 story buildings that do not contain housing, although newer buildings are predominantly mixed-use and take fuller advantage of zoning and height allowances.

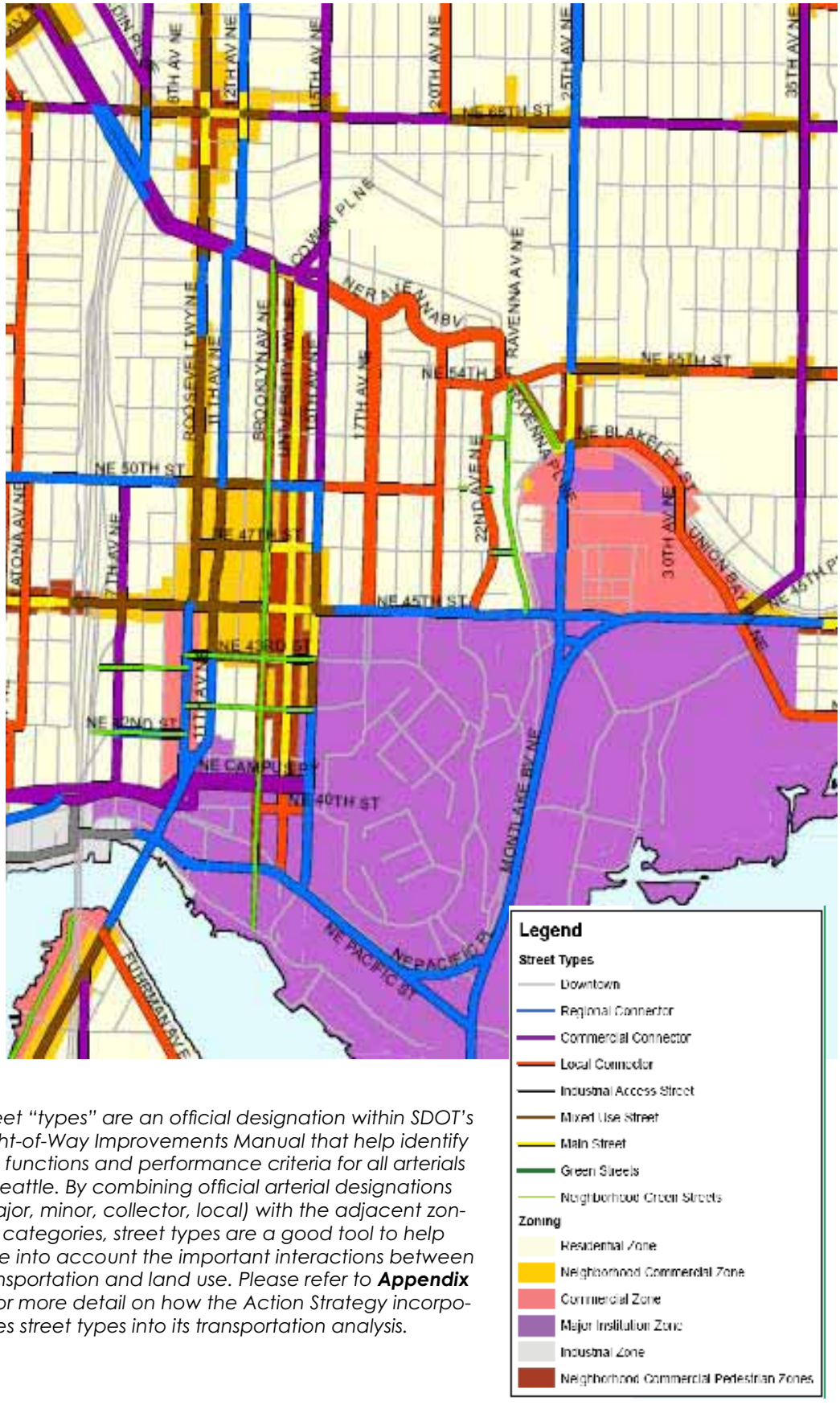
Open Spaces. The Seattle Parks Department operates 10 parks in the study area, dominated by Cowen and Ravenna Park to the north. In the heart of the University District, the University Heights Center (a former school) provides indoor meeting facilities, a community garden, and is the venue for the weekly Farmers' Market, while the University Playground (9th Ave NE/NE 50th St) provides much needed recreation space west of campus. There are a number of smaller "pocket parks" in the study area, including those at 24th Avenue NE/NE 62nd Street, 43rd Avenue NE/NE 9th Street and along the waterfront at the south edge of University campus property. In the eastern portion of the study area is the Calvary Cemetery, a 25-block open space bounded by 30th Avenue NE, NE 55th Street, 35th Avenue NE and NE 55th Street.

People

The **2000 Census** provides a "window in time" to look at the characteristics of the residents & employees of the University Area. The following is a quick summary of some of those characteristics for the University Community Urban Center:

- The University District is one of the densest in the Puget Sound region with 35 persons/acre and over 70 people & jobs/acre, while the larger University Area averages more than 18 persons/acre
- One-third (36%) of households do not own a vehicle
- People walk. More than one in three people walk to work or school while fewer than 30% drive alone
- Transit is an important component of the transportation system with about 23% of commuters traveling by bus

Figure 2: SDOT-Designated Street Types in University Area



Street "types" are an official designation within SDOT's Right-of-Way Improvements Manual that help identify the functions and performance criteria for all arterials in Seattle. By combining official arterial designations (major, minor, collector, local) with the adjacent zoning categories, street types are a good tool to help take into account the important interactions between transportation and land use. Please refer to ***Appendix A*** *for more detail on how the Action Strategy incorporates street types into its transportation analysis.*

- Students account for 71% of the residents within the University District Urban Center, with 18 to 29 year-olds comprising 80% of the overall population

- About 10% of residents are disabled within the University Urban Center, and approximately 45% of those are 65 years and older

Transportation

Getting around by vehicle in Seattle can be a challenge during commute times - and traveling through the University Area is no exception. Not only do vehicles accessing I-5 and SR 520 create significant traffic congestion at ramp locations, but the area's arterial roadway system is restricted on all sides: by I-5 to the west, the Montlake Cut and SR 520 to the south, Portage Bay to the east, and Ravenna Creek to the north. Vehicular traffic funnels to bridges and underpasses that connect across these boundaries, resulting in greater congestion and delays than with a less-restricted street grid system that could more evenly distribute traffic.

Outside of the major arterials that connect to highways and bridges,, however, the University Area transportation system works quite well. Most local streets have relatively low volumes at all times, while some arterials - such as 15th Avenue NE, 35th Avenue NE, NE 65th Street and NE Northlake Way - can operate quite well even during peak commute hours.

Seven bridges in the University Area help overcome the barriers presented by water, steep slopes, and freeways:

- *University and Montlake Bridges*
- *NE 45th St Viaduct*
- *I-5 overpasses at NE 45th and 50th St*
- *Bridge spans over Ravenna Creek on 15th Ave & 20th Ave NE*

The University Area's transportation system works for non-auto users as well. Most pedestrians can walk throughout the University District in relative comfort with few barriers, while many bicyclists and joggers travel along the Burke-Gilman Trail and Ravenna Boulevard for both commuting and recreation. Transit is also a viable alternative to driving a car, with frequent service to downtown. Some 51 transit routes serve the University Area, including Sound Transit and Community Transit regional bus service.

