# The Seattle Department of Transportation Madison Street Corridor BRT Study Purpose and Need





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#### Seattle Madison Corridor Bus Rapid Transit – Purpose and Need

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# **Executive Summary**

#### **Project Purpose**

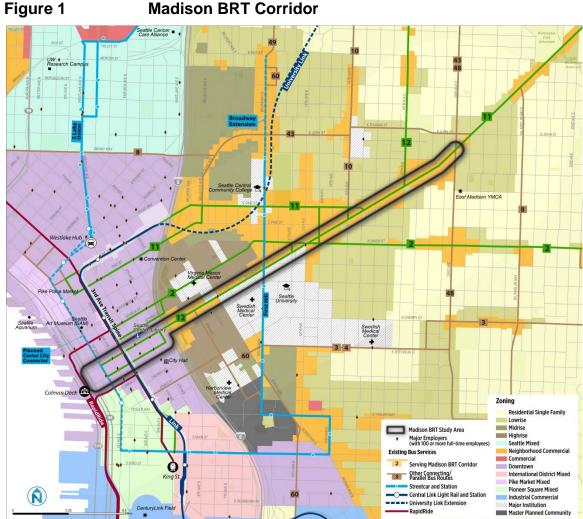
The Madison Street Bus Rapid Transit (BRT) corridor is one of five High Capacity Transit (HCT) corridors identified for priority implementation in the City of Seattle's 2012 Transit Master Plan (TMP). The purpose of the Madison BRT project is to improve transit capacity, travel time, reliability, connectivity, comfort, visibility and legibility in the Madison corridor, while also making related improvements to pedestrian and bicycle access as well as the streetscape and public realm. In so doing, the project would improve overall mobility in a dense and rapidly developing corridor that spans diverse neighborhood districts from Center City to First Hill, Capitol Hill, the Central District, and east of the study area to the Madison Valley and Madison Park. Figure 1 on the following page illustrates the study area.

#### **Project Need**

The Madison BRT project is based on the following needs:

- Residents, employees, visitors, students, and shoppers all need frequent, reliable transit service. Bus service can be slow, unreliable and crowded during peak hours, and service could be more frequent.
- People using transit in the corridor need to make east-west connections to major transit hubs. Madison BRT would connect Colman Dock, RapidRide, Link, Downtown transit corridors, and the First Hill Streetcar, helping to form a network of frequent, high-capacity transit.
- Intensifying land use necessitates a robust multi-modal transportation network for the Madison corridor. The Madison corridor connects Downtown Seattle with dense and growing mixed-use neighborhoods. Large-scale infill development is occurring throughout the corridor and more is expected. The transit network and supporting non-motorized facilities are needed to accommodate this growth.
- Pedestrian and bicycle improvements are needed to support the transit network and improve safety and comfort. Pedestrian and bicycle volumes are high and growing, and the Pedestrian and Bicycle Master Plans identify needed improvements to support these modes.

- Public realm improvements would help support the transit investment, livability, and economic development. The corridor could be made a more pleasant place to spend time by adding more green space, places to sit, and more comfortable and attractive bus stops.
- Affordable access is needed to Center City jobs and the health, social services and educational facilities on First Hill. Higher-quality transit service could ensure that employees, patients, visitors, students and staff have an affordable and convenient travel option.
- Greenhouse Gas (GhG) emissions are on the rise. Seattle's Climate Action Plan relies on high-capacity transit in major corridors, including Madison, to meet targets.



Madison BRT Corridor

# **Purpose and Need**

The Madison Corridor Bus Rapid Transit Project Definition Study will evaluate a range of arterial-based bus rapid transit improvements in the Madison corridor between the waterfront and 23<sup>rd</sup> Avenue. This document describes the purpose and need for the project. The study is planned to take approximately 12 months and will result in a recommended project alternative developed to the 10% design level.

The process will include extensive input from the public, stakeholders and policymakers. Public input on the proposed statement of purpose and need was gathered at the first public open house on September 30, 2014. This input will be incorporated into the final purpose and need, and will inform the evaluation criteria used in the analysis of corridor alternatives.

#### **Corridor Description**

As defined for this study, the Madison corridor extends from the waterfront – defined as between Alaskan Way, adjacent to the Colman Dock Washington State Ferries Terminal, and First Avenue – east-by-northeast to 23<sup>rd</sup> Avenue East. The study area includes Madison itself as well as adjacent segments of other streets, including both cross streets as well as parallel streets in Center City and First Hill. The conceptual BRT alignment shown in the TMP includes a one-way couplet of Madison (westbound) and Marion (eastbound) streets in the Center City, connected by First Avenue and 6<sup>th</sup> Avenue to form a counterclockwise loop at the alignment's western end. BRT service could potentially extend east of 23<sup>rd</sup> Avenue, to Martin Luther King Jr. Way or farther, or service may branch in two or more directions.

Madison is unique among Seattle streets in two key ways. First, it is the only street in the Center City grid to continue east without changing direction, at an angle diagonal to the grid that exists in the rest of the city from Broadway east to Lake Washington. Second, Madison is the only street to extend from Elliot Bay east to Lake Washington. For both reasons, Madison is a major east-west route, connecting relatively low-density residential and neighborhood retail areas in the east (Madison Park and Madison Valley) to denser, more mixed-use districts in its central segments (the Central District, Capitol Hill and First Hill) and the office towers of Center City to the west. Between Broadway, where the grids transition, and  $22^{nd}$  Avenue, where Madison turns due northeast, the street is oriented 32 degrees counterclockwise of east-west, resulting in a series of uniquely configured, complex intersections.

