MADISON EAST-WEST BRT PLANNING STUDY

Purpose and Need Report

FINAL

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Prepared for:

City of Madison

Prepared by:

AECOM

REVISIONS

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Overview

The Madison East-West Bus Rapid Transit (BRT) Planning Study is a 12-month study led by the City of Madison in coordination with Metro Transit and the Madison Area Transportation Planning Board (TPB).

The project will identify and evaluate a transit investment alternative for implementation within the study corridor (Figure 1), which runs from East Towne Mall to West Towne Mall, through the Isthmus. The corridor is approximately 15 miles long.

This study expands on previous planning work to identify a locally-preferred transit investment alternative that meets the needs set forth in this document. At a high level, these needs include providing safe, efficient, and expanded levels of mobility within the increasingly busy study corridor and to improve connectivity between the corridor and employment centers.

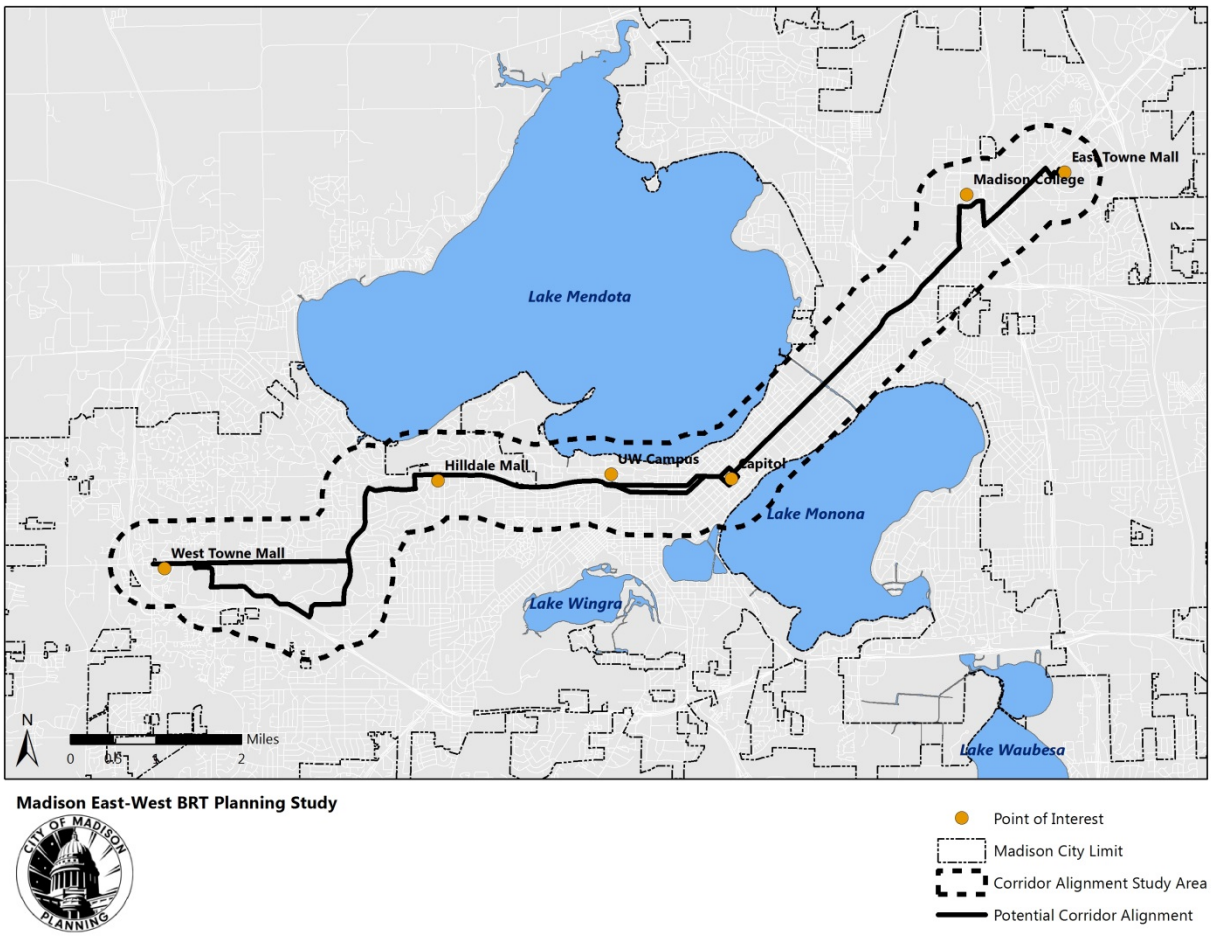
Following a multi-phase, iterative alternative development and evaluation process that is supported by extensive public engagement activities, the City of Madison will recommend the locally preferred alternative (LPA) to the Common Council for adoption. The LPA will be the transit investment alternative that best meets the purpose of and need for the project (as defined in this report) and is competitive for funding through the Federal Transit Administration (FTA) Small Starts capital funding program.

The study is scheduled for completion in fall 2019.

Corridor Context and Description

The proposed BRT corridor runs from approximately East Towne Mall on the east side of Madison, to West Towne Mall on the west side of Madison, running through the Isthmus and the University of Wisconsin (UW) campus (Figure 1). Two options on the west side will be analyzed as part of this study: running BRT on Mineral Point Road or Odana Road. One of these will be selected as part of the LPA.

Figure 1. Madison East-West BRT Corridor



Summary of Project Purpose and Need

Purpose

The purpose of the Madison East-West BRT Planning Study is to identify and implement the optimal transit investment strategy that will accommodate the anticipated growth in travel demand and increased ridership within the corridor, support mobility options that match emerging demographic trends and preferences, leverage the existing transportation infrastructure to improve connectivity within the corridor, and encourage sustainable development patterns that reduce reliance on single-occupant motor vehicles.

Need

- **Improve travel times throughout the corridor.** The high level of transit demand is straining capacity, which is reducing operational efficiency and resulting in schedule slippage and bus stacking. Further, the 2015 On-Board Survey identified overcrowding on buses as a top concern from riders. Existing and future rider demand can be accommodated by investing in the capacity of the transit system.

- **Provide higher and more regular service levels connecting all neighborhoods to services and employment.** Equity is a top priority of City leaders and any investment in transit should serve those who have the greatest need, including low-income populations and transit-dependent individuals and households. Transit should provide efficient connections to jobs and centers of employment.
- **Provide service that meets the needs of everyone, particularly Millennials and Seniors.** Madison is relatively young, but the number of people between the ages of 60 to 64 has doubled between 2000 and 2015.[1] In 2014, the median age of Madison residents was 30.8; which contrasts to the median age of Wisconsin residents at 39.2[2]. Since 2000, Madison has seen significant increases in the number of 20 to 34 years old and 50 to 64 year olds. Even though the number of people between ages 60 and 64 has doubled since 2000, the large increase in millennials has driven down the city's median age. Academic research and industry experience has found that both of these demographic groups are increasingly choosing transit for either lifestyle/environmental/economic reasons (millennials) or mobility reasons (senior citizens).
- **Accommodate increased travel demand to and from existing and planned developments, services, jobs and destinations through multi-modal transportation investments.** Approximately 120,000 motor vehicles pass through the Isthmus on an average weekday.[3] As the residential population in the corridor and commuting employees into the corridor continues to grow, the added demand will strain the capacity of the streets through downtown that are physically constrained by the lakes, therefore it is not feasible to add additional travel lanes. Providing high capacity BRT will more efficiently and quickly move people through the most congested area of the city and will better meet future demands for travel.
- **Madison has demonstrated a commitment to sustainable growth strategies in their adopted plans and policies.** The *Imagine Madison*, *Madison In Motion,* and *Regional Transportation Plan 2050* (RTP 2050) plans call for a transportation system that accommodates transportation needs and demands while mitigating congestion, promoting air quality, and supporting affordable housing goals, sustainability and energy conservation. Transit service also plays a critical role in increasing access to services. High-capacity transit system investment that leverages existing transportation facilities while reducing reliance on single-occupant motor vehicles will be necessary to achieve these goals.

These needs, outlined above, describe why investment in high-capacity transit is necessary in this corridor. The following sections provide the data to support these statements and outline why BRT is a sound investment for the City of Madison.

[1] https://imaginemadisonwi.com/sites/imaginemadisonwi.com/files/document/pdf/City%20Snapshot.pdf.
[2] Ibid.
[3] Ibid.

Project Need #1: Improve travel times throughout the corridor.

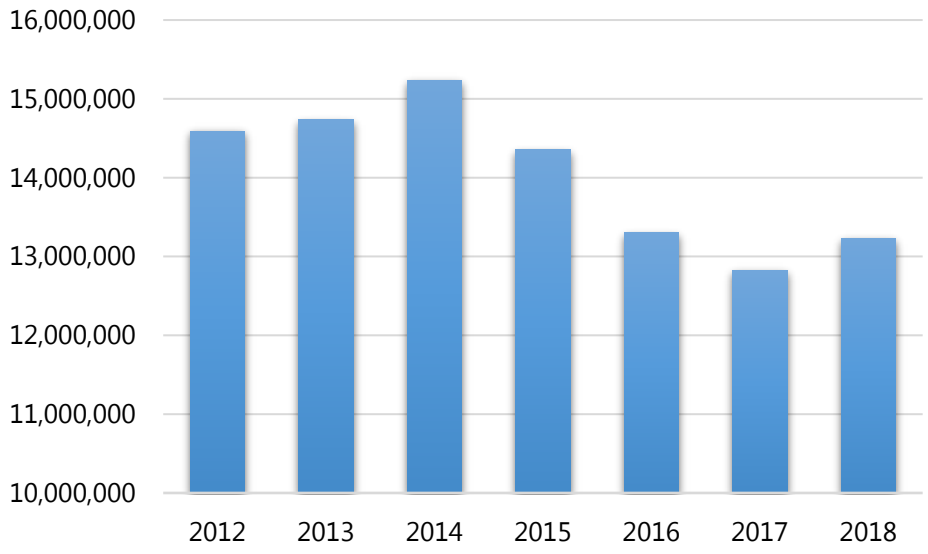
The high level of transit demand in the corridor is straining capacity, which is reducing operational efficiency and resulting in schedule slippage and bus stacking. Further, the 2015 On-Board Survey identified overcrowding on buses as a top concern from riders. Existing and future rider demand can be accommodated by investing in the capacity of the transit system.

Ridership

The City of Madison and Metro Transit completed an on-board survey in spring 2015. The top complaint from riders was crowding on buses; nearly half of the respondents thought that crowding was a problem. This concern was followed by cleanliness of buses (which is associated with crowding) and length of wait times (likely due to insufficient bus frequency). Implementing BRT service would ease crowding concerns and lead to better on-time performance.

Ridership for Metro Transit peaked in 2014, with slight declines between 2015-2017 and an increase in 2018 (Figure 2). However, the Metro Transit system is still operating near capacity. The strain on capacity is leading to slower travel times and crowded buses.

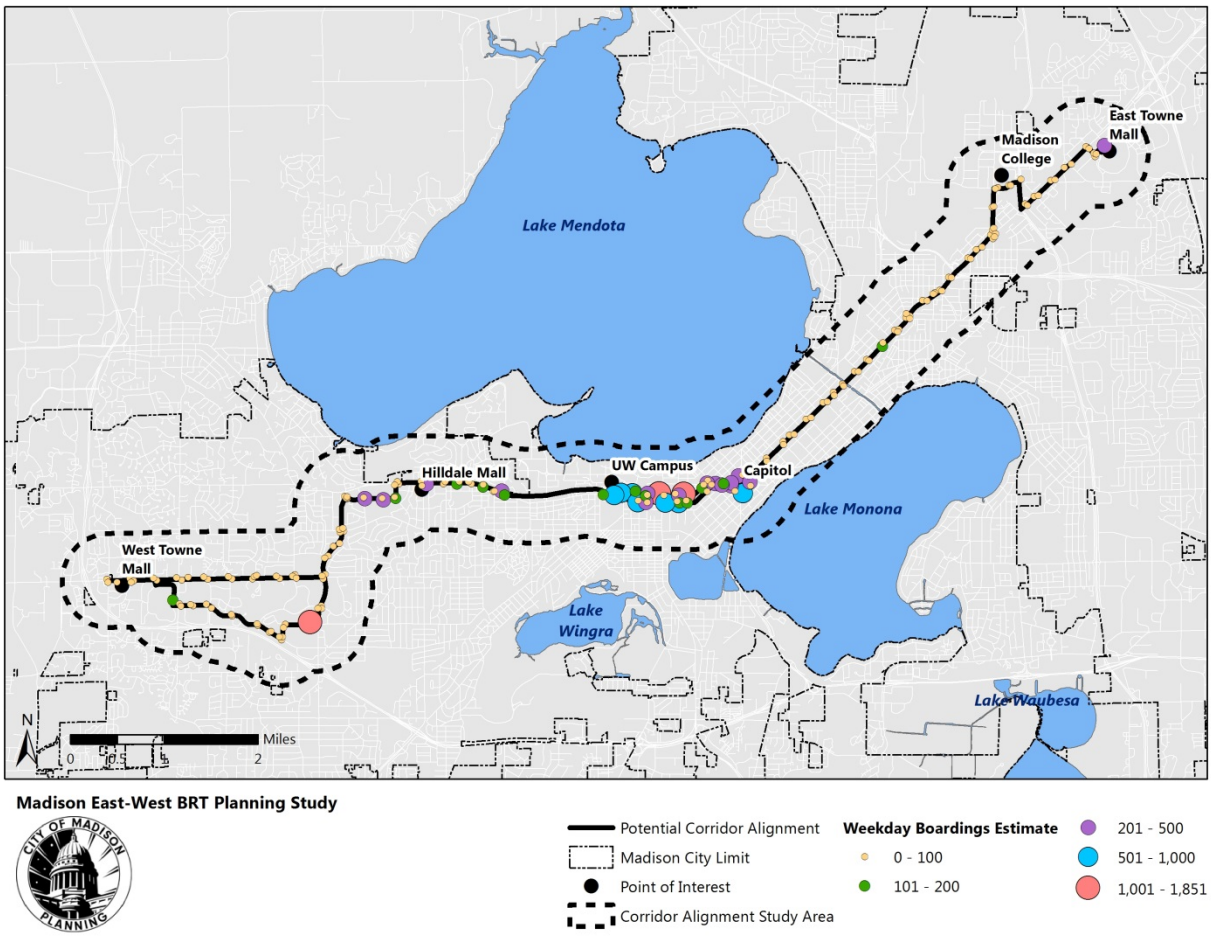
Figure 2. Metro Transit Annual Ridership, 2012–2018



Source: Metro Transit.

There are an estimated 20,000 boardings on the bus stops that are currently on the proposed BRT alignment. There are an additional 21,000 boardings within a half-mile of the alignment (Figure 3). This volume of ridership indicates the high level of demand for transit within the corridor.

Figure 3. Boarding Estimate on Existing Corridor Bus Stops



Source: Metro Transit.

The RTP 2050 discusses the impact BRT will have on the planned transit network. With the implementation of BRT and other planned improvements, the number of average weekday boardings on the system is projected to more than double from around 41,000 to 91,000 by 2050 with assumed growth, while the number of trips (excluding transfers) is projected to grow 80 percent to 74,000. The larger increase in boardings compared to trips is due to the increased transfer rate with the BRT system and additional peripheral routes. The BRT system average daily ridership is projected at 26,300, or 29 percent of the system total.

Transit Options Need to be Competitive with Driving and Ridesourcing

Alternative options to taking transit, including driving and ridesource services, are typically faster than taking transit, though they are generally more expensive. Transit should provide a competitive alternative to driving by offering service that is fast, reliable, and cost-effective.

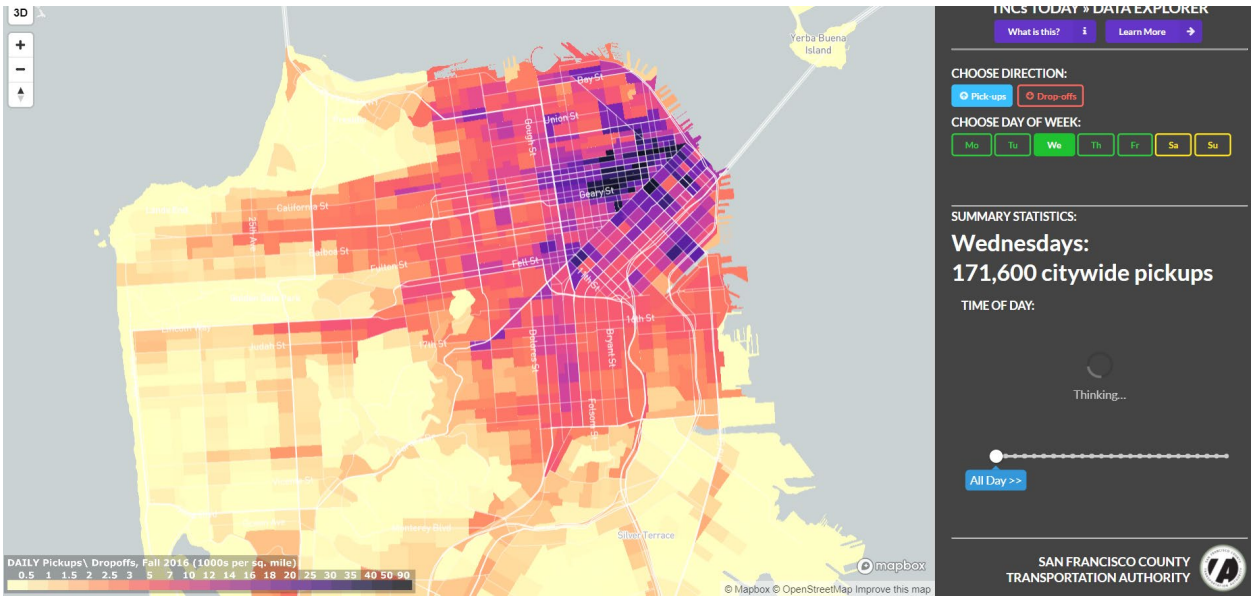
Ridesource/Transportation Network Companies

Some transit users have alternative options to taking transit, including driving and ridesource/transportation network companies (TNC), like Uber and Lyft. Transit needs to be competitive with driving and TNC services in terms of travel times and convenience.

Data from TNC services are limited as most are not publicly available. Some data and research from cities like Seattle, Boston, and San Francisco provide information to understand the broad picture of how TNCs could be impacting transit ridership. A 2017 study from University of California Davis found that TNCs attract passengers away from transit, biking, and walking and that the net effect was an overall reduction in public transit use.[4]

San Francisco estimates the number of daily TNC pick-ups and drop-offs. For example, on a typical weekday, there are 170,000 pick-ups (Figure 4). These trips are concentrated in the densest and most congested part of the city. The average weekday ridership for Muni, San Francisco's transit system, is approximately 700,000.

Figure 4. San Francisco TNC Map



Source: San Francisco County Transportation Authority, https://tncstoday.sfcta.org/.

Seattle recently found that Uber and Lyft provide more than 91,000 rides on an average day.[5] However, in Seattle, TNCs have not undermined transit; public transit ridership has continued to grow simultaneously with TNC growth. This is likely because of the significant local investments in bus service and light rail.

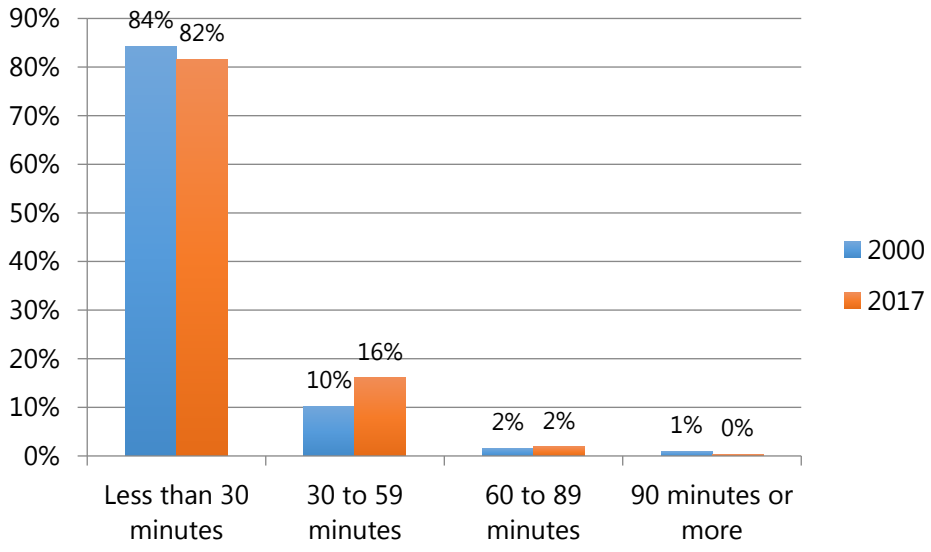
While no data are available for TNCs in Madison, the decrease in ridership starting in 2014 is consistent with the rise in popularity of TNCs. Seattle is a positive example of the importance of investing in transit to compete with and complement ridesourcing.