The Montlake Blvd/25th Ave NE corridor is somewhat of a dividing line between the transit and pedestrian-friendly core of the University District to the west and the more auto-oriented University Village shopping mall and single-family neighborhoods to the east. Steep

grade changes limit east-west pedestrian connections between these two areas, while large reservoirs of parking and severe traffic congestion on Montlake Blvd/25th Ave NE severely limit transit service levels.

U-Pass Program

Vital to the general success of the University Area's transportation system has been the University's "U-Pass" program - which provides education, steep discounts and other incentives for transit, van-pooling, and non-motorized transportation options. The program is largely responsible for the fact that only 23% of University students and employees drive alone for their commute, and roughly 40% commute by bus. While the *Action Strategy's* recommendations will go a long way towards improving transportation facilities for all modes, the continued success and influence of the U-Pass program will be critical to offering real transportation choice and effective congestion management in the University Area well into the future.

One of the many positive effects of the U-Pass program - and of offering true transportation alternatives in general - is the reduction in parking demand (which in turn helps make those alternatives more attractive). This University dormitory located along Brooklyn Ave NE and Campus Parkway is one telling example: what was designed as a parking lot for a few vehicles is now home to dozens of bicycles as well as needed recreation space.

Developing the Action Strategy

The *Action Strategy* includes 47 individual projects in the University Area. While many of the projects have been carried over from the 2002 UATS plan, the *Action Strategy* also took a new look at existing and future transportation needs. Study tasks included:

- Reviewing past and current plans and the UATS recommendations
- Working with the community and key stakeholders
- Updating data on existing conditions to 2007
- Establishing performance measures and thresholds for each mode of travel
- Forecasting 2030 traffic conditions
- Identifying and evaluating system improvements
- Prioritizing recommended projects
- Estimating costs and identifying potential sources of funding

Relevant plans & studies

The 2002 UATS study built upon a host of prior planning related to land use and transportation in the University Area. The Action Strategy reviewed these previous efforts and incorporated the latest information from more recent and on-going planning efforts. The studies and plans that are key to the development of the Action Strategy include:

Figure 8. University Community Urban Center Plan recommendations (1998).

The Action Strategy incorporates and builds upon many recommendations from past planning efforts, including the University Community neighborhood plan

University District Transportation Planning Program (1998) includes a set of recommendations for improving vehicle and transit operations along congested corridors.

Montlake/Pacific Circulation Study (1992) has recommendations for improvements on NE Pacific Street.

University Community Urban Center Plan (1997-1998), developed through the City's Neighborhood Planning Office, recommends improvements to serve pedestrians, bicyclists and transit users.

Roosevelt Neighborhood Plan (2006), calls for the development of a compact, active, pedestrian-friendly mixed core around the light rail station, establishment of a residential parking zone, and other transportation improvements to support the neighborhood business district.

University of Washington Master Plan – Transportation Analysis (2000), analyzed the transportation impacts associated with the University's projected growth out to 2012.

Transportation Strategic Plan (TSP) (updated 2004). The City adopted the TSP in 1998 as a guide for managing the City's transportation system and for implementing the vision of the Seattle Comprehensive Plan. The TSP includes street classifications, travel data, and dozens of specific strategies for prioritizing improvements to Seattle's transportation network.

Seattle Transit Plan (2005) designates a set of arterial roadways as the Urban Village Transit Network (UVTN), which is intended to prioritize investments for providing a fast, frequent and reliable transit system between the city's urban villages and within its urban centers.

University Parks Plan (2005) highlights the character of existing parks and identifies new locations and strategies for expanding the open space system, including recommendations related to the Brooklyn Ave Neighborhood Green Street concept.

Freight Mobility Strategic Action Plan (2005) contains short and long-term recommendations for maintaining freight mobility and meeting the goals of the City's Comprehensive Plan and the TSP. In the University Area, NE Pacific Street and the Montlake Bridge are identified as part of the major truck street network.

SR 520 Bridge Replacement and HOV Project (on-going). The design of a replacement for the current SR 520 bridge and freeway connections is still in flux, particularly with regards to the location and nature of the bridge approaches. The current Preferred Alternative is a six lane facility with two general-purpose lanes and one HOV lane in each direction, plus a shared bicycle and pedestrian trail.

Sound Transit University Link & North Link. Sound Transit is fully-funded to extend its light rail transit system from downtown Seattle to the University Area with an underground station at Husky Stadium. Called the University Link, the extension is scheduled to begin service in 2016. Together with a station on Capitol Hill, the University Link is expected to increase light rail ridership by 70,000, and reduce transit times between the University of Washington and downtown to 9 minutes. As part of Sound Transit 2, the North Link phase of light rail is planning additional underground stations for Brooklyn Ave NE at NE 45th St and 12th Ave NE at NE 65th St. While not currently funded, the preferred alignment analysis, preliminary station designs, and ridership forecasts exist as part of the North Link Final Supplemental Environmental Impact Statement (FSEIS).

Seattle Streetcar Plan (2004). SDOT's Seattle Streetcar Network and Feasibility Analysis includes two route options for a potential extension of the South Lake Union Streetcar along Eastlake Ave into the University Area. From the University Bridge to Campus Parkway, the conceptual alternatives include heading north on Brooklyn Ave to Sound Transit's planned light rail station at NE 45th St, or south along 15th Ave NE/NE Pacific St to the Husky Stadium Station. In 2006, a more detailed engineering feasibility study was completed which did not select an alignment and left a number of issues for future analysis, which SDOT is pursuing as part of its 2008 Streetcar Network Planning initiative.

Seattle Bicycle Master Plan (2007) will greatly expand bike facilities throughout the city, to increase bicycling and improve safety. A number of plan's recommendations were considered and refined and have been included in the *Action Strategy*.

Seattle Pedestrian Master Plan (ongoing, expected final 2008-09). The *Action Strategy* includes a number of pedestrian improvements and pedestrian level-of-service analysis which can be rolled into the Pedestrian Master Plan's project recommendations.

Public Outreach

The original University Area Transportation Study (UATS), completed in 2002, was prepared with the help of a broad range of stakeholders representing resident, business and institutional interests, who assisted in identifying issues, and proposing and prioritizing projects. The *Action Strategy* update effort continued this public outreach, from the earliest stages of the project through to the final report, once again engaging people in identifying issues, developing project recommendations and establishing priorities.

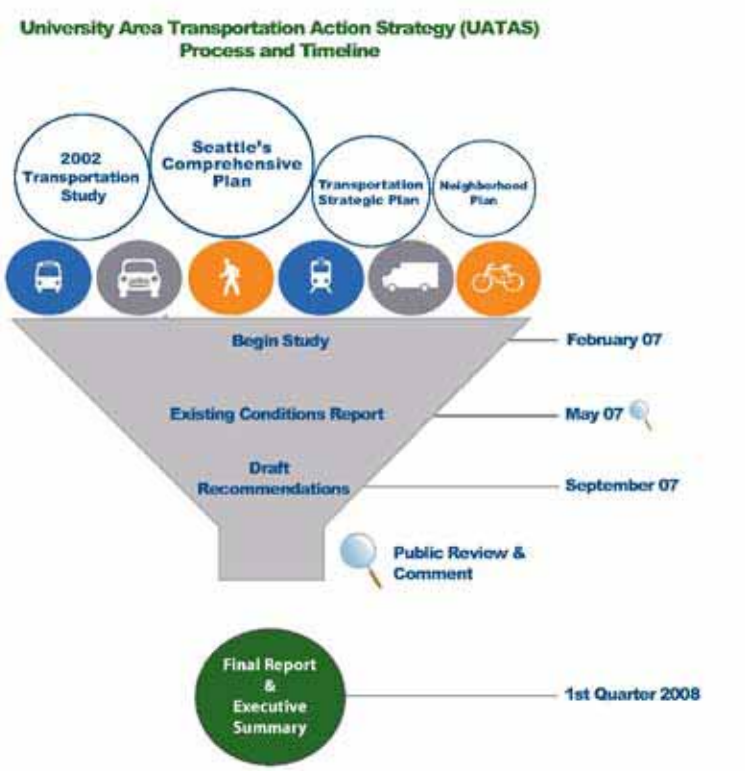
As part of Action Strategy outreach efforts, SDOT staff hosted a booth and solicited public comments for two days at the annual University District Street Fair

The **goals** of the public outreach efforts were to:

- Inform stakeholders about the study update
- Obtain input regarding key issues and proposed strategies, focusing on changes since the 2002 plan
- Build consensus for strategy recommendations.
- Manage expectations by building on the previous study and focusing on transportation projects needed to accommodate expected growth and meet the City's planning, transportation and climate change goals.