The street is also characterized by steep grades, primarily in its westernmost segment between the waterfront and the summit of First Hill, through Center City. Several regional medical centers are located atop First Hill, including Virginia Mason Hospital and Swedish Medical Center along Madison, and the campus of Seattle University is on the east side of the hill. It is the steep grades in this segment that precluded consideration of a rail alternative as part of this study. In all, Madison Street runs 3.7 miles from the shore of Lake Washington, just east of 43<sup>rd</sup> Avenue, to the Alaskan Way just north of the Washington State Ferries terminal at Colman Dock. Along the way, it connects to major north-south and east-west streets including Martin Luther King Jr., 23<sup>rd</sup> Avenue, 15<sup>th</sup> Avenue, Union Street, 12<sup>th</sup> Avenue, Broadway, Boren Avenue, and Center City avenues from Sixth downhill to First. Similarly, transit service operating on Madison is able to connect to a number of routes running both north-south and east-west, including Route 2 on Union and Route 48 on 23<sup>rd</sup> Avenue, or, alternately, to branch off of Madison onto north-south or east-west streets, as both Routes 11 and 12 currently do.

This configuration of streets and transit routes is reflected in the demand for travel within the corridor and between the corridor and Center City described in the previous section. It is also reflected in existing traffic and transit ridership figures. Madison is classified by the City as a Principal Arterial. Its current configuration provides up to four through travel lanes, plus turn lanes. One-way AM peak-hour traffic volumes reach approximately 1,800 vehicles/hour westbound in the segment crossing I-5. Average weekday ridership on Route 12, was 4,110 as of 2011.

#### Existing and Planned/Funded Transit in the Corridor

Figure 2 on the following page shows existing, under construction and approved transit services and facilities in the corridor.

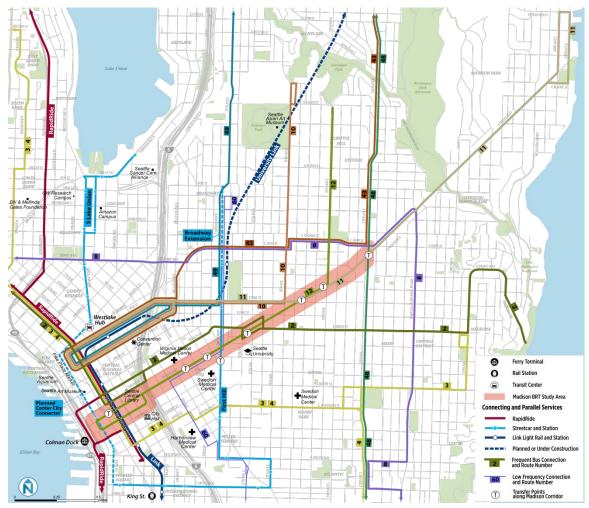
Service within the corridor is provided by a combination of routes:

- Route 12. The most frequent service operating on Madison, Route 12 makes a counterclockwise loop of Madison, 1<sup>st</sup> Avenue, Marion and 6<sup>th</sup> Avenue in Center City before proceeding out Madison to 19<sup>th</sup> Ave, from which point it continues north to Galer Street and Interlaken Park. It operates as often as every five minutes during peak periods, with a mid-day weekday base headway of 15 minutes. It operates seven days a week from approximately 6 a.m. to 11 p.m.
- Route 11. While Route 12 operates on western segments of Madison, Route 11 operates on its eastern segments. At its western end, it makes a counterclockwise loop of Pine, 2<sup>nd</sup> Ave, Pike and Bellevue Ave before proceeding on Pine to Madison and out Madison to the Madison Park neighborhood, where it makes a counterclockwise loop of Blaine Street, 43<sup>rd</sup> Avenue, McGilvra Street and 42<sup>nd</sup> Avenue. Routes 11 and 12 overlap and share stops on Madison between 16<sup>th</sup> and 19<sup>th</sup> Avenues. Route 11 generally operates every 15 minutes on weekdays, with a period of 30-minute frequencies in the mid-day. It operates seven days a week over a longer span than Route 12, until almost 2 a.m. on weeknights.
- Route 2. Route 2 operates on only a short segment of Madison, eastbound between 11<sup>th</sup> and 12<sup>th</sup> avenues and westbound between 13<sup>th</sup> and 12<sup>th</sup> avenues, in the "bowtie" area around the intersection of Madison and Union Street. However, it closely parallels western segments of Madison, operating on Seneca Street westbound and Spring Street eastbound between 3<sup>rd</sup> Avenue and Hubbell Street, just east of Interstate 5, and on Seneca, then Union on First Hill. East of Madison, it continues on Union to 34<sup>th</sup> Avenue, then on Denny Way and Madrona Drive to Lake Washington Boulevard and Madrona Park. In the west, it continues as Route 13 from Center City to Queen Anne. Route 2's east-of-Center City segment generally operates every 15 minutes weekdays, and the service runs until approximately 1 a.m. seven days a week.
- Route 60. Route 60 operates north-south from Capitol Hill to Georgetown, and on Madison between 9<sup>th</sup> Avenue and Broadway. It generally operates every 20 minutes weekdays. It also runs seven days a week, until around midnight on weekdays and 8 p.m. on weekends.

