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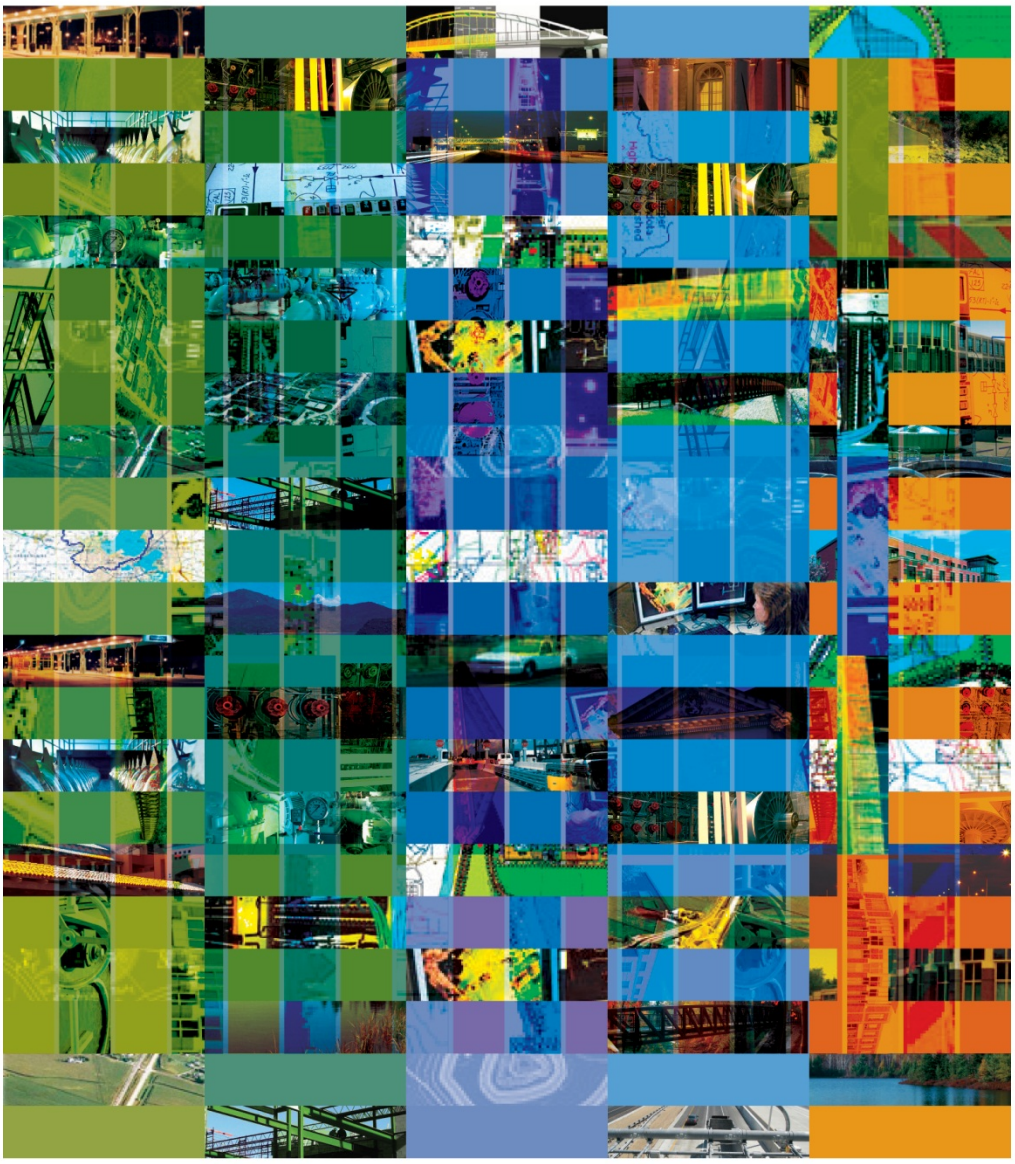
Near Westside Neighborhoods and University Avenue Corridor Transportation Study



Report

City of

Madison, WI

May 2014

STRAND ASSOCIATES®

DRAFT FINAL-(05/22/14)

Report for

City of Madison, Wisconsin

Near Westside Neighborhoods and University Avenue Corridor Transportation Study

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May 2014

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SECTION 1
EXECUTIVE SUMMARY

1.01 STUDY BACKGROUND, THEME, AND GOALS

The City of Madison (City), the Village of Shorewood Hills (Village), and the University of Wisconsin-Madison (UW) jointly funded this Near Westside Neighborhoods and University Avenue Transportation Study (Study).

The Near Westside neighborhoods, the Village, and the larger Madison area are served by University Avenue, an important primary arterial street carrying in excess of 50,000 vehicles per average weekday. This can result in sometimes severe congestion, crashes, and delay to motorists, public transit riders, pedestrians, and bicyclists. As a result, some drivers elect to use nearby residential streets in both Madison and Shorewood Hills to avoid traffic delays and congestion. The local residential streets serving this cut-through traffic are not intended for this use, and this traffic can have a negative impact on quality of life resulting in increased concerns for pedestrian and bicyclist safety.

The portion of University Avenue considered in this Study is from Segoe Road to Breese Terrace. The Study also includes neighborhood streets and transportation infrastructure nearby bound by the following: Lake Mendota to the north; Mineral Point Road, Speedway Road, and Regent Street to the south; Segoe Road to the west; and Breese Terrace to the east.

The Study approach was broken into three phases. Phase 1 of the Study involved needs identification and review of base and future conditions and took place from January through July 2013. Workshops were held to gather stakeholder input: the first on March 12 at Madison West High School and the second on March 20 at the Shorewood Hills Village Hall. Phase 2 of the Study involved development and review of potential solutions and took place from July through September 2013. Workshops were held to gather additional stakeholder input and feedback on the range of possible corridor modifications: the first on September 12 at the Shorewood Hills Village Hall and the second on September 23 at Covenant Presbyterian Church. Phase 3 of the Study involved development of recommendations, one public information meeting, and study documentation. It included the development of near- and long-term recommendations, a review of funding opportunities, and identification of next steps for implementation.

Based on stakeholder feedback and planning level evaluation of possible modifications, the study team developed a Guiding Theme and three Primary Goals. These were considered when developing the list of recommendations.

A. Theme and Goals

Table 1.01-1 lists the Guiding Theme and Primary Goals developed by the study team.

Guiding Theme	
Considering the high physical and environmental impacts and total project costs associated with significant motor vehicle capacity expansion (an eight-lane corridor or grade separations), primarily seek options to reduce demand for peak-hour single occupant motor vehicle (SOMV) travel and/or improve conditions for alternate modes without a severe detriment to car and bus travel.	
Primary Goals	
Goal TR: (Transit)	Provide exclusive and/or prioritized transit that moves high volumes of people within this portion of the University Avenue transportation corridor.
Goal AC: (Access)	Improve access (options for both ingress and egress) to the west UW campus and VA medical complex areas.
Goal PB: (Pedestrian/Bicycle)	Improve the connectivity and comfort level of bike and pedestrian travel in the study area.

Table 1.01-1 Guiding Theme and Primary Goals

1.02 BASE CONDITIONS

A. Travel Demand Management

Travel Demand Management (TDM) measures seek to achieve more efficient use of transportation infrastructure by reducing the demand for single occupant motor vehicle trips during peak travel times. The Village, City, and UW all engage in various forms of TDM. The result of this concerted and coordinated effort is evident in the most recent US Census data. From 2007 to 2011 in the Madison metropolitan area as a whole, 78.7 percent of work trips were made by car. This 22.3 percent share for alternate modes is fifth highest in the country exceeding Portland, Oregon, and Austin, Texas, and on par with much larger urban areas such as Boston, Massachusetts, and Chicago, Illinois.[1]

B. Pedestrian Accommodations

Pedestrian accommodations vary in the general study area. While sidewalks are provided on both sides of the major corridors, most of the Village of Shorewood Hills and portions of the Greater Regent neighborhood lack sidewalks. Portions of the arterial corridors of University Avenue, Campus Drive, and Midvale Boulevard can act as impediments to pedestrian travel. There is a perception that some of the traffic signals along University Avenue do not provide sufficient crossing times; however, upon review of the signal controller settings, pedestrian crossing times consistent with industry practices and requirements are in fact provided at each intersection when a pedestrian button is pressed.

C. Bicycle Accommodations

In general, the study area and the Madison metropolitan area as a whole are well-served by a large network of interconnected bicycle facilities, with some gaps still needing to be completed. On-street dedicated and shared-lane facilities as well as off-street paths are available for bicyclists. The most common issues cited by stakeholders included lack of east-west connectivity from University Bay Drive to Shorewood Boulevard; the campus path crossing of Highland Avenue

[1]From *Transportation in Transition*, December 2013, by United States Public Interest Research Group (U.S. PIRG)

north of Campus Drive; and a lack of north-south connectivity between the area bounded by Midvale Boulevard and Allen Street/Edgewood Boulevard.

D. Transit Service

Metro Transit provides the main transit service in the City of Madison metropolitan area via local bus service. The Study corridor is a critical link in Metro Transit's route structure. In 2011, more than 14.9 million rides were recorded on Metro Transit, a 9.5 percent increase over 2010. Currently 8.6 percent of work trips in Madison use transit, which ranks 44th in the nation. University Avenue is an extremely important transit corridor. There are 15 Metro Transit route numbers that serve University Avenue, not including supplemental school service. Almost 490 buses travel on University Avenue during a typical weekday, not including school service.

E. Motor Vehicle Peak-Hour Congestion and Queuing

The study team completed traffic modeling to evaluate current levels of driver delay and queuing during peak traffic conditions. Synchro8/SimTraffic8 software was used for this analysis. For urban streets, conditions at intersections are typically used to evaluate operations. Currently, some intersections in the Study area are near capacity during peak times, and a few intersections or individual movements are over capacity.

F. Crash History

Crash analysis for transportation facilities is often divided into at least two categories: crashes at intersections and crashes along corridors. For motor vehicle crashes, crash rates are typically used (crashes per vehicle or vehicle miles) rather than the gross number of crashes. This is so facilities that carry different volumes of motor vehicle traffic can be compared to one another.

The University Avenue corridor from Midvale Boulevard to Grand Avenue experienced the most bicycle and pedestrian crashes. There were 13 from 2007 through 2011, or about 2.5 per year. This corridor also experiences the highest motor vehicle and some of the highest bicycle and pedestrian traffic of any of the corridors evaluated. It is expected then that the higher number of potential conflicts resulted in the highest number of pedestrian and bicycle crashes.

The study team reviewed crash data at 29 intersections in the Study area; 16 experienced a bicycle or pedestrian crash between 2007 and 2011. Only one location had more than two bicycle or pedestrian crashes in that period. The intersection of University Avenue and Farley Avenue/University Bay Drive experienced three pedestrian and two bicycle crashes.

The Highland Avenue corridor had the highest motor vehicle crash rate from 2007 through 2011 of the corridors evaluated, and the rate was 1.64 times the statewide average for an urban arterial facility. It is important to note, however, that the number of crashes and crash severity were both low. Only one injury was reported from the 21 total crashes in the five-year period (4 percent). Three crashes occurred at the VA Hospital entrance just north of the railroad tracks. Three crashes involved bicyclists, two of which were traveling along Highland Avenue while one was crossing Highland Avenue at the UW

multiuse path north of the railroad tracks. Two crashes involved a vehicle traveling on Highland Avenue sideswiping a legally parked vehicle.

For motor vehicles, intersection crash rates are typically calculated as the number of crashes per one million entering vehicles (MEV). In Wisconsin, an intersection crash above 1.5 MEV is often considered a candidate for a safety study. Intersections with crash rates between 1.0 and 1.5 MEV warrant monitoring.

None of the 20 intersections the study team evaluated experienced a crash rate over 1.5 MEV, and only two locations had crash rates above 1.0 MEV. The intersection of Mineral Point Road and Midvale Boulevard had a crash rate of 1.01 MEV. The City will be making modifications at this location in 2015. The intersection of Mineral Point Road/Speedway Road and Glenway Street had a crash rate of 1.11 MEV.

G. Cut-Through Traffic

This study included a license plate survey to identify how much of the traffic on the most common cut-through routes is in fact cut-through traffic. This type of data collection is very budget-intensive, as field staff must manually collect plate numbers at multiple locations simultaneously. For this reason, only inbound traffic on select routes during a weekday AM peak period was collected.

The study indicates that about 55 percent of the traffic entering the Village of Shorewood Hills during the AM peak period on Lake Mendota Drive ultimately leaves the Village via Lake Mendota Drive, Shorewood Boulevard, or Oxford Road. At least some of this traffic is likely destined to the Eagle Heights housing area and probably should not be categorized as cut-through. About 15 percent of the traffic entering on Shorewood Boulevard ultimately exits the Village via Oxford Road. Some of this is likely student drop-offs at Shorewood Elementary.

For the Greater Regent neighborhood, the study shows inbound cut-through traffic during the AM peak period varies from about 20 to 50 percent on the routes surveyed. Franklin Avenue has the highest percentage of vehicles that enter the area and ultimately exit at one of the locations surveyed. Of the traffic exiting the area at Franklin Avenue and University Avenue, about 25 percent originated from one of the three entry points surveyed.

The study team also collected data on traffic entering the UW/VA Hospital area northbound on University Bay Drive and Highland Avenue. About 5 to 10 percent of the entering traffic was found to have “cut through” the Greater Regent neighborhood, while 92 to 96 percent had not cut through. This equated to about 100 cut-through vehicles total during the AM peak hour on the day the survey was conducted. Some of this traffic was likely coming from points south of Speedway and Mineral Point Road, and was thus taking a reasonable route to the UW/VA Hospital area and other points north.

H. Neighborhood Parking Concerns

A significant amount of feedback was provided to the study team by residents of the Greater Regent Neighborhood regarding on-street parking use by daily commuters. Opinions varied regarding the level of concern caused by the high use parking areas. Some residents liked the fact

that the parked vehicles tend to slow or “calm” traffic on neighborhood streets. Some felt the parking was primarily a concern on streets that do not have sidewalk for pedestrians. Other residents opined that the phenomenon of commuters/employees parking in the neighborhood and walking, bicycling, or taking transit to work was not acceptable and should not be allowed.

1.03 FUTURE CONDITIONS

The general Study area has been and will continue to be an attractive area for redevelopment projects. The relatively recent changes to the Hilldale Mall area and proposals for reconfiguration of the Hill Farms State Office Building site are clear indicators of this. In addition, a number of smaller redevelopment projects have recently been or will soon be completed including the Walnut Grove shopping center, properties in the Doctors Park area, the mixed use development in the southeast quadrant of the University Avenue and Farley Avenue intersection, the 2550 University development northwest of University Avenue and Highland Avenue, and more.

Based on the results of scenario testing using the 2035 travel demand model maintained by the Dane County Transportation Planning Board, the study team agreed to use 115 percent of the Base motor vehicle traffic volumes to develop and test potential intersection and corridor modifications. The actual traffic growth that will occur over the next 15, 20, or 25 years will be dependent on many factors. The Study area already produces a high percentage of travel by alternate modes. If the status quo is maintained, 15 percent growth could be reached by about 2025. If the influences of TDM, mixed use redevelopment and densification and/or improved or premium transit service can work together to continue reducing the demand for peak-hour single-occupant motor vehicle trips, 15 percent growth may not be reached until 2040, if ever.

For this study, the quantitative operational evaluation of possible intersection and corridor modifications has been completed using Synchro8 traffic modeling software. The study team agrees it is an appropriate tool to develop and test different scenarios in terms of the impact on motor vehicle operations. These impacts in turn affect conditions for the other modes. Higher levels of motor vehicle congestion and queuing can lead to increased traffic on neighborhood streets, higher crash rates, less comfortable conditions for pedestrians and bicyclists, and less predictable transit service. The intersections expected to experience the most congestion and queuing in the future include University Avenue and Midvale Boulevard, Midvale Boulevard and Mineral Point Road, University Avenue and Shorewood Boulevard, University Avenue and Blackhawk Avenue, and Regent Street and Highland Avenue/Speedway Drive.

1.04 DEVELOPMENT AND REVIEW OF POTENTIAL MODIFICATIONS

The study team discussed the range of potential Study Corridor modifications and considered options from a Do Nothing scenario to a scenario that would extend Campus Drive by creating a grad--separated expressway from Farley Avenue through Segoe Road. Modifications were developed at a schematic planning level only and each was evaluated for its impact on travel in the area. Three key intersections along University Avenue were evaluated in greater detail: at Midvale Boulevard, at Shorewood Boulevard, and at Farley Boulevard/University Bay Drive. Results from these key

intersections would help the study team understand the type of corridor University Avenue could or should be over the longer term.