Given that the *Action Strategy* is an update, rather than a new study, outreach focused on existing, organized stakeholders groups. These included: neighborhood councils, associations and chambers of commerce; partner transportation agencies; and the

University of Washington. In addition, the general public and students in particular (most of whom would not have been living in the area five years ago) were encouraged to review and comment on proposed plans through articles in the UW Daily and North Seattle Herald, the project's website, a booth at the University Street Fair, and a public open house.



Public outreach was organized around 4 project milestones:

1. Project Kick-Off
2. Production of an Existing and Future Conditions Report
3. Draft List of Project Improvement Concepts
4. Final Report

At each of these milestones, SDOT staff and consultants contacted and/or met with community stakeholders to provide project information and solicit feedback. Refer to **Appendix J** for more details.

Existing & Future Conditions

The project team updated the UATS information about existing traffic, collisions, bus operations and transportation issues to ensure that the *Action Strategy* reflects the existing needs of the University Area. The analysis assembled a variety of available data that identified existing problem areas and changes in the transportation network that have occurred since the 2002 plan. The project team did extensive field verification from confirming sidewalk widths to

reviewing vehicle queuing at particular intersections. The intent of this effort was to gain a strong understanding of the transportation system and to identify the issues and the potential solutions.

Once the City's travel demand model was updated to reflect current conditions, household and employment growth forecasts - as well as assumptions of specific future transportation investments - were added to this model to forecast future traffic conditions for 2030. In forecasting future conditions, the City assumes a SR 520 bridge replacement with two lanes of additional traffic capacity but does not assume changes to the "interchange" location south of the Montlake Bridge. Model assumptions also include a 520 bridge toll and direct access ramps for HOV's. Light rail service is also assumed with three new stations at Husky Stadium, NE 43rd Street/Brooklyn Avenue and NE 65th Street/12th Avenue.

Details on the land use and employment growth forecasts, future transportation investment assumptions, and specific travel model outputs can be found in **Appendix C and G**.

Performance Measures/ Thresholds

Performance measures and thresholds were developed for pedestrians, bicyclists, transit and vehicles. These performance measures were used to evaluate existing problem areas and identify future needs. For each performance measure, an 'acceptable' threshold was defined. Where conditions fell below the threshold they were mapped by mode to highlight problem areas. A more detailed discussion of performance measures and thresholds by each mode is included in **Appendix A**.

Project Proposals

In addition to the detailed performance analyses for each mode, ideas for transportation projects were developed from a variety of sources, including suggestions from stakeholders and past planning efforts. Not all of the ideas the project team considered moved forward to become recommendations; each project was assessed with regards to costs, benefits, feasibility and partnership requirements and opportunities. Projects that were too costly, difficult to implement, or provided too little benefit fell by the wayside. The final set of recommended projects had to meet several criteria:

- Improve mobility, sustainability, safety ,access and choice
- Improve a significant problem that benefits a significant number of users
- Can realistically be implemented within the constraints of available right-of-way, adjacent land uses, and the need for coordination and cooperation with other public and private interests

Project Prioritization

Recommended projects were prioritized depending on how well the project met seven evaluation criteria, consistent with the method used by SDOT to prioritize projects citywide. The criteria are:

- Safety
- Mobility
- Preserving or Maintaining Infrastructure
- Cost Effectiveness or Cost Avoidance
- Supports Comprehensive Plan Urban Village Strategy
- Improving Environment
- Economic Development

Once scored, project staff grouped projects into 4 categories:

- **Low Cost/Early Implementation** projects that may be implemented relatively easily due to modest cost and low levels of complexity.

- **High Priority** projects that address major transportation issues and have a high benefit to the study area, but will require effort to obtain necessary funding & coordination.

- **Medium Priority** projects, that while beneficial to the area's transportation system, may not be able to compete with citywide priorities at this time or may address an anticipated - rather than existing - transportation need.

- **Partnership** projects that require coordination and cooperation with a partner agency. Many of these projects will likely need to be associated with larger actions, such as the SR 520 bridge replacement or improvements to the I-5 corridor, if they are to be implemented.

Identifying Potential Funding

The final step in developing the *Action Strategy* was to identify costs and funding sources that will be available for University Area projects. The project team looked at the amounts and types of funds that may be available citywide between now and 2030 and estimated a range of revenues that could potentially fund University *Action Strategy* project recommendations.

Modes

Modes are the different ways that people and goods travel, including vehicles, freight, transit, bicycling & walking.

The City of Seattle's Comprehensive Plan and Transportation Strategic Plan make it clear in their goals, policies and objectives that the historic emphasis on moving cars (of the at the expense of improving other modes) is over. Today, the goal of Seattle's transportation professionals is to 'move people and goods,' a small but important distinction that recognizes our inability to "build our way out of traffic congestion" without investing in transit and non-motorized transportation.

Creating Balance

Decades of investment focused on maximizing vehicle capacity has created an imbalanced transportation system. By creating incentives for driving at the expense of transportation choices, these investments have put in place artificial barriers for walking, biking, and taking transit. Achieving a balanced transportation system will require a very strong emphasis on removing these barriers over the next several decades. Providing viable alternatives to driving alone is also critical to achieving the goals of the Mayor's Climate Action Plan and the shared vision of Seattle as a sustainable city.

Despite current and expected growth in population and jobs within Seattle, much of the basic street infrastructure is not likely to change very much. The potential for new freeways, highways and major arterials is extremely limited, while widening existing streets is increasingly difficult, expensive, and disruptive to existing neighborhoods and businesses. The City simply will not be able to build its way out of traffic congestion. Therefore, as more Seattle residents, employees, and commerce need to get around town, the City will have to use its public rights-of-way much more efficiently than it has in the past.