[4] https://steps.ucdavis.edu/new-research-ride-hailing-impacts-travel-behavior/.
[5] https://www.seattletimes.com/seattle-news/transportation/how-popular-are-uber-and-lyft-in-seattle-ridership-numbers-kept-secret-until-recently-give-us-a-clue/.

Commuting Times

Within a half-mile around the alignment, there are approximately 52,400 workers. The Census defines workers as anyone in the workforce who is at least 16 years old. Of these workers, over 42,000 (82 percent) have less than a 30-minute commute (Figure 5). The percentage of workers who have a 30 to 59 minute commute has increased since 2000, increasing from 10 percent of workers to 16 percent. This likely reflects the increased congestion on the roadways in the corridor and strain on capacity of the transit system.

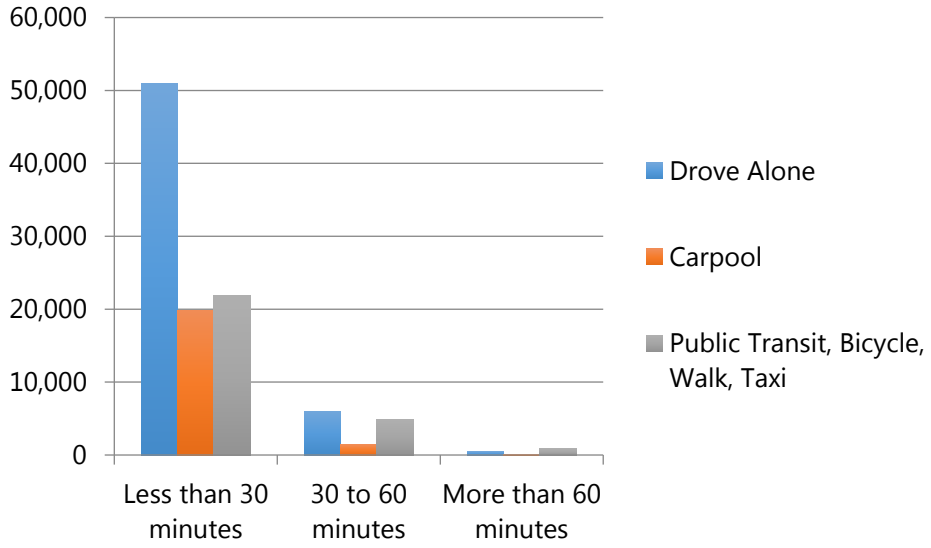
Figure 5. Corridor Workers Commute Time



Source: U.S. Census 2000 and American Community Survey, 2013-2017.

Within the City of Madison, most workers who had a commute of 30 minutes or less chose to drive, while the rest are evenly split between carpooling and public transit/bicycling/walking. For commutes longer than 30 minutes, about an equal number of workers chose to either drive alone or take transit/bicycle/walk, (Figure 6).

Figure 6. Transportation Times by Mode for the City of Madison



Source: U.S. Census Bureau, American Community Survey 2006-2010 Five-year estimates. Special Tabulation: Census Transportation Planning.

Time and Cost Savings

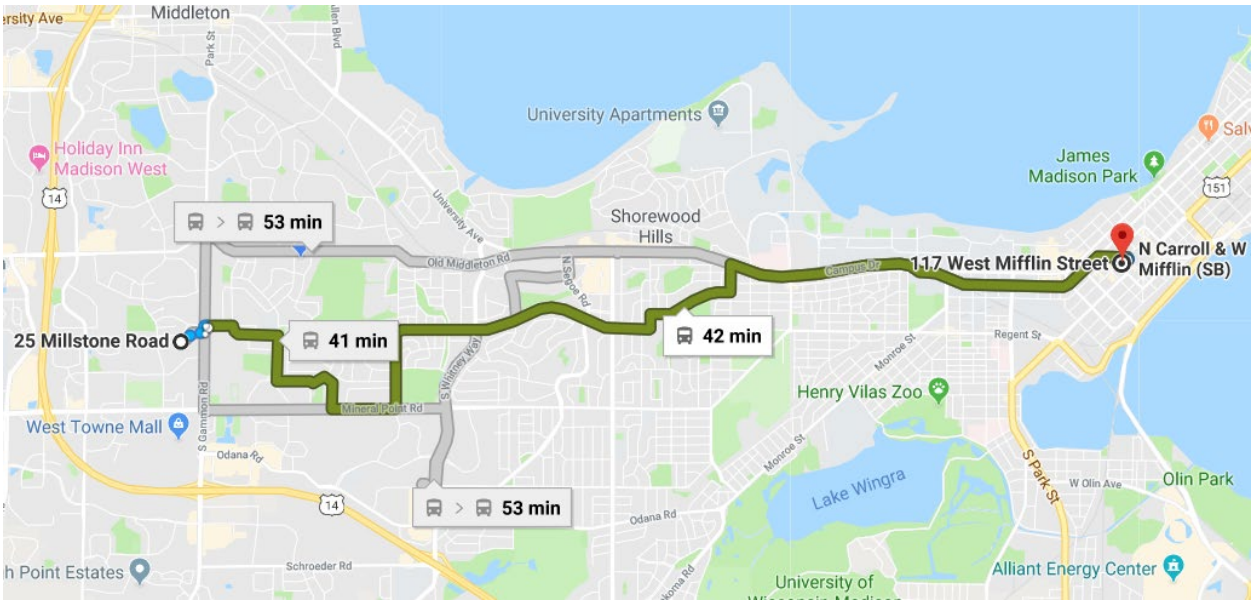
According to Google Maps, it take approximately 40 minutes to travel from the west side to arrive in downtown Madison at 8:00 a.m. via transit and 32 minutes from the east side via transit (Table 1, Figure 7, and Figure 8). Driving time varies based on traffic, but is still generally faster than taking transit.

Table 1. Transit vs. Driving Travel Time and Cost Comparison

	Taking Transit	**Driving**
West Side to Downtown	41 minutes	16-28 minutes
East Side to Downtown	32 minutes	12-28 minutes
Cost	$2.00 per ride/$65.00 monthly	$0.545 per mile/$985 monthly

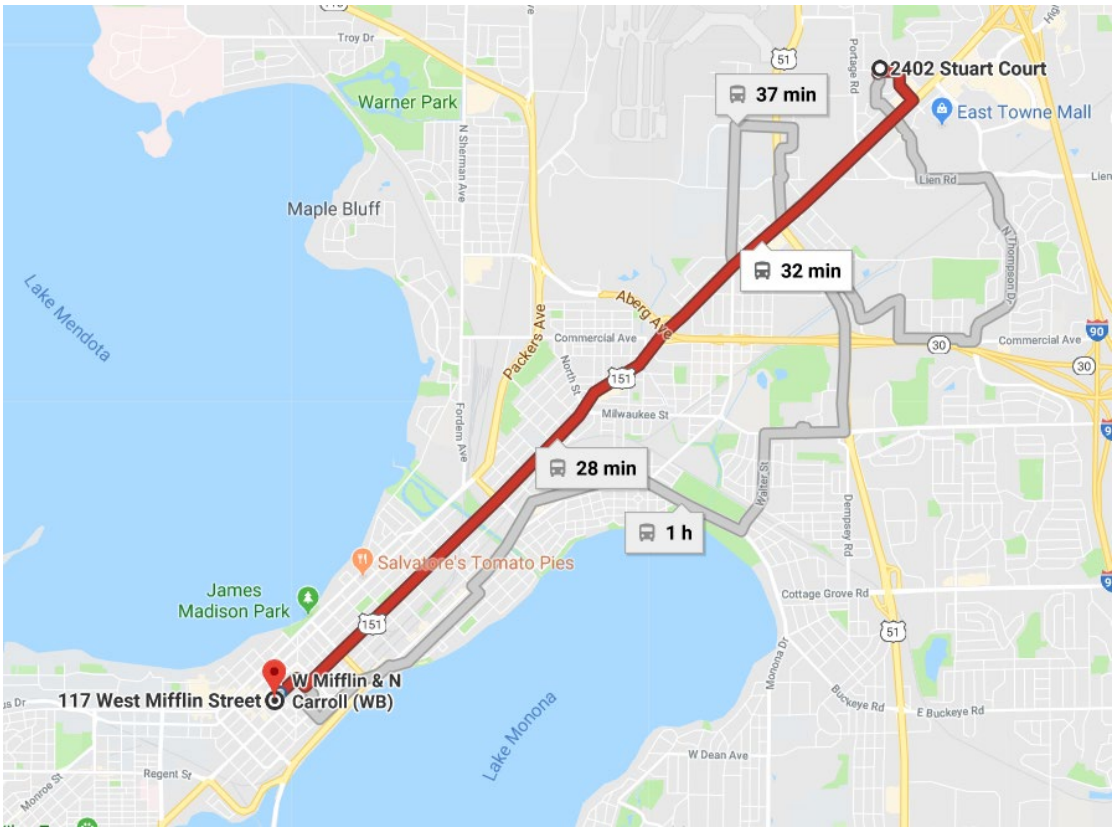
Source: Google Maps, Metro Transit, Center for Neighborhood Technology, Internal Revenue Service.

Figure 7. Transit Travel Times from the West Side Arriving at 8:00 AM



Source: Google Maps, 2019.

Figure 8. Transit Travel Times from the East Side Arriving at 8:00 a.m.

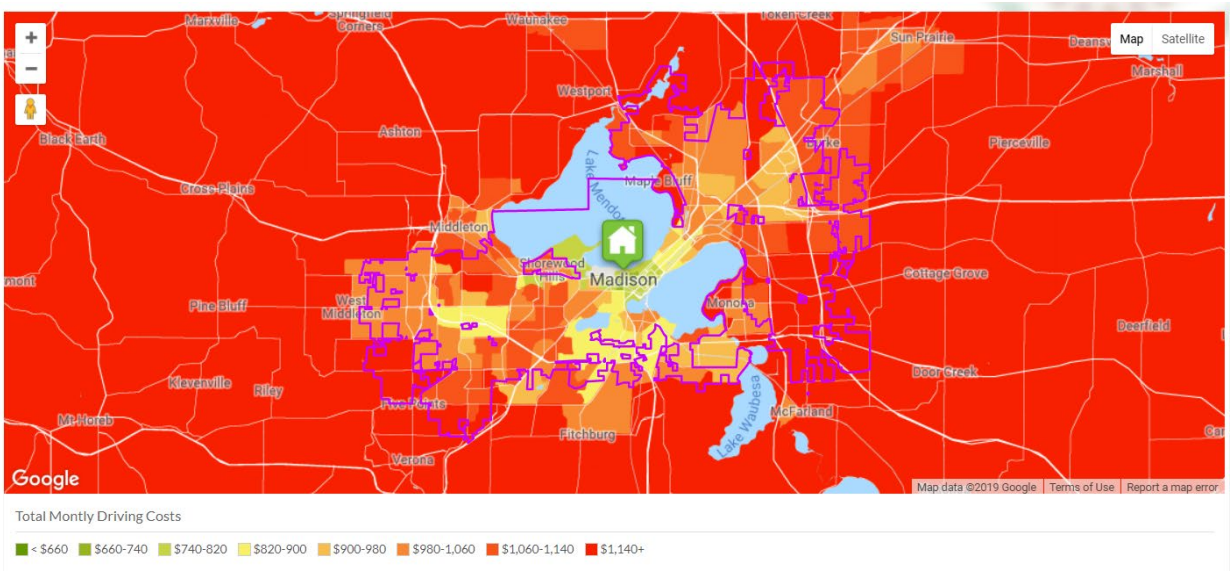


Source: Google Maps, 2019.

In addition to time savings, cost savings is another important factor that influences commuters to choose public transportation. According to the Center for Neighborhood Technology's Housing and Transportation Index, the monthly cost of automobile ownership in Madison is $985 (Figure 9). The current price for a Madison Metro Transit 31-day pass is $65.

Within the central part of the corridor, the cost of driving tends to be less than the far west and east sides of the corridor. BRT would provide higher cost savings to those riders who live at either end of the corridor and need to commute into the central area.

Figure 9. Total Monthly Driving Costs



Source: Center for Neighborhood Technology, 2019 https://htaindex.cnt.org/total-driving-costs/.

Transportation Network

Because the proposed BRT alignment runs through the most developed parts of the city, there is a robust existing transportation network. It is important to understand the existing network in order to understand the needs of the users and how the network can be best utilized to accommodate additional commuters and users of all modes of transportation.

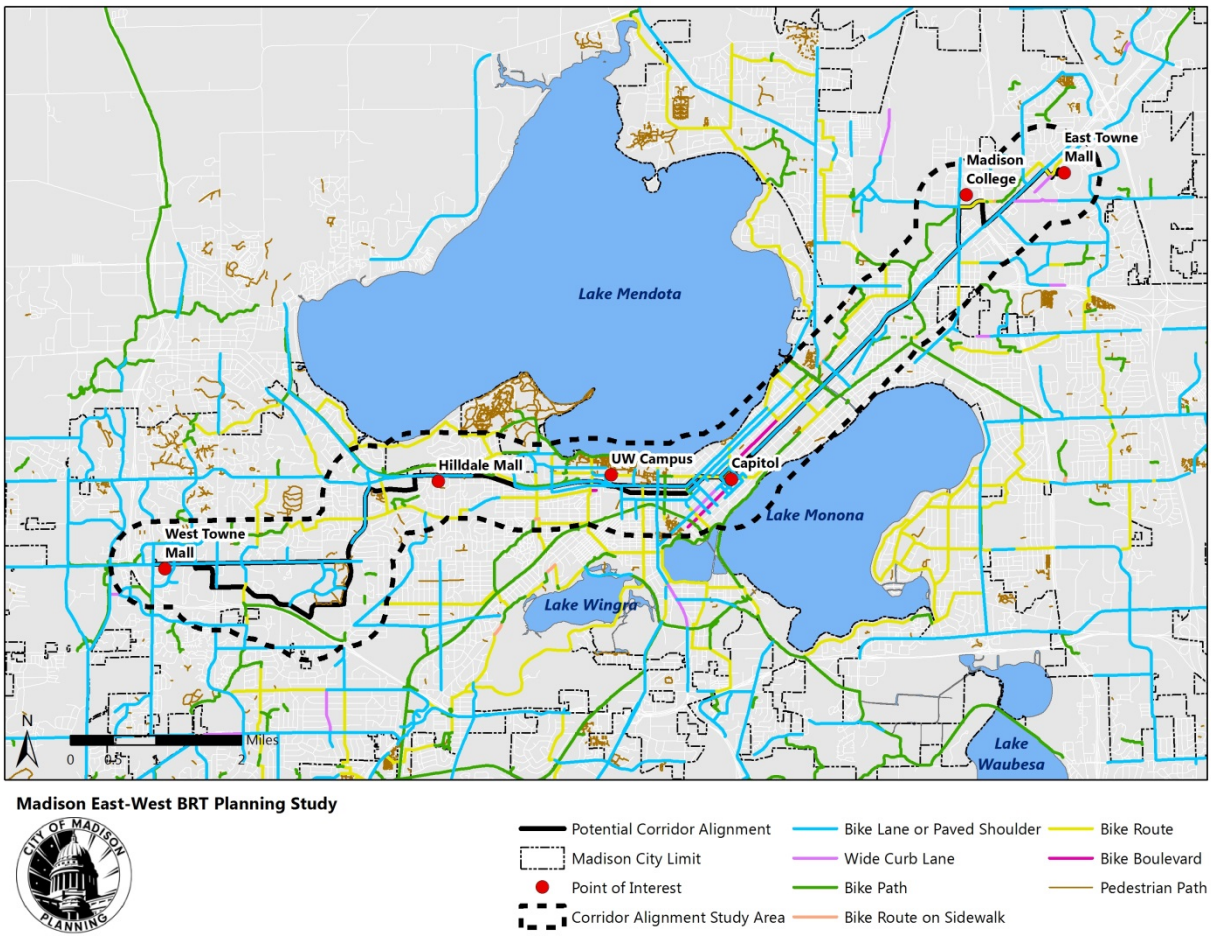
Bicycle and Pedestrian Network

There are extensive bicycle and pedestrian facilities throughout the corridor. Figure 10 shows where these facilities are in relation to the BRT alignment. The bicycle network is comprised of different types of facilities, including bike lanes, shoulders, boulevards, and routes. In addition to the pedestrian paths identified on Figure 10, there are sidewalks on most streets throughout the corridor. The bicycle and pedestrian connections need to be maintained and enhanced as BRT is implemented so that riders can access the BRT route and stations by non-motorized transportation modes.

The RTP 2050 has identified several recommendations and supporting actions for bicycles and pedestrians. These recommendations will be important to consider when implementing the BRT service. These recommendations are listed below.[6]

- Expand the bikeway network with new shared-use paths and on-street facilities
- Maintain and modernize existing bicycle facilities
- Eliminate bicycling barriers and hazards in the bikeway network
- Provide adequate bicycle parking
- Improve bicycle and pedestrian safety
- Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods
- Retrofit regional streets with modern, safe pedestrian accommodations
- Maintain sidewalks and pedestrian facilities for year-round use

Figure 10. BRT Corridor Bicycle and Pedestrian Network



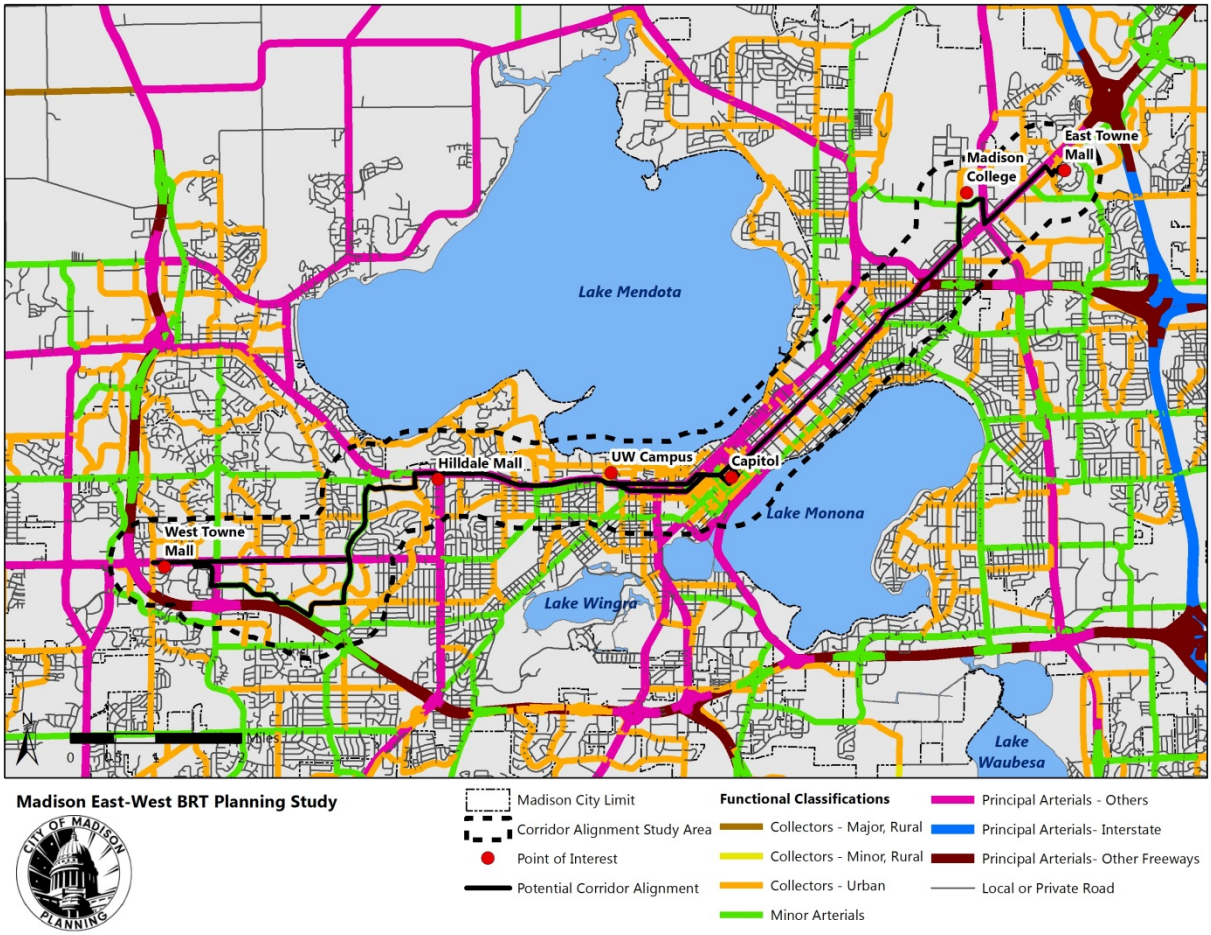
Source: City of Madison and MATPB

[6] RTP 2050 Appendix A: Project and Policy Recommendations.