In addition to existing King County Metro bus service along the corridor, a number of major transit connections exist, are under construction or are planned within the corridor. These are described in greater detail later in this document, but include:

- The existing Washington State Ferries terminal at Colman Dock (Pier 52) and adjacent water taxi terminal at Pier 50.
- The future Center City Connector streetcar line at First Avenue.
- The existing RapidRide C, D and E lines operated by King County Metro, which stop on and adjacent to Third Avenue.
- Existing King County Metro, Sound Transit, and Community Transit (Snohomish County) bus routes operating north-south on Second, Third Fourth and Fifth Avenues.
- The existing Downtown Seattle Transit Tunnel (DSTT) below Third Avenue, which is used by Sound Transit's Link light rail as well as express bus routes.
- The First Hill Streetcar line, which will open in 2015 along Broadway.
- Planned priority bus corridors along 12<sup>th</sup> and 23<sup>rd</sup> Avenues.

Figure 2 Existing Transit in the Madison BRT Corridor



#### Policy Background and Framework

High-quality, high-capacity transit service in Seattle's busiest corridors is essential if the City is to maintain a high quality of life for residents, workers and visitors; if it is to remain competitive in the global economy; and if it is to achieve its ambitious goals for ecological sustainability, social equity, and public health.

Seattle has developed a series of transportation planning documents in support of these aims. They will inform this project and include the following:

- Seattle Comprehensive Plan. The Seattle Comprehensive Plan (2005) identifies an Urban Village Strategy to promote job and housing growth in concentrated centers that can be efficiently accessed and connected by a multimodal transportation system, including high-quality, frequent transit. A major update to the Seattle Comprehensive Plan is underway and elements of the Plan will be updated incrementally through 2015. A new "Transit Communities" subsection of the plan calls for the City to "leverage local and regional transit investments by aligning and coordinating land use policies and public investment to foster the development of strong residential and business communities oriented around transit."
- Transit Master Plan (2012) and Seattle Transit Plan (2005). The Transit Master Plan (TMP) identified five corridors as priorities for major investments in high-capacity transit, as well as additional priority bus corridors. The TMP identified Madison (described as "Capitol Hill-Downtown-Waterfront") as one of three corridors "that have immediate potential and deserve further study and investment." The 2012 TMP supplanted the 2005 Seattle Transit Plan, which was developed to support the creation of transit connections between urban villages. This concept, referred to as the Urban Village Transit Network (UVTN), stated that high quality transit service and future development should be concentrated along travel corridors that meet criteria including high ridership and productivity potential.
- Action Agenda. SDOT's 2012 Action Agenda outlines policies and actions oriented around five core principles: (1) Keeping it Safe, (2) Focusing on the Basics, (3) Building Healthy Communities, (4) Supporting a Thriving Economy, and (5) Providing Great Service. Of particular relevance to the Madison BRT project, the Action Agenda includes policies to:
  - Maximize the environmental benefits of the transportation system
  - Increase mobility and access for everyone
  - Make transit the efficient, affordable choice for a variety of trips
  - Increase efficient and affordable access to jobs and education
  - Support Center City and neighborhood business district access
- Seattle Jobs Plan. The Seattle Jobs Plan for 2013 has four organizing themes: Innovate, Educate, Build, and Partner. Of particular relevance to the Madison BRT

project, the plan calls for connecting "Seattle's neighborhoods with high capacity transit, to provide residents and businesses with affordable, reliable ways to get around our city.

- Climate Action Plan. Seattle's 2012 Climate Action Plan develops a Carbon Neutral Scenario for the city, consisting of strategies that would reduce greenhouse has (GhG) emissions by 90 percent by 2050 relative to 2008 levels. Within the transportation sector, this scenario assumes a 30 percent reduction in travel by lightduty vehicles (cars and light trucks)<sup>1</sup> by 2030 and a 40 percent reduction by 2050. It targets expansion of transit infrastructure and service sufficient to increase transit's share of passenger miles from 8 percent today to 25 percent by 2050 (a level achieved in cities such as San Francisco). The plan also notes that denser urban development can help facilitate achievement of travel reduction strategies and the carbon neutral goal.
- Bicycle Master Plan. Adopted this spring, the Seattle Bicycle Master Plan articulates
  a vision and goals for bicycling in the city and maps out a Citywide Network of
  routes with accompanying Local Connectors. It also identifies facility types ranging
  from off-street trails to protected bicycle lanes and neighborhood greenways. While
  Madison itself is not part of the Citywide network, protected lanes are recommended
  on Seneca and Spring in the Center City and Union in the Central Area, and Marion
  and University on First Hill are designated as neighborhood greenways.
- Pedestrian Master Plan. The Seattle Pedestrian Master Plan includes policies, programs, design criteria and projects to further pedestrian safety, comfort and access. Based on data assessment, the plan identifies High Priority along the Roadway and High Priority Crossing the Roadway locations for improvement. The latter includes many locations within the Madison corridor, including three intersections in the Center City (Alaskan Way, Second and Fourth avenues) and three to the east of I-5 (Boren, Broadway Court and 12<sup>th</sup> Avenue/Union). Additionally, much of the corridor west of 15<sup>th</sup> Avenue is within a Tier 1 High Priority Area for improvements.
- Seattle Race and Social Justice Initiative (RSJI). The RSJI is a social equity initiative, a multifaceted program to combat racism. Among other platforms, it includes strengthened City contracting requirements for women- and racial minority-owned businesses, updated community-based neighborhood plans in Southeast Seattle, and a Neighborhood Matching Fund grand program targeted at social justice-related efforts.