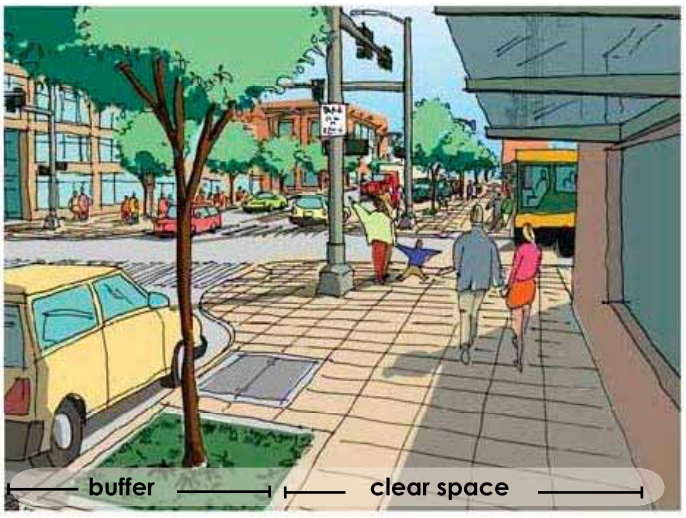
There is a strong and growing desire for people in the city to rethink the ways we live, work and shop. The Comprehensive Plan introduced many new concepts when it was developed well over a decade ago, with many citizens unfamiliar with the concept of "urban villages." Now, many people whose neighborhoods weren't designated as urban villages are asking to become one - a recognition that even single-family areas can be a part of vibrant neighborhoods, places where, when they walk out

the front door, they can run into their neighbors on the sidewalk, walk to the store and access important neighborhood services, or enjoy a great variety of places to go and things to see and do - all conveniently close to home.

Walking

In the University Area, walking is one of the primary ways people get around. **Of those people living in the urban center, more walk to work than drive alone** – 35% vs. 30%. Nearly one in four of all peak period trips to and from the University of Washington are made on foot.

Of the 47 projects recommended in this study, 28 are targeted to improve conditions for people who walk. These projects will widen sidewalks, add trail connections, improve street crossings, increase safety and reduce the wait at signals. Projects range from adding curb bulbs at intersectopms to developing a new trail connection from the University Campus to the Burke-Gilman Trail. Taken together, the projects will improve pedestrian safety, and make walking more convenient and enjoyable for more people.

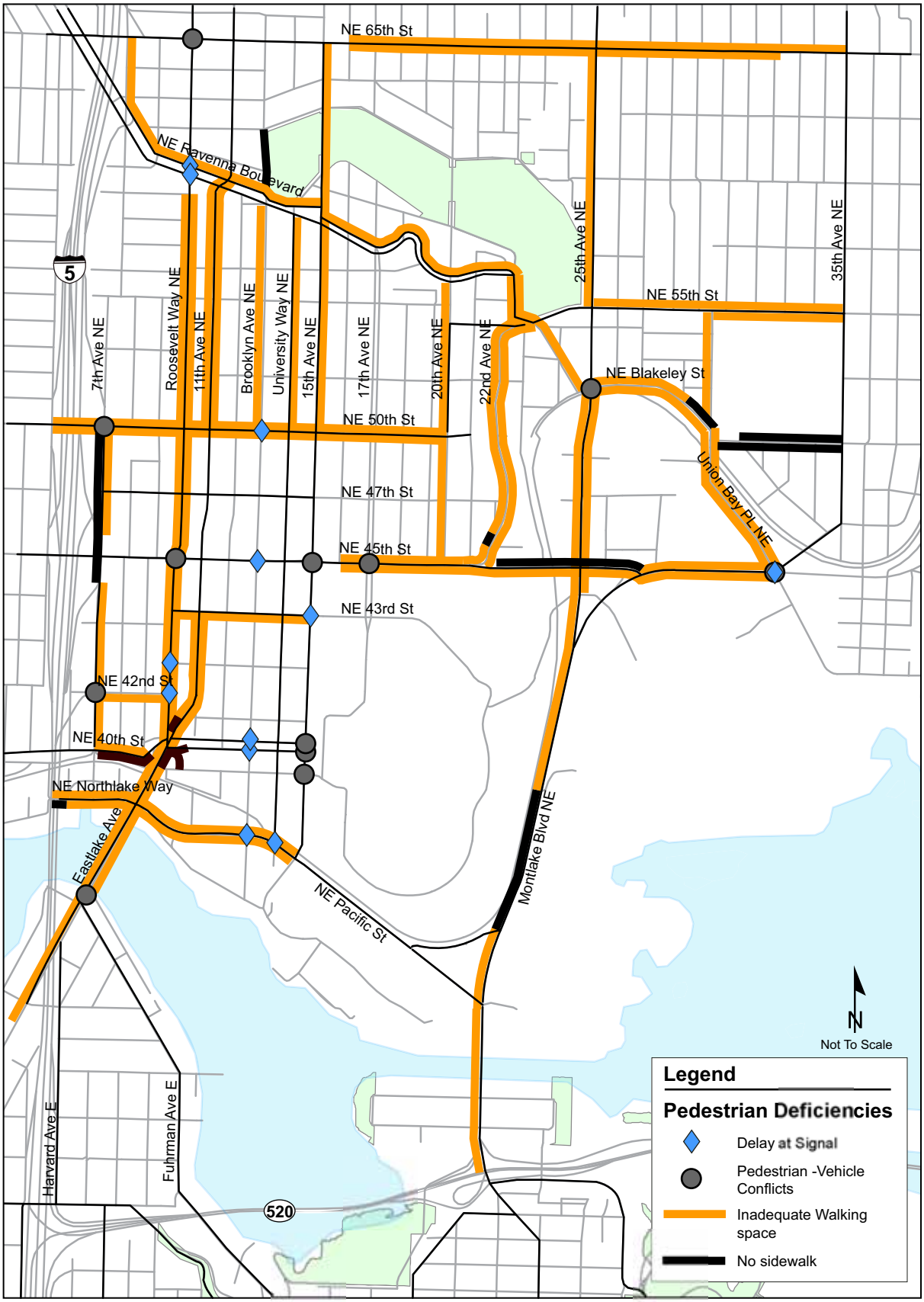


Evaluating walking

This study established a set of performance measures and thresholds for pedestrians including:

- Width of the walking space (clear space)
- Distance between walkers and moving vehicles (buffer space)
- Ease of crossing the street at intersections, including how long people have to wait to cross and how many vehicles make right and left turns across the crosswalk
- Safety (collision history)

Figure 3: Pedestrian Sidewalk Deficiencies (2007)



Based on 5 factors of pedestrian safety and comfort, the University Area Transportation Action Strategy has identified various deficiencies within the pedestrian transportation network, represented above.

Walking conditions today

In general, the University Area has a high-quality environment for pedestrians. Almost all streets have sidewalks on both sides and pedestrian crossings are well marked. Many corridors, such as University Way, have sidewalk widths that are appropriate to the foot traffic they serve. On the other hand, there are places where sidewalks don't meet 'acceptable' thresholds and where crossings could be improved. **Figure 3** shows the areas where pedestrian facilities are not adequate.

Sidewalks and traffic buffers

A good pedestrian environment includes adequate space to walk and pass as well as a separation, or buffer, from moving vehicles. Just as roads have been widened to accommodate more car traffic over the years, now Seattle's sidewalks need to be widened to encourage and serve more pedestrians. The walking space should be clear of objects and be at least six feet wide in order to be accessible, with wider sidewalks in busier areas. The areas occupied by tree pits and street furniture are not counted within the six foot minimum.

The distance between where people walk and moving traffic is the buffer space, which is generally a combination of parked cars and/or planting strips. When parking is not allowed during peak hours on busy streets, removing the parking lane and turning it into a travel lane removes an important safety buffer for pedestrians, which must be balanced against the need for more capacity for vehicles during the peak travel times.

Almost all of the heavily traveled streets in the study area provide adequate clear walking space; most, however, do not have enough buffer space, usually due to a lack of planting strips or limits to on-street parking.

Crossing the street

Delay: Walking should be convenient without unnecessary delays. If, for example, a person walking a mile catches a red light at every intersection, a 15-20 minute walk could easily lengthen into a 30-40 minute walk. Most of the signalized intersections in the study area have complete signal cycles under two minutes, meaning that the light turns green in each direction about once every minute. Where there is a separate signal phase for vehicles turning left, the total cycle time is longer.