1.05 RECOMMENDATIONS

Based on stakeholder feedback and planning level evaluation of possible modifications, the study team developed the Guiding Theme and the three Primary Goals. These were considered when developing the list of recommendations. The study recommendations on the whole are intended to align with the Guiding Theme. Each recommendation is also anticipated to advance at least one of the Primary Goals.

Based on the planning level evaluation of the proposed modifications, each recommendation was designated as Nearer Term or Longer Term. Nearer-Term improvements are generally those that have lower impacts and/or lower costs. Longer-Term improvements have moderate to high impacts or costs and therefore will likely need to be completed as part of a larger overall initiative or design and construction project.

The full list of recommendations is included in the Section 6, as well as Appendix G; 29 Nearer Term and 19 Longer-Term modifications are recommended. The recommendations include travel demand management, physical modifications for pedestrians and bicycles, motor vehicle capacity expansion, installation of new partial signals similar to the one at University Avenue and Marshall Court/ Ridge Street, investigating adaptive signal control, and more.

1.06 CONCLUSIONS AND POSSIBLE NEXT STEPS

The Study Area including the Village of Shorewood Hills, the Greater Regent Neighborhood, and the west campus of the UW is a desirable place to live and work. It is anticipated that development and redevelopment in the Study Area will continue to increase the demand for transportation for the foreseeable future as residences, jobs, and services continue to be added. This growth is part of local plans and is a healthy prospect for the City, Village, and University. Some of the natural amenities that contribute to livability in the area such as Lakes Mendota and Wingra, the UW Arboretum, and the parks and golf courses on the near west side also create transportation challenges.

Mobility along University Avenue is important to the success of area businesses and the UW. Significant motor vehicle capacity expansion (constructing an eight-lane corridor or extending Campus Drive to the west by adding grade separations and interchanges) would have significant impacts and costs both physically and in terms of livability. Therefore, the study team settled on an overall goal for the corridor that focuses on improving conditions for pedestrian, bicycle, and transit travel while minimizing negative impacts on motor vehicle travel.

The study team believes the recommendations are achievable and when taken together will communicate and enhance the multimodal nature of the corridor. The primary next steps in implementing the recommendations include the following:

1. Continue to advocate for a Regional Transit Authority (RTA) with state lawmakers to advance enhanced (preferably exclusive right of way) transit serving the Study Corridor.

2. Consider investigating the creation of an Intergovernmental Commission if RTA legislation is unlikely in the Nearer Term.

3. Implement a means to incentivize participation in regional Travel Demand Management solutions.

4. Considering the importance of efficient travel in the Study Area, make improvements to east-west and north-south bicycle connections a high priority when selecting which future projects areawide should be implemented.

5. Continue to require improvements that balance bicycle, pedestrian, transit, and motor vehicle needs as part of the development/redevelopment review and approval process.

6. Implement the access modifications proposed in this report (partial signals) and do not allow new full-access signals along the Study Corridor.

SECTION 2
INTRODUCTION, STUDY OVERVIEW, AND PUBLIC WORKSHOP NO. 1

2.01 STUDY BACKGROUND

The City of Madison (City), the Village of Shorewood Hills (Village), and the University of Wisconsin-Madison (UW) jointly funded this Near Westside Neighborhoods and University Avenue Transportation Study (Study). Figure 2.01-1 shows a portion of the University Avenue corridor in the study area.

The Near Westside neighborhoods, the Village, and the larger Madison area are served by University Avenue, an important primary arterial street carrying in excess of 50,000 vehicles per average weekday. This can result in sometimes severe congestion, crashes and delay to motorists, public transit riders, pedestrians, and bicyclists. As a result, some drivers elect to use nearby residential streets in both Madison and Shorewood Hills to avoid traffic delays and congestion. The local residential streets serving this cut-through traffic are not intended for this use, and this traffic can have a negative impact on quality of life resulting in increased concerns for pedestrian and bicyclist safety.

Figure 2.01-1 A Portion of the University Avenue Study Corridor

The street pattern and development in this area do not lend themselves to good alternative routes. This results in challenges to accommodating continued growth and maintaining residential neighborhoods while also providing for modes of travel including bike, pedestrian, and transit. Along with regional growth, the City, University, and Village continue to grow and generate additional traffic, including major redevelopment projects pending that require community and intergovernmental review and input. This Study:

1. Evaluates the transportation impacts for currently proposed and future development including development opportunities within existing neighborhoods, using adopted neighborhood plans, where present, as a basis for future redevelopment conditions.

2. Identifies pros and cons of potential solutions and considers feedback from area stakeholders.

3. Develops a set of stakeholder-integrated transportation strategies and projects.

4. Informs decision-making related to further growth and land use applications as well as neighborhood livability interests in the study area, particularly related to UW Hospital projects, Village of Shorewood Hills redevelopment, and City of Madison redevelopment.

5. Discusses next steps of implementation based on the study recommendations.

The Study process included standard transportation planning and engineering efforts intended to identify and vet short- and long-term street and transportation recommendations. The Study is intended to develop and incorporate recommendations to reduce the incidence of vehicles using neighborhood streets to avoid University Avenue traffic congestion and improve neighborhood livability by improving conditions for pedestrian, bicycle, transit, and personal motor vehicle travel.

2.02 STUDY LIMITS AND APPROACH

The portion of University Avenue considered in this Study is from Segoe Road to Breese Terrace. The Study also includes neighborhood streets and transportation infrastructure nearby bound by the following: Lake Mendota to the north; Mineral Point Road, Speedway Road and Regent Street to the south; Segoe Road to the west; and Breese Terrace to the east. Figure 2.02-1 shows the Study area.

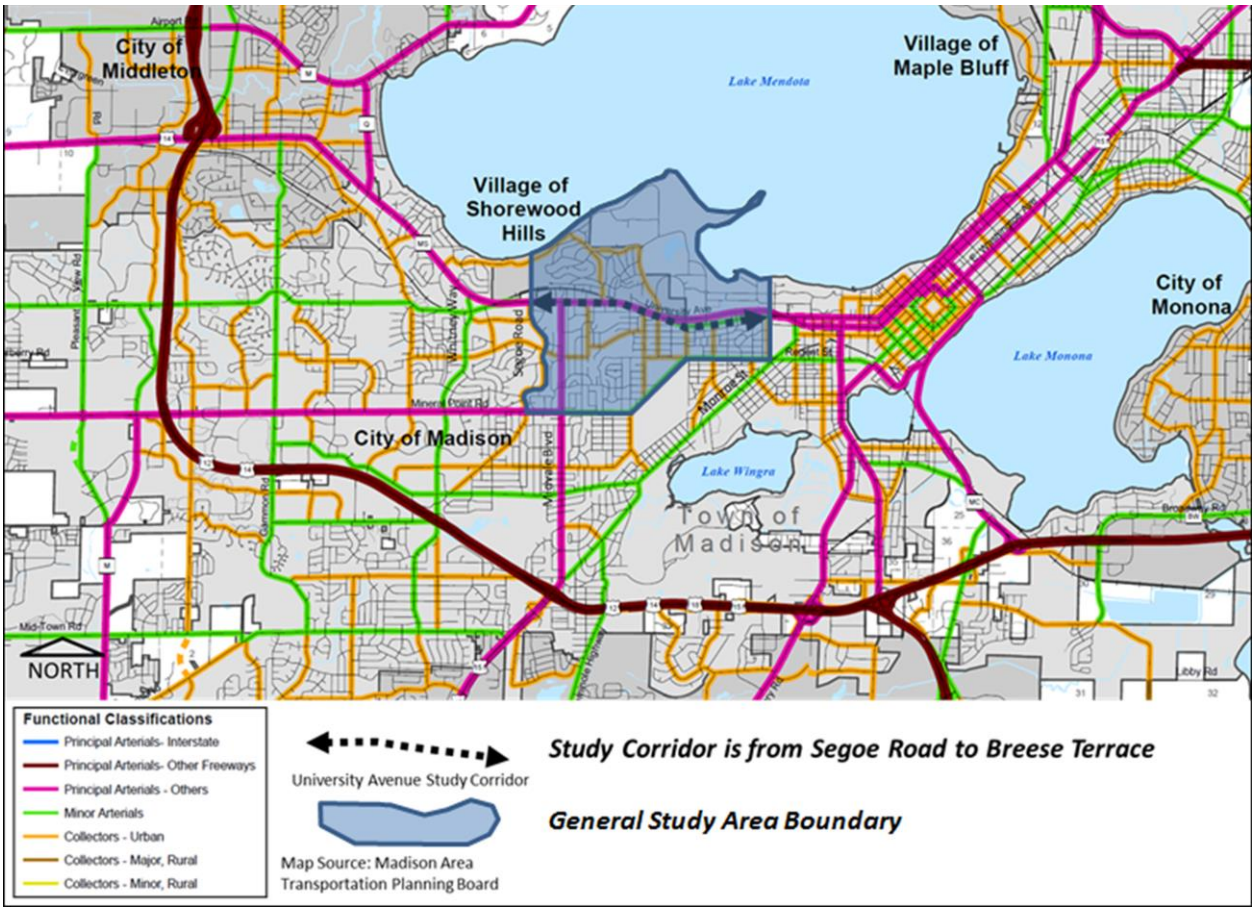


Figure 2.02-1 Study Area

The Study approach was broken into three phases, as illustrated in Figure 2.02-2.

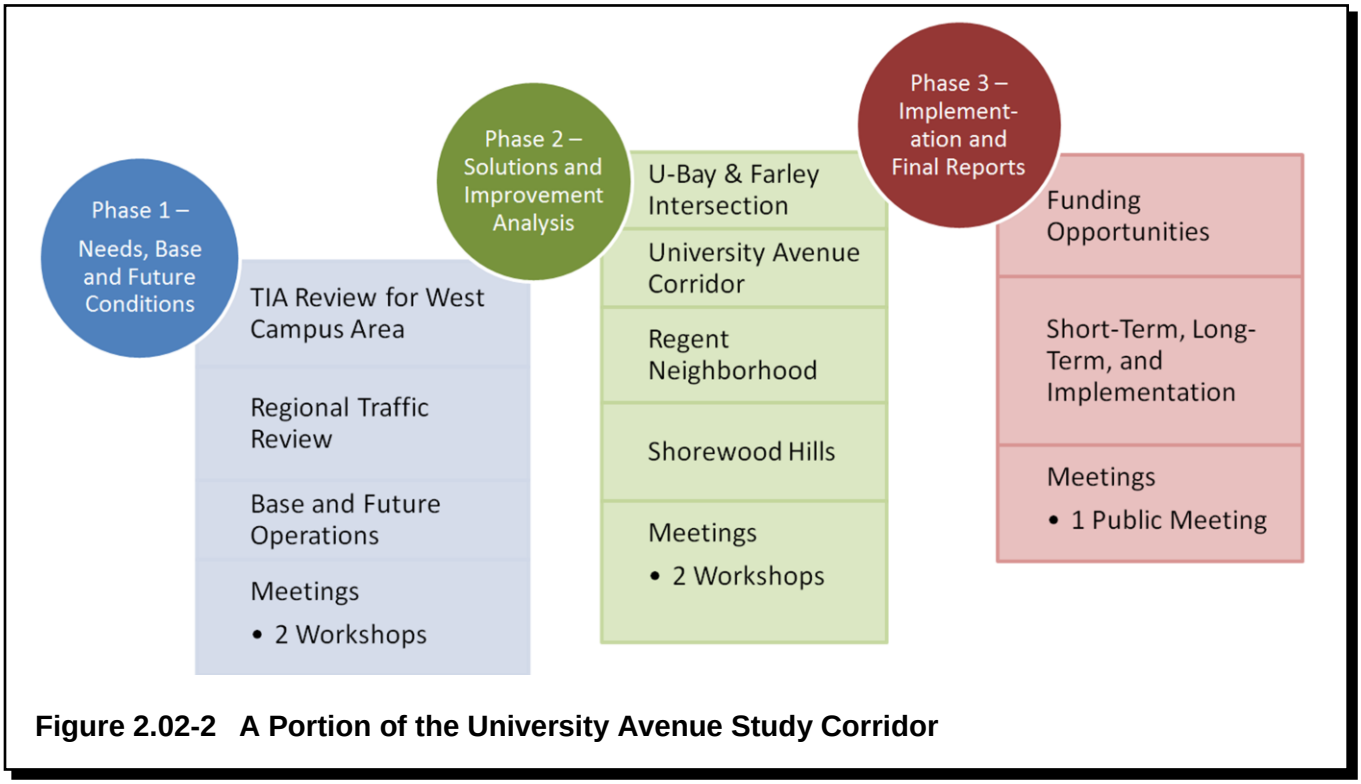


Figure 2.02-2 A Portion of the University Avenue Study Corridor

Phase 1 of the Study involved needs identification and review of base and future conditions and took place from January through July 2013. It included data gathering and field data collection, a review of the Traffic Impact Analysis (TIA) performed by others for the UW Hospital parking garage expansion project and an assessment of traffic operations near the west campus area, and a review of base and projected future travel demand. Workshops were held to gather stakeholder input: the first on March 12 at Madison West High School and the second on March 20 at the Shorewood Hills Village Hall. An online survey was also created and a link to the survey was sent to the City of Madison neighborhood associations' Listserve, provided at the public workshops, and posted on the Shorewood Hills and Madison Web sites.

Phase 2 of the Study involved development and review of potential solutions and took place from July through September 2013. It included additional field data collection, review of stakeholder input from the first set of workshops and the online survey, development of a range of possible modifications to transportation infrastructure, and motor vehicle operations analysis. Workshops were held to gather additional stakeholder input and feedback on the range of possible corridor modifications: the first on September 12 at the Shorewood Hills Village Hall and the second on September 23 at Covenant Presbyterian Church.

Phase 3 of the Study involved development of recommendations, one public information meeting, and study documentation. It included the development of near- and long-term recommendations, a review of funding opportunities, and identification of next steps for implementation.

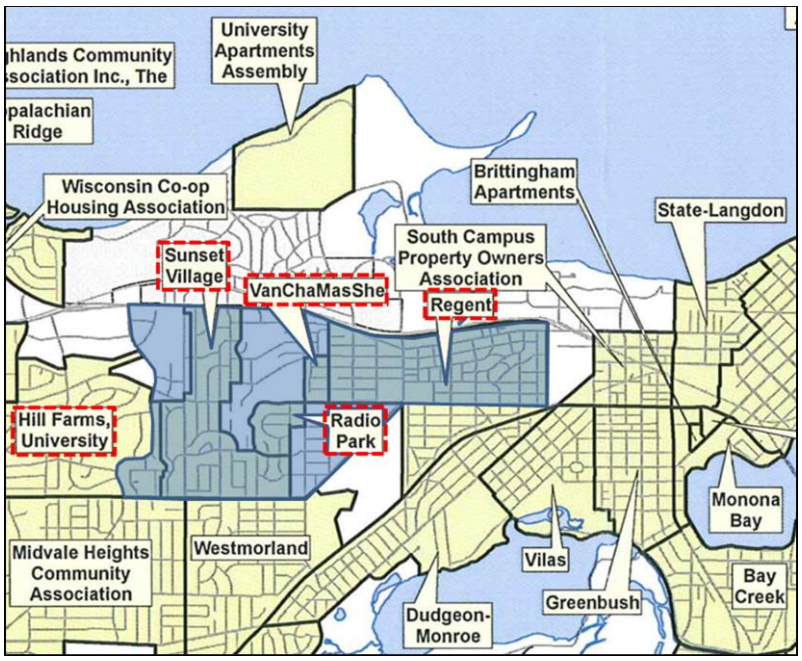
2.03 STUDY AREA CONTEXT

A. Village of Shorewood Hills, Greater Regent Neighborhood, University of Wisconsin-Madison

This Study was jointly funded by the Village of Shorewood Hills, the University of Wisconsin-Madison (UW) and the City. Each entity recognizes the need to work together on transportation solutions along, across, and adjacent to University Avenue and understands that projects undertaken in one area impact the others. Travel choices and the factors that influence them do not start and stop at municipal or governmental boundaries.

The Village was incorporated in 1927 by combining the existing College Hills and Shorewood real estate plats. By the 1950s, the City grew to surround the Village. The streets within the Village are somewhat circuitous, narrow, and with a few exceptions do not have sidewalk on either side. University Avenue is the only east-west arterial corridor serving the Village.

The Greater Regent neighborhood as considered in this Study includes areas represented by several neighborhood associations as shown in Figure 2.03-1. The current land uses developed from east to west, with the oldest neighborhoods dating back to the 1920s on the east end and the areas to the far west dating to the 1950s and 1960s.