<sup>&</sup>lt;sup>1</sup> As defined by the National Highway Traffic Safety Administration, light-duty vehicles include minivans, sport utility vehicles, and trucks with gross vehicle weight less than 8,500 pounds.

#### Project Need Background

The Madison BRT project is based on the following needs:

#### Improve Transit Service

Existing transit service in the Madison corridor is provided primarily by King County Metro Routes 2, 11, and 12 (as well as a short segment of Route 60). These routes can be slow, unreliable and crowded during peak periods.

Based on data collected between June 2013 to May 2014, on-time performance on all three routes is below the Metro goal of 80 percent schedule adherence (based on a standard of between one minute early and five minutes late at timepoints). On-time performance is lowest on Route 11, with only 68 percent of trips on time, and 30 percent of trips late. Route 2 also has a high percentage of late trips, with nearly a quarter (24 percent) of trips running late. On-time performance is highest on Route 12, with 78 percent of trips on time. These data are illustrated in Figure 3.

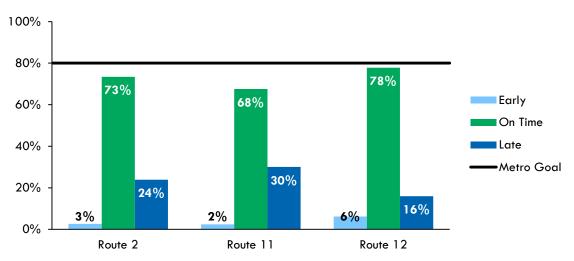


Figure 3 On-Time Performance: Routes 2, 11, 12

Transit in the corridor is also not currently time-competitive with driving. As shown in Figure 4 on the following page, travel time on Madison is up to 68 percent slower by bus than by car. Based on data collected in January 2013, travel by bus is least time-competitive eastbound in the morning and afternoon peak periods (7-9 a.m. and 5-7 p.m.). With the exception of the westbound direction in the afternoon peak, auto travel times from Madison &  $2^{nd}$  Avenue to Madison &  $23^{rd}$  Avenue are generally about 10 minutes, while transit travel time ranges from 14 to 18 minutes. Both auto and transit travel times are roughly 15 minutes westbound in the afternoon peak.

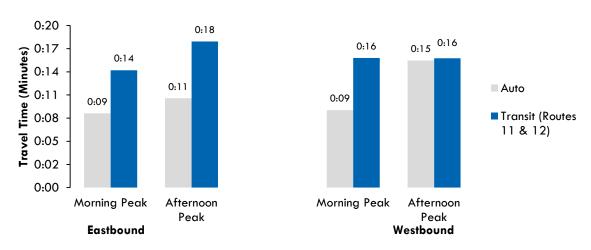
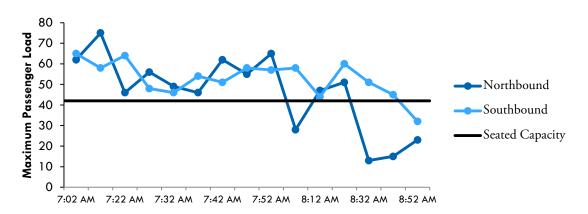


Figure 4 Transit and Auto Travel Times

Finally, Madison buses are often overcrowded. Figure 5 shows maximum loads observed on Route 12 in January 2013 during the morning peak period (7-9 a.m.), when crowding is most severe. From 7-8 a.m., maximum loads on all trips northbound (eastbound on Madison) and southbound (westbound) exceed the seated capacity of the bus. Additionally, there is strong demand for transit capacity in both directions at peak hours, as opposed to being limited to downtown-oriented ridership.