Roadway Network

Several major roadways run through the project area. Most of the roadways that the proposed BRT alignment would run on are principle arterials (Figure 11). Streets such as East Washington Avenue, University Avenue, and Mineral Point Road are major thoroughfares that traverse wide swaths of the city and are used by drivers, bicyclists, transit riders, and pedestrians.

Figure 11. Current Roads Functional Classifications



Source: MATPB.

The RTP 2050 describes the needs and recommendations for maintaining the roadway network's efficiency, safety, and cost-effectiveness. RTP 2050 has identified the following recommendations for streets and roadways:[7]

- Preserve and maintain the region's street and highway system in a manner that minimizes life cycle cost, maintains safety, and minimizes driver costs while reducing their impact on the environment.

[7] RTP 2050 Appendix A: Project and Policy Recommendations.

- Build a well-connected network of regional roadways to accommodate future growth and avoid the need for overly wide streets and intersections that create barriers for pedestrians and bicyclists.
- Incorporate complete streets and green streets concepts for regional and local roadways.
- Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals and policies.
- Address safety needs on the regional roadway system.

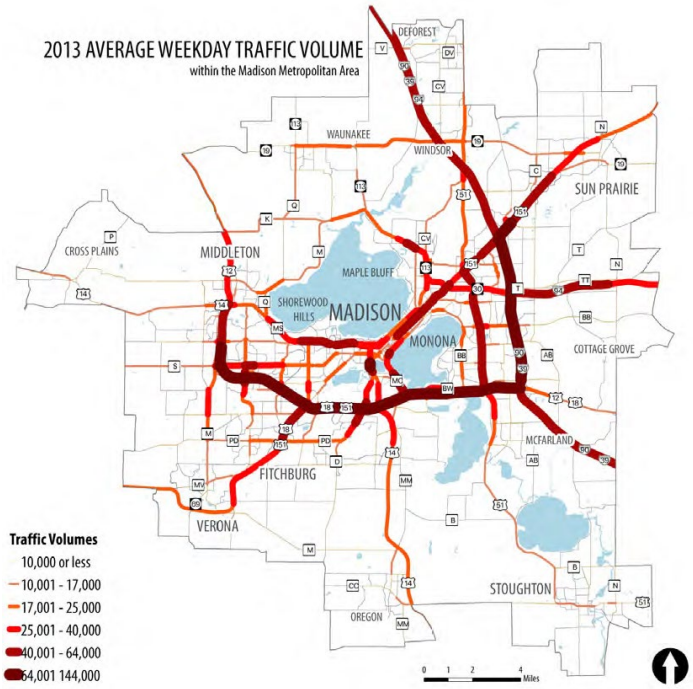
The outcomes of the needs and recommendations identified in RTP 2050 are the programmed and planned projects for roadways in the area. There are currently no roadway expansion projects within the BRT corridor. The lack of planned roadway-related capacity improvements within the BRT corridor reinforces the need for other transportation capacity improvements like the BRT project.

The City of Madison and Village of Shorewood Hills are in the initial phases of a project to reconstruct a portion of University Avenue, from Shorewood Boulevard/Hill Street to University Bay Drive/Farley Avenue. The project includes reconstruction of pavement, curb and gutter, sidewalk as necessary, street lighting, traffic signals, water main sanitary sewer and storm sewer. Design alternatives will include analysis to try and improve pedestrian and bicycle connectivity, BRT, and stormwater drainage.[8]

As traffic volumes on roadways throughout the Madison area have increased, traffic congestion has worsened (Figure 12 and Figure 13). Traffic operations can be represented by Level of Service (LOS), which is a qualitative indication of the traffic conditions on a roadway or at an intersection, ranging from A (no congestion) to F (most congestion). The Madison Area Transportation Planning Board considers an LOS of D as generally acceptable, although in some areas, such as downtown Madison, lower LOS ratings are permissible due to constrained right-of-way availability. LOS data is one of the inputs to the regional travel demand model, which is used to determine future travel levels and patterns and helps to inform the roadway projects included in the RTP 2050.

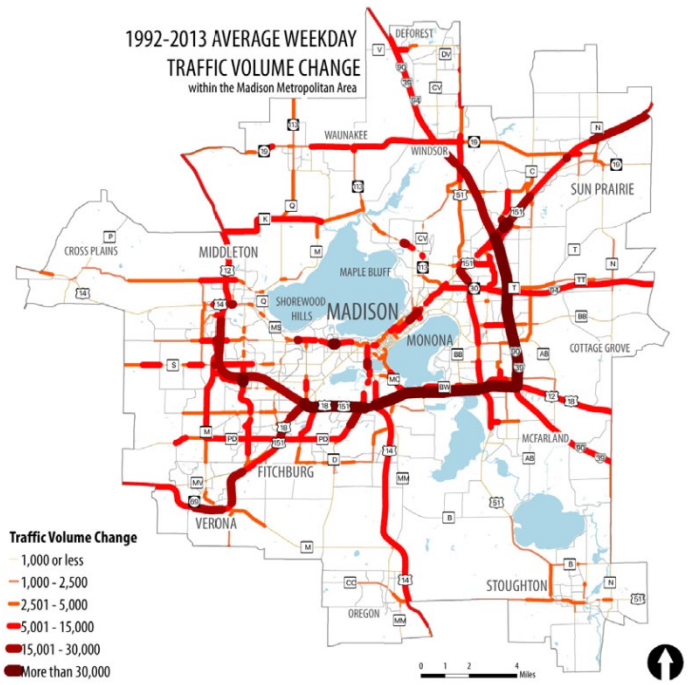
[8] https://www.cityofmadison.com/engineering/projects/university-avenue.

Figure 12. Madison Metropolitan Area Average Weekday Traffic Volume, 2013



Source: RTP 2050, page 3-14.

Figure 13. Madison Metropolitan Area Average Weekday Traffic Volume Change, 1992–2013



Source: RTP 2050, page 3-14.

Transit Network

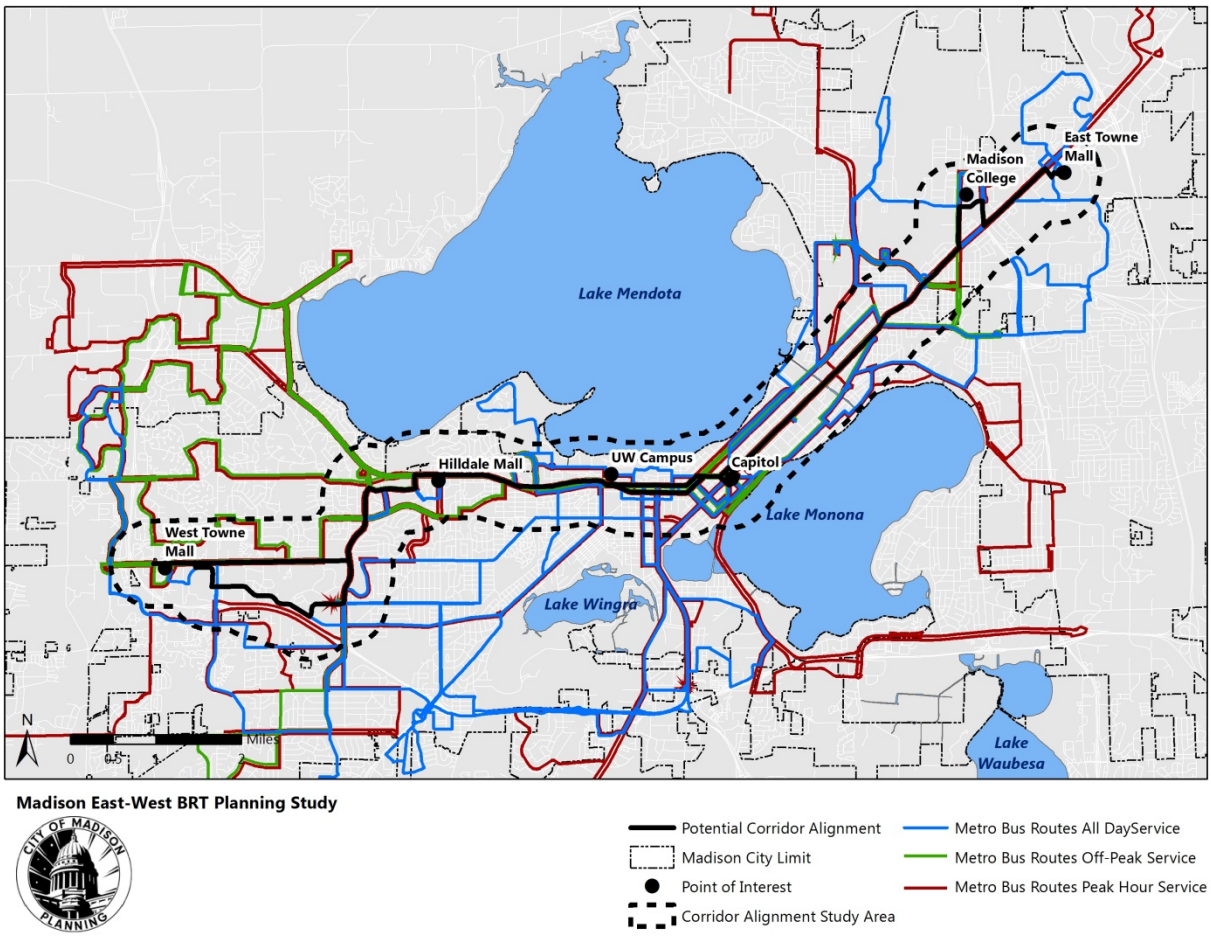
The current transit network runs through most of the proposed BRT corridor and across major parts of the city. The current bus routes would be realigned with the implementation of BRT in order to best maximize efficiency and connect to the BRT network. Figure 14 shows the existing transit routes that intersect the BRT corridor.

The RTP 2050 has identified nine recommendations and supporting actions for public transit, listed below:[9]

- Implement a BRT system
- Improve the local bus network
- Add service in developing neighborhoods
- Enhance transit stops with improved pedestrian/bicycle access and amenities
- Utilize alternative service delivery models to serve low-demand areas
- Maintain, expand, and enhance bus rolling stock and supporting facilities
- Implement a regional express bus network
- Expand park-and-ride facilities in conjunction with BRT and express services
- Implement a regional transit entity with stable funding and representative governance

[9] RTP 2050 Appendix A: Project and Policy Recommendations.

Figure 14. Existing Transit Network that Intersects BRT Route



Source: Metro Transit.

Project Need #2: Provide higher and more regular service levels connecting all neighborhoods to services and employment.

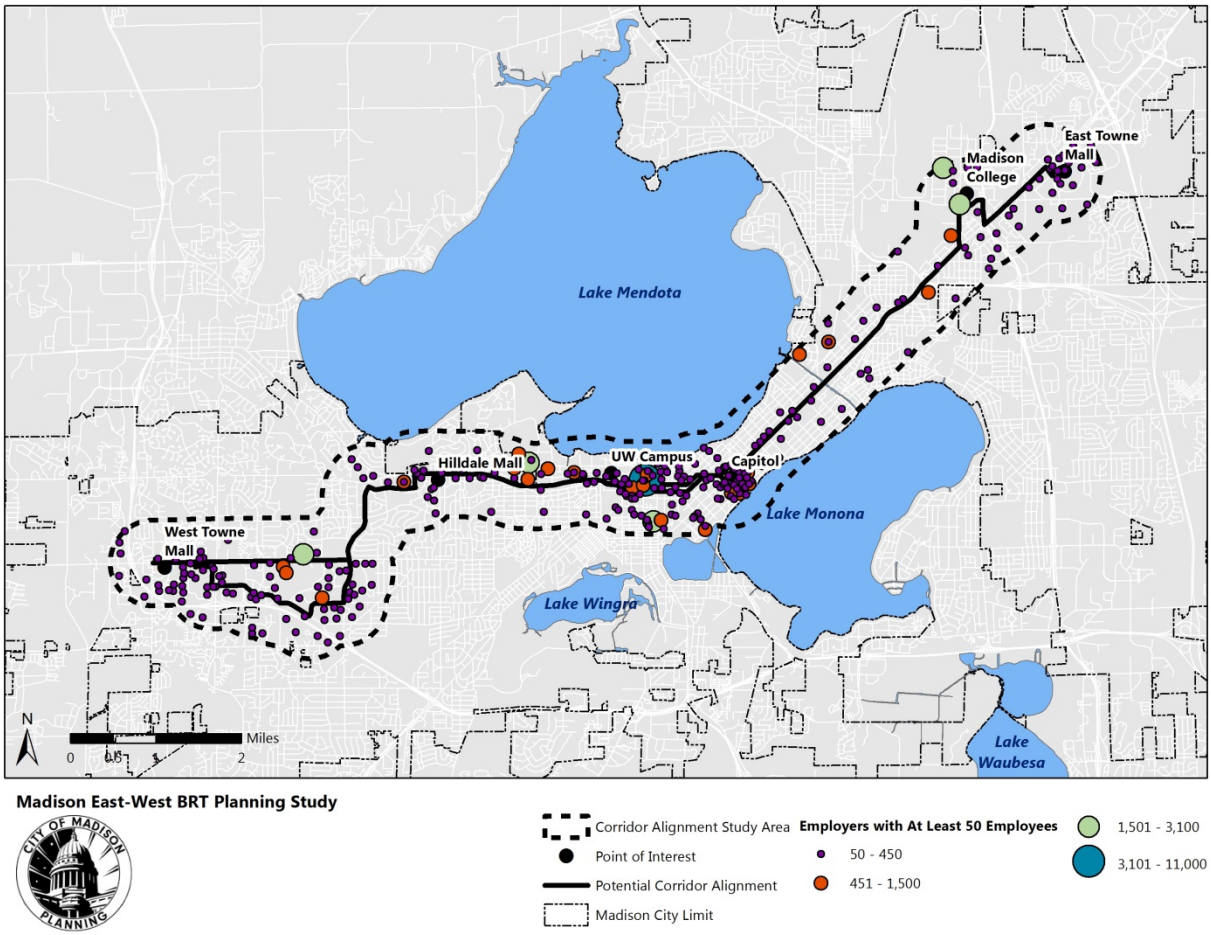
Equity is a top priority of City leaders, and any investment in transit should serve those who have the greatest need, including low-income populations and transit-dependent individuals and households. Transit should provide efficient connections to jobs and centers of employment.

As noted in the previous section, travel times for transit are often slower than driving, particularly when traveling longer distances, such as from the west or east sides into downtown. Although not part of this BRT study, the north and south side BRT corridors will be studied at a later date; the east and west corridors were initially chosen because they have lower operating costs and a forecasted higher number of riders. Successfully establishing BRT on the East-West BRT Corridor will facilitate the expansion to the North-South Corridor in the future.

Employment Centers

There are several major employment centers throughout the corridor. Figure 15 shows the locations of major employers with at least 50 employees. These employers attract workers from across the city and the region.

Figure 15. Employers with At Least 50 Employees



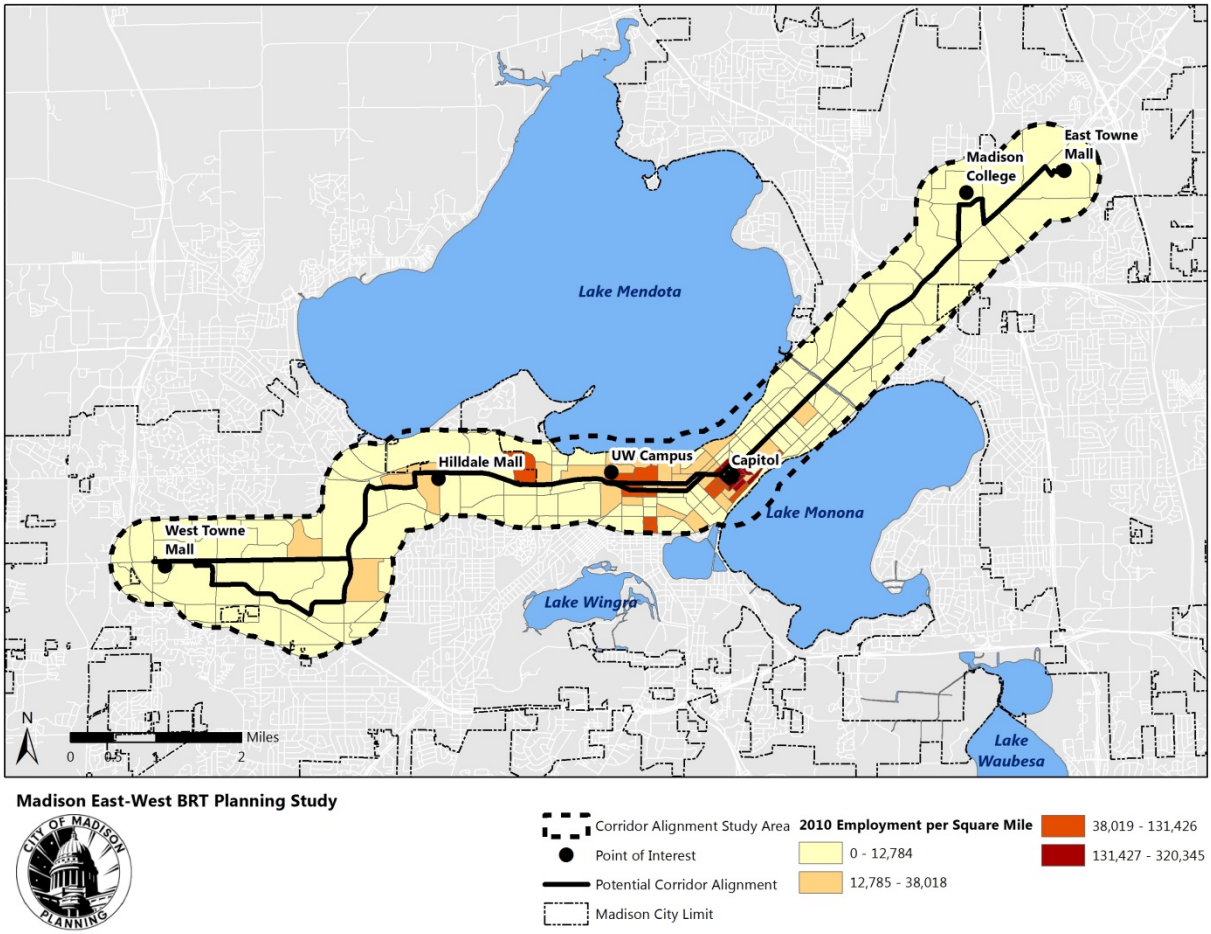
Source: Madison Area Transportation Planning Board and InfoUSA, 2016.

In 2010, employment density in the corridor was primarily concentrated at the Capitol and UW-Madison campus (Figure 16). This high concentration of employment in the Isthmus is projected to continue, the 2050 employment forecast shows employment concentrated around the Capitol and UW campus and a slight increase eastward along East Washington Avenue (Figure 17).