Source: cityofmadison.com

Figure 2.03-1 Greater Regent Neighborhood Area for This Study

The street grid in this area is severed by natural topography, parks, cemeteries, and a municipal golf course. A number of the local streets do not have sidewalks. University Avenue and the Mineral Point Road/ Speedway Road/ Regent Street corridor are the east-west arterials serving these neighborhoods. Midvale Boulevard is the only north-south arterial corridor serving these neighborhoods.

The UW was founded in 1848. According to the UW's Long Range Transportation Plan (LRTP), much of the street grid, particularly on the west side of campus adjacent to the Study area, follows paths originally laid out around glacial drumlin hills and other land features by farmers and other first settlers in the area. The UW is one of the largest employment centers in Dane County, yet access to the west

campus is limited. The University Avenue/Campus Drive corridor is the only east-west arterial serving the campus and along with the railroad tracks that run parallel creates a barrier to north-south movement in the area. The nearest north-south arterial corridors are Midvale Boulevard to the west and Park Street to the east.

B. Natural and Physical Barriers

The natural geography of Dane County creates transportation barriers. Figure 2.03-2 shows how the Madison Isthmus impacts travel from the near east side to the near west side. This reinforces the importance of providing a transportation system that is able to efficiently move people through this constrained area.

The lakes, wetlands, parks, and other resources that contribute to livability in the area present challenges for mobility by disrupting the street grid system. Topography in the study area also impacts bicycle and pedestrian travel between certain locations.

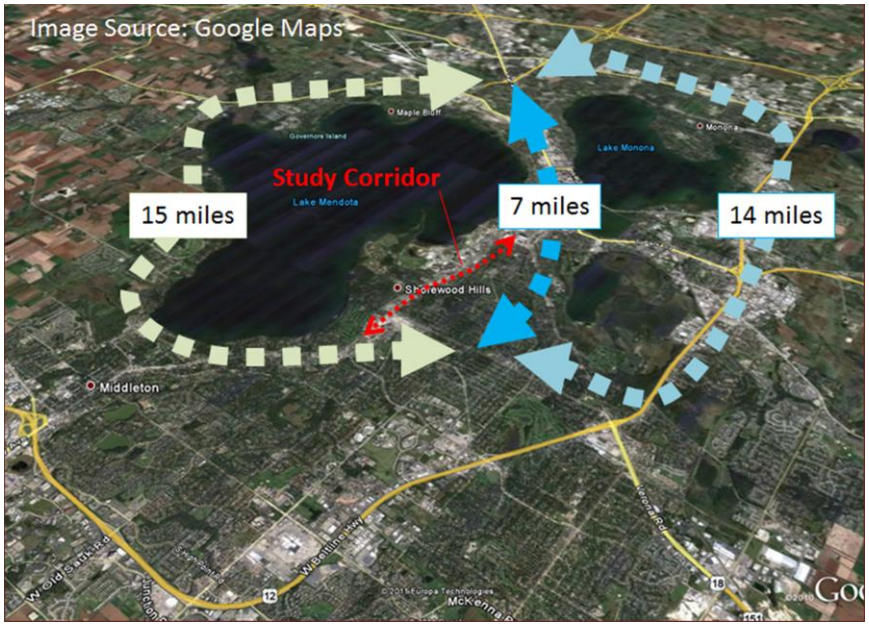
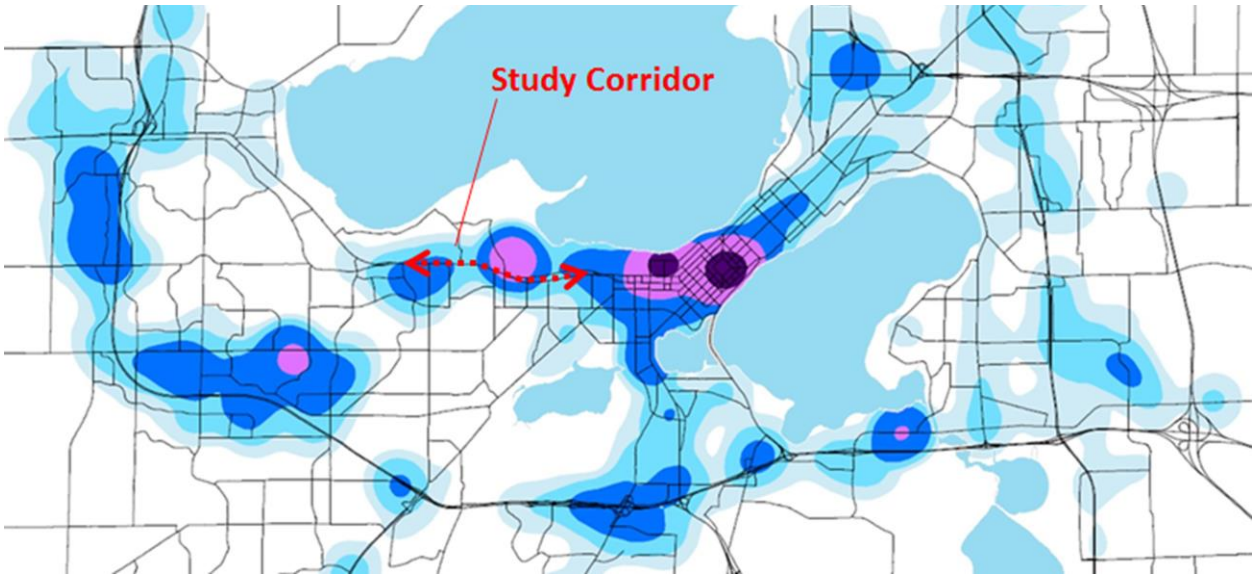


Figure 2.03-2 Travel Distances Through and Around the Isthmus

C. Employment Density

Figure 2.03-3 shows the employment density in the area.



Source: Madison Area Transportation Planning Board

Figure 2.03-3 A Portion of the University Avenue Study Corridor

The UW campus and downtown Isthmus area represent the highest employment centers in Dane County. UW employs approximately 13,000 staff and faculty, with another 40,000 students making trips to and from campus on typical weekdays during the fall and spring semesters. Employment on the Isthmus is greater still. The University Avenue corridor is a vital artery serving these employment centers, and within the Study area, there is not a comparable parallel route to provide relief to University Avenue/Campus Drive.

D. University Avenue Corridor as a Higher Mobility Route

In the 1960s, the University Avenue corridor was proposed to be part of an urban expressway running from Whitney Way, through the Isthmus between East Gorham and East Johnson Streets, to the intersection of Packers Avenue and Aberg Avenue. Figure 2.03-4 shows the planned route and the portions of the expressway that were constructed.

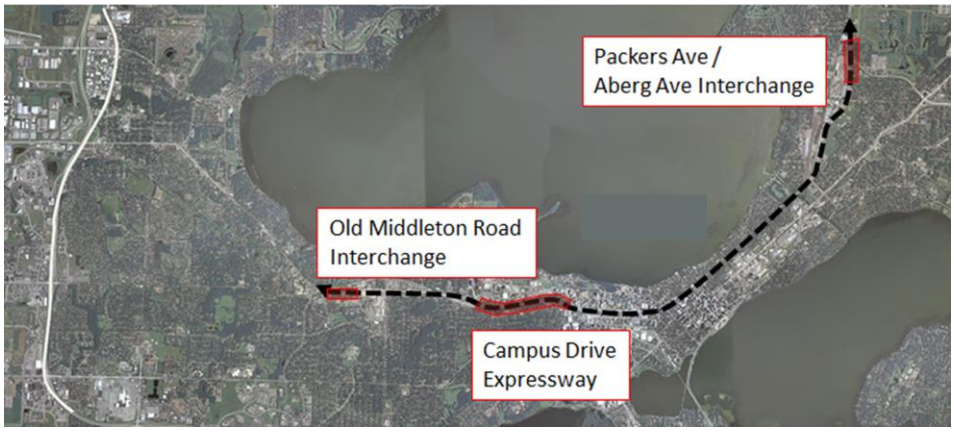
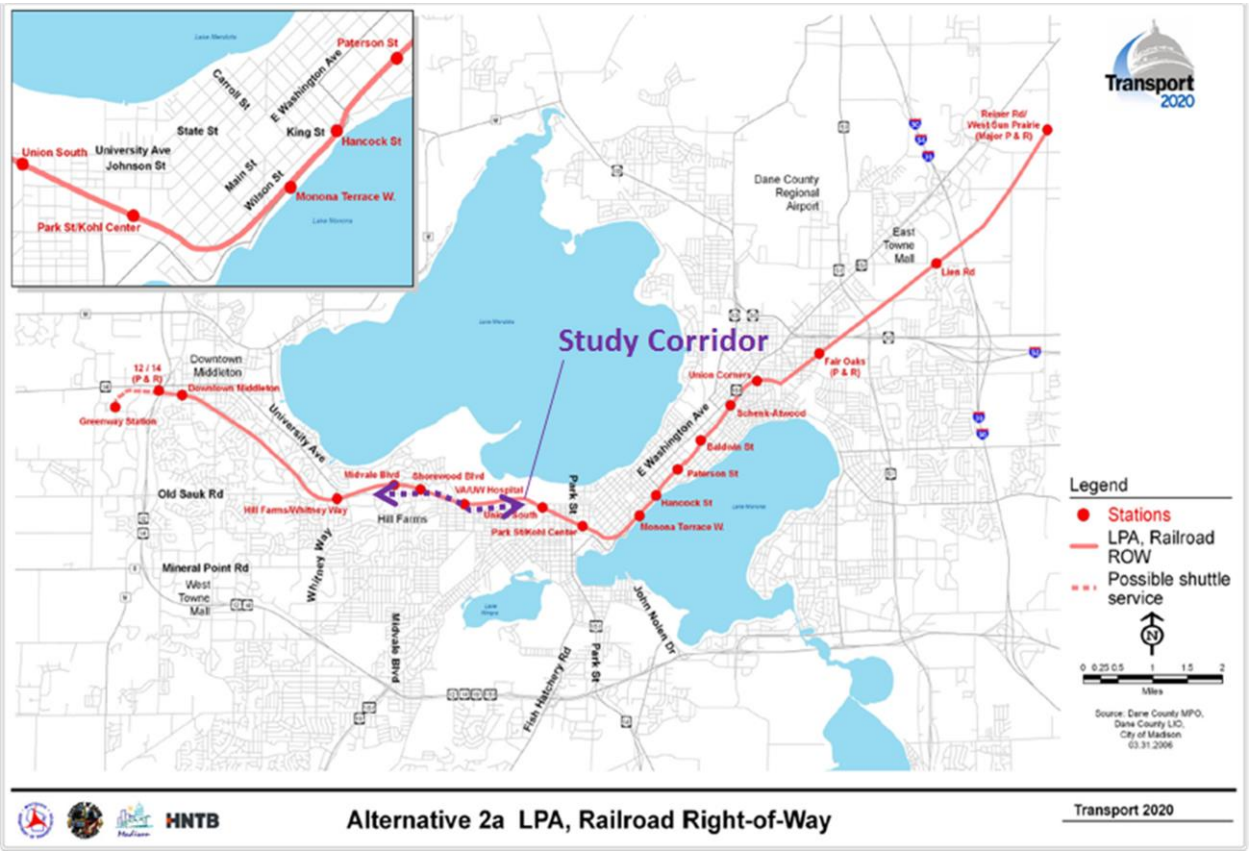


Figure 2.03-4 Portions of a Proposed Continuous Expressway That Were Constructed

In the 1970s, City representatives and area stakeholders agreed not to proceed with additional portions of the parkway. The decision was made with the understanding that by choosing not to increase motor vehicle capacity along this major arterial route, peak period traffic could spill over on to adjacent streets with lower classifications, including to local streets within nearby neighborhoods as drivers seek routes that avoid congestion.

Transport 2020 was a major transportation study completed in 2008 designed to develop a long-term transportation solution for Dane County and the Madison Metropolitan Area. It was sponsored by Dane County, the City, and the WisDOT, with support from UW and the Metropolitan Planning Organization (MPO). The Transport 2020 study proposed a long-term transportation system that included a multimodal system consisting of commuter rail, express bus services, park-and-ride lots, and improvements to local bus service.

In 2008, Transport 2020 submitted a New Starts Application to the Federal Transit Administration (FTA) for financing to begin project engineering on the Locally Preferred Alternative (LPA). This application for federal funds was to begin the first piece of the project: a 16-mile east-west commuter rail line operating within an existing freight rail corridor between the City of Middleton and an area just southwest of the City of Sun Prairie, directly through the Isthmus of the City of Madison. The proposed Transport 2020 LPA is shown in Figure 2.03-5. This improvement was meant to relieve the congestion in the Isthmus area, including within the Study corridor, and provide service to the UW campus and downtown employment centers.



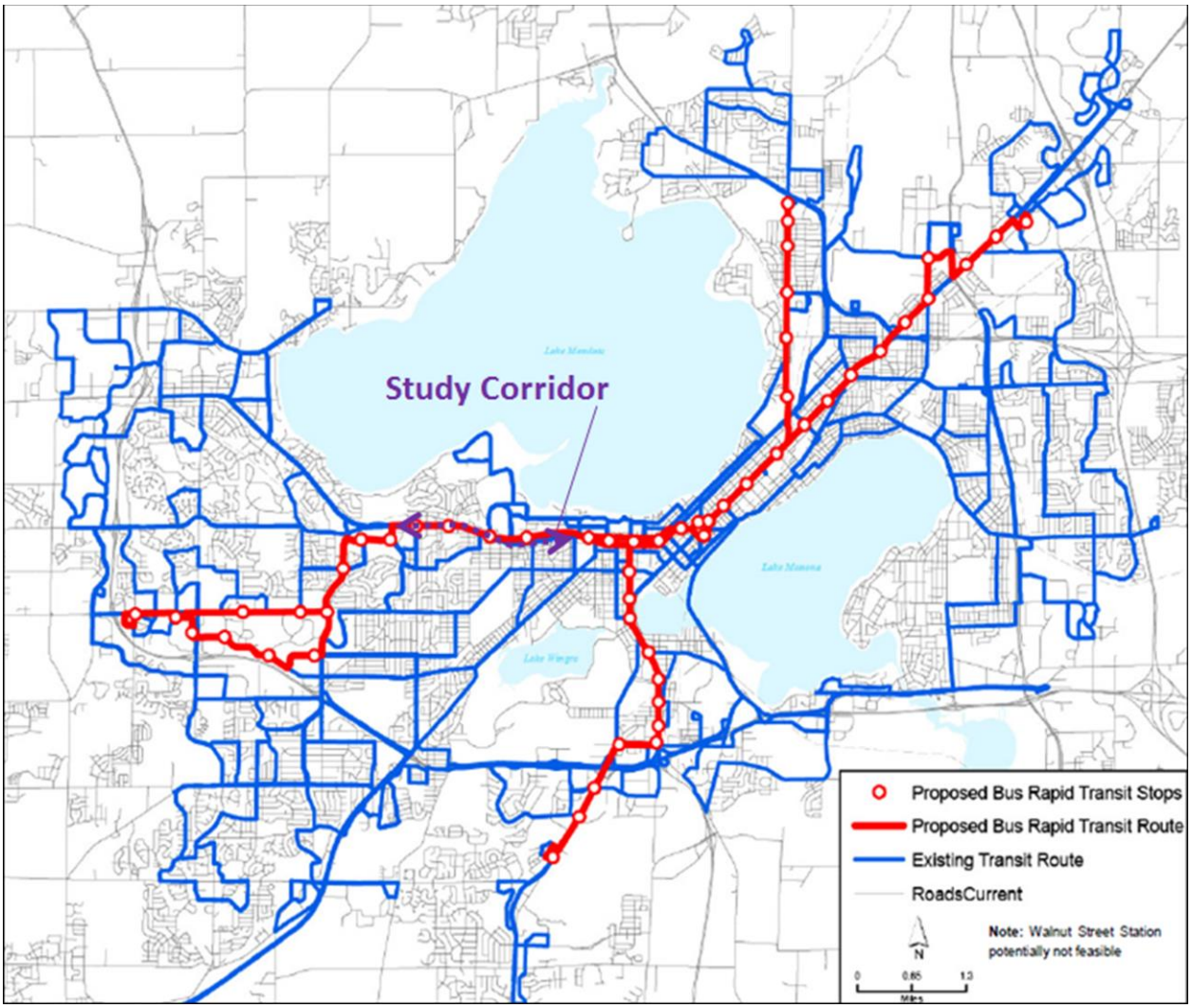
Source: http://www.transport2020.net/alts.html accessed 9/2013

Figure 2.03-5 Locally Preferred Alternative from Transport 2020

In 2009, the FTA application was withdrawn because of the lack of both a Regional Transit Authority (RTA) and a local financial commitment for capital and operating costs. The project is currently on hold pending RTA legislation and consideration of other alternatives such as Bus Rapid Transit (BRT).