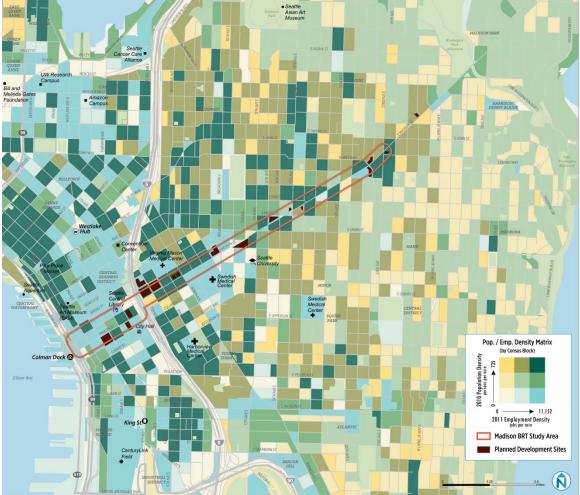




### Serve Growing Demand

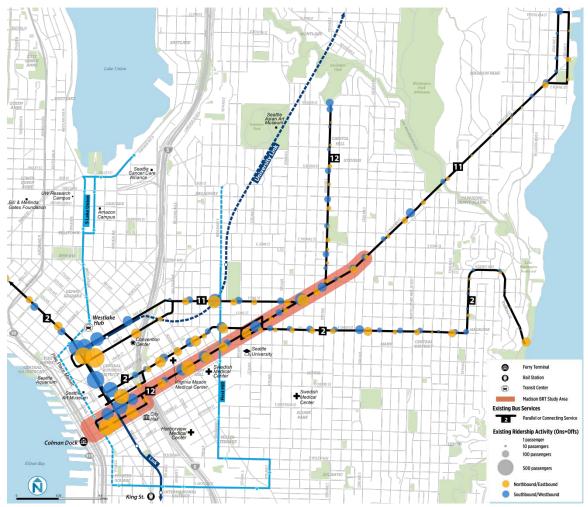
Nearly 30 percent of Seattle's jobs and 10 percent of the city's population are within one-half mile of Madison, a total of 130,000 jobs and 50,000 residents. By 2035, the area within a half-mile of Madison is projected to have 60,000 more jobs (a 46 percent increase) and 20,000 additional residents (a 40 percent increase). Existing (2010) population and employment density and planned development sites in the corridor are shown in Figure 6 below.

Figure 6 2010 Population and Employment Density and Planned Development Sites



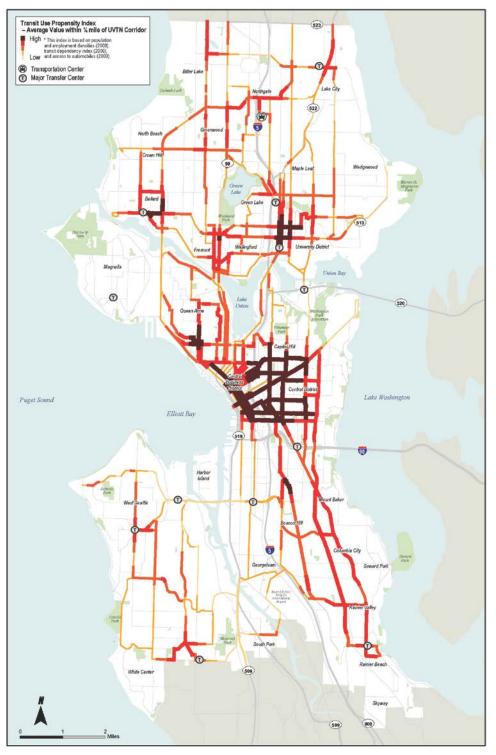
Existing population and employment densities in the corridor result in high demand for travel by transit and other modes. Currently, more than 30,000 people a day board buses at stops within one-half mile of Madison, including boardings on King County Metro routes 2, 3, 4, 8, 9, 10, 11, 12, 43, 48, 49, and 60). Figure 7 shows ridership on Routes 2, 11, and 12.

Figure 7 Ridership by Route: Routes 2, 11, 12



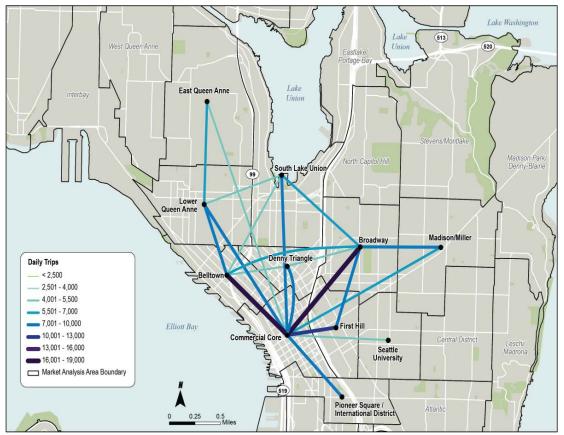
Ridership on existing transit services may not be indicative of the potential market for transit in the corridor. For the Transit Master Plan, travel market analysis was conducted using a Transit Use Propensity (TUP) Index factoring in strong indicators of demand for transit service including population and employment densities as well a "transit dependency index" accounting for low-income households, persons with disabilities, seniors, and access to automobiles. Resulting scores were then mapped in a variety of ways. Figure 8 on the following page, excerpted from the TMP Briefing Book, shows average values within onequarter mile of Urban Village Transit Network corridors, including Madison. As the figure illustrates, there is an area of the highest possible value for transit use propensity extending from Center City east and northeast to First Hill, the Central District and Capitol Hill, with Madison at its center.

# Figure 8 Transit Use Propensity by Urban Village Transit Network Segment (2008)



Additional analysis of travel between Local Market Analysis Areas (MAA's) was conducted using the Seattle Travel Demand Model. This analysis, part of which is illustrated in Figure 9 below, found that demand for travel by all modes between the "Commercial Core" and First Hill MAAs is greater than for all other origin-and-destination pairs in the greater Center City area except Commercial Core-Belltown and Commercial Core-Broadway (Capitol Hill). Commercial Core-"Madison/Miller" is also a relatively strong travel market.