It is necessary to plan for how these workers will access their jobs. The Capitol and UW-Madison are physically constrained; building additional roadways to accommodate personal motor vehicles is not an option, and would not be effective. In order to move more people without causing additional congestion,

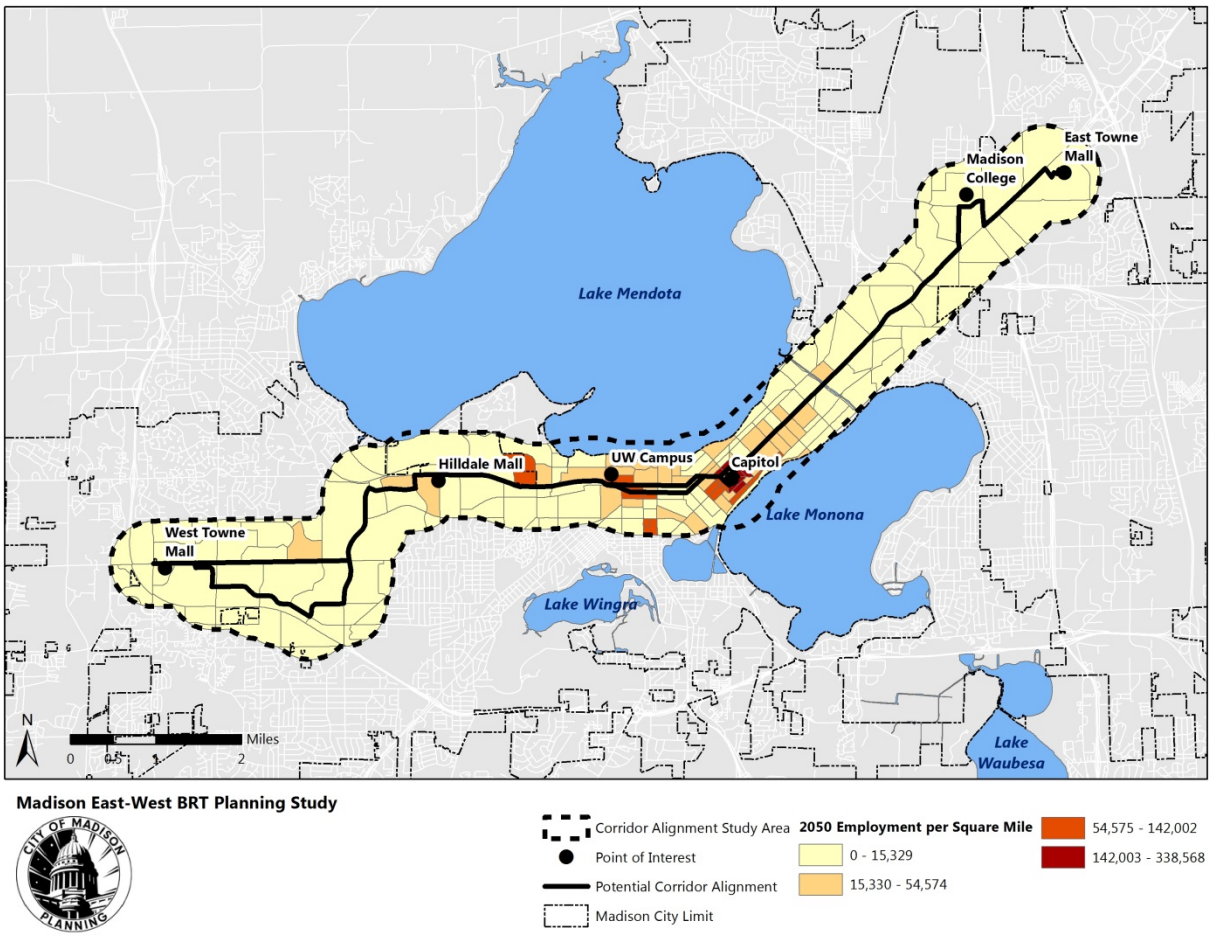
BRT service will be essential to employment access. Furthermore, a city with fast transit options is attractive to new workers and will be beneficial in continuing to attract top talent to the city.

Figure 16. 2010 Employment Density



Source: Madison Area Transportation Planning Board.

Figure 17. 2050 Employment Density



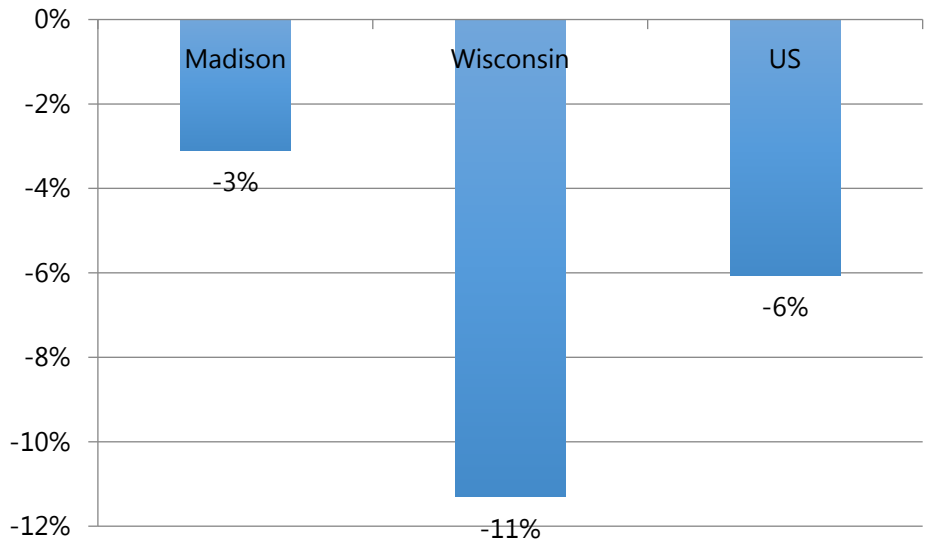
Source: Madison Area Transportation Planning Board.

Affordable Transit Options

For many people, taking transit is the only option to travel to/from work, to/from school, and run errands. Transit should serve all populations efficiently and at an affordable cost.

Figure 18 shows the change in median income from 2000 to 2017 in 2017 dollars. The median income in Madison decreased approximately 3 percent. This is slightly better than the state and the United States, where the median income decreased 11 percent and 6 percent, respectively. This indicates that wages continue to rise at a slow pace since the recession. At the same time cost of living expenses continue to increase. Rising costs combined with slow income growth reinforces the need for affordable and reliable transit options.

Figure 18. Percent Change in Median Income 2000 to 2017 in $2017



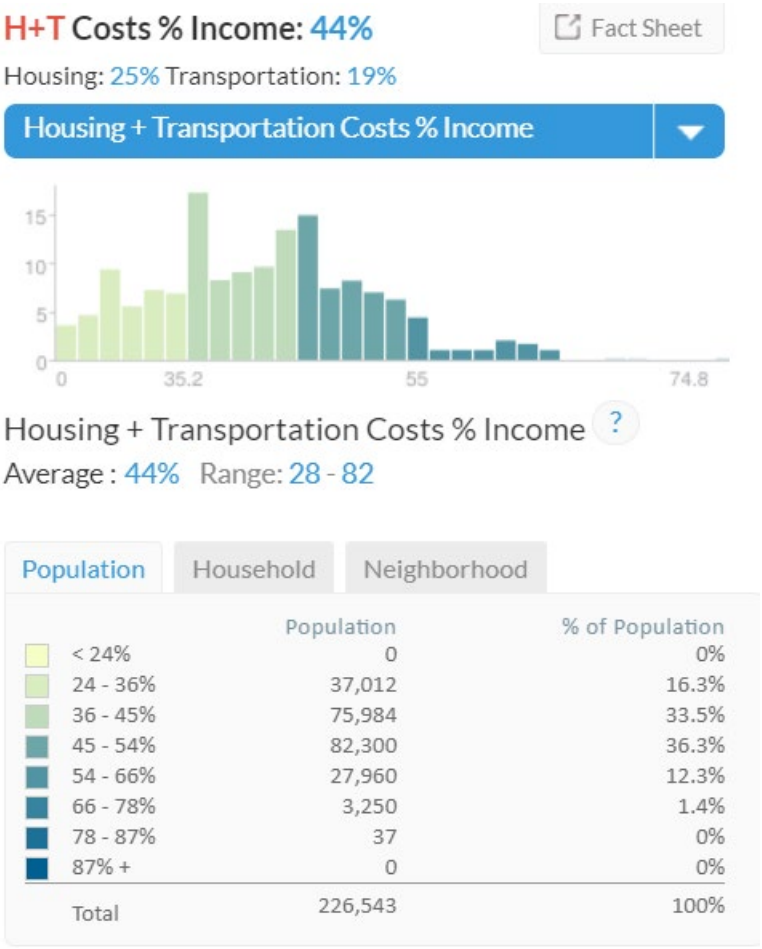
Source: U.S. Census 2000 and 2017.

The costs of housing and transportation together are the primary expenses for a household. In general, these costs should not exceed 45 percent of household income. According to the Center for Neighborhood Technology's Housing and Transportation Index, the average combined cost of housing and transportation for Madison is 44 percent (Figure 19). However, this is for the whole city, the corridor includes a disproportionate share of households below poverty, and therefore, those households spend a higher share of their income on housing and transportation.

While housing and transportation costs are at an acceptable percent, those costs are likely to rise faster than wages in the coming years. In particular, energy costs are forecasted to increase[10], directly impacting both the cost of housing and the cost of driving, which reinforces the need for an affordable alternative to driving.

[10] https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf.

Figure 19. Housing and Transportation Index for the City of Madison



Source: Center for Neighborhood Technology, 2019.

Populations More Likely to Use Transit

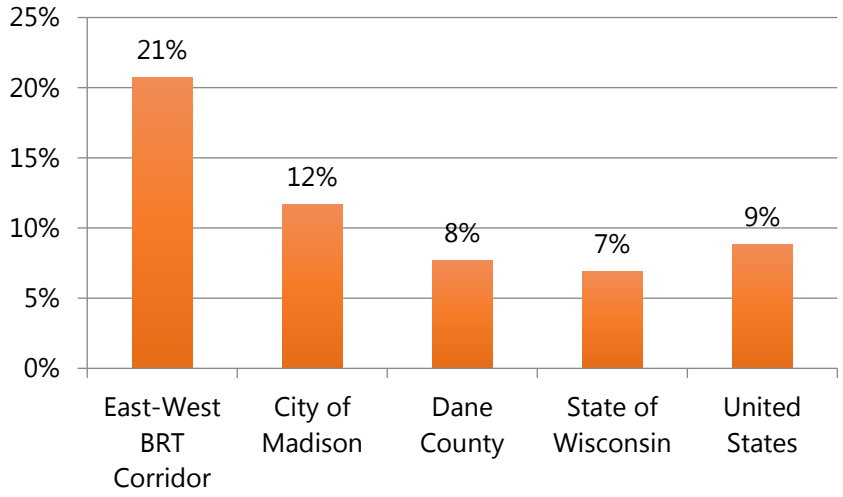
Three key factors help define populations that typically rely on transit service. These indicators are:

- Households that do not own a car, known as zero-car households
- Minority Populations (Black, Asian, American-Indian, Native Hawaiian and Pacific Islander, and Hispanic)
- People living below the poverty line

Zero-Car Households

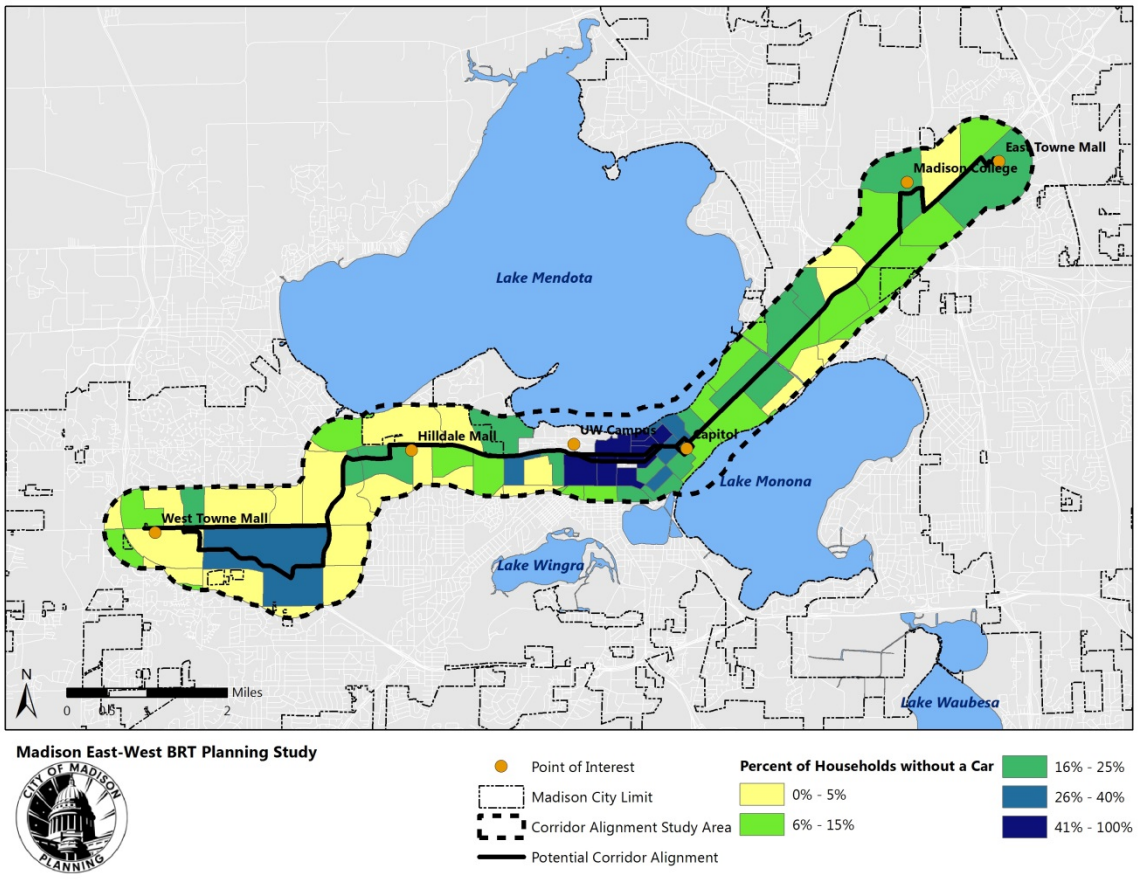
Figure 20 and Figure 21 show the percentage of households without a car and where those households are located within the study corridor. Nearly 21 percent of households within the corridor do not own a car. These households are primarily concentrated near the UW campus; however, there are high rates of households without a car throughout the corridor. There are comparatively more households without a car when compared to the overall City of Madison, Dane County, State of Wisconsin, and the United States.

Figure 20. Percentage of Households without a Car



Source: American Community Survey, 2013-2017.

Figure 21. Corridor Households Without a Car

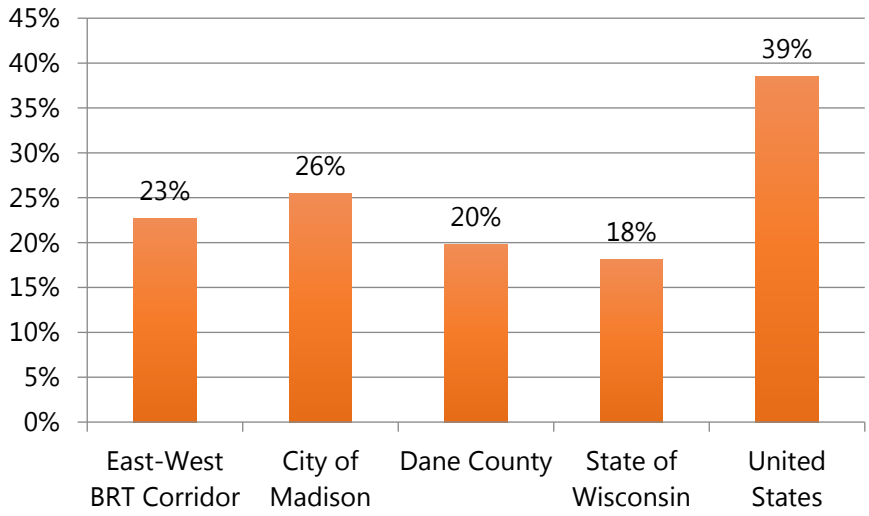


Source: American Community Survey, 2013-2017.

Minority Population

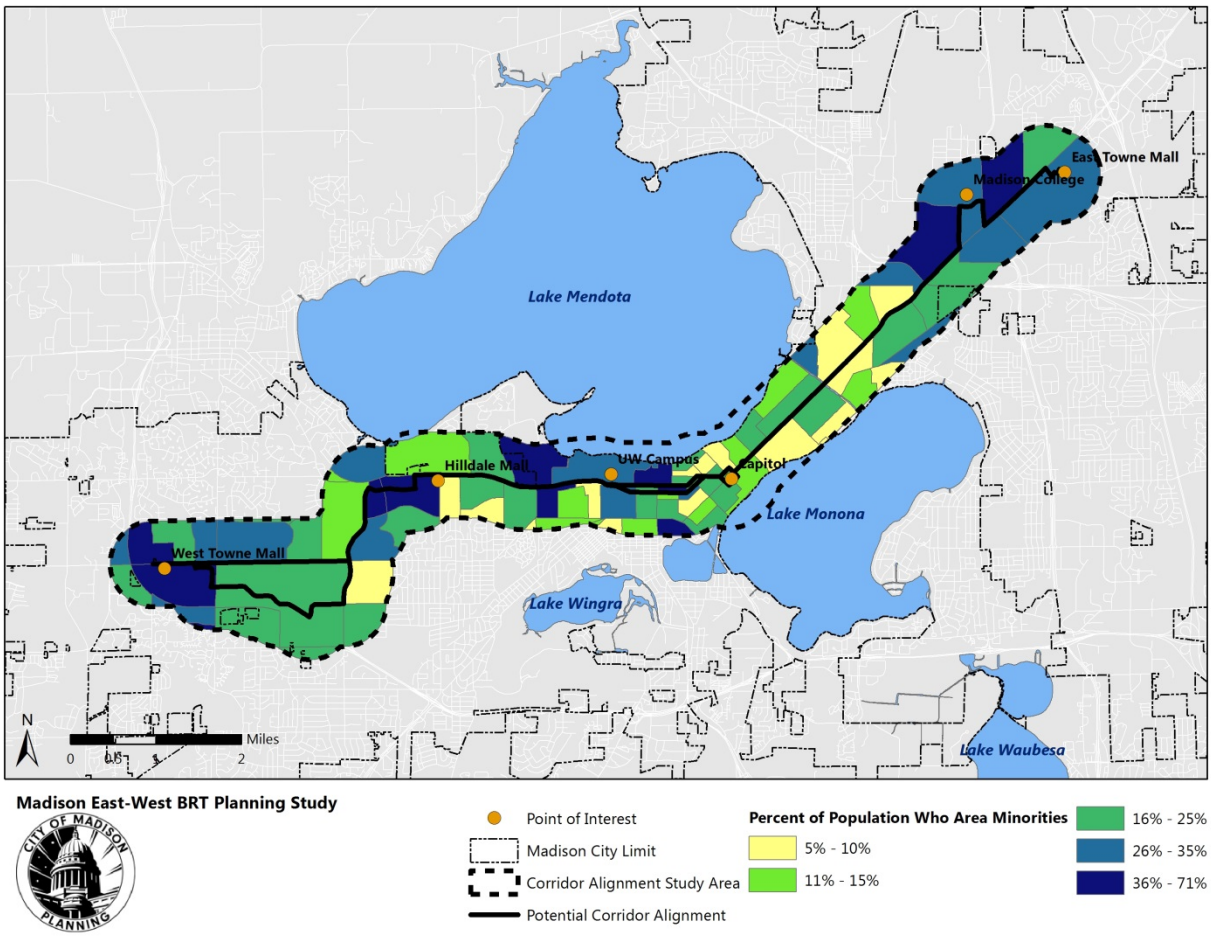
Figure 22 shows the minority population compared to the total population. In the East-West BRT Corridor, approximately 23 percent of the population is minorities. These populations are spread throughout the corridor and not concentrated in one particular area (Figure 23). The percentage of the population who are minorities in the corridor is relatively consistent compared to the minority population for the City of Madison as a whole, as well as Dane County and the State of Wisconsin, but lower than the United States.

Figure 22. Percentage of Population Who Are Minorities



Source: American Community Survey, 2013-2017.

Figure 23. Percentage of Population Who Are Minorities

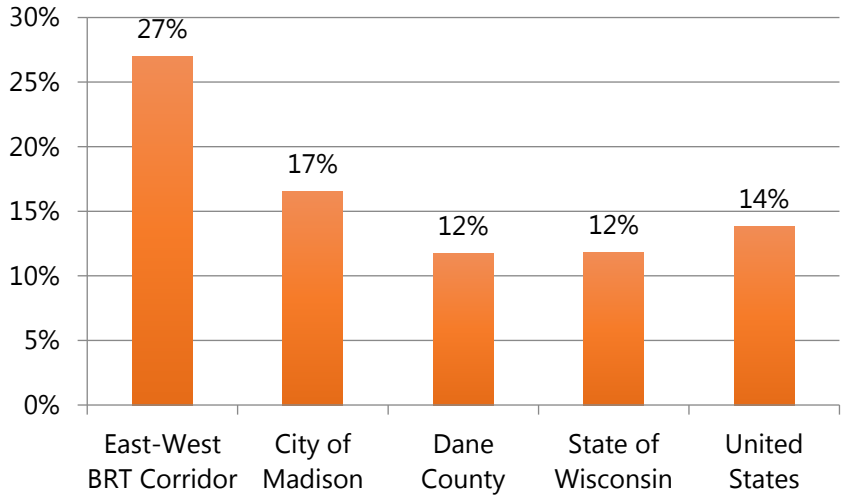


Source: American Community Survey, 2013-2017.