The Madison Transit Corridors Study (BRT Study) evaluated BRT in the Madison area. The study, completed in May 2013, was funded by part of a federal Sustainable Communities Regional Planning grant administered by the Capital Area Regional Planning Commission (CARPC), and led by the MPO.

The BRT Study evaluated four corridors: north, south, east, and west out of the downtown area that included a common central segment in the UW Campus area and central Isthmus. Those corridors are the most heavily traveled transit corridors in the city with over 20,000 of about 60,000 total daily boardings. In the west corridor, the study analyzed a Mineral Point Road alignment and an Odana Road alignment. Both west corridors include the University Avenue Study corridor. Figure 2.03-6 shows the BRT corridors that were evaluated.



Source: Madison Transit Corridor Study, May 2013

Figure 2.03-6 Proposed BRT Service Including a Portion of the Study Corridor

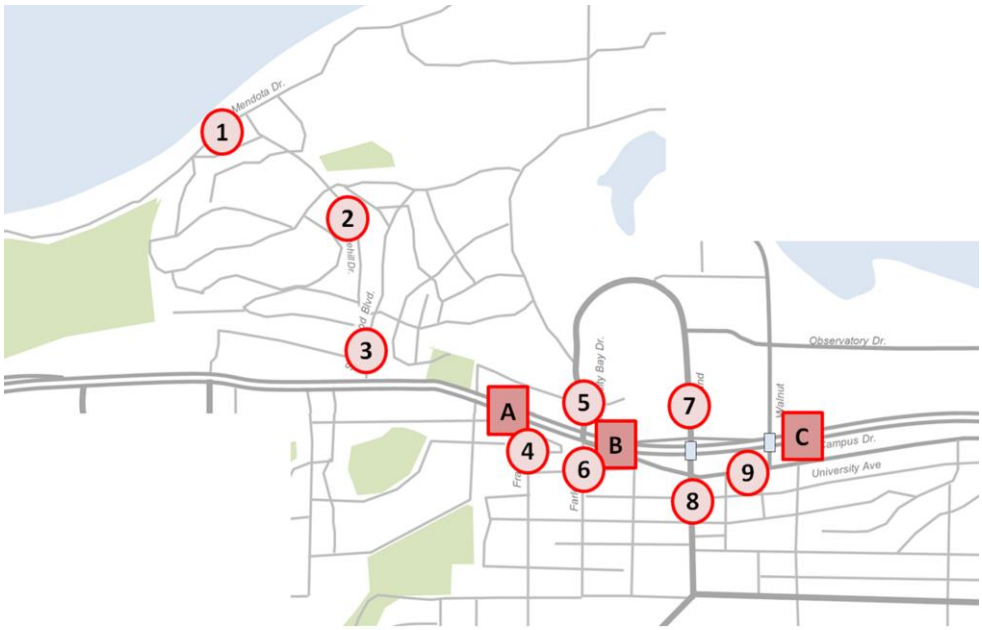
Estimated construction costs range from about $25 million to $70 million for each of the four corridors, with a total cost of about $138 million (2016 dollars). Annual operating and maintenance costs are estimated at almost $10 million (2012 dollars). Daily ridership is forecasted to range from about 4,000 to 10,000 trips per day on each of the corridors.

E. Historic Traffic Volumes

Figure 2.03-7 shows motor vehicle traffic volumes along University Avenue/Campus Drive and other Study area streets. In general, traffic volumes have grown steadily over the past 20 years or so on University Avenue/Campus Drive. Average annual growth rates have been about 0.7 to 0.8 percent a

year. For comparison, other major arterials in Wisconsin such as Bluemound Road in Brookfield have grown from 0.0 to 4.0 percent a year since the early 1990s.

Interestingly, most of the parallel neighborhood streets have not shown any traffic growth in the past 20 years, and some have not shown significant growth even as far back as the 1950s.



Map Location	1956 Traffic	1991 Traffic	2011 Traffic
University Avenue/Campus Drive			
A	16,420	48,200	54,750
B	18,370	44,050	50,750
C	19,300	36,130	41,600
Village of Shorewood Hills			
1 (Lake Mendota Drive)	1,075	1,740	1,070
2 (Edgehill Drive)	--	1,990	1,100
3 (Shorewood Boulevard)	3,620	7,000	6,300
Greater Regent Neighborhood			
4 (Franklin Avenue)	2,800	2,900	3,000
5 (University Bay Drive)	--	8,250	13,350
6 (Franklin Avenue)	2,315	4,400	4,800
7 (Highland Avenue)	--	12,600	9,800
8 (Highland Avenue)	4,760	7,900	6,150
9 (University Avenue)	17,700	13,350	12,000

Figure 2.03-7 Historic Motor Vehicles Average Annual Daily Traffic in Vehicles per Day

2.04 PUBLIC WORKSHOP NO. 1

The first opportunity for direct public input occurred in spring 2013. Two workshops were held: the first was at West High School on March 12 and the second was at the Shorewood Hills Village Hall on March 20. The materials at each were identical.

A. Format and Workshop No. 1 Materials

The workshops consisted of about a 20-minute presentation covering similar material to that outlined above. This was followed by questions and answers and a goals identification exercise. The goals exercise asked attendees to work together to develop a list of goals for the study area and University Avenue corridor. Each table reported back to the group, and the goals were listed on large sheets of paper. Finally, participants were given three "dot" stickers and asked to place stickers by the goals they felt were most important to help the study team prioritize project efforts.

Appendix A contains the workshop materials and a summary of the input received.

B. Summary of Public Comments

The results of the goals exercise from both workshops are listed in Table 2.04-1.

Goal/Concern	Village of Shorewood Hills		Greater Regent Neighborhood	
	Votes	Rank	Votes	Rank
Reduce cut-through traffic	15 dots	1	14 dots	4
Implement improved transit/encourage mode shift	8 dots	2	32 dots	1
Improve bike and pedestrian crossings	7 dots	3	21 dots	2
Provide park and ride lots/reduce parking on neighborhood streets	5 dots	4	16 dots	3

Table 2.04-1 Results from the Goals Exercise at the First Round of Public Workshops

Two forms were provided for written comments: the first asked for a listing of the top three goals for the corridor; the second was a general comments sheet. The written responses followed a similar theme as the results of the dot exercise, in that concerns of nearby residents centered on ways to reduce peak-hour motor vehicle traffic and impacts on the adjacent neighborhoods such as cut-through traffic and commuter parking. Requests to ease congestion by expanding motor vehicle capacity were made, but these were less common than requests for improvements to alternate modes of travel.

Appendix A contains the workshop materials and a summary of the input received.

SECTION 3
BASE CONDITIONS

3.01 ONLINE SURVEY

The Study included an online survey to gather additional input from the public and local stakeholders. Full results are included in Appendix B. Over 1,000 responses were received. The first question asked respondents to indicate where they lived, and the remainder of the survey could not be completed unless this question was completed. Of the survey respondents, 34 percent live in the Village and 33 percent live in the greater Regent neighborhood; 29 percent of the respondents work on the UW campus while an additional 11 percent work on the Isthmus.

There is excellent mode split with 30 to 40 percent of trips made by respondents occurring by foot, bike, and transit at least a few times per week. Overall however, about 50 to 70 percent of respondents still drive the University Avenue Study corridor to work a few times per week or more, and 80 percent drive a few times per week or more for errands.

The highest ranking issues regarding motor vehicle conditions included:

1. Peak congestion along the corridor.
2. Congestion at major intersections.
3. Crossing or turning left from side streets.
4. Left turns from University Avenue to the side streets.
5. Motor vehicle speeds.

The highest ranking neighborhood transportation issues included:

1. Better east-west bicycle connections.
2. Improvements for bicycles and pedestrians crossing University Avenue.
3. Better north-south bicycle connections.
4. Managing cut-through traffic.
5. Managing on-street commuter parking.

When asked whether corridor modifications were needed, about 90 percent of respondents agreed that either small (60 percent) or major (30 percent) modifications should be considered; 10 percent indicated that no changes were necessary.

3.02 TRAVEL DEMAND MANAGEMENT

Travel Demand Management (TDM) measures seek to achieve more efficient use of transportation infrastructure by reducing the demand for single occupant motor vehicle trips during peak travel times. The Village, City, and University all engage in various forms of TDM. The result of this concerted and coordinated effort is evident in the most recent US Census data. From 2007 to 2011 in the Madison metropolitan area as a whole 78.7 percent of work trips were made by car. This 22.3 percent share for alternate modes is fifth highest in the country exceeding Portland, Oregon, and Austin, Texas, and on par with much larger urban areas such as Boston, Massachusetts, and Chicago, Illinois.[1]

[1]From *Transportation in Transition*, December 2013, by United States Public Interest Research Group (U.S. PIRG).

Some of the more effective TDM policies and planning efforts currently in use and impacting the Study area are summarized in the following subsections.[2]

A. Improving Transport Options

The Village, City, and UW all seek to provide transportation options and encourage the use of alternate modes of travel in multiple ways.

1. Alternative Work Schedules

UW-Madison/Hospitals is one of the largest employers in Dane County. The various purposes people have for visiting the west campus area such as working at the hospitals, teaching, attending undergraduate classes, completing graduate level research, and administration services for the University reduces the concentration of trips during typical weekday peak periods, particularly in the morning peak.

2. Transit

The Study corridor is one of the most heavily used transit corridors in Metro Transit's service area. The local bus transit service routes along University Avenue from Segoe Road to Breese Terrace are often near or at capacity during AM and PM peak commuting times. Metro Transit currently operates 15 bus routes along the Study corridor with peak headways as low as 8 minutes. The City of Monona also offers express commuter bus service to downtown Madison and the UW Campus.

Enhanced transit has also been studied for this area. First, Light Rail Transit (LRT) was studied as part of the Transport 2020 project. More recently, BRT was studied as part of the Madison Transit Corridor Study. Either system would use the Study corridor as a key link in the larger system and include multiple stations/stops between Segoe Road and Breese Terrace with enhanced amenities such as sheltered waiting areas, automated ticket purchase, bicycle parking, and more.

3. Bicycling Infrastructure

The City of Madison has had since 1972 a strong commitment to improving bicycle infrastructure and system connectivity and the Village and UW support this effort. Improvements continue to be made as streets are reconstructed and land uses redevelop in the Study area. The online survey results indicate that 40 to 50 percent of people traveling in the Study area do so by bicycle at least a few times per week. Improvements to bicycle connections were routinely cited as one of the highest priority goals for transportation in the Study area. Figure 3.02-1 shows bicyclists traveling along Midvale Boulevard.

[2]This TDM discussion is organized based on information provided by the Victoria Transport Institute at www.vtpi.org

Existing bicycling infrastructure contributes to the high ridership in the area. Bicycle racks provided on Metro Transit buses integrate transit and bicycle travel. The B-Cycle bike-sharing program operated by Trek continues to expand in participation and station locations. Through the approval process, project owners are continuing to be asked to provide additional infrastructure to encourage bicycling such as locker and shower facilities, abundant and easily accessible bike parking, and more.

Figure 3.02-1 Bicyclists on Midvale Boulevard

4. Carsharing

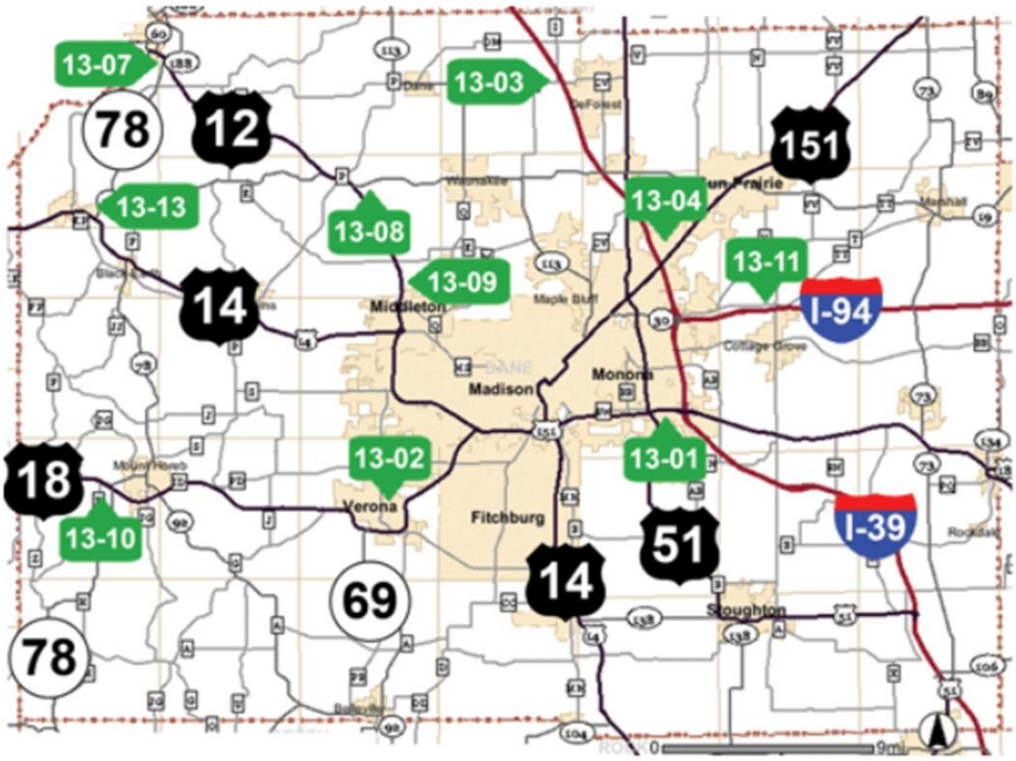
There are two carsharing services serving the Study area. Community Car is a Madison-based car sharing service. Vehicle locations serving the Study area include one at Hilldale, two at Eagle Heights Apartments, and one at 1111 Regent Street east of Camp Randall Stadium. The UW also provides carsharing by Zipcar with five vehicle locations around campus.

5. Ridesharing

There are several types of shared ride services that can be used for travel in the Study area. Local taxi service is provided by Badger Cab, Green Cab, Madison Taxi, and Union Cab. Guaranteed Ride Home is a program that allows registered participants to use vouchers for emergency trips when they are at work without a vehicle. Rideshare Etc. is an online ride matching program that is sponsored by the Madison Area Transportation Planning Board and the Wisconsin Department of Transportation. The Wisconsin Department of Administration also operates the State Vanpool ridesharing program for both state and non-state workers commuting to Madison.

6. Park and Ride Lots

Figure 3.02-2 shows the regional park and ride lots in Dane County that are operated by the Wisconsin Department of Transportation (WisDOT).



Lot No.	Name	Parking Spaces	Bike Path Connectivity	Metro Transit Service
13-01	Dutch Mill	347	Yes	Yes
13-02	Verona	77	Yes	No
13-03	DeForest	56	No	No
13-04	American Center	141	No	Yes
13-07	Sauk City	39	No	No
13-08	Springfield Corners	49	Yes	No
13-09	Middleton	51	Yes	No
13-10	Mount Horeb	24	Yes	No
13-11	Cottage Grove	107	No	No
13-13	Mazomanie	40	No	No

Figure 3.02-2 WisDOT Park and Ride Lots in Dane County

More than 930 parking spaces are provided in ten lots. Five of the lots have access to regional bike paths. Two of the lots are currently served by Metro Transit.

Metro Transit serves additional locations for commuters in the metro area including the North Transfer Point on Huxley Street, the Northside Towncenter at Sherman Avenue and Northport Drive, and the American Center on East Park Boulevard. The UW operates Lot 200 located in the University Research Park off Science Drive between Whitney Way and Mineral Point Road.

This lot is served by Metro Transit. UW also recently opened two new park and ride lots that are served by free shuttle service. Lot 202 is located on West Wingra Drive between Park Street and Fish Hatchery Road. Lot 203 is located at the Hill Farms State Office Building on Eau Claire Avenue. Lots 200, 202, and 203 require a parking permit with a lower fee than on campus lots.

B. Incentives

1. Commuter Financial Incentives

Currently, the businesses and residents in the Madison metropolitan area are not subject to carbon taxes, road user fees, road pricing, or other methods of restructured transportation infrastructure and maintenance financing. There are financial incentives and disincentives built into the price and location of parking in the downtown and campus areas and other transportation policies currently in place, such as the bus passes available to UW students. Employers are encouraged to provide financial incentives that encourage less commuting by single-occupant vehicles, but are typically not obligated to do so.