Overall, twelve intersections fail to meet acceptable thresholds for pedestrian delay; 5 are on Brooklyn Ave NE - a "Neighborhood Green Street" which has higher expectations for pedestrian comfort, while 4 are located along Roosevelt Way - a major north/south arterial that creates barriers for east/west pedestrian travel. While few opportunities were identified to reduce

pedestrian delay at these locations, the *Action Strategy* used this analysis to help prioritize other pedestrian improvements along these corridors.

Pedestrian-vehicle conflicts: Pedestrians must use care while in a crosswalk to avoid left and right turning vehicles, even with a "walk" signal. "Pedestrian-vehicle conflict" is a measure of the number of vehicles turning across the crosswalk during the time pedestrians have a walk signal. Twelve intersections, located across the study area fail to meet conflict thresholds, which vary based on the type of street.

Safety: Compared to other urban areas in the city, the University Area is a relatively safe place to walk. Crossing the street, however, is still a challenging part of a pedestrian's journey and safety concerns are real. Between 2004 and 2006, 46 pedestrians in the study area were hit by vehicles and one was killed, all while crossing a street. More than half of the collisions (24 out of 46) occurred at busy intersections at the junction of two major roadways. About one in four collisions happened at a mid-block location rather than at an intersection. Three intersections had three collisions each:

- NE 45th St at 11th Ave NE
- NE 45th St at Roosevelt Way NE
- Roosevelt Way NE at NE 65th St

Burke-Gilman Trail

The Burke-Gilman Trail is a major transportation corridor for bicyclists and pedestrians. Volumes are particularly concentrated near the University of Washington, where the trail forms a loop around the east and south edges of the University, allowing access to many parts of the campus. Staircases, pedestrian bridges, and smaller trails connect from campus buildings to the Burke-Gilman Trail.

The evaluation of the Burke-Gilman Trail focused on identifying locations where potential conflicts occur, particularly where the trail crosses a road. Another focus was identifying where there are missing or poor connections between the trail and major destinations. The University of Washington's upcoming Burke-Gilman Trail Plan will take a comprehensive look at trail issues and make specific recommendations for improvements to the trail.

Pedestrian Master Plan

Having completed the Seattle Bicycle Master Plan, SDOT is now in the midst of a Pedestrian Master Plan process, which will define actions to make Seattle the most walkable city in the nation. The plan will use the principles of the "5 E's", Education, Engineering,

Enforcement, Encouragement and Evaluation, to:

- Get more people walking.
- Reduce the number and severity of crashes involving pedestrians.
- Engage all of Seattle in a meaningful dialogue about what is needed to create and connect walkable urban villages with important destinations.

Bicycling

Bicycle use is high throughout the study area with the highest use near the University of Washington campus and on the Burke-Gilman Trail. According to the University, **approximately 4,000 students and staff bicycle to campus**. The City recently completed the Seattle Bicycle Master Plan for the entire city. The project team used the plan's recommendations and added greater detail to key projects for the University Area.

Bicycle features are included in 23 of the recommended projects. These projects add bicycle lanes and sharrows, improve trail crossings, create better connections and increase bicyclist safety.

Evaluating bicycling

A bicyclist is more likely to ride on a street where the rider feels safe. While some experienced riders don't mind "mixing-it-up" with heavy traffic, most bicyclists prefer a street or corridor where traffic volumes and speeds are lower, and/or where space is set aside for bicycles.

The Bicycle Level of Service (BLOS) index measures the comfort level of a street for bicyclists. The BLOS includes daily traffic, speed limits, amount of on-street parking and the number and width of travel lanes. The project team applied the BLOS to each of the bicycle corridors in the study area as designated in the Seattle Bicycle Master Plan. In addition, the project team conducted a safety evaluation based on bicycle-vehicle collisions reported between 2004 and 2006.

Other than the Burke-Gilman Trail and the bicycle lanes on the University Bridge and along Ravenna Blvd NE, there are few dedicated facilities in the study area for bicyclists. While the Bicycle Master Plan will go a long way to bringing these new facilities, a bicycle 'network' that connects to the area's major destinations does not yet exist.

Figure 4 shows the bicycle corridors that fall below the acceptable BLOS, as well as locations where three or more bicycle-vehicle collisions occurred in the last three years.

Figure 4: Bicycle Network Deficiencies (2007)

Based on national Bicycle Level-of-Service (BLOS) methodology, the Action Strategy located deficiencies within the bicycle network for the University Area as designated by the Bicycle Master Plan. Facilities located on the University of Washington campus and on off-street corridors such as the Burke Gilman Trail were not analyzed.

Bicycling conditions today

With the exception of the Burke Gilman Trail, vehicles and bicycles in the University Area generally share the same roadways. Bicyclists generally ride along the edge of the roadway or along the side of a row of parked cars. About half of the study area streets commonly used by bicyclists were rated below the acceptable threshold for street adequacy. The two lowest rated streets are NE 45th Street and NE 50th Street, where there are high levels of bicyclist discomfort and high levels of bicycle-vehicle conflicts.

Street adequacy: Conflicts between vehicles and bicycles can occur where riders need to cross the stream of traffic to make left turns, where off-street pathways cross streets, where the roadway is not wide enough to comfortably accommodate both modes, or where vehicles are moving at a much higher speed than bicyclists.

Safety: City records show a concentration of bicycle-vehicle collisions occur near the intersection of Eastlake Avenue E/Fuhrman Avenue E, near the south end of the University Bridge. These collisions are related to bicyclists moving across traffic lanes to turn left onto Harvard Avenue E. Other high collision locations include the Burke-Gilman Trail crossings near the intersection of NE Pacific Street/University Way NE and at Blakeley Street/25th Avenue NE.

Bicycle Master Plan

The Seattle Bicycle Master Plan has created a vision for the University Area. The plan's major goals are to:

* Increase use of bicycling in Seattle for all trip purposes. Triple the amount of bicycling in Seattle by 2017

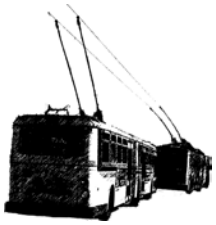
- Improve safety of bicyclists throughout Seattle. Reduce the rate of bicycle crashes by one-third by 2017

To achieve these goals, the Bicycle Master Plan has established a carefully planned set of projects to create a complete bicycle network throughout the city and has established policies to make bicycling more convenient, to promote bicycling and educate bicyclists, and to secure funding to implement the plan.

Figure 5: Bicycle Master Plan - Recommended Facilities

Most of the 2007 Bicycle Master Plan projects are not specifically called out in the Action Strategy: they are assumed to be "implemented" by the Action Strategy's 2030 timeframe. However, the Action Strategy does provide recommendations to refine and/or address unresolved issues and project alternatives identified by the Bicycle Master Plan, as well as other multi-modal projects that provide benefits to bicyclists.

Transit



The University Area enjoys one of the highest levels of transit ridership in the region. King County Metro, Community Transit, Sound Transit and the University of Washington collectively operate 51 transit routes within the area. The University of Washington's U-PASS program, which provides all students, faculty, and staff with a bus pass (unless they actively opt out), has increased ridership on King County Metro routes to the point where U-Pass trips account for nearly percent10% of all of Metro's riders. **Nearly 40% of students and staff commute to the UW campus by bus**.