According to U.S. Census data, between July 1, 2012 and July 1, 2013, Seattle was the fastest-growing major city in America, with a population increase of 2.8 percent, and between July 1, 2010 and July 1, 2013, it added more than 42,000 new residents. Much of this growth has been occurring in central neighborhoods, and one of the greatest community concerns identified through the stakeholder outreach process was the pace of recent development – or, more specifically, that investments in transportation infrastructure were not keeping pace with development. Interviewees were most concerned about traffic impacts, followed by parking (as many developments include no or only limited on-site parking). In both cases, the root concern was the impact of additional automobile use on existing residents, employees and visitors. Transit was viewed positively in part because it was seen as a means of ameliorating these impacts.

#### **Provide Transit Connections**

The Madison corridor, which is generally oriented east-west, intersects with a series of important existing, under construction and planned north-south transit corridors. From west to east, these include:

- The Washington State Ferries terminal at Colman Dock (Pier 52) and adjacent water taxi terminal at Pier 50.
- The Center City Connector, a streetcar line planned to connect the existing South Lake Union and under-construction First Hill streetcar lines, primarily via First Avenue. Approved by City Council in July 2014, the Connector will primarily operate in exclusive transit-only lanes. The Seattle Streetcar network is a partnership of the city, Sound Transit, which is a partner in planning for the system, and King County Metro, which operates the service under contract. The Connector's planned northbound platform between Madison and Marion could be co-located with or adjacent to the western BRT terminal.
- The RapidRide C, D and E Lines operated by King County Metro, which stop on or adjacent to Third Avenue. RapidRide is a BRT service, but one designed as a lighter version of BRT than is envisioned for Madison, operating primarily in mixed-traffic in downtown Seattle. The C Line runs to West Seattle, while D Line runs to Ballard and E Line operates via Aurora Avenue North to Shoreline.
- King County Metro, Sound Transit, and Community Transit (Snohomish County) bus routes operating north-south on Second, Third Fourth and Fifth Avenues. These include local routes as well as regional express services oriented toward commuters. The Third Avenue Transit Corridor is used by more than 2,500 buses per day.
- The Downtown Seattle Transit Tunnel (DSTT) below Third Avenue, which is used by Sound Transit's Link light rail as well as Seattle and regional express bus routes. The closest entrance to University Street Station is two blocks north of Madison, while the closest entrances to Pioneer Square Station are three blocks south of Marion. Starting in 2016, Link light rail, which currently runs south to Seattle-Tacoma International Airport, will continue north to the University of Washington, and it is planned to be extended to Northgate by 2020.
- The First Hill Streetcar line, which will open soon along Broadway. The line will connect to the under-construction Capitol Hill Link Light Rail Station at its northern end and to the Chinatown-International District Station, King Street Station (serving Amtrak and Sound Transit Sounder commuter rail) and Pioneer Square at its southern end.
- Priority bus corridors along 12<sup>th</sup> and 23<sup>rd</sup> Avenues. Metro does not currently operate service on 12<sup>th</sup> Avenue. However, Route 48 runs as often as every 10 minutes on 23<sup>rd</sup> Avenue, providing connections between the 85<sup>th</sup> Street corridor in the north, the University District, and the Mt. Baker neighborhood in the south. In both corridors,

a series of improvements are planned, including transit signal priority, improvements to stops, and queue jump lanes.

Each of these connections increases the utility of both connecting routes and of the larger network of which they are a part. As the only east-west High-Capacity Transit corridor planned in the city of Seattle, and as the only major east-west transit corridor planned in the city north of the East Link light rail project in the Interstate 90 (I-90) corridor, Madison is of particular importance to the emerging local and regional trunk transit systems. Of special note, it will provide direct "first and last mile" connections between the Ferry Terminal, DSTT and First Hill, supplementing the First Hill streetcar, which will connect Link and First Hill from the south.

#### Improve Mobility for Cyclists and Pedestrians

In addition to its importance for transit, the corridor serves as a key east-west link for cyclists and pedestrians. High volumes of non-motorized traffic use portions of the Madison corridor. Peak-hour bicycle and pedestrian volumes at the intersection of Madison and 12<sup>th</sup> Avenue are depicted in Figure 10. For several of the count periods, the combined volume of bicyclists and pedestrians during the afternoon peak hour (5-6 p.m.) was over 2,000.

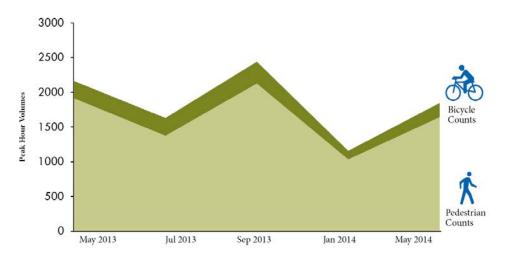
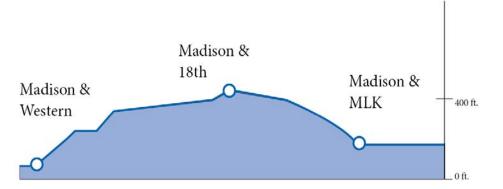


Figure 10 Peak Hour Bicycle and Pedestrian Counts at 12<sup>th</sup> and Madison

In the western segments, grades are steep, and in much of the corridor sidewalks are constrained. Between Western Avenue near the waterfront and Terry Avenue at the summit of First Hill, a distance of roughly three-fifths of a mile, Madison ascends at an average grade of nearly 10 percent (greater on some blocks). It is this grade that has precluded consideration of rail service in the corridor. For pedestrians and cyclists, the grade can act as a deterrent to travel. In other cases, those who might otherwise walk or bike choose to take transit instead, at least in the uphill direction. Grades on Madison are depicted diagrammatically in Figure 11 on the following page.