2. Modal Priority and Encouragement

Providing an advantage to alternate modes of transportation can provide incentive for people to use them. Such measures could include dedicated bus lanes, bicycle boxes at intersections, and grade-separated pedestrian crossings. Currently some examples exist in the study area, primarily for improving bicycle and pedestrian priority at specific locations.

In general, encouragement for using alternate modes is high in the study area. This encouragement comes in many forms. There is a proven and ongoing local commitment to improving conditions for bicyclists, pedestrians, and transit riders as part of all major projects. There is significant momentum that occurs as larger and larger shares of commuters choose to walk, bike, and ride transit. There is also increasing public awareness of the benefits of reducing peak-hour single-occupant motor vehicle commuting and of the improvements to the quantity, quality, and accessibility of traveler information that is available to the commuting public.

3. Parking

The amount of available, inexpensive motor vehicle parking has a direct impact on motor vehicle trips. The Village ordinances require about the same amount of parking for new land uses as those of other Dane County communities. Significant redevelopment projects typically require approval through the Planned Unit Development process, and the Village has a history of requiring bicycle parking, typically at a ratio of at least one space per residential unit. The City's recently updated zoning code actually has no minimum requirement for off-street motor vehicle parking and, in many cases, sets maximum motor vehicle parking thresholds, and includes bicycle parking requirements for nearly all land uses. The UW has adhered to a long-standing commitment to maintain approximately 13,000 parking spaces even as projects increase on-campus staff, faculty, students, and visitors. The tradeoff with providing less parking is that some people will choose to continue to drive and park in locations that are not intended for frequent commuter use. This is occurring today in the Greater Regent neighborhood portion

of the Study area. Two-hour parking throughout the Village of Shorewood Hills generally prevents this occurrence.

C. Land Use Management

How the Village, City, and UW choose to grow will impact future travel demand. The current desire to encourage higher density, mixed use development and redevelopment and improve multimodal connections acts as a TDM measure in and of itself. These types of developments are more suitable for successful transit service, they make trip making by walking or bicycling more feasible, and they allow for easy linking of some trip types.

3.03 PEDESTRIAN ACCOMMODATIONS

Pedestrian accommodations vary in the general study area. While sidewalks are provided on both sides of the major corridors, most of the Village of Shorewood Hills and portions of the Greater Regent neighborhood lack sidewalks. Portions of the arterial corridors of University Avenue, Campus Drive, and Midvale Boulevard can act as impediments to pedestrian travel. There is a perception that some of the traffic signals along University Avenue do not provide sufficient crossing times; however, upon review of the signal controller settings, pedestrian crossing times consistent with industry practices and requirements are in fact provided at each intersection when a pedestrian button is pressed.

Pedestrian activity is relatively high in the Study area. The presence of the VA and UW Hospitals and UW campus results in many pedestrian trips to and from the nearby residential areas. A large amount of commercial and office land uses are located on both sides of University Avenue along the length of the Study corridor and also west of Midvale Boulevard. These land uses also generate a significant amount of pedestrian travel. The University Avenue intersections at University Bay Drive/Farley Avenue (Figure 3.02-3) and Highland Avenue have the highest pedestrian volumes in the Study area.

Figure 3.02-3 Pedestrian Accommodations at University Bay Drive/Farley Avenue

The subsections below summarize locations of highest need for pedestrians as identified by project stakeholders and the study team. A full summary of pedestrian issues and opportunities as presented at the second set of Study workshops is included in Appendix C.

A. University Avenue and Shorewood Boulevard

Crossing University Avenue at this signalized intersection was cited by many study participants as a concern and prompted the formation of a citizen advocacy group called Citizens for Safe Corridors. Primary concerns include a lack of compliance by drivers in stopping at the marked stop bars and turning vehicles failing to yield to pedestrians in the crosswalks (primarily southbound right-turning vehicles crossing the west crosswalk and southbound left-turning vehicles crossing the east crosswalk). Shorewood Hills Elementary School is located north of University Avenue and some of the children that attend there live south of University Avenue. Crash data from 2007 through 2011 included 1 pedestrian crash out of a total of 42 intersection crashes reported.

B. University Avenue and Blackhawk Avenue

Crossing University Avenue at this unsignalized intersection was cited by study participants as a concern. Crash data from 2007 through 2011 did not include any reported crashes involving pedestrians. In August of 2013, there was a crash involving pedestrians in which a mother and her infant in a stroller were struck by a vehicle because the driver failed to see them crossing in front of a vehicle in the adjacent lane that had yielded to their crossing.

C. University Avenue and University Bay Drive/Farley Avenue

Crossing University Avenue at this signalized intersection was cited by study participants as a concern. Crash data from 2007 through 2011 included 4 pedestrian crashes out of 83 crashes reported. There was also a comment received regarding northbound vehicles attempting a right turn on red failing to notice pedestrians crossing in the south crosswalk.

D. Midvale Boulevard at Hilldale Mall Entrance North of Heather Crest

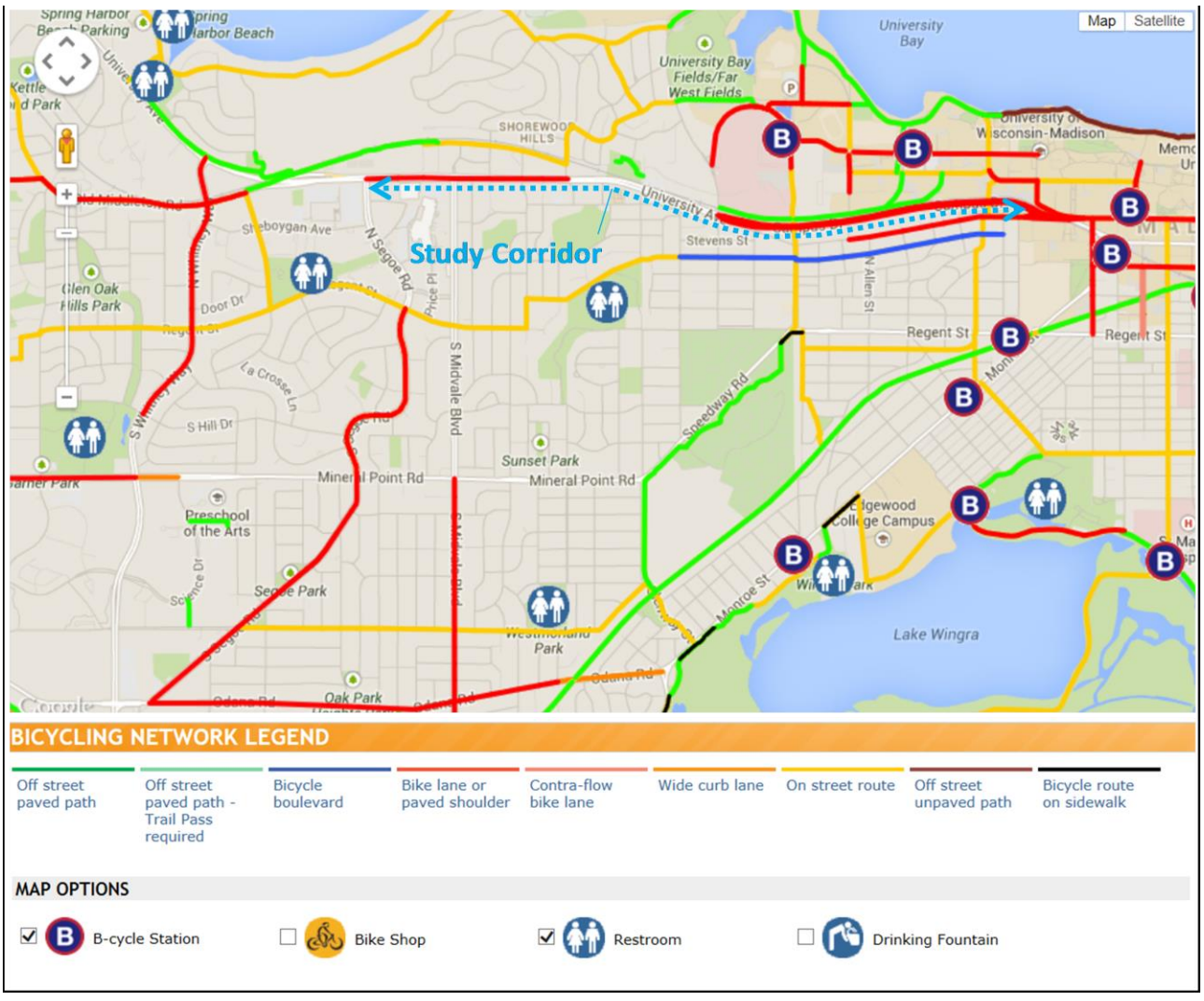
Crossing Midvale Boulevard at this location was cited as a concern. The primary issue appears to be southbound U-turning motor vehicles that conflict with the marked crosswalk on the north side of the intersection. The U-turn maneuver is somewhat common here because the Mall exit to the north allows only an eastbound right turn. Drivers wishing to exit the Mall here and travel north on Midvale Boulevard make an eastbound right turn followed by a southbound U-turn at the subject median break. Crash data from 2007 through 2011 included three reported crashes, none of which involved pedestrians.

E. Missing Sidewalks

Some residents of the Greater Regent neighborhood south of University Avenue cited missing sidewalks as a concern. This was particularly the case on streets where the combination of a significant amount of daily commuter parking and a lack of sidewalks occurs.

3.04 BICYCLE ACCOMMODATIONS

In general, the study area and the Madison metropolitan area as a whole is well-served by a large network of interconnected bicycle facilities, with some gaps still needing to be completed. On-street dedicated and shared-lane facilities as well as off-street paths are available for bicyclists. Figure 3.04-1 shows the existing bicycle system serving the Study area.



Source: cityofmadison.com

Figure 3.04-1 Bicycle Facilities in the Study Area

The following subsections summarize locations of highest need for bicyclists as identified by project stakeholders and the study team. A full summary of bicycle issues and opportunities as presented at the second set of Study workshops is included in Appendix C.

A. East-West Connectivity from University Bay Drive to Shorewood Boulevard

The single most common stakeholder issue cited for any of the travel modes was the lack of continuity for east-west bicycle travel between the on-street bicycle lanes on Locust Drive at Shorewood Boulevard and the UW campus path that runs on the north side and parallel to University Avenue/Campus Drive east of University Bay Drive. Bicyclists in this area must choose between riding on the most heavily traveled portion of University Avenue, traveling through the private parking area between University Avenue and Marshall Court, or riding along Marshall Court and using University Bay Drive to make the connection between Marshall Court and the UW path.

B. Campus Path Crossing of Highland Avenue north of Campus Drive

The path crossing at this location was cited as a concern for bicyclists. Part of the issue involves the lack of visibility of the traffic signal heads at the Westbound Campus Drive Ramps intersection, which makes it difficult for path bicyclists to know where conflicting traffic from the south will be originating from. Crash data from 2007 to 2011 included 1 crash involving a bicyclist out of 22 crashes reported.

C. North-South Connectivity between the area bounded by Midvale Boulevard and Allen Street/Edgewood Avenue

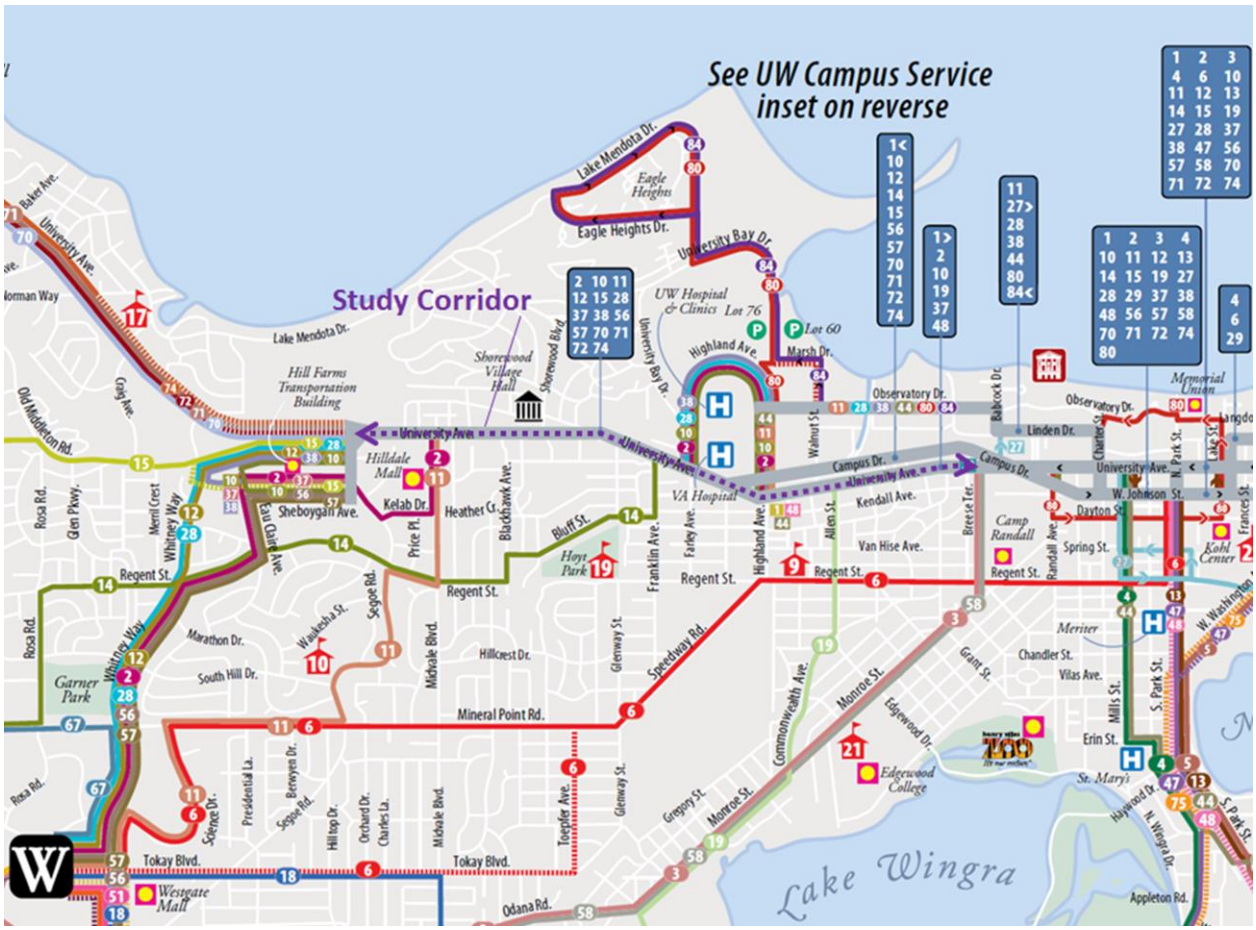
Traveling north-south between the bicycle facilities that are parallel to the Study corridor area and the Southwest Path that runs parallel to Monroe Street can be challenging. There is a lack of a dedicated, lower motor vehicle volume north-south route between Spooner Street/Prospect Avenue, particularly north of Speedway Road/Regent Street. Rolling topography and physical barriers including Hoyt Park, Resurrection Cemetery, Forest Hill Cemetery, and Glenway Golf Course also decrease north-south connectivity.

3.05 TRANSIT SERVICE

Metro Transit provides the main transit service in the City of Madison metropolitan area via local bus service. The Study corridor is a critical link in Metro Transit's route structure. Figure 3.05-1 shows the Metro Transit routes in the Study area.

In 2011, more than 14.9 million rides were recorded on Metro Transit, a 9.5 percent increase over 2010. Currently 8.6 percent of work trips in Madison use transit, which ranks 44th in the nation.

University Avenue is an extremely important transit corridor. There are 15 Metro Transit route numbers that serve University Avenue, not including supplemental school service. Almost 490 buses travel on University Avenue during a typical weekday, not including school service.



Source: cityofmadison.com

Figure 3.05-1 Metro Transit Routes in the Study Area

The most common comment provided by project stakeholders regarding transit was the desire for enhanced transit service (commuter rail or express bus service) to reduce the demand for peak-hour single-occupant motor vehicle trips. The Madison Transit Corridors Study (BRT Study) evaluated BRT in the Madison area. The study, completed in May 2013, was funded by part of a federal Sustainable Communities Regional Planning grant administered by the CARPC, and led by the MPO. The BRT Study evaluated four corridors: north, south, east, and west out of the downtown area that included a common central segment in the UW Campus area and central isthmus. Those corridors are the most heavily traveled transit corridors in the city with over 20,000 of about 60,000 total daily boardings.