Evaluating transit

The Seattle Transit Plan establishes five performance measures and benchmarks (or goals) for the Urban Village Transit Network (UVTN) corridors:

- **Frequency**: Every 7 to 15 minutes depending on route
- **Span of Service**: 16 to 24 hours a day
- **Passenger Loading**: Averaged over the day, most passengers should find a seat
- **Reliability**: Trips should be more than 3 minutes late
- **Speed**: On average, busses should travel at greater than 50% of the posted speed limit

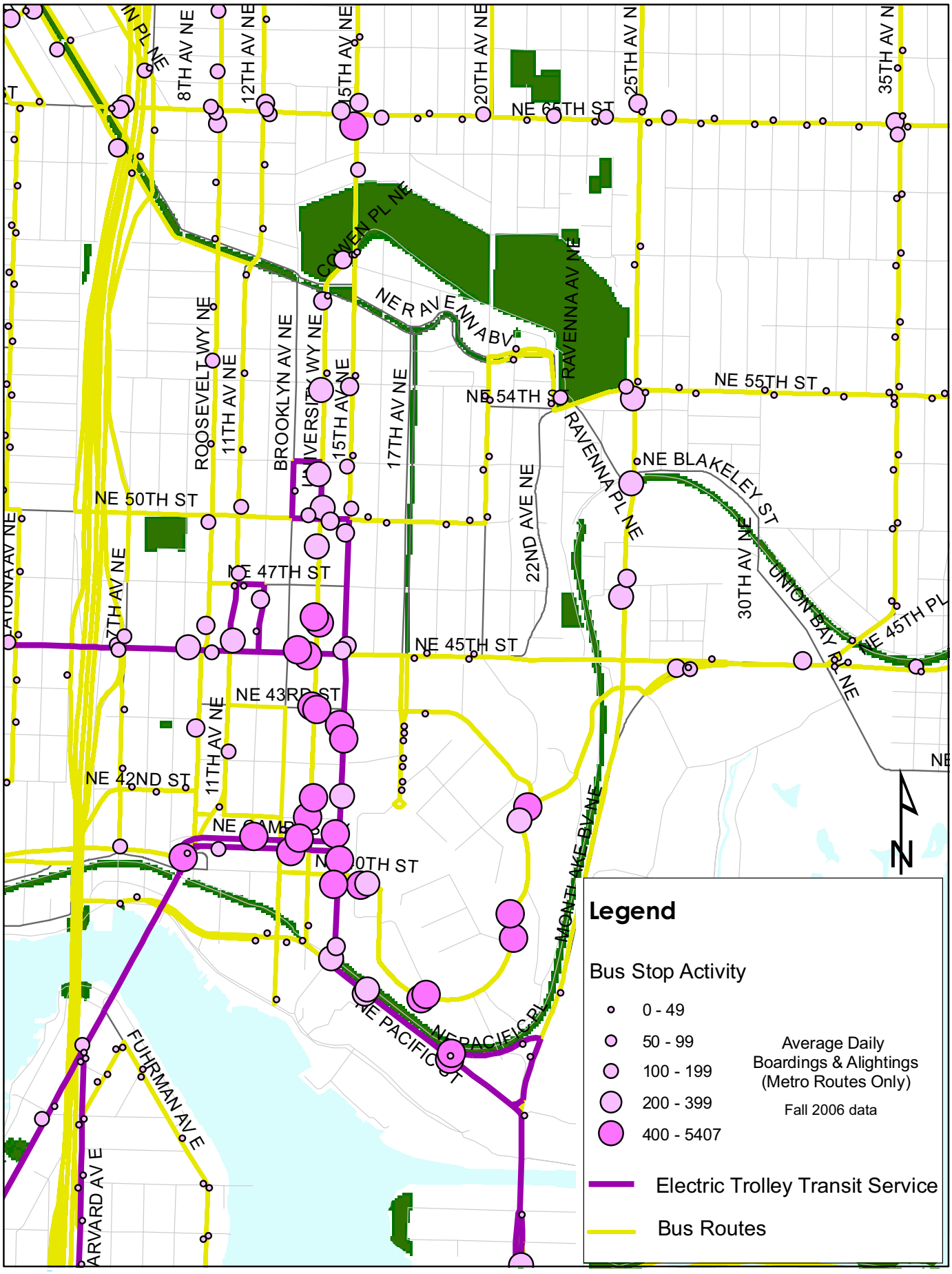
In the University Area, all bus routes currently operate on UVTN corridors. These corridors, which are identified in **Figure 6**, include:

- 15th Avenue NE
- NE Pacific Street
- University Way NE
- Eastlake Avenue
- Roosevelt Way NE
- 11th/12th Avenue NE
- 35th Avenue NE
- NE 65th Street
- NE 42nd Street
- NE Campus Parkway
- Stevens Way and Pend Oreille Rd (University of Washington campus)

Transit conditions today

Meeting the UVTN thresholds requires cooperation between the transit operators and the City. While King County Metro, Community Transit and Sound Transit are responsible for setting service hours and schedules, the ability of the buses to meet speed and reliability thresholds depends significantly on the operating conditions of city streets. Furthermore, when buses are consistently delayed in traffic, it costs more to provide frequent service as each bus takes longer to make a round trip.

Figure 6: Existing Transit Routes and Stop Activity



Speed & Reliability: The project team focused on projects to improve street operating conditions for buses that will improve transit speed and reliability. **Figure 7** show the transit corridors that fail to meet the UVTN travel speed thresholds.

When buses operate mixed with high volumes of traffic, slow speeds, plus delays while waiting to merge back into traffic, slow bus service. When buses stop to drop off and pick up passengers in the traffic lane, it speeds transit but slows other traffic, as drivers must wait behind the bus or create more congestion by changing lanes to avoid the delay.

Three primary transit corridors in the study area, NE 45th Street, NE Pacific Street and 15th Avenue NE, have very low travel speeds for buses. Other corridors with deficient speeds are Roosevelt Way NE and 11th/12th Avenue NE. Montlake Boulevard NE, although a designated UVTN corridor, has only limited transit service, so its very slow travel speeds do not affect many riders.