Population Below Poverty

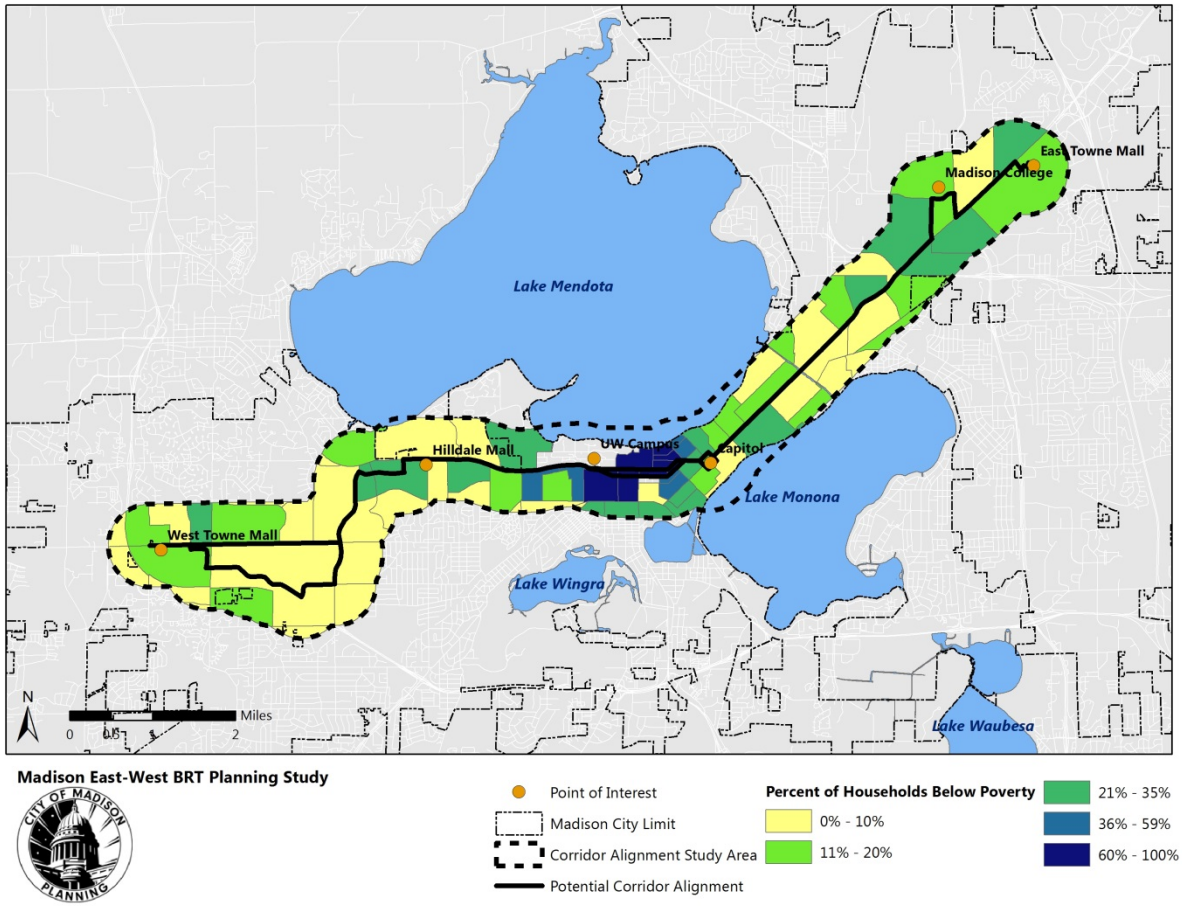
Figure 24 shows the households below poverty for the corridor and comparative geographies. Approximately 27 percent of households in the corridor are below poverty. Most of these households are located near the UW campus and are likely students. However, households below poverty are spread throughout the corridor (Figure 25). The percentage of households that are below poverty in the corridor is much higher than the City of Madison, Dane County, State of Wisconsin, and the United States.

Figure 24. Households Below Poverty



Source: American Community Survey, 2013-2017.

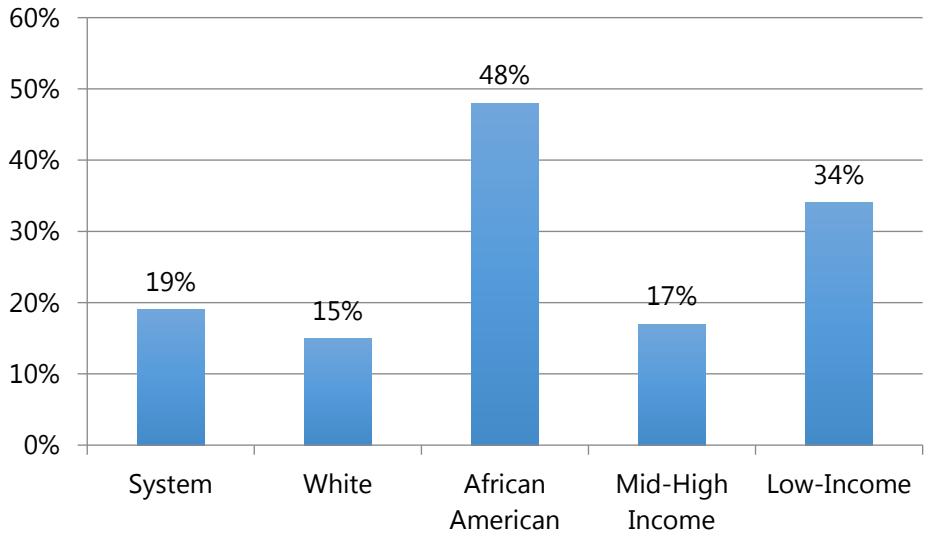
Figure 25. Corridor Households Below Poverty



Source: American Community Survey, 2013-2017.

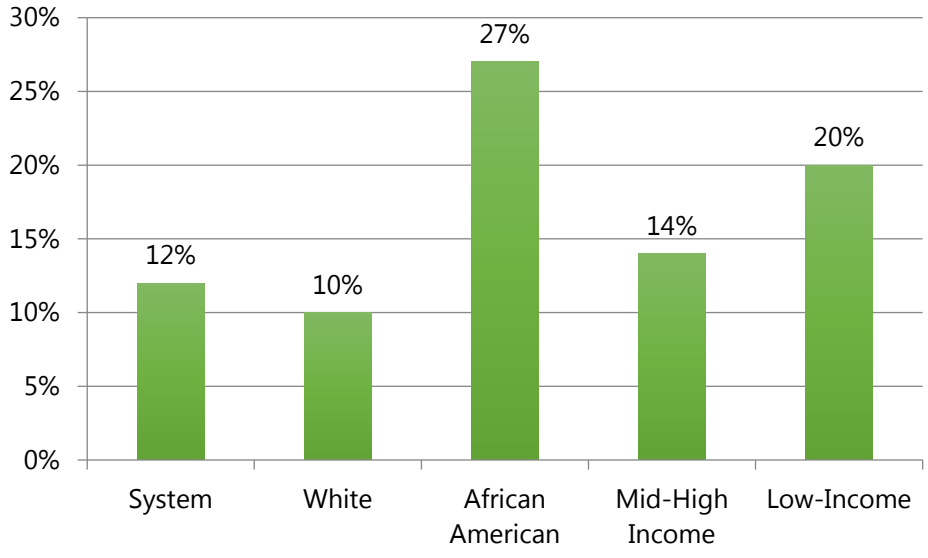
In addition to being more likely to rely on transit, many minority and low-income households face higher transfer rates (changing from at least one bus route to another) and longer overall travel times. BRT aims to serve all riders, but particularly those who rely on transit with faster, more frequent, one-seat rides that reduce the need for transfers (Figure 26 and Figure 27).

Figure 26. Bus Transfer Rates for Minorities and Low-Income Populations



Source: Metro Transit.

Figure 27. Share of Transit Riders with Travel Times that Exceed 45 Minutes



Source: Metro Transit.

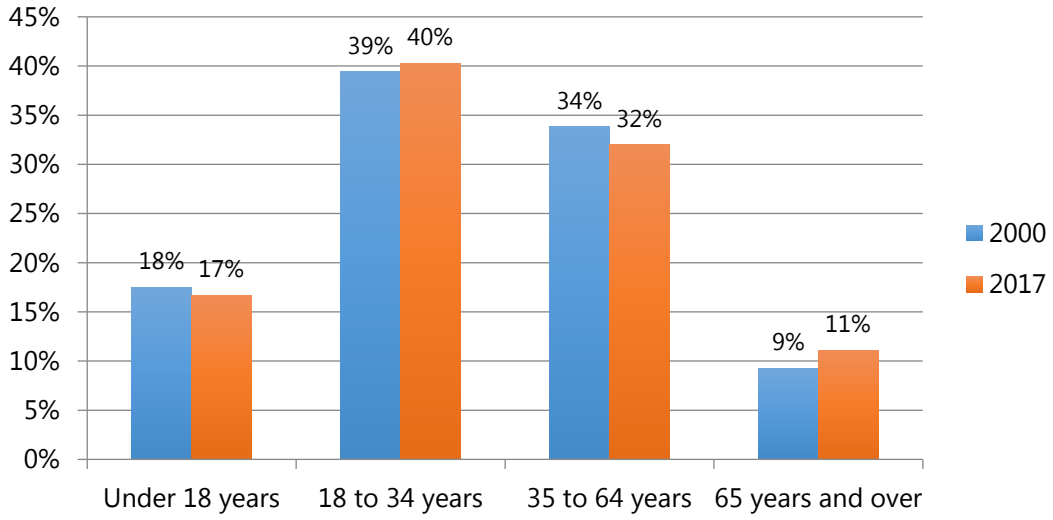
Project Need #3: Provide service that meets the needs of everyone, particularly millennials and seniors.

In 2014, the median age of Madison residents was 30.8; which contrasts to the median age of Wisconsin residents at 39.2[11]. Since 2000, Madison has seen significant increases in the number of 20 to 34 year olds and 50 to 64 year olds. Even though the number of people between ages 60 and 64 has doubled since 2000, the large increase in millennials has driven down the city's median age. Academic research and industry experience have found that both of these demographic groups are increasingly choosing transit for either lifestyle/environmental/economic reasons (millennials) or mobility reasons (senior citizens).

Madison is Young and the Senior Population Growing

In 2017, the largest segment of the population was 18 to 34 year olds. This has stayed relatively consistent since 2000 (Figure 28).

Figure 28. City of Madison Population Age Distribution, 2000 and 2017

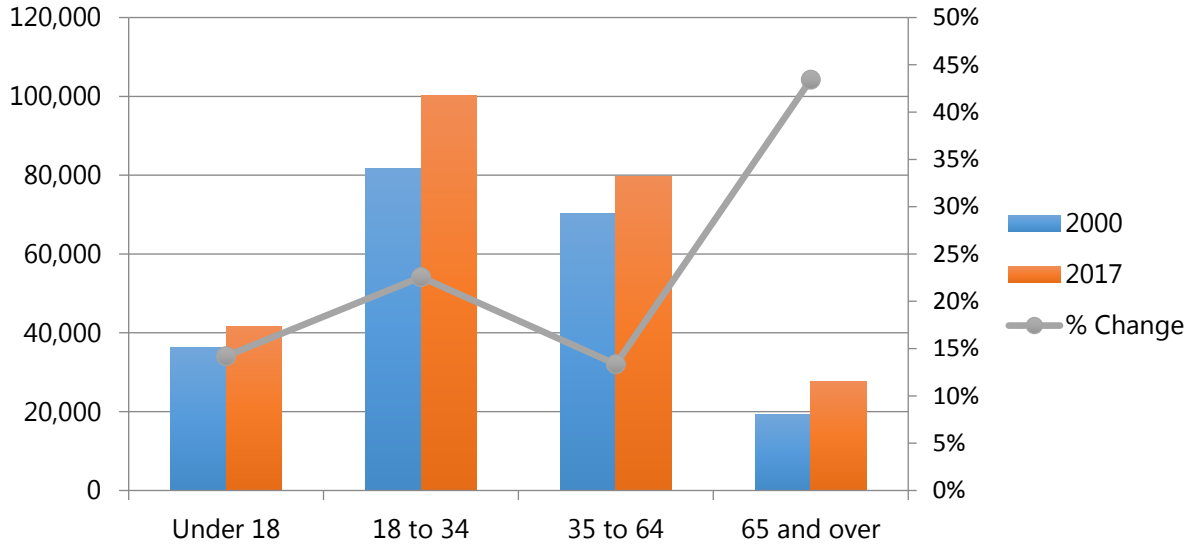


Source: U.S. Census, 2000 and 2017.

In terms of percent change between 2000 and 2017, the largest change was a 43 percent increase in people over the age of 65. This is followed by a 23 percent increase in people between 18 and 34 years old (Figure 29).

[11] https://imaginemadisonwi.com/sites/imaginemadisonwi.com/files/document/pdf/City%20Snapshot.pdf.

Figure 29. City of Madison Percent Change in Population by Age Group, 2000 to 2017

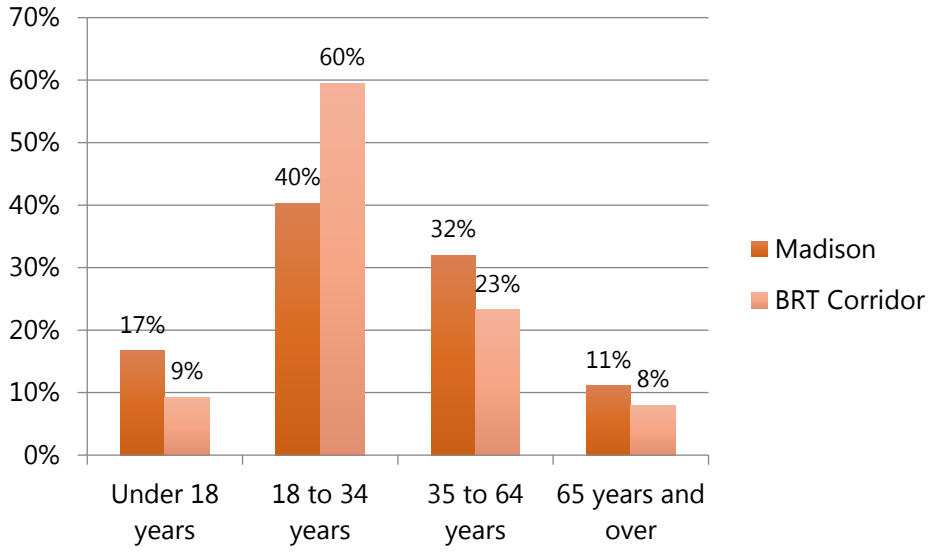


Source: U.S. Census, 2000 and 2017.

Study Corridor Population Distribution

The population distribution in the corridor has a higher percentage of millennials, 18 to 34 year olds, when compared to the city as a whole. Approximately 60 percent of the corridor population consists of millennials versus 40 percent of the city (Figure 30).

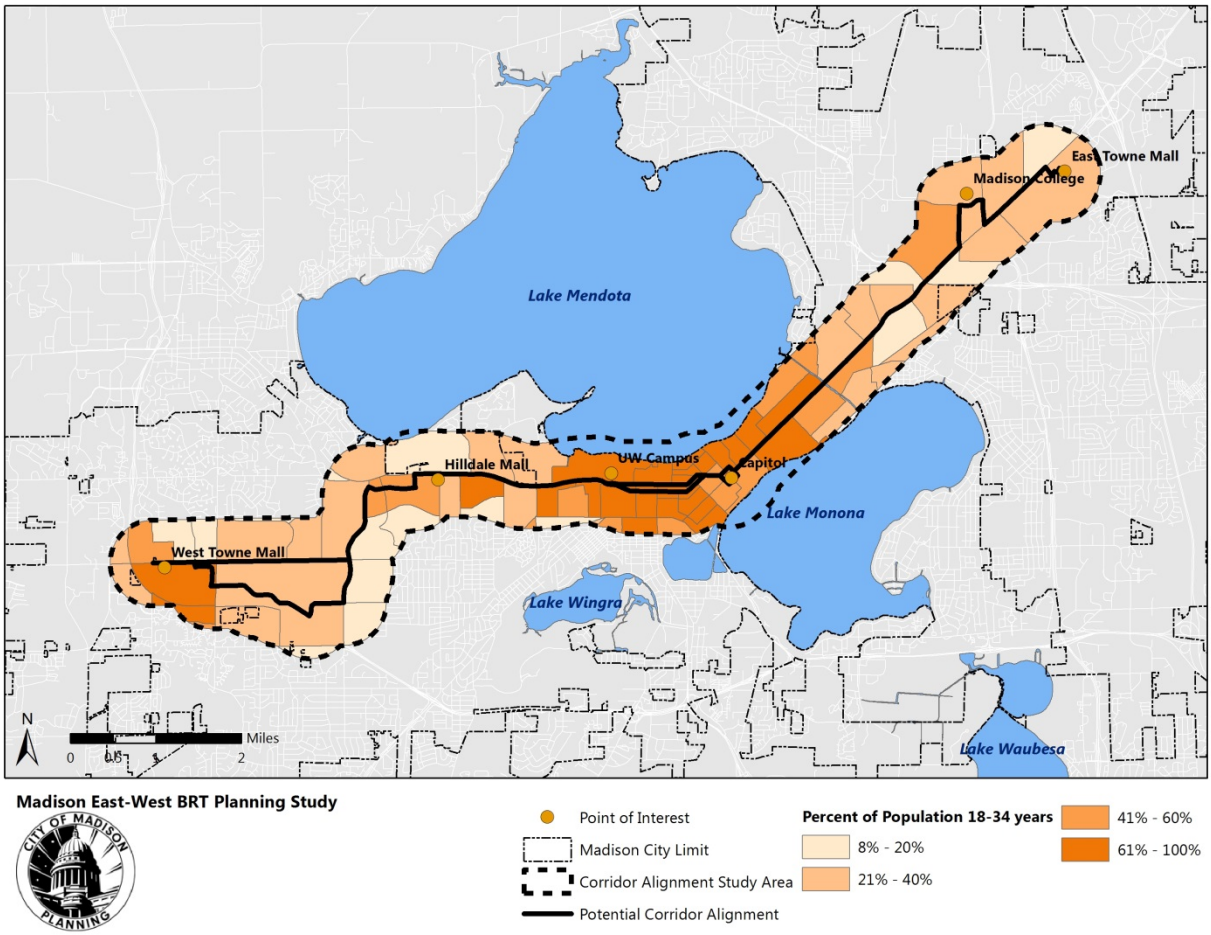
Figure 30. Population Age Distribution of City of Madison and BRT Corridor



Source: American Community Survey, 2013-2017.

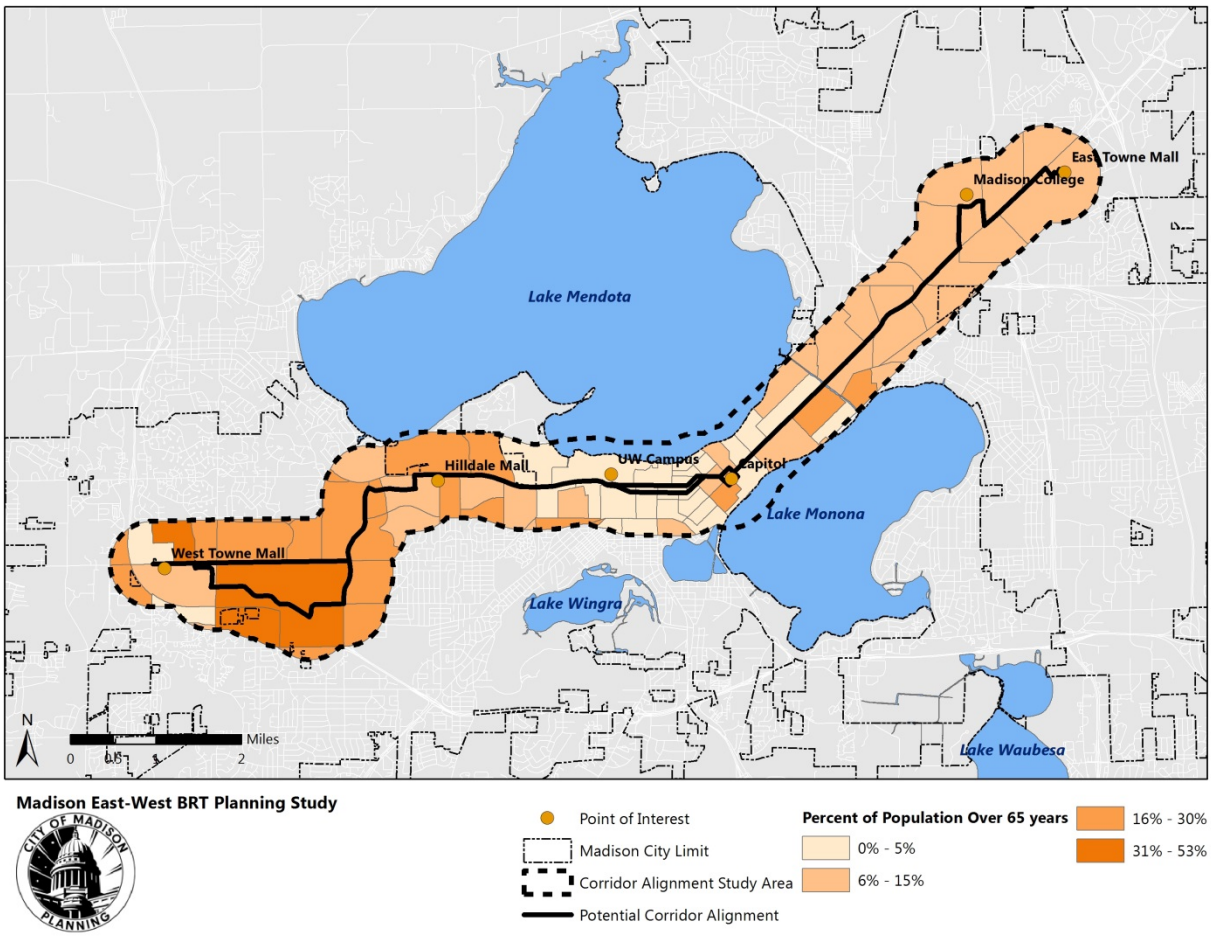
Figure 31 shows that most of the millennials in the corridor live near the UW campus and the Capitol. This is in contrast to where the senior population lives in the corridor. The highest concentration of people over the age of 65 live on the west side, and the lowest density of seniors is near the UW campus and Capitol area. Since over half of the corridor population is a millennial, it is essential to understand their habits and attitudes about driving and taking transit. Similarly, even though only 8 percent of the corridor population is over the age of 65, this will likely grow in the future.