In the west corridor, the study analyzed a Mineral Point Road alignment that included an option for 4.3 miles of fixed guideway in the median of University Avenue. The total estimated cost of the BRT system is about $138 Million (2016 dollars). Daily ridership is forecasted to range from about 4,000 to 10,000 trips per day on each of the corridors. The study concluded that the fixed

guideway alternative (BRT-only lanes in the median) along University Avenue would require additional right-of-way to be purchased from adjacent businesses and would have particularly severe impacts east of Shorewood Boulevard.

A summary of transit conditions presented at the second set of Study workshops is included in Appendix C.

3.06 MOTOR VEHICLE PEAK-HOUR CONGESTION AND QUEUING

The study team completed traffic modeling to evaluate current levels of driver delay and queuing during peak traffic conditions. Synchro8/SimTraffic8 software was used for this analysis. For urban streets, conditions at intersections are typically used to evaluate operations. Currently, some intersections in the Study area are near capacity during peak times, and a few intersections or individual movements are over capacity.

Level of Service (LOS) is one metric used to evaluate how a street is functioning for motor vehicles, including passenger cars, freight/deliveries, and bus transit. LOS is based on the average delay experienced by motor vehicles and uses a scale from LOS A (very little delay) to LOS F (the motor vehicle service capacity of the intersection is exceeded). Table 3.06-1 shows the Base conditions along the corridor for the PM peak hour. Listed are the overall LOS, the number of individual movements operating at LOS F, and movements that experience a Volume to Capacity ratio (V/C) greater than 1.0 and 0.9.

Intersection LOS is one performance measure used in transportation planning, but it must be considered in conjunction with other factors impacting how a street serves all modes of traffic. Poor motor vehicle LOS alone does not necessitate modifications. Nor does an acceptable motor vehicle LOS indicate that a street is serving all modes of travel adequately.

Intersection	Control	Level of Service	LOS F Mov's	VC > 1.0	Add'l VC > 0.90
		LOS (seconds of delay)	No.	No.	No.
		Base	Base	Base	Base
University Ave. & Segoe Road	Signal	B (17.8)	**1**	0	0
University Ave. & Hilldale Way	2-way Stop	C (21.8)	0	0	0
University Ave. & Midvale Blvd.	Signal	D (66.9)	**3**	3	0
University Ave. & Blackhawk Ave.	2-way Stop	**F (>300)**	**2**	2	0
University Ave. & Shorewood Blvd.	Signal	C (21.4)	**1**	1	1
University Ave. & Ridge Street	Partial Signal	A (4.4)	0	0	0
University Ave. & University Bay Dr./ Farley Ave.	Signal	C (23.5)	0	0	0
University Ave. & Highland Ave.	Signal	B (16.7)	0	0	0
University Ave. & Walnut St.	Signal	C (29.6)	0	0	1
Midvale Blvd. & Mineral Point Rd.	Signal	D (41.8)	0	1	2
Midvale Blvd. & Regent St.	Signal	B (10.1)	0	0	0
Mineral Point Rd. & Glenway St.	Signal	A (8.9)	0	0	0
Regent St. & Farley Ave.	2-way Stop	B (13.2)	0	0	0
Regent St. & Highland Ave./ Speedway Dr.	All-way Stop	E (46.4)	**3**	3	0
Highland Ave. & Campus Dr.	Signal	A (10.0)	0	0	0
Highland Ave. & VA Hospital	Signal	B (18.2)	0	0	0
Highland Ave. & Observatory Dr.	Signal	B (13.7)	0	0	0
Lake Mendota Dr. & Edgehill Dr.	1-way Stop	A (8.7)	0	0	0

Source: Synchro8 output

Table 3.06-1 Base Motor Vehicle Operating Conditions During the PM Peak Hour

The intersections experiencing notable operational concerns under current conditions are described in the following subsections.

A. University Avenue and Blackhawk Avenue

This intersection operates under stop-control for the northbound and southbound approaches. The northbound and southbound left turns from the side street on to University Avenue operate at LOS F during heavy traffic periods. There are not suitable gaps for these left-turning maneuvers. In the afternoon, westbound vehicles queuing at the Midvale Boulevard intersection to the west can sometimes reach Blackhawk Avenue, complicating operations and further degrading operations. It should be noted that the traffic operations software used for the analysis sometimes overestimates side-street delay at two-way stop-controlled intersections. A manual delay study would need to be conducted in the field to more accurately assess the LOS at this location.

B. Regent Street and Speedway Drive and Highland Avenue

This intersection is under all-way stop control, and the pavement markings were recently modified and improved to better define the crosswalks and pedestrian refuge areas. During peak traffic conditions, delays can approach one minute for the average vehicle traveling through the intersection. Queuing can also be significant, particularly eastbound during the AM peak hour and westbound and southbound during the PM peak hour. It should be noted that the traffic operations software used for the analysis sometimes overestimates delay at all-way stop intersections. A manual delay study would need to be conducted in the field to more accurately assess the LOS at this location.

C. University Avenue and Midvale Boulevard

This intersection is signal-controlled. During the heaviest traffic periods, queuing on one or more of the approaches can reach lengths that block upstream driveways and/or intersections. This typically occurs for eastbound and northbound traffic during the AM peak and southbound and westbound traffic during the PM peak. Field observation revealed that pedestrians in the west crosswalk that are crossing north-south occasionally do not clear the intersection and must wait a cycle in one of the refuge areas in the median. In addition, the far side bus stops sometimes cause queuing behind a stopped bus that reaches the intersection. This occurred more often for eastbound buses during the AM peak hour and westbound buses during the PM peak hour.

D. University Avenue and Shorewood Boulevard.

This intersection is signal-controlled. The traffic modeling indicates the overall intersection operates at LOS C conditions. The southbound left turn operates at LOS F during the PM peak hour. Southbound queuing can be significant at times, often backing to Locust Drive and occasionally to the railroad tracks just north of Locust Drive.

E. University Avenue and Farley Avenue/University Bay Drive

This intersection is signal-controlled. The traffic modeling indicates the overall intersection operates at LOS C conditions without any movements at LOS F. Observation of the model, however, indicates significant congestion and queuing southbound on University Bay Drive. Field observation confirms these conditions, with queues often backing through the Marshall Court intersection and occasionally reaching the Highland Avenue intersection farther north.

3.07 CRASH HISTORY

Crash analysis for transportation facilities is often divided into at least two categories: crashes at intersections and crashes along corridors. For motor vehicle crashes, crash rates are typically used (crashes per vehicle or vehicle miles) rather than the gross number of crashes. This is so facilities that carry different volumes of motor vehicle traffic can be compared to one another. The following sections summarize the results of the crash analysis. Appendix D contains additional details from the crash analysis.

A. Corridor Crashes

1. Bicycle and Pedestrian Crashes

Table 3.07-1 summarizes the bicycle and pedestrian crashes that occurred along the Study area corridors from 2007 through 2011.

The University Avenue corridor from Midvale Boulevard to Grand Avenue experienced the most bicycle and pedestrian crashes. There were 13 from 2007 through 2011, or about 2.5 per year. This corridor also experiences the highest motor vehicle and some of the highest bicycle and pedestrian traffic of any of the corridors evaluated. It is expected then that the higher number of potential conflicts resulted in the highest number of pedestrian and bicycle crashes.

University Avenue from Grand Avenue to Breese Terrace (“Old University”) had 10 bicycle and pedestrian crashes. This corridor carries significantly less motor vehicle traffic (12,000 vehicles per day) than University Avenue west of Grand Avenue (55,000) vehicles per day. So, on a “per exposure” basis, this corridor could be considered less safe for pedestrians and bicyclists. It is important to note that significant changes were made to the lane designations, on-street parking areas, and on-street bicycle accommodations as part of a reconstruction in 2011.

Segment	Termini	Segment Length (miles)	ADT	Year	Ped	Bike
University - Campus	Midvale to Grand	0.90	55,000	2007	2	1
				2008	0	0
				2009	0	1
				2010	4	3
				2011	1	1
				Total	**7**	**6**
University	Grand to Breese Terrace	1.03	12,000	2007	2	2
				2008	1	0
				2009	1	1
				2010	0	0
				2011	3	0
				Total	**7**	**3**
Campus	Grand to Breese Terrace	1.00	38,500	2007	0	0
				2008	0	0
				2009	0	0
				2010	0	0
				2011	0	0
				Total	**0**	**0**
Midvale	University to Mineral Point	1.01	21,500	2007	2	0
				2008	1	0
				2009	0	0
				2010	0	0
				2011	0	2
				Total	**3**	**2**
Mineral Point/Speedway	Midvale to Highland	1.34	17,000	2007	0	1
				2008	1	1
				2009	1	2
				2010	0	0
				2011	0	1
				Total	**2**	**5**
Highland	University to Regent	0.28	7,300	2007	0	1
				2008	0	0
				2009	0	0
				2010	0	0
				2011	0	0
				Total	**0**	**1**
Total		2.93	105,500	2007	6	5
				2008	3	1
				2009	2	4
				2010	4	3
				2011	4	4
				Totals	**19**	**17**

Table 3.07-1 Bicycle and Pedestrian Crashes by Corridor

2. Motor Vehicle Crash Rates

The project team evaluated crash rates along six corridors. Table 3.07-2 shows the overall results for the five-year period from 2007 through 2011.

Corridor	Limits	Total Crashes	Total Crash Rate 2007 - 2011	Statewide Rate for Comparable Facility	Corridor Rate divided by Statewide Rate
University Avenue	Midvale Boulevard to Farley Avenue	354	391	313	**1.25**
University Avenue	Grand Avenue to Breese Terrace	81	359	343	**1.05**
Campus Drive	Grand Avenue to Breese Terrace	28	40	78	0.51
Midvale Boulevard	Mineral Point Road to University Avenue	102	259	343	0.76
Mineral Point Road/Speedway Road	Midvale Boulevard to Highland Avenue	137	331	343	0.97
Highland Avenue	Regent Street to University Avenue	21	562	343	**1.64**

Crash rates are Crashes per 100 Million Vehicle Miles Traveled

Table 3.07-2 Motor Vehicle Corridor Crash Rates

The Highland Avenue corridor had the highest crash rate from 2007 through 2011 of the corridors evaluated, and the rate was 1.64 times the statewide average for an urban arterial facility. It is important to note, however, that the number of crashes and crash severity were both low. Only one injury was reported from the 21 total crashes in the five-year period (4 percent). Two crashes involved bicyclists traveling along Highland Avenue. Two crashes involved a vehicle traveling on Highland Avenue sideswiping a legally parked vehicle.

The University Avenue corridor from Midvale Boulevard to Farley Avenue experienced a crash rate that was 1.25 times the statewide average. Injuries occurred in 9 percent of these crashes. The rate for crashes resulting in A-Level (or incapacitating) injuries was 2.27 times the statewide average. Of the 13 A-level crashes within this section of the Study corridor, seven occurred at the Farley Avenue/University Bay Drive intersection, one of which involved a pedestrian. Four of the seven crashes involved an eastbound left-turning vehicle that failed to yield to oncoming westbound traffic (or selected an insufficient gap in which to make the left turn across University Avenue/Campus Drive).

Two fatal crashes occurred on Midvale Boulevard during the five-year period. This resulted in a fatal crash rate that was 3.62 times the statewide average. Both crashes involved vehicles traveling at exceedingly high speeds (85 mph or higher) northbound through the intersection of Midvale Boulevard and Mineral Point Road. The City will be reconstructing this intersection in 2015 and will be making safety improvements at that time.

B. Intersection Crashes

1. Bicycle and Pedestrian Crashes

The study team reviewed crash data at 29 intersections in the Study area; 16 experienced a bicycle or pedestrian crash between 2007 and 2011. Only one location had more than two bicycle or pedestrian crashes in that period. The intersection of University Avenue and Farley Avenue/University Bay Drive experienced three pedestrian and two bicycle crashes.

In the three crashes involving pedestrians at Farley Avenue/University Bay Drive, one pedestrian suffered an A-level (incapacitating) injury, one suffered a B-level (nonincapacitating) injury, and one suffered a C-level (possible) injury. The A-level injury occurred when a westbound motor vehicle struck a southbound pedestrian in the east crosswalk after a vehicle in the adjacent lane had stopped to yield the right-of-way to the pedestrian (the "double jeopardy" hazard). The B-level injury occurred when a westbound vehicle made a left turn on the green indication to southbound Farley Avenue and failed to identify a pedestrian crossing Farley Avenue in the south crosswalk and struck the pedestrian. The C-level injury occurred when a pedestrian crossing University Bay Drive was struck by an eastbound left-turning vehicle that ricocheted into the north crosswalk after being struck by a westbound through vehicle.

In the two crashes involving bicycles at Farley Avenue/University Bay Drive, the bicyclists both suffered C-level injuries. In the first crash, a northbound right-turning motor vehicle turned on a red signal and struck a bicyclist crossing Farley Avenue westbound in the south crosswalk. In the second crash, a northbound right-turning motor vehicle struck a northbound through bicyclist on a green signal indication.

2. Motor Vehicle Crash Rates

For motor vehicles, intersection crash rates are typically calculated as the number of crashes per one million entering vehicles (MEV). In Wisconsin, an intersection crash above 1.5 MEV is often considered a candidate for a safety study. Intersections with crash rates between 1.0 and 1.5 MEV warrant monitoring.

None of the 20 intersections the study team evaluated experienced a crash rate over 1.5 MEV, and only two locations had crash rates above 1.0 MEV. The intersection of Mineral Point Road and Midvale Boulevard had a crash rate of 1.01 MEV. The City will be making modifications at this location in 2015. The intersection of Mineral Point Road/Speedway Road and Glenway Street had a crash rate of 1.11 MEV.

At Mineral Point Road/Speedway Road and Glenway Street, there were 25 crashes from 2007 through 2011. Eleven of these (44 percent) appear to be related to the vertical profile west of the intersection combined with the skew angle between Mineral Point Road and Speedway Drive. Most of the 11 crashes occurred when an eastbound vehicle on Mineral Point Road lost control approaching or while traveling through the intersection. Fifteen of the crashes (60 percent) occurred when the road was wet, icy, or snow-covered. There was one A-level injury, five B-level injures, and two C-level injuries, resulting in about one-third of the crashes

involving injuries. There were two crashes involving bicyclists, both of which involved a bicyclist traveling eastbound along Mineral Point Road/Speedway Road. The bike crashes resulted in one A-level and one B-level injury.

3.08 CUT-THROUGH TRAFFIC

The University Avenue corridor and the Mineral Point Road/Speedway Road/Regent Street corridor are the only two east-west arterial systems serving the Near Westside of Madison. The Midvale Boulevard and Whitney Way corridors are the only north-south arterials. For a variety of reasons, drivers sometimes elect to leave these arterial corridors and travel alternate routes to reach their destinations. For the most part, these alternate routes often consist of local or neighborhood streets in Shorewood Hills and the Greater Regent Neighborhood. This traffic is referred to as “cut-through” traffic because it does not start or end within the neighborhoods through which it travels.

This study included a license plate survey to identify how much of the traffic on the most common cut-through routes is in fact cut-through traffic. This type of data collection is very budget-intensive, as field staff must manually collect plate numbers at multiple locations simultaneously. For this reason, only inbound traffic on select routes during a weekday AM peak period was collected. Figures 3.08-1 and 3.08-2 show the results of the cut-through traffic data collection for Shorewood Hills and the Greater Regent Neighborhood, respectively. Additional information is provided in Appendix E.