#### Figure 11 Grades on Madison



While sidewalks on Madison and Marion in Center City are relatively wide, sidewalks to the east of I-5 are generally just 10 feet across or less, and their condition varies. Where landscaping, transit infrastructure and other street furniture occupies the outer portion of the sidewalk, and where the "door zone" of buildings adjacent to the sidewalk occupies the inner portion, the available "through space" for pedestrians is limited to a few feet.

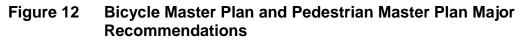
Additionally, east of Broadway where Madison intersects both north-south and east-west streets at an angle – and particularly between Broadway and 22<sup>nd</sup> Avenue where it intersects them at an angle of 32 degrees counterclockwise from east-west – there is a series of complex intersections, some with as many as six legs. Six-legged intersections require signal cycles with additional phases, extending wait times to cross for motorists as well as transit riders, bicyclists and pedestrians. Complex intersections, particularly those with configurations that are especially unique, can also be confusing to users and thus unusually dangerous. This problem is compounded where motorists can make a relatively unencumbered "soft" right turn of less than 90 degrees, rather than a standard right-angle turn requiring them to nearly come to a stop (depending on the radius). Notable complex intersections along Madison include the intersections with 12<sup>th</sup> Avenue and Union, 14<sup>th</sup> Avenue and Pike, and 24<sup>th</sup> and E. John.

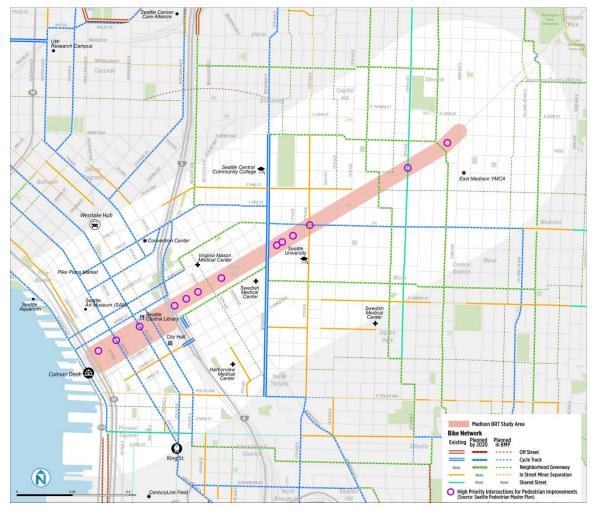
Pedestrian comfort and safety along the segment of Madison from First Hill east were major concerns raised by community members during the stakeholder interview process. To a somewhat lesser extent, commenters expressed concern with conditions for cyclists in the corridor. For both pedestrians and cyclists, the grades in the corridor are substantial enough to discourage walking and biking in certain sections.

As previously noted, the recently adopted Seattle Bicycle Master Plan recommends implementation of protected bicycle lanes on Seneca and Spring in the Center City and Union in the Central Area, and Marion and University on First Hill are designated as neighborhood greenways. This project will consider the potential for these and additional improvements in the corridor. As was also previously noted, the Seattle Pedestrian Master Plan identifies a half-dozen High Priority Crossing the Roadway locations for improvements to pedestrian infrastructure in the corridor, including three intersections in the Center City (Alaskan Way, Second and Fourth Avenues) and three to the east (Boren, Broadway Court and 12<sup>th</sup> Avenue/Union).

Additionally, much of the corridor west of 15<sup>th</sup> Avenue is within a Tier 1 High Priority Area for improvements.

Key recommendations from the Bicycle and Pedestrian Master Plans are illustrated in Figure 12.





#### Improve the Streetscape

East of Center City, parts of Madison are perceived by some as unattractive, with limited public space, and the street can act as a barrier between neighborhoods to the north and south.

A number of the stakeholders interviewed expressed this concern. In particular, Madison from First Hill to 23<sup>rd</sup> Avenue is perceived to suffer from a lack of street trees. Additionally, many of the building facades on First Hill consist of vacant retail spaces or "institutional" blank walls. Finally, the roadway itself is viewed by some as a "speedway" that acts as a barrier east of First Hill between Capitol Hill and the Central District.