Figure 31. Percentage of Population 18 to 34 years old



Source: American Community Survey, 2013-2017.

Figure 32. Percentage of Population Over 65 years old



Source: American Community Survey, 2013-2017.

Many recent studies have shown that seniors and millennials share some commonalities on driving and transit use. As seniors age, and especially as the baby boomer generation moves into their later years, physical and cognitive limitations increasingly pose risks and barriers to driving safely, requiring some to abandon driving altogether. A study of 259 seniors found that while most seniors prefer cars to transit, seniors will use transit if basic conditions are met, including availability of transit information, assurance that transit is convenient and safe, and outreach and planning efforts that target seniors of diverse racial, economic, and educational backgrounds.[12] Improving transit accessibility for seniors is a priority outlined in *Imagine Madison*, *Madison In Motion,* and RTP 2050.

According to the *Madison In Motion* plan, millennials are purchasing fewer cars and are waiting longer to get their driver's license, if at all. While 92 percent of people between the ages of 20 and 24 had a driver's

[12] JoIris Babka, Rhianna, Joseph Zheng, Jill Cooper, and David Ragland. 2008. *Removing Barriers for Seniors at Transit Stops and Stations and the Potential for Transit Ridership Growth*. Institute of Transportation Studies, UC Berkeley, Institute of Transportation Studies, Research Reports, Working Papers, Proceedings.

license in 1983, only 79 percent had a driver's license in 2011.[13] Moreover, a 2018 survey has revealed that while over two-thirds of baby boomers believe their car was worth more than the cost of maintenance, only 49 percent of millennials share that opinion.[14] Instead of driving, millennials are increasingly turning to alternative modes of transportation, including walking, biking, transit, and ride share. According to a 2018 mobility survey, 56 percent of millennials believe access to transit is important, and 65 percent would use transit more if it were more convenient or accessible.[15]

Driving is no longer the definitive transportation option for seniors and millennials that it has historically been for other generations. While seniors are choosing transportation alternatives for safety and mobility reasons, millennials are driving less by choice for lifestyle-related reasons. Ultimately, both groups would be more willing to use transit if it were more convenient, demonstrating a greater demand for accessible transit options.

Planned Developments for Millennials and Seniors

As the number of seniors and millennials in Madison increases, developments across the city have targeted these age groups. Plans such as *Imagine Madison*, *Madison In Motion,* and RTP 2050 specify that transit-oriented development (TOD) can be especially valuable for seniors and Millennials, especially in terms of housing choices. One of the major senior living communities on the west side of Madison, Oakwood Village, was identified as an activity center in transition in the *Imagine Madison* plan, meaning city staff anticipates development in and around the area in future years. More specifically, several developments targeting Madison's senior population are under construction and planned, including the following within the BRT corridor:

- **Union Corners Grandfamily** – targeting the growing demographic of "grand families" with grandparents raising grandchildren
- **Normandy Square Senior Apartments** – providing 58 units of senior housing (48 of which would be affordable and 10 would be market rate)
- **Tree Lane Senior Apartments** – providing 54 units of senior housing (51 of which would be affordable)

Much of the recent development boom in Madison has been attributed to the growth in the city's millennial demographic.[16] Many developments under construction and in planning have followed suit in marketing unique housing options, location, and amenities to millennials. Developments within the BRT corridor targeting millennials include:

- **Mixed-Use Development on South Fair Oaks Avenue** – the developer has indicated that its apartments will appeal to empty nesters, young urban professionals, outdoor enthusiasts, and

[13] *Madison In Motion*, page 33.
[14] https://usa.streetsblog.org/2018/11/13/millennials-unhappily-stuck-in-their-parents-transportation-system/comment-page-2/.
[15] https://www.apta.com/resources/reportsandpublications/Documents/APTA-Transformation-of-the-American-Commuter.pdf.
[16] https://madison.com/wsj/business/madison-area-apartment-construction-still-booming/article_1b50dd63-8da5-566e-bcce-a53323d05777.html.

young families, with possible business tenants including a yoga studio, restaurant, salon, or technology company[17].

- **Hotel Indigo** – the website of the future hotel highlights its proximity to Capitol Square, shopping on State Street, and a new music venue, as well as its unique food and drink selection, noting "you'll see why Madison attracts a record number of millennials."
- **University Crossing Mixed Use Development** – the apartment complex that was completed in an earlier phase of the project emphasizes its location "in the center of it all," as well as its socially-oriented amenities, such as a rooftop courtyard, community room, and planned social events.

Project Need #4: Accommodate increased travel demand to and from existing and planned developments, services, jobs and destinations through multi-modal transportation investments.

Approximately 120,000 motor vehicles pass through the Isthmus on an average weekday.[18] As the residential population in the corridor and commuting employees into the corridor continues to grow, the added demand will strain the capacity of the streets through downtown. These streets are already physically constrained by the lakes; therefore, it is not feasible to add additional travel lanes. Providing high-capacity BRT will more efficiently and quickly move people through the most congested area of the city and will better meet future demands for travel.

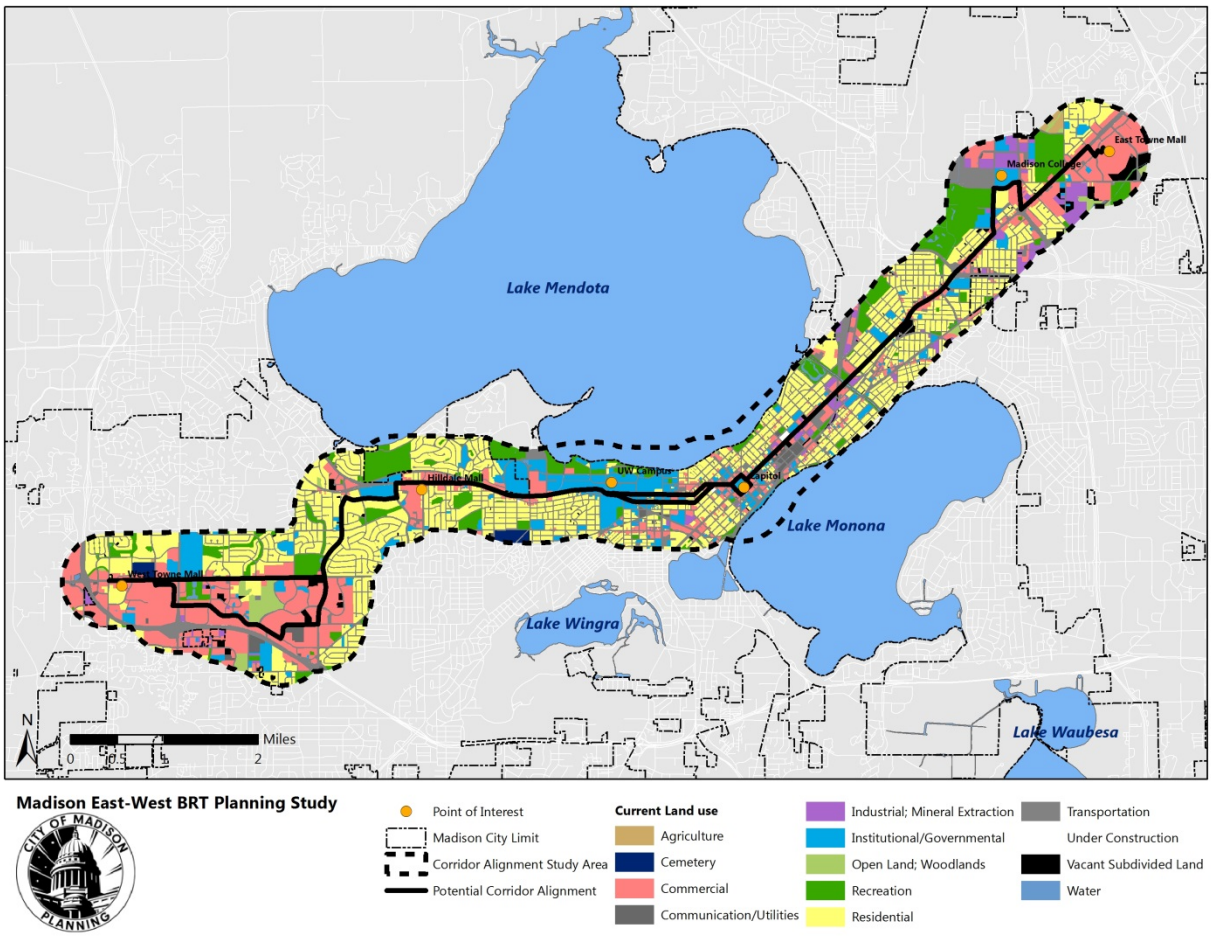
Planned Developments

Land Use

Figure 33 shows the current land use for the study corridor. Figure 34 shows generalized future land use. The generalized future land use highlights areas of employment, emphasizing their importance. The future areas of employment in the corridor are along East Washington Avenue, University Research Park, and the area just west of Hilldale Mall. Medium- to high-density residential use is also planned for these areas. The next section discusses the planned developments for the corridor.

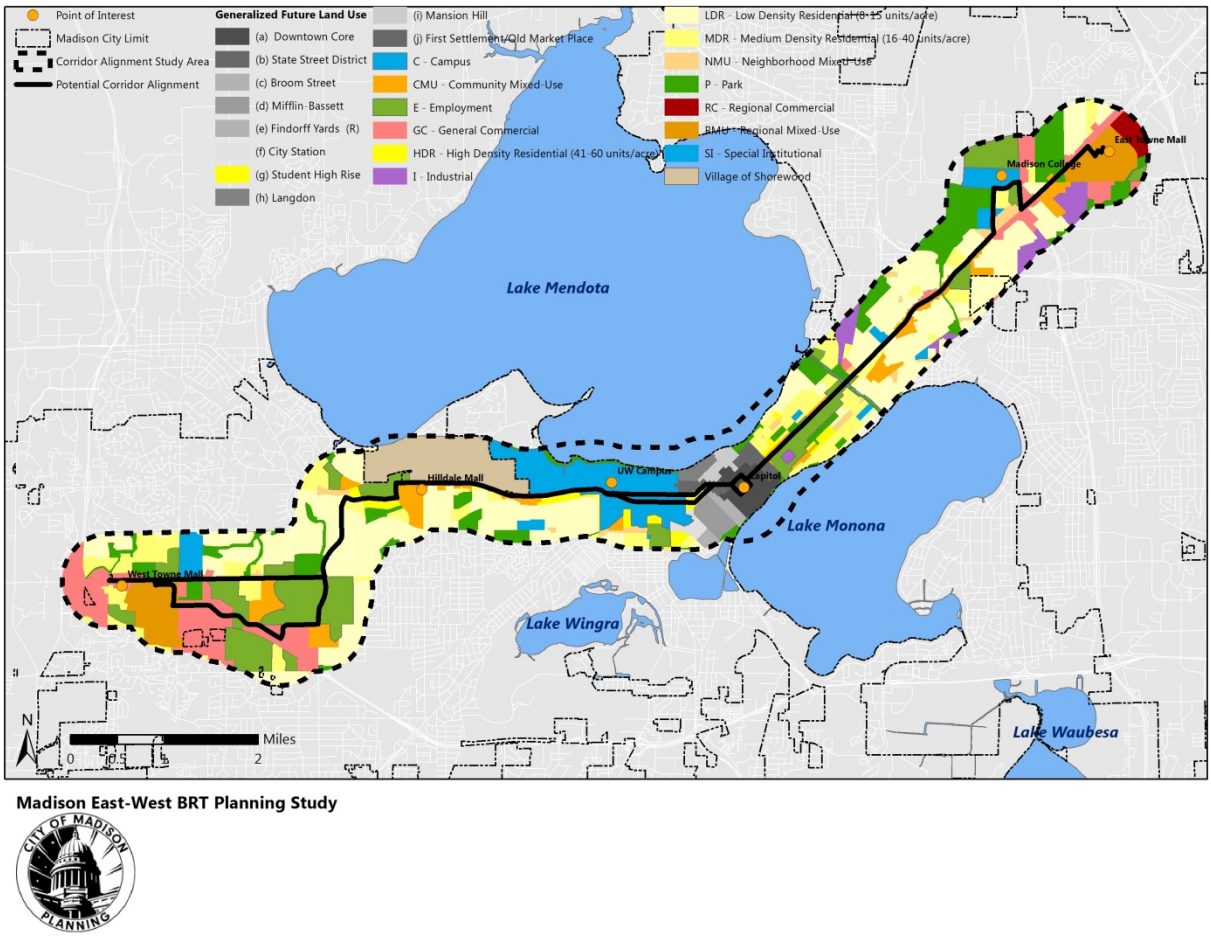
[17] https://madison.com/ct/news/local/govt-and-politics/proposed-development-would-bring-apartments-commercial-retail-space-to-east/article_54362149-c547-5d92-aea9-47114b836bb0.html.
[18] https://imaginemadisonwi.com/sites/imaginemadisonwi.com/files/document/pdf/City%20Snapshot.pdf.

Figure 33. Current Land Use



Source: City of Madison.

Figure 34. Future Land Use



Madison East-West BRT Planning Study

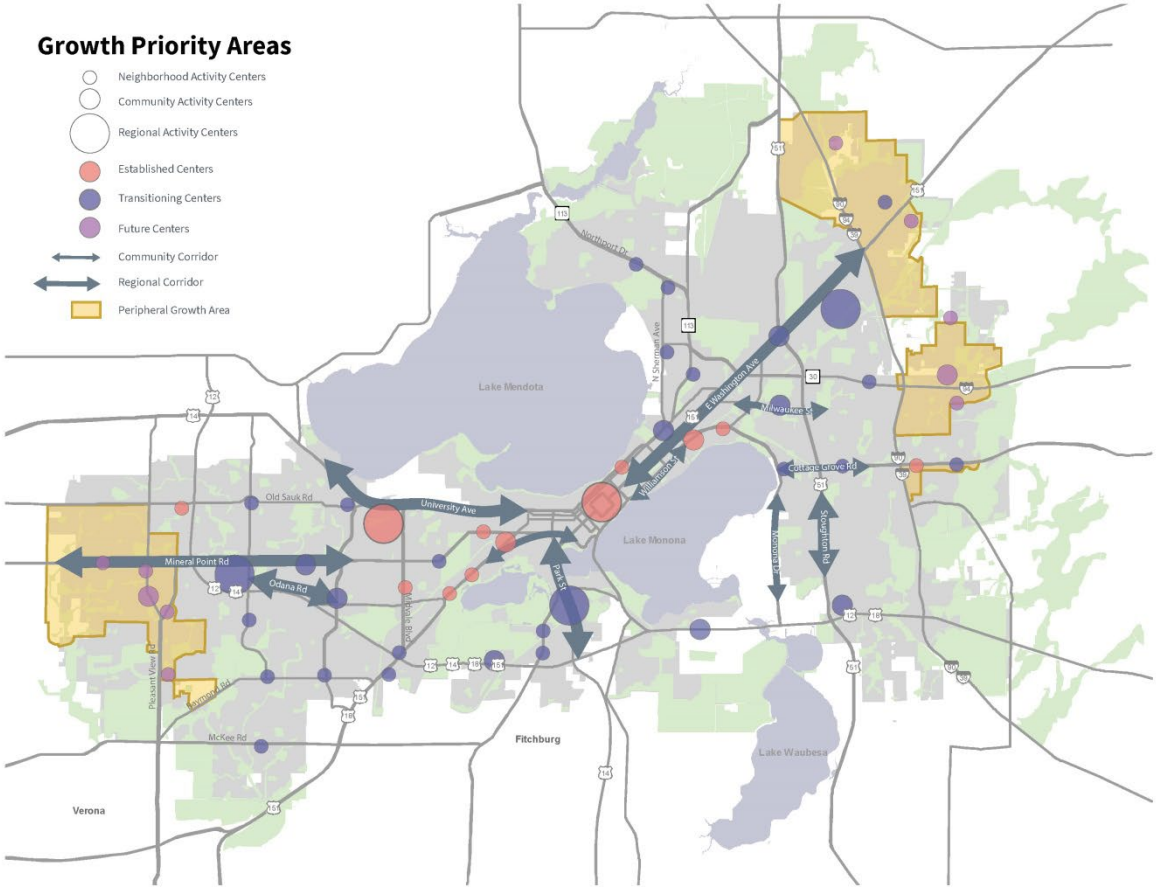
Planned Developments

Madison has rapidly developed in recent years, and many more developments are planned across the city. As part of the *Imagine Madison Plan*, a growth framework was established, including growth priority areas, to focus where developments are planned and built. The growth priority areas, illustrated on Figure 35, consist of activity centers, corridors, and peripheral growth areas, many of which overlap with the planned BRT corridor. Regional corridors including East Washington Avenue, University Avenue, Odana Road, and Mineral Point Road, have been designated as corridors that can support a mix of land uses due to existing and planned transit service. Additionally, activity centers within the proposed BRT corridor, such as Capitol Square, East and West Towne Malls, and Hilldale Mall, have been designated as major nodes that can support intensive mixed-use development due to their proximity to transit routes and major streets. There are also several "transitioning" and "future" activity centers within the corridor that are expected to accommodate much of the projected new development that "Established" activity centers will not be able to absorb, including:

- East Towne Mall
- East Washington Avenue and Stoughton Road intersection
- Site of future Madison Public Market, in the vicinity of the Yahara River and the East Johnson Street and First Street intersection

- University Crossing development, in the vicinity of the University Avenue, Old Middleton Road, and Whitney Way intersections
- Whitney Way and Odana Road intersection
- Oakwood Village University Woods, in the vicinity of the Mineral Point Road and Island Drive intersection
- West Towne Mall

Figure 35. Imagine Madison Growth Priority Areas



Source: Imagine Madison, page 16.

There are several planned developments located in and proximate to the identified growth priority areas across the city and within the corridor. Table 2 lists the planned developments within the corridor, with multiple developments marketing the proposed development's access to transit. The Madison Public Market is one of the city's most significant developments, and has been in planning for several years. Transit accessibility was a prominent measure evaluated in the site analysis, and its proposed location near the Yahara River and First Street was chosen, in part, for its prime access to transit. Additionally, the University Crossing mixed-use development has taken advantage of its location within the City's TOD overlay district, and the West Place mixed-use development on the west side of Madison highlighted its location on the planned BRT alignment in its application to the City.