A. Shorewood Hills Cut-Through Traffic

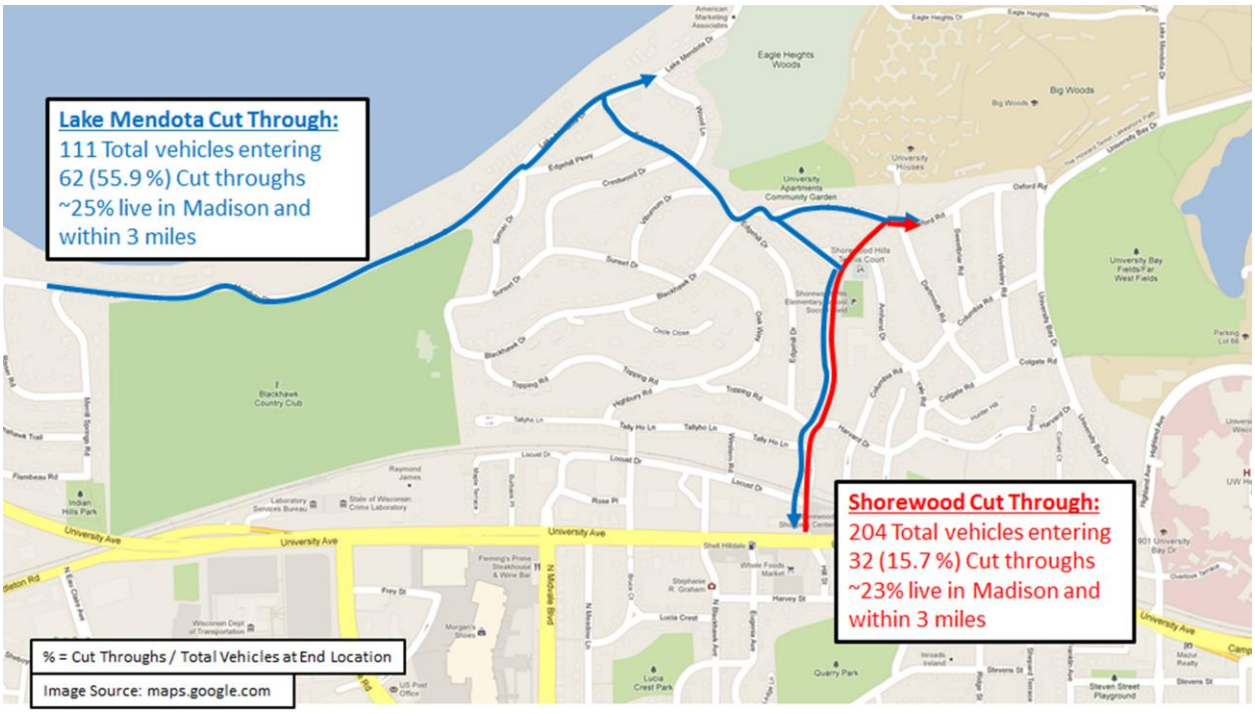


Figure 3.08-1 Results of Cut-Through Traffic Study–Shorewood Hills

The study indicates that about 55 percent of the traffic entering the Village during the AM peak period on Lake Mendota Drive ultimately leaves the Village via Lake Mendota Drive, Shorewood Boulevard, or Oxford Road. At least some of this traffic is likely destined to the Eagle Heights housing area and probably should not be categorized as cut-through. About 15 percent of the traffic entering on Shorewood Boulevard ultimately exits the Village via Oxford Road. Some of this is likely student drop-offs at Shorewood Elementary.

B. City of Madison Cut-Through Traffic

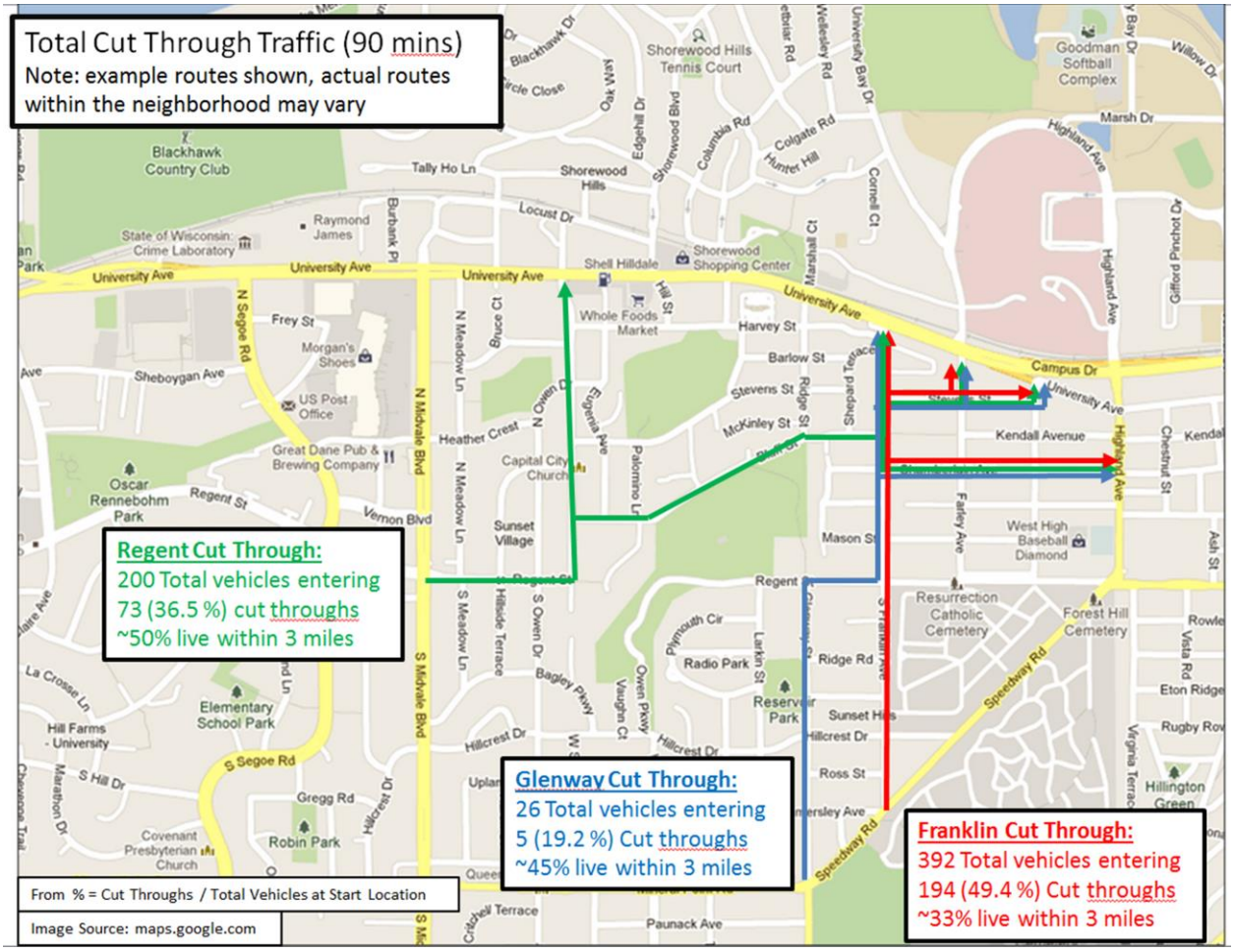


Figure 3.08-2 Results of Cut-Through Traffic Study–Greater Regent Neighborhood

For the Greater Regent neighborhood, the study shows inbound cut-through traffic during the AM peak period varies from about 20 to 50 percent on the routes surveyed. Franklin Avenue has the highest percentage of vehicles that enter the area and ultimately exit at one of the locations shown. Of the traffic exiting the area at Franklin Avenue and University Avenue, about 25 percent originated from one of the three entry points surveyed (not shown on graphic; see Appendix E for additional information on cut-through traffic).

The study team also collected data on traffic entering the UW/VA Hospital area northbound on University Bay Drive and Highland Avenue. About 5 to 10 percent of the entering traffic was found to have "cut through" the Greater Regent neighborhood, while 92 to 96 percent had not cut through. This equated to about 100 cut-through vehicles total during the AM peak hour on the day the survey was conducted. Some of this traffic was likely coming from points south of Speedway and Mineral Point Road, and was thus taking a reasonable route to the UW/VA Hospital area and other points north.

3.09 NEIGHBORHOOD PARKING CONCERNS

A significant amount of feedback was provided to the study team by residents of the Greater Regent Neighborhood regarding on-street parking use by daily commuters. Figure 3.09-1 shows two locations where concerns were voiced.

Image source: maps.google.com

Figure 3.09-1 Examples of High Use Areas for On-Street Parking

Opinions varied regarding the level of concern caused by the high use parking areas. Some residents liked the fact that the parked vehicles tend to slow or "calm" traffic on neighborhood streets. Some felt the parking was primarily a concern on streets that do not have sidewalk for pedestrians. Other residents opined that the phenomenon of commuters/employees parking in the neighborhood and walking, bicycling, or taking transit to work was not acceptable and should not be allowed.

SECTION 4
FUTURE CONDITIONS

4.01 RECENT, ONGOING, AND ANTICIPATED STUDY AREA REDEVELOPMENT

As part of this study, the team reviewed a traffic impact study prepared by others and also completed an independent analysis of traffic impacts as a result of the proposed UW parking garage expansion on Highland Avenue at Observatory Drive. While some of the new stalls will replace surface stalls that are being removed, there is a net increase in parking on the west side of campus that results from the project. The incremental increase in traffic volumes and delays for the garage project was found to be negligible south of University Avenue in the Greater Regent Neighborhood. While the impacts of this specific project were modest, the long-term accumulation of small impacts from multiple projects is considered in this study.

The general Study area has been and will continue to be an attractive area for redevelopment projects. The relatively recent changes to the Hilldale Mall area and proposals for reconfiguration of the Hill Farms State Office Building site are clear indicators of this. In addition, a number of smaller redevelopment projects have recently been or will soon be completed including the Walnut Grove shopping center, properties in the Doctors Park area, the mixed use development in the southeast quadrant of the University Avenue and Farley Avenue intersection, the 2550University development northwest of University Avenue and Highland Avenue, and more.

The study team also reviewed available plans for the neighborhoods in the Study area. Figure 4.01-1 shows a summary graphic across multiple plans of the locations where redevelopment is anticipated.

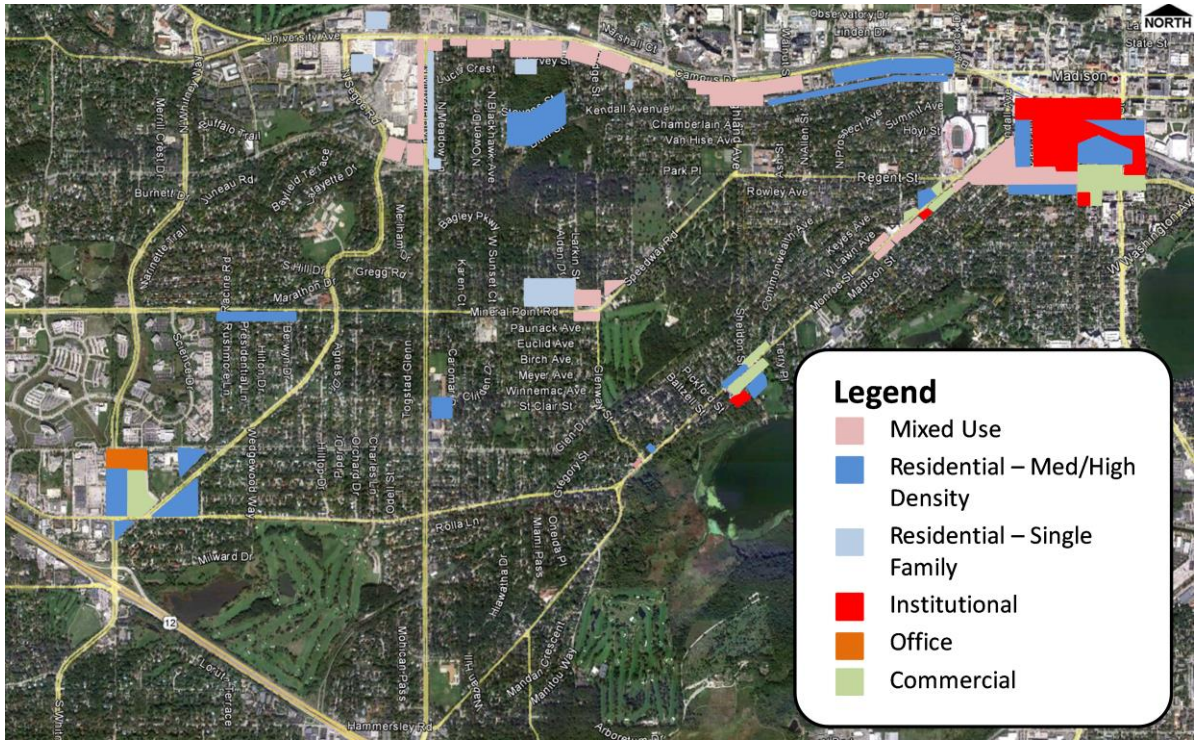


Image source: Google Earth

Figure 4.01-1 Anticipated Redevelopment in the Study Area

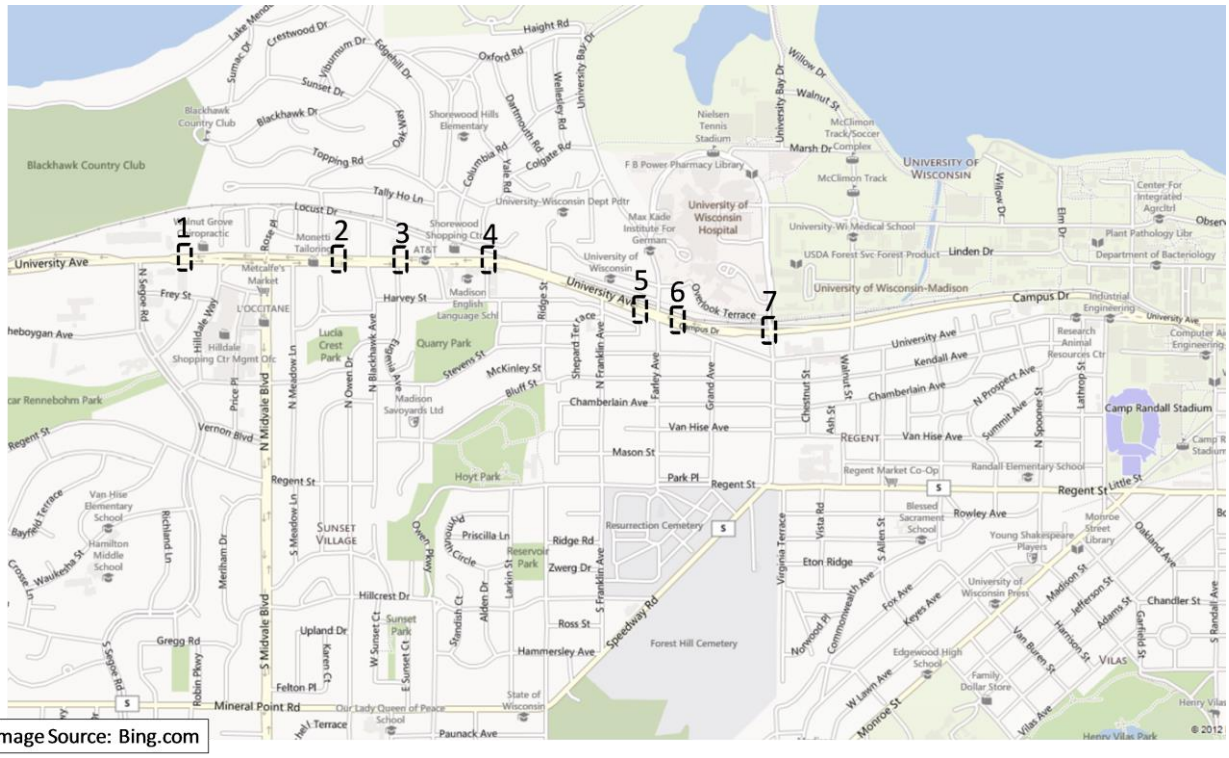
These redevelopment projects will impact travel demand in the area. The number of trips made will increase as the amount of population and employment continues to increase. This pattern of densification and mix of land uses (whether within a single redevelopment or through the additional residences, commercial uses, and employment in proximity) suggests the increase in motor vehicle trips during peak periods will grow more slowly than other types of trips. In other words, the percentage of trips that are taken outside of peak periods and/or via walking, bicycling, or transit will increase as redevelopment continues.

4.02 TRAVEL DEMAND MODELING

The Dane County Transportation Planning Board (TPB) is the Metropolitan Planning Organization for the Madison metropolitan area. The TPB maintains a travel demand model that is used for transportation planning purposes. For this Study, the team used the travel demand model as a tool to develop a future traffic scenario for traffic modeling in the development and evaluation of corridor and intersection modifications. The model used was the Cube 2035 Daily model available in February 2013.

The Dane County Travel Demand model uses socioeconomic data to generate trips to and from the Traffic Analysis Zones (TAZs) within the model. Characteristics such as number of lanes, speed, link class, and link capacity control the traffic volumes on each of the coded streets as the model is run.