From west to east, the land use and urban design context in the corridor can be briefly described as follows:

- Center City. Adjacent land uses downtown are primarily commercial, including large office towers. Sidewalks on Madison and Marion in this segment are moderate in size, with a fair number of street trees, and diagonal parking on one side of the street serves as a buffer from traffic, contributing to a sense of safety for pedestrians. The steep grades leading from the waterfront to First Hill are a challenge for pedestrians.
- First Hill. The steep grades leading up from the waterfront continue to the summit of First Hill, ending at Terry Avenue. In this segment, uses are mixed commercial and residential, and the scale is more human, a mixture of mid- and low-rise buildings. There are regular street trees, although the sidewalks are relatively narrow, and the pedestrian through zone is very narrow where there are trees. On the summit of First Hill and headed east toward Broadway, institutional uses (primarily Swedish Medical Center) line the south side of Madison and commercial uses are on the north side. There are up to two lanes of traffic each way during peak periods through this segment and extending to the east, with curbside parking in places. The Department of Planning and Development, SDOT and Seattle Parks and Recreation are currently partnering on the First Hill Public Realm Action Plan, an effort to improve streetscapes, open and recreational spaces and pedestrian conditions in the neighborhood. Key streets will be identified for development of Street Concept Plans, which will then be adopted as part of the City's Right of Way Improvement Manual.
- Capitol Hill/Central District. East of Broadway, the environment transitions, with Seattle University and the Silver Cloud Hotel as mid-rise development, transitioning to low-rise and mixed commercial and residential, with some surface parking fronting the street. Sidewalks are relatively narrow, and although there are trees and furniture, there is more room for pedestrians to pass than on First Hill. There is a small park, McGilvra Place Park, at 15<sup>th</sup> Avenue and Pike Street. The complex, irregularly configured intersections in this segment can be confusing to all users of

#### Madison Corridor BRT Study | Purpose and Need Statement City of Seattle

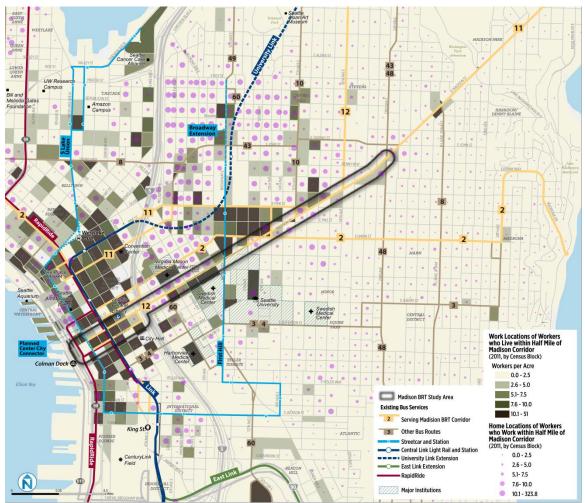
the street, and require pedestrians to make "multi-leg" crossings. At 19<sup>th</sup> Avenue East, the Seattle Parks Department is working with the community to identify construction funding for the Cayton Corner Park.

#### Affordable Connections to Jobs and Services

In addition to traditional office employment, there are growing numbers of service jobs in the Center City. Additionally, visitors and employees of the hospital and university campuses on First Hill rely heavily on public transportation, as do residents of senior housing.

As was noted earlier, nearly 30 percent of Seattle's jobs, or 130,000 jobs, are within one-half mile of Madison, and by 2035 another 60,000 jobs are projected to be added. Forty-four percent of residents in the Madison corridor (within one-half mile of Madison) also work in the corridor. Furthermore, 46 percent of workers in the corridor are low- or medium-income. For low- and medium-income employees, workplace locations for corridor residents and home locations of corridor employees are shown in Figure 13.

#### Figure 13 Home and Workplace Locations of Low- and Medium-Income Employees



In addition to the jobs they provide, the major institutions on First Hill – within the corridor, Virginia Mason Hospital, Swedish Medical Center, and Seattle University – are major destinations for patients, guests, and students. As of fall 2012, total enrollment at

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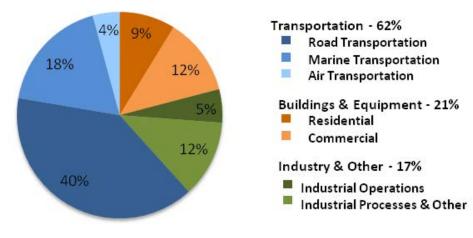
Seattle University was 6,519, while according to data collected by U.S. News & World Report, Swedish had 32,389 admissions and Virginia Mason had 16,539 admissions in the most recent years for which data were available.

#### Reduce Greenhouse Gas Emissions

To meet its goals for GhG reduction, the City of Seattle needs to create an environment that will promote long-term sustainable growth, with development patterns that are less automobile-oriented and more supportive of its environmental goals. In 2013, Seattle adopted an updated Climate Action Plan with a goal of reducing vehicle miles traveled (VMTs) 20 percent between 2008 and 2030.

To achieve its aggressive goals, Seattle will need to invest in an efficient public transportation system that connects key residential and employment areas to encourage residents and visitors to travel by transit. As of 2008, approximately 40 percent of Seattle's greenhouse gas emissions came from road-related transportation sources, as shown in Figure 14 below. Transportation is the only sector in Seattle for which GhG emissions have increased, now roughly 7 percent above 1990 levels. Specific transportation actions recommended in the Climate Action Plan, developed through a Transportation Advisory Group and Green Ribbon Committee process, include providing higher capacity transit to support dense mixed-use neighborhoods. Analysis conducted for the Transit Master Plan found that bus rapid transit on Madison should reduce GHG emissions by 247 metric tons of carbon dioxide equivalent per year over a 2009 baseline.





Source: City of Seattle 2008 Greenhouse Gas Inventory