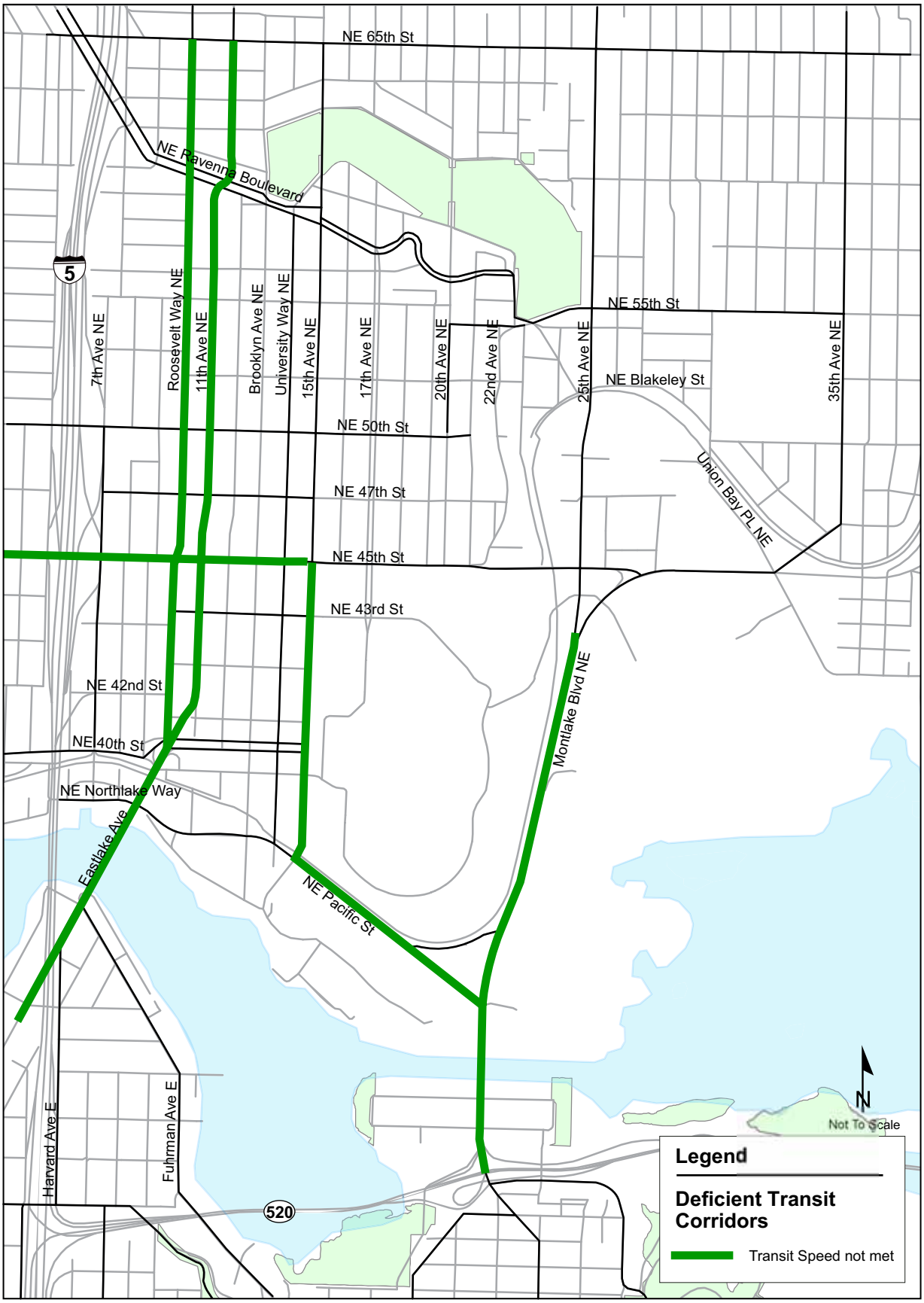
For a passenger waiting for a bus, service reliability is an important factor. To be reliable, buses should arrive within a few minutes of their posted schedule. Reliability issues are normally related traffic conditions, such as traffic congestion and crashes. In many cases, transit agencies will adjust the posted schedule to match anticipated traffic conditions. Of the UVTN corridors in the University area, nine fail to meet the transit reliability threshold. The worst corridor in terms of transit reliability is NE 45th St where traffic congestion and slow travel speeds affect the ability of buses to get to their stop locations on-time.

Future transit conditions

By 2030, the North Link Light Rail extension is expected to be constructed providing frequent, fast, reliable light rail service and the opportunity to reconfigure bus service to bring passengers to and from the three University Area stations. The North Link Final Supplemental EIS estimates a reduction in travel time between the University District and downtown Seattle from 22 minutes (currently by bus) to 8 minutes when light rail operation begins. The FSEIS also projects daily light rail boarding as 3,500 riders at the Roosevelt Station, 11,500 at the Brooklyn Station, and 21,500 at the University of Washington Station.

By 2030, however, without additional improvements, the travel speeds on roadways serving as primary bus transit corridors are projected to operate poorly, with several transit corridors having average travel speeds below 10 mph. These corridors include NE Pacific Street, NE 45th Street, 7th Avenue NE and 15th Avenue NE.

Figure 7: Transit Speed Deficiencies (2007)



The Action Strategy used the speed & reliability performance measures from the Seattle Transit Plan to analyze transit operations in the University Area.

Sound Transit

Preliminary design for the underground platform level at Husky Stadium Station.

Central Link

The first phase of development for Sound Transit's light rail system (Link) is set to begin operation from Sea-Tac airport to Westlake Station in 2009. As part of this first phase, there will be no major changes to transit (bus) routes operated by King County Metro in the greater University Area.

University Link

The second phase of Link light rail will bring service to the southern portion of the University Area, with new underground stations on Capitol Hill (Broadway between John St and Denny St) and at Husky Stadium (Montlake Blvd and Pacific St). Construction is set to begin in 2008 with the beginning of service expected in 2016.

Sound Transit 2

An extension of light rail north of Husky Stadium Station (North Link) has been planned as part of a larger "Sound Transit 2" package, which would include expanded light rail, Bus Rapid Transit (BRT), 'Sounder' commuter rail, and limited streetcar investment in some areas.

In November 2007, a proposal from Sound Transit to fund 'Sound Transit 2' was defeated as part of a larger regional transportation ballot measure known as the "Roads & Transit" package. While Sound Transit officials and planners are expected to reduce the level of investment as originally envisioned in Sound Transit 2, there is every indication that whatever plan comes forward will include expanding light rail service through the University Area, with stations at Brooklyn Ave in the University District and near 65th Ave in the Roosevelt neighborhood. The *Action Strategy* assumes these light rail connections will be in place by the 2030 timeframe, with optimistic projections having service reach these areas as early as 2018.

Vehicles

Nineteen projects recommended in this plan are targeted primarily to drivers. Of these, fifteen are designed to help speed traffic and reduce delays, while four focus on safety.

The analysis of conditions for vehicles typically measures and evaluates traffic during the worst hour of the day which is normally during the evening commute (the "peak" period). During the PM peak hour, 4,900 vehicles travel on Montlake Boulevard NE; 3,200 vehicles cross the University Bridge; and 2,300 travel on NE Pacific Street. In addition to the daily congestion associated with peak travel, traffic is also particularly heavy during events such as football games and festivals.

Evaluating vehicles

There is a long-established methodology for the evaluation of vehicle traffic conditions. Traffic vehicle counts, signal timing and phasing, percentages of truck and bus traffic are all inputs into computer models which calculate the Level of Service (LOS) for arterials and at individual intersections. These LOS measures allow traffic engineers to identify existing problems and show what the effects would be of investing in roadway improvements. In addition to LOS, the project team also evaluated vehicle collisions between 2004 and 2006.

Vehicle conditions today

Along a few of the corridors in the University Area, traffic can be congested and slow-moving for many hours each day, although on others traffic moves smoothly off-peak and acceptably in the peak. Much of the congestion in the area is related to vehicles traveling to and from I-5 and SR 520. Congestion on these regional facilities can also worsen University Area traffic by backing up traffic onto city streets and diverting trips onto arterials. In the University Area, as elsewhere in the city, topography and water have limited the ability to construct a simple grid system of evenly spaced arterials, placing more burdens on those streets that do connect across longer distances. In addition to Lake Washington, the Ship Canal, Lake Union and various small gulches, the University of Washington campus limits through routes to the edges of the campus. I-5 also creates an additional barrier, with widely spaced overpasses which tend to funnel all through traffic.

Figure 8 shows the roads and intersections that fall below an acceptable LOS threshold during the evening peak hour and the locations where high numbers of vehicle collisions have occurred.

Freight Corridors: The NE Northlake Way – NE Pacific Street – Montlake Bridge Corridor is the only designated Major Truck Street in the University Area. Major Truck Streets serve as primary routes

for transporting goods within the City's street system. Freight movements along this corridor are largely related to maritime industries located along the north shore of Lake Union and in Ballard. During peak hours, this is a highly congested corridor with eastbound movements on NE Pacific Street operating at 6 mph.