Table 2. Planned Developments within the BRT Corridor

Name	Address	Retail/Residential Sq. Ft.	Number Units	Notes
Proposed Music Venue/Night Club	3116 Commercial Avenue	7,500 sq. ft.	NA	
Proposed Mixed-Use Development[a]	131 South Fair Oaks Avenue	11,000 sq. ft./ 153,000 sq. ft.	161 apartments	
Fair Oaks Apartments*	134 South Fair Oaks Avenue	2,500 sq. ft./ 87,088 sq. ft.	80 apartments	
Union Corners Grandfamily	2507 Winnebago Street	106,708 sq. ft.	60 apartments	Development targets "grand families" with grandparents raising grandchildren.
Winnebago Arts and Cohousing	2048-2114 Winnebago Street	64,000 sq. ft. cohousing building 10,300 sq. ft. circus arts facility	45 condos/ 10 artist studios	
Proposed two-story flat	1139 Williamson Street	2,750 sq. ft.	2 apartments	
Proposed Madison Public Market	200 North First Street	50,000 sq. ft.		This major development has been in planning for several years.
Hotel Indigo	901 East Washington Avenue	94,705 sq. ft.	144 hotel rooms	
Evans Scholarship House	141 Langdon Street	27,700 sq. ft.	75-90 beds	
University Crossing Mixed-Use Development	5102 Silver Tree Run	15,329 sq. ft./ 35,637 sq. ft.	48 apartments	First floor office space could accommodate 35-45 employees. The southeast corner of the site is designated under the TOD overlay.
Normandy Square Senior Apartments	6509 Normandy Lane	2,380 sq. ft./86,930 sq. ft.	58 apartments	
West Place Mixed-Use Development	302 South Gammon Road	11,000 sq. ft. retail (2 buildings) 314,000 sq. ft. office space (6 buildings)		Application emphasized proximity to future BRT route.

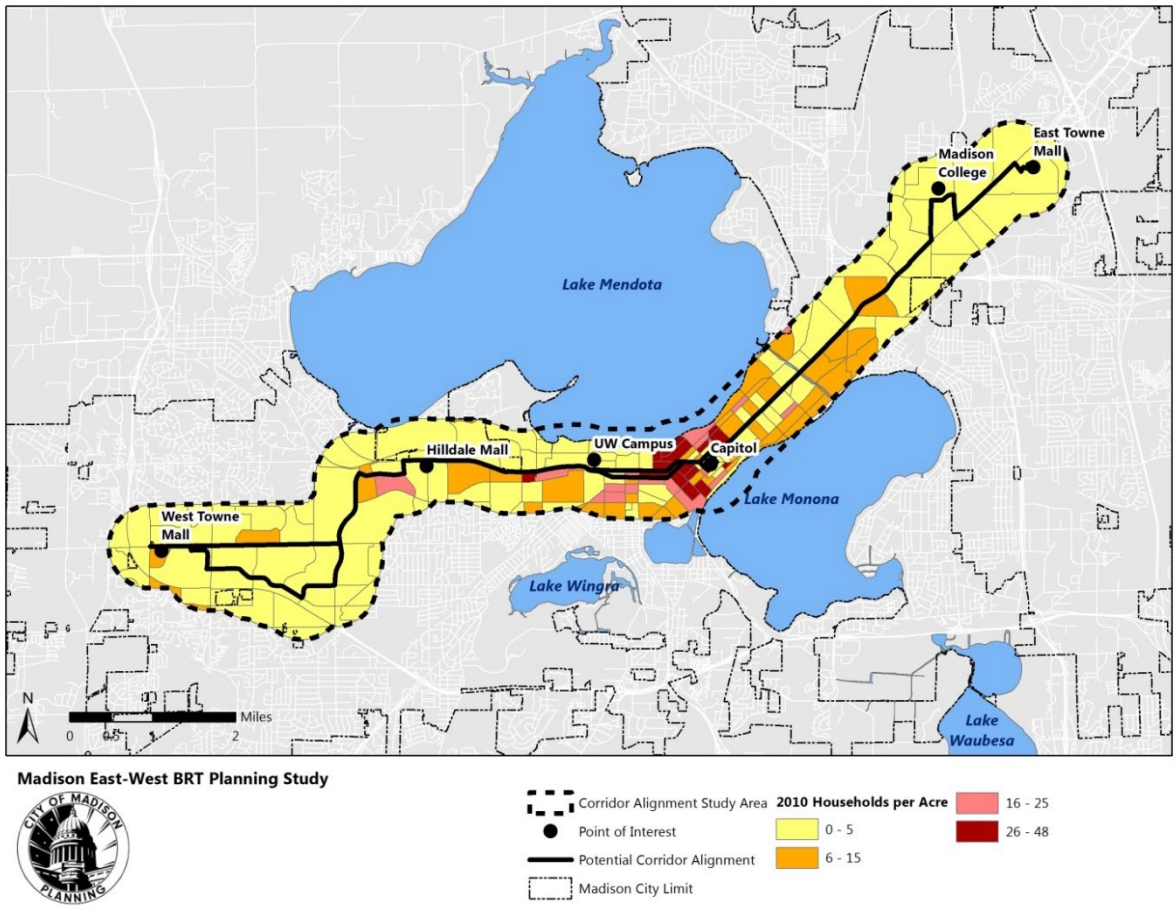
Name	Address	Retail/Residential Sq. Ft.	Number Units	Notes
Tree Lane Senior Apartments	7941 Tree Lane		60 apartments	Provides affordable housing to an economically diverse senior population

Source: City of Madison Department of Planning, Community & Economic Development; Current Development Projects Map, Wisconsin Housing and Economic Development Authority 2018 Low Income Housing Tax Credits (LIHTC) Awards.
[a]Development is one block outside of the half-mile buffer of the BRT alignment.

Current and Future Households

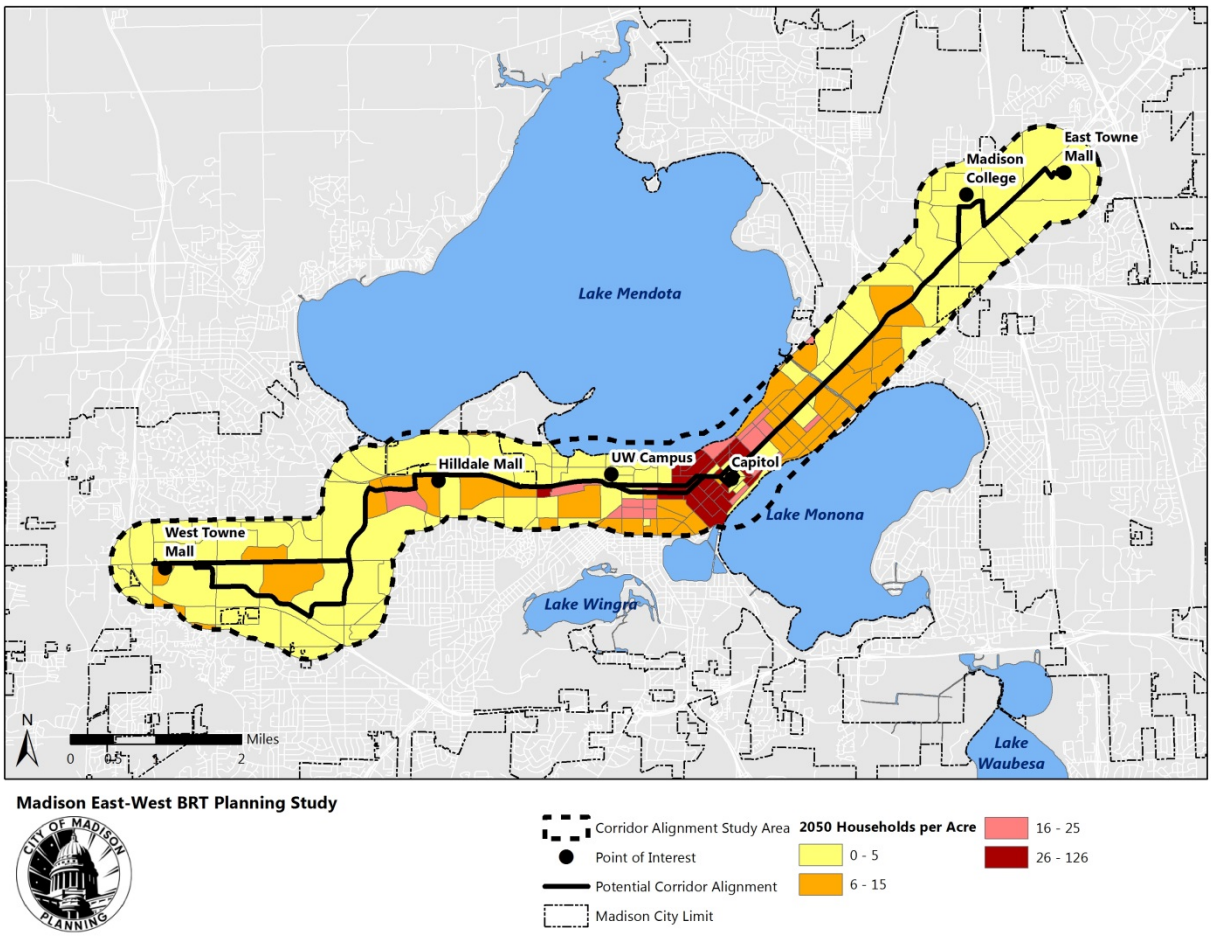
The part of the corridor that has the highest housing density is the Isthmus, around the UW campus and the neighborhoods east of the Capitol (Figure 36). In 2010, the highest housing density was 48 households per acre. By 2050, the housing density is forecasted to increase to as high as 126 households per acre (Figure 37). The areas with the highest density will continue to be around the Capitol, UW campus, and neighborhoods along East Washington Avenue. With an anticipated increase of nearly 2.5 times the number of households per acre as 2010, the transportation system will be beyond capacity without an investment in a high-capacity transit system.

Figure 36. 2010 Households per Acre



Source: Madison Area Transportation Planning Board.

Figure 37. 2050 Households per Acre



Source: Madison Area Transportation Planning Board.

Activity Generators

Tourism in downtown Madison supports 4,260 jobs and local revenue generated by visitor activity in downtown Madison is approximately $16.3 million. In 2017, visitor spending grew 7.3 percent in downtown Madison, reaching $276.1 million, of that, $31.1 was on local transportation. Supporting this volume of visitors through fast and reliable transit options is essential to maintaining a robust tourism sector.[19]

The top reasons people visit downtown Madison are the UW-Madison campus, the Monona Terrace Convention Center, and the State Capitol/Government. The primary activities are dining and shopping.

Several public venues in the corridor generate a significant amount of activity. Some activity is special events and seasonal, such as UW football games and the zoo; others are more consistent throughout the year, such as the Overture Center.

19

https://assets.simpleviewcms.com/simpleview/image/upload/v1/clients/madison/Dane_County_Madison_Economic_Impact_2017_838211af-ea31-495f-9b2a-31bde0224536.pdf.

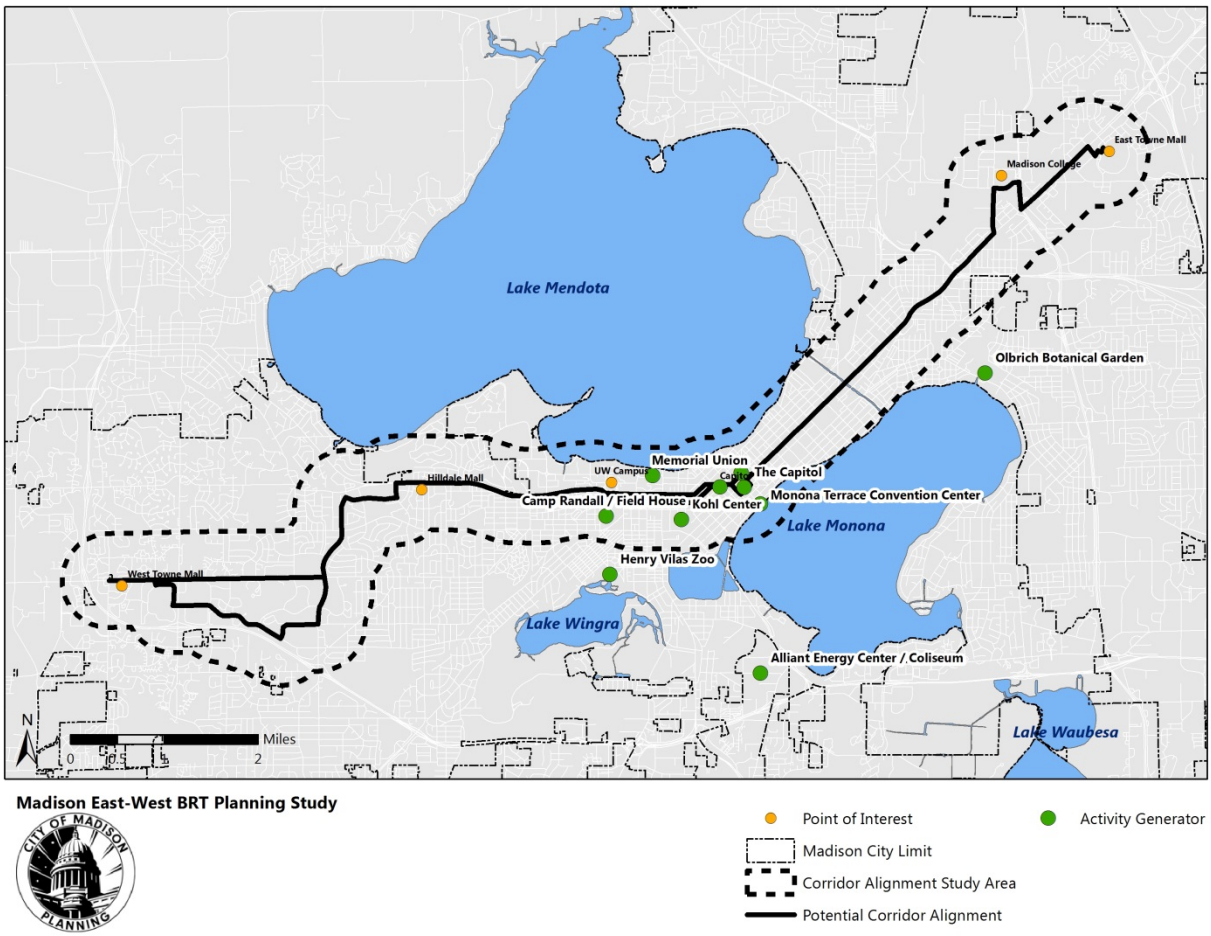
There are 14 major venues within or near the study corridor; these places attract 8,325,700 visitors annually (Table 3 and Figure 38). Fast, high-capacity BRT will support these attractions and help to ease congestion generated from these places.

Table 3. Activity Generators and Annual Attendance

Venue	Annual Attendance
UW-Madison/Memorial Union	3,065,000
Kohl Center	1,030,000
Henry Vilas Zoo	825,000
Overture Center	660,000
Camp Randall / Field House	560,000
Farmer's Market (the Capitol)	500,000
Monona Terrace Convention Center	350,000
Olbrich Botanical Garden	250,000
Taste of Madison (the Capitol)	250,000
Madison Children's Museum	245,000
Art Fair on the Square (the Capitol)	200,000
Museum of Contemporary Art (Overture Center)	185,000
Chazen Museum (UW Campus)	110,000
The Capitol Tours (the Capitol)	95,700

Source: Various sources.

Figure 38. Public Venues and Activity Generators



Source: Various sources.

Major Employers

There are approximately 129,000 jobs located within the study area corridor. Table 4 shows the top 10 employers by number of employees. The top employer are the city and state governments, though these employees are spread throughout the corridor in different departments and agencies (Figure 39).

Table 4. Top 10 Employers within the Study Corridor

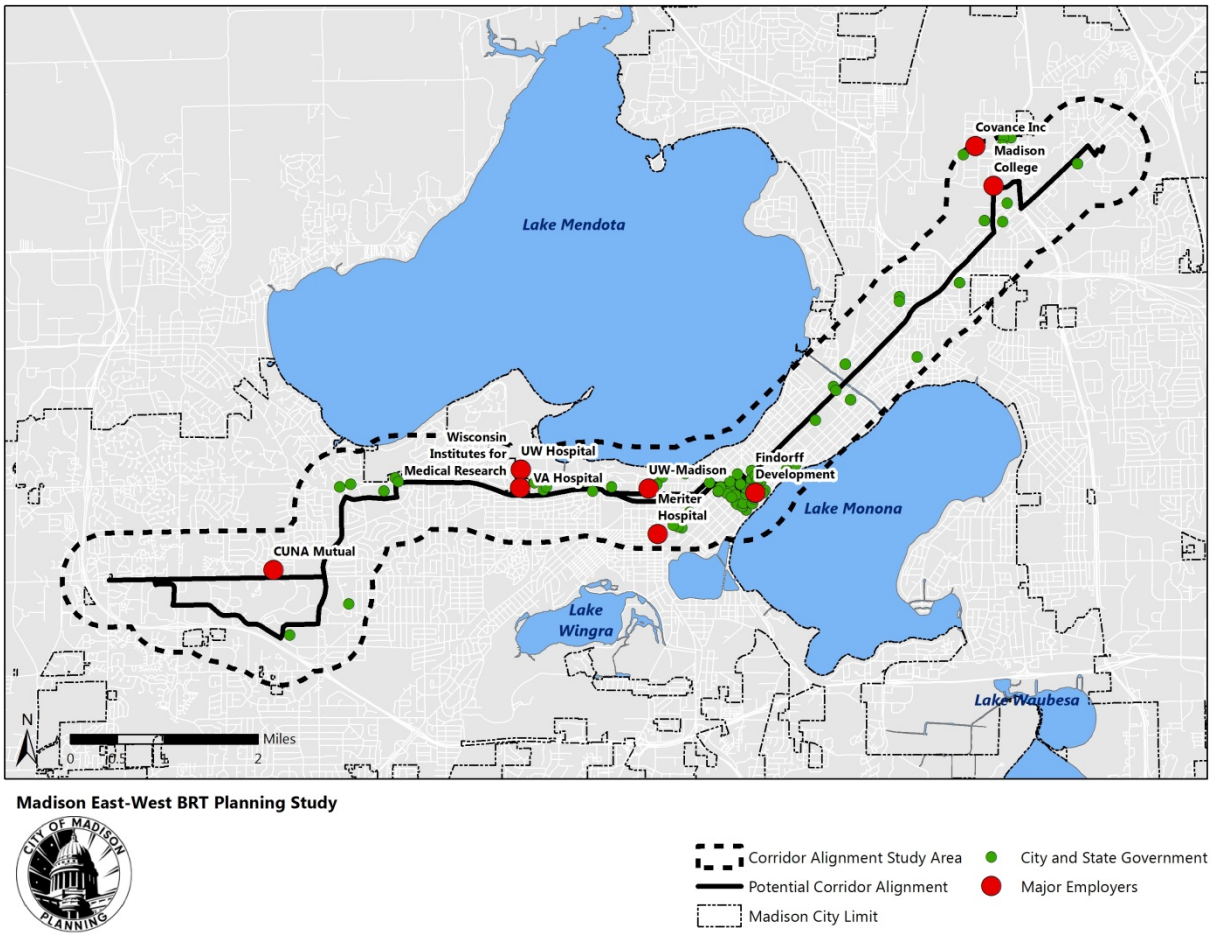
Employer	Number of Employees
City and State Government	13,000
UW-Madison	11,000
UW Hospital	3,066
Meriter Hospital	2,815
Covance	2,260
Wisconsin Institutes for Medical Research	2,000

Employer	Number of Employees
CUNA Mutual	2,000
Madison College	1,850
Veterans Administration	1,400
Findorff Development Co.	1,000

Source: Madison Area Transportation Planning Board and Infosys, 2016.

These employers are primarily in the health, education, and government sectors. They are spread throughout the corridor, emphasizing the need for transportation that can move commuters quickly throughout the East-West BRT Corridor (Figure 39).