Safety: Intersection collisions within the University Area are well below the average compared to other areas in the City. During 2004-06, no intersections had more than five annual collisions, suggesting that slower travel speeds may reduce the number of collisions. Mid-block collisions between intersections, however, were higher than the 5 per year threshold and are a concern. Three mid-block locations along Montlake Boulevard and two locations along NE 45th Street had five or more collisions per year.

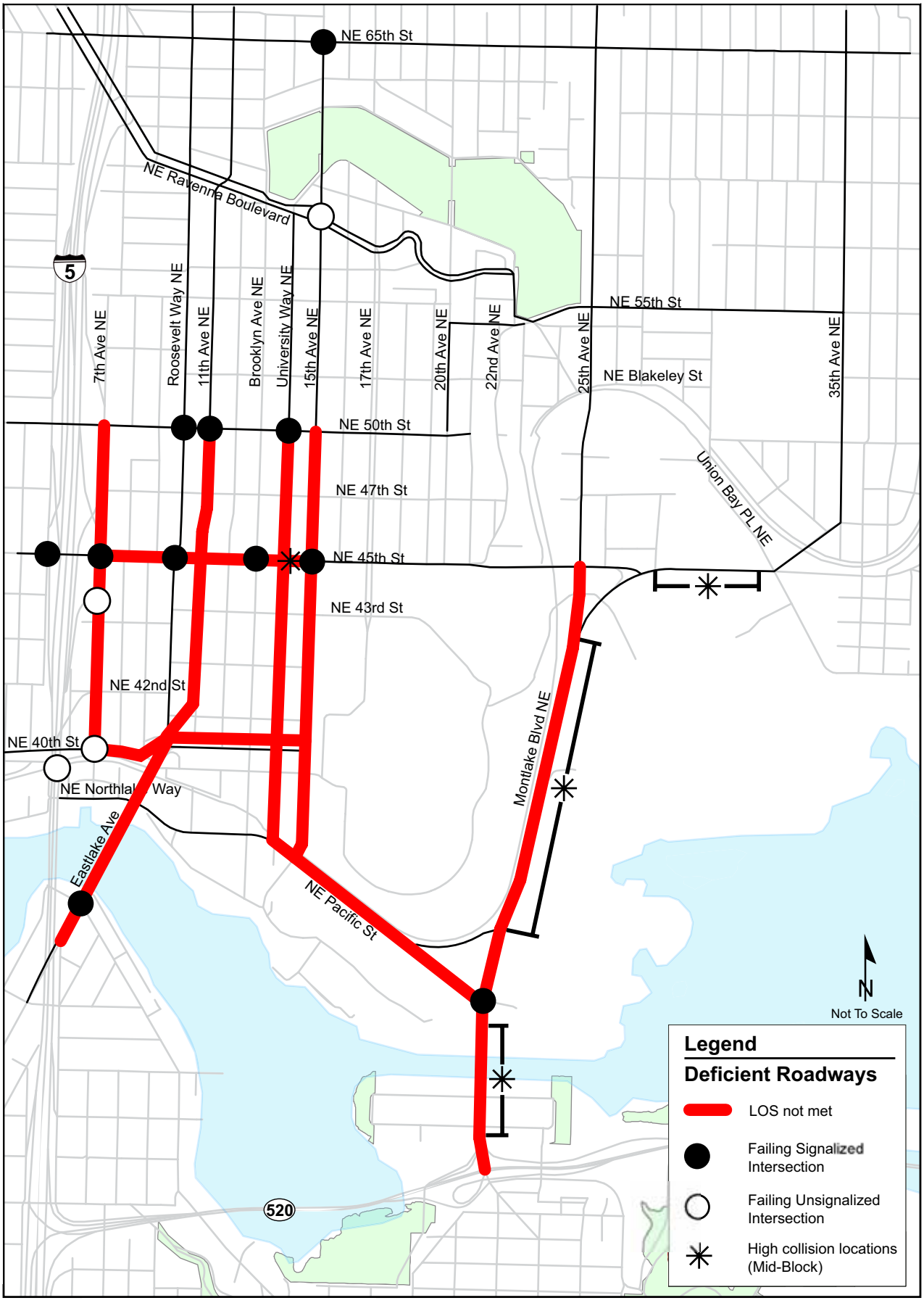
Travel Speeds: Congestion and pedestrian activity both contribute to relatively slow speeds on many streets within the study area. Montlake Boulevard in the southbound direction is the worst performing arterial with peak hour travel speeds averaging 3 mph – just under the average walking speed. In total, seven corridors operate below 10 mph in one or both directions during the evening peak hour:

- Montlake Boulevard from NE 45th Street to SR 520
- NE 40th Street from 15th Avenue NE to 7th Avenue NE
- NE Pacific St from University Way NE to Montlake Blvd
- University Way NE from NE Pacific Street to NE 50th St
- 7th Avenue NE from NE 40th Street to NE 45th St
- NE 45th Street from 7th Avenue NE to 15th Ave NE.
- 15th Avenue from NE 50th Street to NE Pacific St

Even during peak periods, 25th Avenue NE, 35th Avenue NE, NE Northlake Way and the sections of NE 45th Street east of 15th Avenue maintain an average travel speed of above 20 mph.

Intersections: Intersection operations and system-wide traffic congestion are strongly related. As the amount of traffic at an intersection increases, it becomes more difficult for an intersection to handle the traffic, to the point where the intersection "breaks down." When an intersection fails, drivers experience long delays, often waiting through two or three complete signal cycles. Impatient drivers may cut through adjacent residential areas creating neighborhood concerns. The analysis included all signalized intersections and unsignalized intersections where two arterial roadways meet. Some of the findings from the analysis of intersection operations are:

Figure 8: Vehicles Deficiencies (2007)



- Fifteen of the intersections studied operate below acceptable performance thresholds
- Five of the eight signals on NE 45th Street operate below the thresholds.
- During the PM peak hour, the all-way stop controlled intersections at NE 40th Street/7th Avenue NE and NE 40th Street/6th Avenue NE operate below thresholds
- Three out of the eight signals on NE 50th Street operate below thresholds
- The worst intersections include the signals at the I-5 ramps on NE 45th Street, Roosevelt Way/NE 45th St and the signal at NE Pacific St/Montlake Blvd NE

Future Vehicle Conditions

By using the City's traffic forecasting model, we can look ahead at future traffic conditions in 2030. The model includes changes in land use and employment and assumes Link light rail is operating and the SR 520 bridge replacement project is complete. Figure _-_ shows the University Area deficiencies in 2030.

Intersection Operations

Traffic will continue to grow within the University Area, particularly on streets that parallel corridors that operate below acceptable levels. In addition to the seven poor-performing corridors today, two additional corridors, NE Northlake Way and NE 50th St, are forecast to operate below the 10 mph threshold by 2030.

Traffic growth will continue to put pressure on intersection operations. The 2030 analysis shows nine new locations that are likely to operate below acceptable thresholds during the PM peak hour. Findings include:

- Along NE 45th St, the intersections at Union Bay Place/Mary Gates Memorial Drive and Montlake Boulevard NE will likely operate below thresholds.
- Brooklyn Ave NE will likely experience traffic growth, with deficient intersections at NE 50th St, NE 45th St, NE 43rd Street and Campus Parkway.
- Intersections at the junctions of heavily traveled streets such as NE Pacific St/15th Ave NE and NE 65th St/25th Ave NE will likely fall below thresholds.