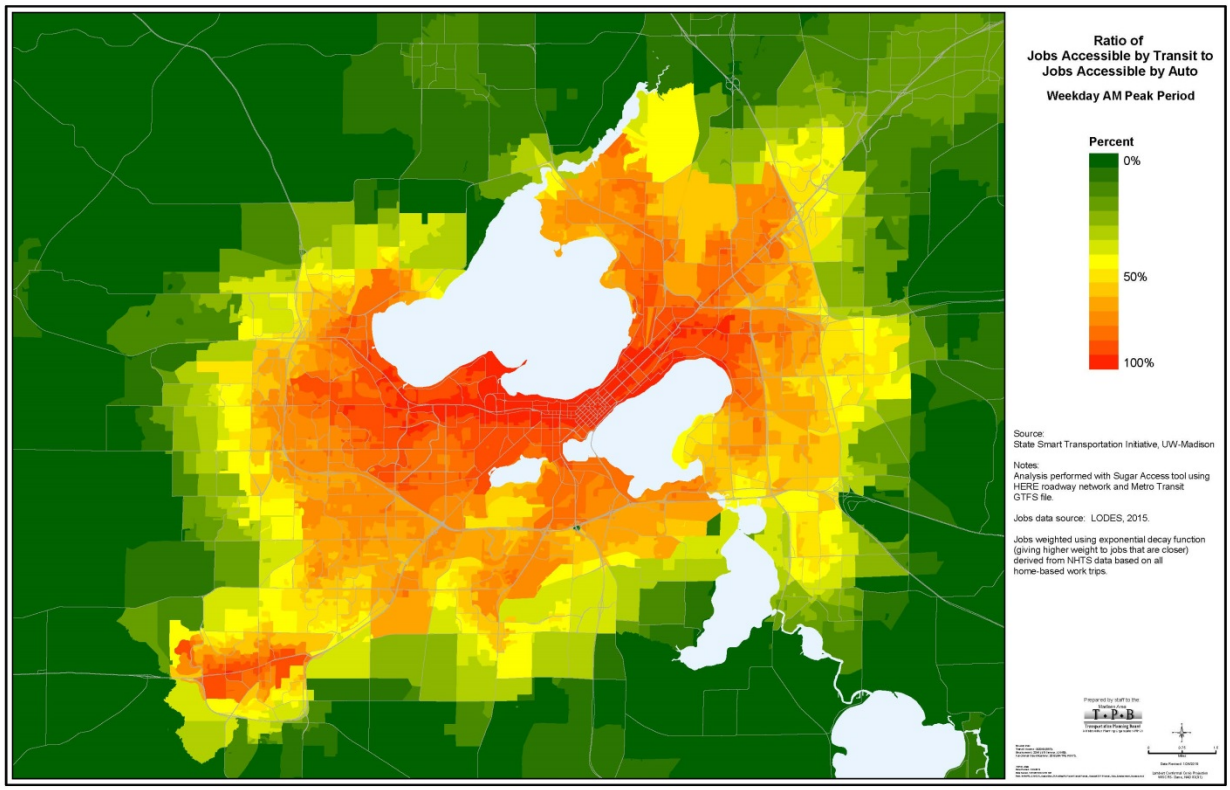
Figure 39. Location of the Top 10 Employers in the Corridor



Source: Madison Area Transportation Planning Board and Infosys, 2016.

Figure 40 shows the ratio of jobs that are accessible by transit versus jobs that are accessible by automobile. Many of the jobs in the corridor are accessible by transit, though the transit options may not be competitive in terms of travel time, as previously discussed.

Figure 40. Ratio of Jobs Accessible by Transit to Jobs Accessible by Auto

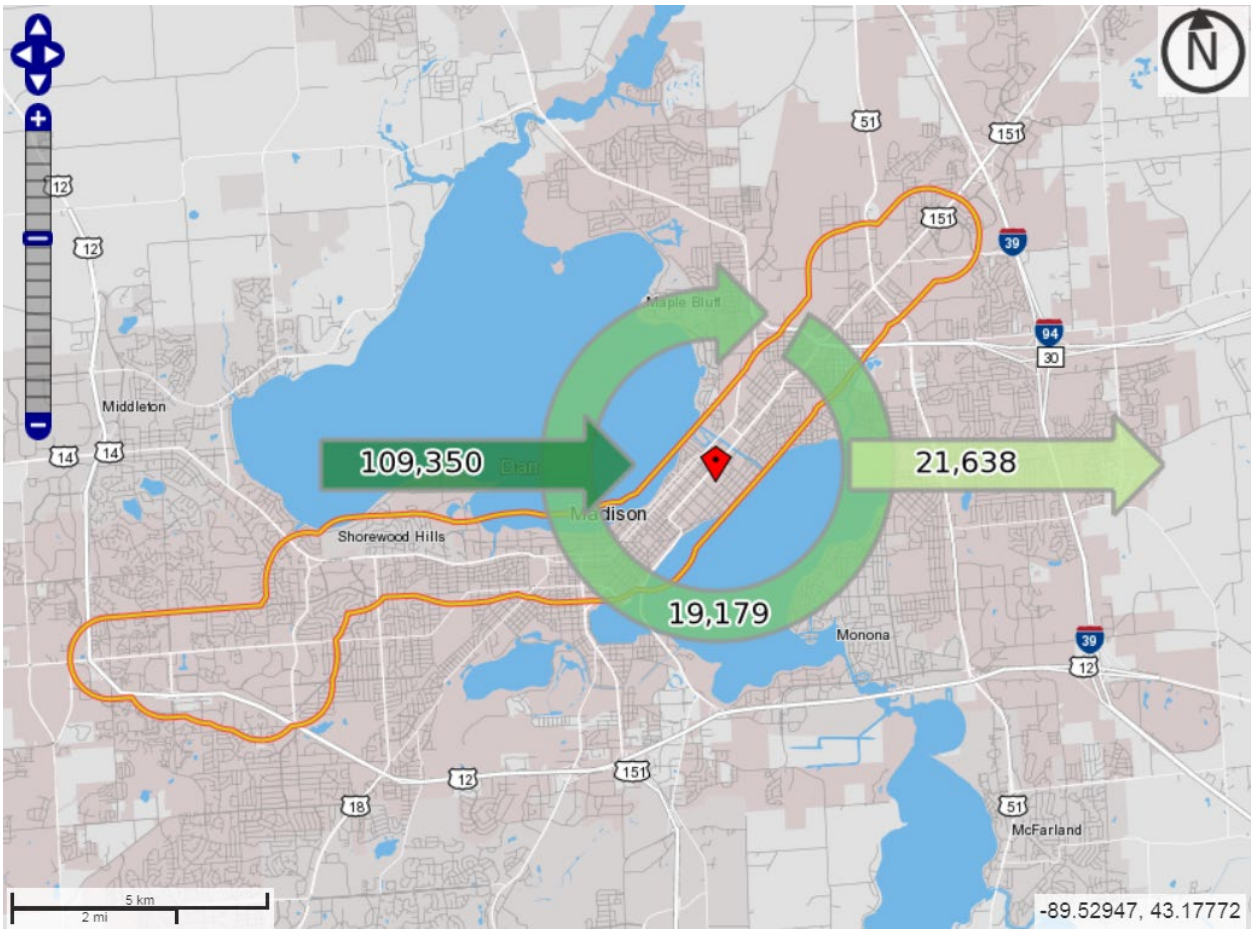


Source: State Smart Transportation Initiative, 2015.

Figure 41 shows the flows of workers who come into the corridor to work (and live outside of the corridor), those who leave the corridor to go to work (and live inside the corridor), and those who both live and work within the corridor. According to OnTheMap Longitudinal Employer-Household Dynamics (LEHD) data, there are:

- 109,300 people who are employed within the corridor, but live outside of it
- 19,200 people who both live and work within the corridor
- 21,600 people who live in the corridor, but work outside of it

Figure 41. Inflow/Outflow of Workers and Residents in the Corridor



Source: OnTheMap, LEHD, 2015.

Employment is forecast to increase to at least 135,000 by 2050. Currently 109,000 people come into the corridor for work. That high number of workers in a dense and constricted area of the city has strained the transportation network to its capacity. The city needs BRT to move more people more quickly and more efficiently.

The current capacity of the streets on the Isthmus is 3,300 vehicles per hour. The current demand on the street network is 3,600 vehicles per hour; demand is already exceeding capacity. By 2050, demand will increase by an additional 2,100 vehicles per hour, for a total of 5,700 vehicles per hour. This level of demand is unsustainable and an alternative to driving is necessary. Just 38 buses can move 1,500 people per hour through the Isthmus, which would greatly relieve congestion.[20]

[20] https://www.cityofmadison.com/dpced/planning/documents/MNC%202018%20Lynch.pdf.

Project Need #5: Invest in sustainable options that are consistent with local/regional Plans, and future technology.

The *Imagine Madison*, *Madison In Motion,* and RTP 2050 plans all call for a transportation system that accommodates transportation needs and demands while mitigating congestion, promoting air quality, and supporting affordable housing goals, sustainability, and energy conservation. Transit service also plays a critical role in increasing access to services. A high-capacity transit system investment that leverages existing transportation facilities while reducing reliance on single-occupant motor vehicles will be necessary to achieve these goals.

Reduction in Pollutant Emissions and Single-Occupant Motor Vehicles

Climate change is a significant challenge that needs to be addressed at all levels to adequately mitigate the negative impacts on the environment. Having a strong transit system is one solution that helps to solve this challenge. The recent National Climate Assessment proposed three solutions to addressing climate change. These are:

- Putting a price on greenhouse gas emissions
- Establishing government regulations on how much greenhouse pollution can be emitted
- Spending public money on clean-energy research[21]

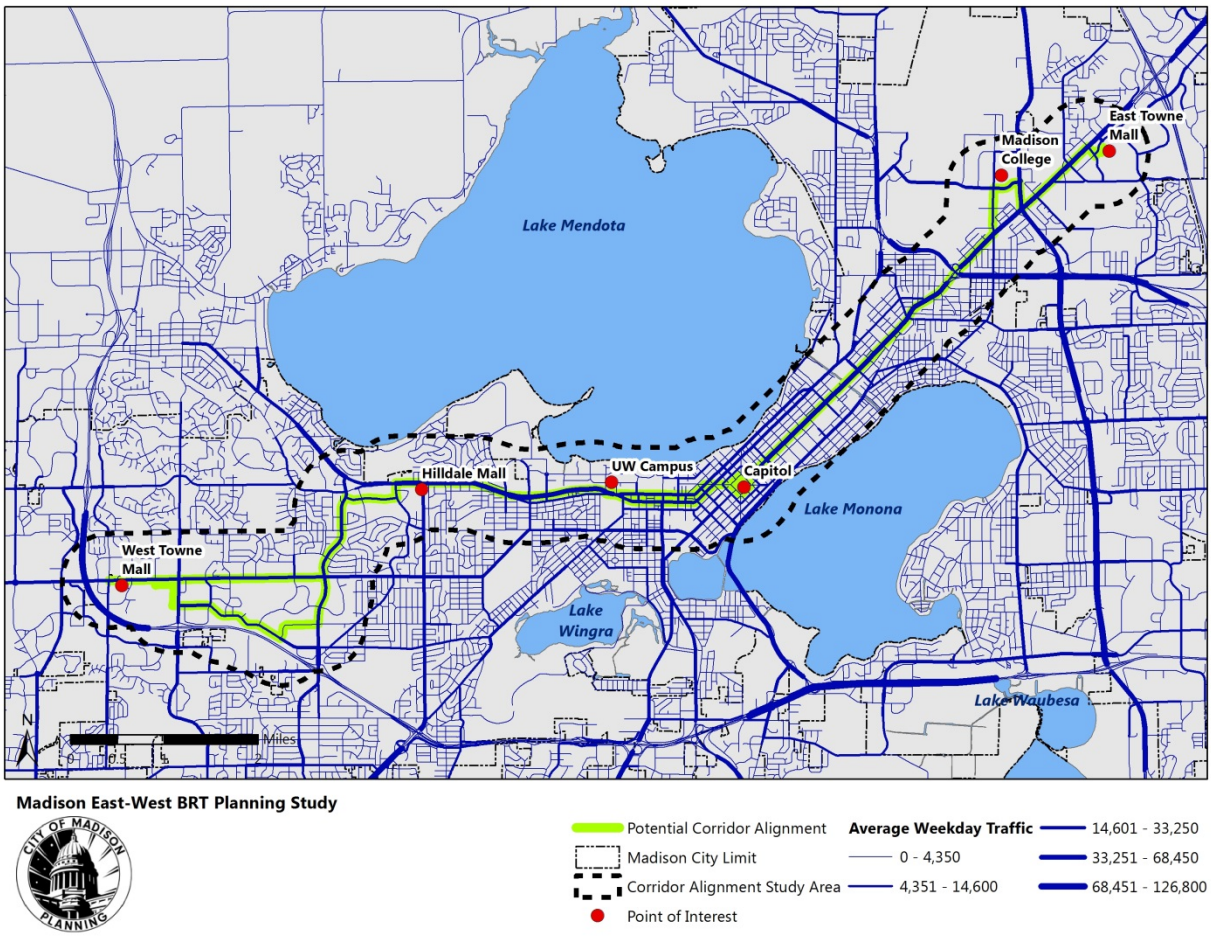
If these solutions are implemented, carbon-based fuel sources, such as gasoline used by most personal motor vehicles, will become more expensive. The more expensive driving personal vehicles becomes, the more likely people are choose to take transit. By having a robust transit system, the city will be prepared for the eventual increase and will able to accommodate the influx of riders.

BRT may help to reduce personal vehicle traffic volumes, which could further result in reductions in energy consumption as well as air pollutant emissions. Additionally, BRT can help reduce the overall amount of vehicle miles traveled and shift commuters to high-capacity transit vehicles (BRT vehicles can carry 80 to 120 passengers). Reducing the number of vehicles to transport the same amount of passengers with modern, high-capacity vehicles can reduce traffic congestion and emissions. Currently, the corridor is one of the most heavily travelled and congested in the city, and future projections indicate increased commuters and congestion. BRT could assist in reducing future energy consumption and air pollutant emissions.

Figure 42 shows that the BRT route runs through some of the highest traffic volumes in the city.

[21] https://nca2018.globalchange.gov/.

Figure 42. Madison Average Weekday Traffic Counts, June 2018



Source: City of Madison, 2018.

Corridor, Municipal, and Regional Plans

Several local plans call for sustainable growth and multi-modal investments. The recommendations and policies set forth in these plans are summarized below.

Imagine Madison

- Increase the use and accessibility of energy efficiency upgrades and renewable energy. Transportation is a major contributor to greenhouse gas emissions. The City should provide alternative forms of transportation for the public as well as planning for and supporting infrastructure to expand the use of electric vehicles.

Madison In Motion

- Expansion is no longer the preferred transportation enhancement option, as the roadway system is at or near capacity. Madison will need to be proactive on congestion management measures due to geographic constraints limiting roadway expansion options.
- Target growth patterns, including TOD to minimize congestion by increasing population in areas with good access to transit.

RTP 2050

One of the goals described in this plan is to reduce the environmental impact of the transportation system. Some of the policies outlined in the plan that support this goal are:

- Design and build sustainable transportation infrastructure and implement operations programs that avoid or mitigate negative environmental impacts and augment positive changes.
- Implement purposed intelligent transportation technologies that improve traffic flow, encourage eco-driving, make transit and bicycling easier and more convenient, create new mobility services, provide traveler information, and better integrate the different modes. Projects implementing these technologies should encourage and facilitate private sector transportation innovation and integration of public and private transportation options.
- Incentivize alternatives to single-occupant vehicle driving through strategic investments in alternative transportation, public and employer-based commute options programs, transportation demand management/vehicle trip reduction ordinances, and parking policies.

Madison Sustainability Plan

This plan establishes a vision of Madison as a self-reliant community, relying on renewable and local resources. This plan also states that "multi-modal transportation is a key to improving Dane County's sustainability."

- Goal: Improve air quality. Action: Increase mass transit options
- Goal: Improve transportation planning and systems to provide better access for community's needs.
    - Action: Implement further planning efforts to create efficient regional transit hubs, including development an express bus/BRT program to decrease commute times and improve customer service.
    - Action: Foster corridor planning, TOD, and high-density, mixed-use development along corridors.
- Goal: Implement existing city, Metropolitan Planning Organization, and regional alternative transportation plans
- Goal: Expand the number of neighborhoods and commercial centers where sustainable transportation choices enable mobility without a car. Action: Establish BRT and Metro express service.
- Goal: Influence reductions in transportation-related carbon impacts. Action: Improve public transit options such as offering more service and integrating multi-modal transportation options

The need for fast BRT service is thoroughly established through multiple local plans. These plans have looked at high-capacity transit as a means to increase sustainability in the city and region.

Future-proofing and Technology-Ready Solutions

Autonomous bus is an emerging bus mode that is expected to operate using driverless technology. It is currently being developed in Singapore, France, Germany, and China and leverages vehicle-to-vehicle communication technology; it is not currently operational within the United States for high-capacity transit like BRT.

While the first generations of this technology relied on the vehicles communicating with fixed infrastructure through sensors and other technology embedded in pavement, the current state of technology is trending towards smart vehicles that communicate with each other across the broader transportation network (connected vehicles) while operating without driver control (automated vehicles). Technology is continuing to rapidly advance, and industry standards and specifications are continuously evolving.

The East-West BRT project presents the opportunity to leverage existing technology (using intelligent transportation systems tools like traffic signal priority to support BRT schedule adherence) while using strategic guideway design to position the corridor for future evolution towards autonomous and electric buses as the technology matures.

Goals and Objectives

The following four goals and related objectives have been established for the East-West BRT Corridor. These will be utilized for the development of evaluation criteria used in comparing the alternative transit investment options for the corridor. The goals and objectives are outlined in Table 5.

Table 5. East-West BRT Corridor Goals and Objectives

Goal	Objective
Increase the efficiency, attractiveness, and utilization of transit for all users	• Provide reliable, frequent service that improves the experience of existing customers and attracts "choice" riders • Provide capacity for future growth in transit ridership • Provide enhanced passenger amenities and infrastructure • Reduce travel times
Efficiently manage the forecasted increase in corridor travel demand	• Provide frequent, high-capacity, one-seat transit connections between key East-West BRT Corridor activity generators • Manage increasing corridor travel demand through more efficient use of the existing transportation network • Contribute to acceptable levels of traffic operations and parking supply in the corridor • Improve pedestrian and bicycle connections to East-West BRT Corridor transit • Coordinate with existing and planned transit services
Contribute to a socially-, economically-, and environmentally-sustainable transportation network	• Promote a more efficient and sustainable transportation system that reduces energy usage, emissions, and costs of living • Increase mobility and accessibility for transit-dependent populations • Support regional planning efforts for a more balanced, multi-modal transportation network in the region • Support local and regional goals for compact, mixed-use development along the corridor • Support institutional and key stakeholder planning efforts
Develop and select an implementable and community-supported project	• Define and select transit improvements with strong public, stakeholder and agency support • Define and select transit improvements that are cost-effective and financially feasible, both in the short- and long-term • Define and select transit improvements that are competitive for FTA funding

Evaluation Criteria

In order to evaluate the initial group of transit modes and alignment options and identify the appropriate mode-alignment pairings that will comprise the detailed alternatives, the East-West BRT Planning Study will follow a three-step method.

- The first step (Tier 1 Evaluation) will define project alternatives, with different alignment options in downtown and on the west side.
- The second step (Tier 2 Evaluation) will evaluated the project alternatives defined in the first step using the evaluation criteria outlined below.
- The alternative(s) that fare(s) best against the detailed criteria in this second step will be identified as preferred alternative(s) and further refined in the third step (Tier 3). The LPA will be identified at the conclusion of the third step.

The evaluation criteria associated with each step are a combination of quantitative and qualitative performance measures.

- The Tier 1 Evaluation will apply fewer and broader measures, including information from previous corridor/area studies. The analysis will largely rely on order-of-magnitude estimates and the outcomes of similar transit projects from around the country.
- The Tier 2 Evaluation will apply more detailed and alternative-specific evaluation results.
- The Tier 3 Evaluation will evaluate the preferred alternative(s) against federal criteria to identify and refine the LPA.

This three-step process will result in the identification of an LPA that not only meets locally-identified project purpose and needs, but is also competitive for federal funding.

Table 6 presents the evaluation criteria that are likely to be used during the three steps of alternative evaluation. Note that each successive step builds upon the criteria from the previous step, ensuring a consistent rating throughout.

Table 6. Evaluation Criteria

Project Goals	Evaluation Phases		
	Tier 1 (qualitative analysis)	**Tier 2 (qualitative and quantitative)**	**Tier 3 (quantitative and qualitative)**
Increase the efficiency, attractiveness, and utilization of transit for all users	• Typical ridership capacity • Service reliability	• Ridership • Transit travel times	• Mobility improvements[a]
Efficiently manage the forecasted increase in corridor travel demand	• Connectivity between population and employment centers	• Traffic impacts • Parking impacts • Potential right-of-way impacts • Bicycle and pedestrian impacts	• Mobility improvements[a] • Congestion relief[a]
Contribute to a socially-, economically-, and environmentally-sustainable transportation network	• Environmental impacts (visual, natural) • Demonstrated ability to catalyze economic development • Consistency with existing corridor character • Compatibility with local and regional plans	• Station area population and employment densities • Station area equity characteristics • Station area land use and economic development opportunities • Environmental impacts/benefits	• Economic development[a] • Land use [a] • Environmental benefits[a]
Develop and select an implementable and community-supported project	• Typical per-mile capital cost • Community support	• Capital and operating and maintenance costs • Cost effectiveness • Community support	• Financial capacity analysis[a] • Cost effectiveness[a]

[a]Consistent with FTA New Starts/Small Starts criteria.