The base and future daily demand model was used for calculating a range of growth likely along the University Avenue Study corridor. First a Base run (2006) was completed to generate the base (existing) conditions for the corridor. Next a Future run (2035) was completed to estimate future traffic volumes. To test the effect of capacity expansion, the links along the study corridor were expanded by one lane in each direction. The Future condition was then rerun. The unexpanded future run served as the bottom of the growth range while the expanded future run would serve as the high end of the growth range. The volumes and growth rates were then taken from seven locations along the study corridor shown in Figure 4.03-1



Source: Bing.com

Figure 4.03-1 Demand Model Growth Rate Locations

To calculate an estimated corridor growth rate, each of the seven locations would be ranked based on how much the alternative improved the capacity at each of the locations. The rates were then averaged to determine the corridor growth rate. A zero to ten rating was completed for each location with zero being that the capacity remained similar to existing while ten would represent an additional lane of traffic or a freeway facility with the existing lanes. The growth along the study corridor is likely to range between 0.6 and 0.9 percent per year based on the level of capacity expansion.

4.03 FORECASTED TRAFFIC GROWTH FOR EVALUATION OF POSSIBLE MODIFICATIONS

Based on the results of the scenario testing in the 2035 demand model, the study team agreed to use 115 percent of the Base motor vehicle traffic volumes to develop and test potential intersection and corridor modifications. The actual traffic growth that will occur over the next 15, 20, or 25 years will be dependent on many factors. The Study area already produces a high percentage of travel by alternate modes. If the status quo is maintained, 15 percent growth could be reached by about 2025. If the influences of TDM, mixed use redevelopment and densification and/or improved or premium transit service can work together to continue reducing the demand for peak-hour single-occupant motor vehicle trips, 15 percent growth may not be reached until 2040, if ever.

4.03 FUTURE CONDITIONS WITH EXISTING FACILITIES

Section 3 outlines existing needs for pedestrians, bicyclists, transit riders, and drivers. For this study, the quantitative operational evaluation of possible intersection and corridor modifications has been completed using Synchro8 traffic modeling software. The study team agrees it is an appropriate tool to develop and test different scenarios in terms of the impact on motor vehicle operations. These impacts in turn effect conditions for the other modes. Higher levels of motor vehicle congestion and queuing can lead to increased traffic on neighborhood streets, higher crash rates, less comfortable conditions for pedestrians and bicyclists, and less predictable transit service.

Figure 4.03-2 summarizes motor vehicle traffic operations for Base and Future conditions using the existing transportation infrastructure.

Intersection	Control	Level of Service LOS (seconds of delay)		LOS F Mov's No.		VC > 1.0 No.		Add'l VC > 0.90 No.	
		Base	Future	Base	Future	Base	Future	Base	Future
University Ave. & Segoe Road	Signal	B (17.8)	B (19.9)	1	0	0	0	0	0
University Ave. & Hilldale Way	2-way Stop	C (21.8)	D (32.4)	0	0	0	0	0	0
University Ave. & Midvale Blvd.	Signal	D (66.9)	F (88.4)	3	4	3	3	0	2
University Ave. & Blackhawk Ave.	2-way Stop	F (>300)	F(>300)	2	2	2	2	0	0
University Ave. & Shorewood Blvd.	Signal	C (21.4)	E (68.4)	1	2	1	2	1	0
University Ave. & Ridge Street	Partial Signal	A (4.4)	B (14.8)	0	0	0	0	0	0
University Ave. & University Bay Dr./ Farley Ave.	Signal	C (23.5)	C (27.6)	0	0	0	0	0	1
University Ave. & Highland Ave.	Signal	B (16.7)	C (24.6)	0	0	0	0	0	1
University Ave. & Walnut St.	Signal	C (29.6)	D (37.1)	0	1	0	1	1	0
Midvale Blvd. & Mineral Point Rd.	Signal	D (41.8)	F (97.5)	0	2	1	3	2	0
Midvale Blvd. & Regent St.	Signal	B (10.1)	B (12.1)	0	0	0	0	0	0
Mineral Point Rd. & Glenway St.	Signal	A (8.9)	B (10.4)	0	0	0	0	0	0
Regent St. & Farley Ave.	2-way Stop	B (13.2)	B (14.8)	0	0	0	0	0	0
Regent St. & Highland Ave./ Speedway Dr.	All-way Stop	E (46.4)	F (84.2)	3	5	3	5	0	0
Highland Ave. & Campus Dr.	Signal	A (10.0)	B (18.1)	0	0	0	0	0	0
Highland Ave. & VA Hospital	Signal	B (18.2)	C (23.6)	0	1	0	0	0	1
Highland Ave. & Observatory Dr.	Signal	B (13.7)	B (13.6)	0	0	0	0	0	0
Lake Mendota Dr. & Edgehill Dr.	1-way Stop	A (8.7)	A (8.8)	0	0	0	0	0	0

Source: Synchro8 output

Figure 4.03-2 Base and Future (115 Percent of Base Volumes) Motor Vehicle Operating Conditions During the PM Peak Hour on Existing Facilities

A. University Avenue and Midvale Boulevard

Traffic modeling indicates this signalized intersection will experience LOS F operations at 115 percent of the Base volumes with no modifications made. During the PM peak hour, the westbound left-turn (WBL) volume is nearly twice the capacity of that movement at the signal, and delays are forecasted to exceed 5 minutes. This severe congestion will impact upstream intersections and SimTraffic8

simulation modeling suggests the queues could reach Shorewood Boulevard or farther. Such congestion may impact safety, travel patterns, and travel demand (both time of day and mode choice).

The southbound through (SBT) and northbound right turn (NBR) also operate well into the LOS F range with delays of greater than two minutes on average. The eastbound left turn (EBL) operates at LOS F as well.

B. Midvale Boulevard and Mineral Point Road

Traffic modeling indicates this signalized intersection will experience LOS F operations at 115 percent of the Base volumes with no modifications made. The eastbound and westbound through movements (EBT and WBT) are over capacity and operate at LOS F with delays exceeding two minutes on average. The City is considering limited modifications at this intersection.

C. University Avenue and Shorewood Boulevard

Traffic modeling indicates this signalized intersection will experience LOS E operations at 115 percent of the Base volumes with no modifications made. The southbound left turn (SBL) operates at LOS F with delays over two minutes on average. The WBT also operates over capacity and experiences LOS F conditions with average delay of 114 seconds per motor vehicle.

D. University Avenue and Blackhawk Avenue

As in the Base condition, traffic modeling indicates significant delays and queuing at this unsignalized intersection at 115 percent of the Base volumes with no modifications made. Left turns and through movements from the side street will not be possible during peak times because of a lack in adequate gaps in University Avenue traffic. The EBL and WBL left-turn volumes from University Avenue may also exceed capacity at times.

E. Regent Street and Highland Avenue/ Speedway Drive

Traffic modeling indicates this all-way stop-controlled intersection will experience LOS F operations at 115 percent of the Base volumes with no modifications made. All three westbound movements operate at LOS F with delays over two minutes on average. The SBT and southbound right turn (SBR) also operate over capacity and experience LOS F conditions.

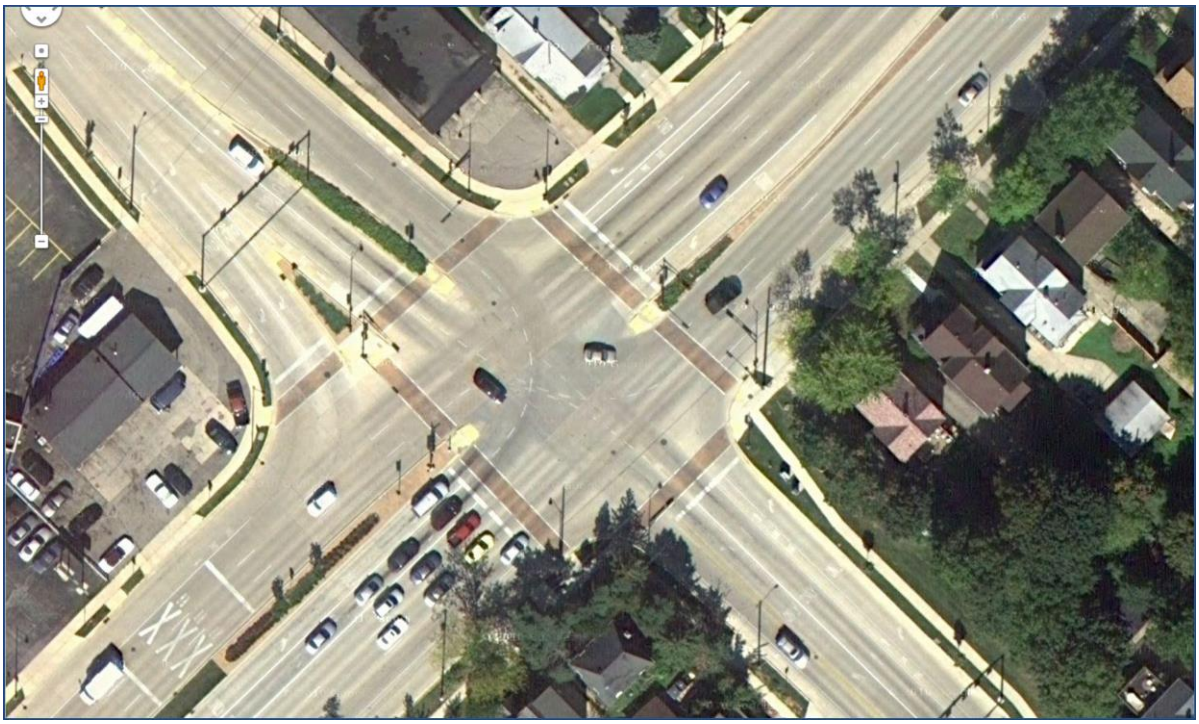
SECTION 5
DEVELOPMENT AND REVIEW OF POTENTIAL MODIFICATIONS AND PUBLIC WORKSHOP NO. 2

5.01 POTENTIAL MODIFICATIONS OVERVIEW

The study team discussed the range of potential Study Corridor modifications and considered options from a Do Nothing scenario to a scenario that would extend Campus Drive by creating a grade-separated expressway from Farley Avenue through Segoe Road. Modifications were developed at a schematic planning level only and each was evaluated for its impact on travel in the area. Three key intersections along University Avenue were evaluated in greater detail: at Midvale Boulevard, at Shorewood Boulevard, and at Farley Boulevard/University Bay Drive. Results from these key intersections would help the study team understand the type of corridor University Avenue could or should be over the longer term.

5.02 PEDESTRIAN MODIFICATIONS

Appendix F includes the Summary of Pedestrian Issues and Opportunities exhibit that was displayed at the Public Workshop No. 2 events. Potential modifications include new sidewalk, changes to pavement markings, signal timing changes, signal phasing changes including the addition of Flashing Yellow Arrows (FYA), expanded refuge areas (see Figure 5.02-1), new partial signals (similar to Ridge Street/Marshall Court), relocated crosswalks, and new grade separations.



Source: bing.com

Figure 5.02-1 East Washington Avenue and First Street Pedestrian Refuge Areas

There are locations where sidewalk is not currently provided or is provided on one side of the street only. Sidewalk was added along the east side of Highland Avenue completing the previous gap from the westbound Campus Drive ramps to Observatory Drive in the fall 2013 so that it is now continuous on both sides of the street. Sidewalk is also missing along the east side of University Bay Drive and providing it may require additional right-of-way from the VA Hospital and the UW. The opportunity to add sidewalk here will occur during the next reconstruction project for University Avenue from Shorewood Boulevard to Campus Drive, anticipated to occur within the next ten years. In the Greater Regent Neighborhood area south of University Avenue, sidewalk is also missing in some areas. Adding sidewalk to these local streets would require agreement from homeowners and the Alderperson as well as City Council action, with costs typically assessed back to the homeowners.

Along the University Avenue corridor, modifications should be made to convey a more pedestrian-oriented facility. These could include enhanced crosswalk markings (continental-style markings, see Figure 5.02-2), expanded refuge areas, the addition of partial signals with generous central refuge areas to provide additional signal-controlled, two-stage crossings, modifications to crossing times (Hilldale Way/Maple Terrace and Blackhawk Avenue are two candidate locations), signal phasing (protected only left-turn movements) and/or installation of FYAs. Grade-separated pedestrian/bicycle crossings could also be considered; however, the high cost of construction and maintenance, relatively flat topography, and the barrier presented by the railroad corridor north of University Avenue provide significant challenges for this treatment.

Source: bing.com

Figure 5.02-2 Continental-Style Crosswalk Marking Recently Added at Shorewood Boulevard

5.03 BICYCLE MODIFICATIONS

Appendix F includes the Summary of Bicycle Issues and Opportunities exhibit that was displayed at the Public Workshop No. 2 event. Potential modifications include new or extended bicycle boulevards, new on-street bike accommodations, new off-street paths, new or modified pavement markings, signal timing changes, signal phasing changes including the addition of Flashing Yellow Arrows (FYA), expanded refuge areas, new partial signals (similar to Ridge Street/Marshall Court), new bicycle signal heads (see Figure 5.03-1), and new grade separations.

Source: mutcd.fhwa.dot.com

Figure 5.03-1 Bicycle Signal Head

A modified bicycle boulevard was recently created along Kendall Avenue from Lathrop Street to Franklin Avenue and feedback has generally been positive. This boulevard could be extended west along Kendall Avenue and Bluff Street to Blackhawk Avenue, or potentially farther west along Blackhawk Avenue and Regent Street to Midvale Boulevard or beyond, although on-street parking restrictions may be necessary to do so. A north-south bicycle boulevard may also help with the lack of connectivity. While topography and multiple physical barriers make this challenging, one potential corridor may be Franklin Avenue including a marked bike lane in the uphill direction and a shared lane with sharrow marking in the downhill direction. This may require on-street parking restrictions in some locations.

On-street bike accommodations along University Avenue are provided from Segoe Road to Shorewood Boulevard. These could be extended as part of the next University Avenue reconstruction project from Shorewood Boulevard to Campus Drive, anticipated to occur within the next ten years. On-street accommodation may also be able to be improved north-south on Highland Drive through the Campus Drive overpass if the existing slope paving between the sidewalk and bridge abutments can be removed and replaced with a vertical wall (see Figure 5.03-2).

Source: google.com

Figure 5.03-2 Removal of Slope Paving Could Provide Added Width on Highland Avenue Under Campus Drive

The most important off-street path connection to be made is between Locust Drive at Shorewood Boulevard and the east-west path that runs north of Campus Drive beginning at University Bay Drive and continuing to the east. The Village of Shorewood Hills will be constructing a path north of the railroad tracks from Shorewood Boulevard to Marshall Court in 2014. The Village is also working diligently to complete the path between Marshall Court and University Bay Drive as properties in that area redevelop.

Potential modifications to traffic signal-controlled locations may also benefit bicyclists. The installation of FYAs can reinforce that the permissive left-turn phase still requires motorists to yield to conflicting traffic, including bicyclists and pedestrians traveling through the intersection. Partial signals provide a two-stage crossing with a center refuge (Hilldale Way/Maple Terrace and Blackhawk Street are two candidate locations). City and UW staff are also evaluating the addition of bicycle signal heads at the path crossing near the intersection of Highland Avenue and the West Campus Drive ramps. The bike signal heads would be located at the path crossing north of the railroad tracks and would work in conjunction with the existing traffic signal at the intersection south of the tracks.

Grade-separated pedestrian/bicycle crossings could also be considered, however the high cost of construction and maintenance, relatively flat topography, and the barrier presented by the railroad corridor north of University Avenue provide significant challenges.

5.04 TRANSIT MODIFICATIONS

Appendix F includes the Summary of Transit Conditions exhibit and the Summary of Existing Right-of-Way and Potential Transit Priority exhibit that were displayed at the Public Workshop No. 2 event. Potential modifications include transit priority measures, implementation of BRT, and implementation of enhanced transit along the railroad right-of-way.

Source: BRT Service Design Guidelines, VTA Transit Sustainability Policy

Figure 5.04-1 Example of Queue Jump at Signalized Intersection

Transit priority can take many forms. For the University Avenue corridor, it would likely consist of a few specific treatments. First, at intersections consideration could be given to providing transit signal priority from Segoe Road to Farley Avenue/University Bay Drive. This technology can extend the green signal indication on the mainline when a bus is behind schedule and approaching, or potentially end a side-street phase early, so that the transit vehicle is more likely to receive a green indication when arriving at the intersections. Queue jump accommodations provide a dedicated lane and signal head for transit vehicles and allow them to depart an intersection before the other motor vehicles that are queued up, sometimes for hundreds of feet during peak times (see Figure 5.04-1). Second, along the corridor itself, a dedicated lane could be provided for transit with the goal of reducing delays and improving service reliability. The benefit of all three treatments is less for local service when there are high-use bus stops immediately downstream of the signalized intersections. They are more effective for express service (such as BRT) when stops are limited.

BRT could be implemented along the University Avenue corridor. The Madison Transit Corridors Study recently evaluated BRT service in the Madison area and the Study Corridor was a key component of the west corridor. The study did not recommend providing dedicated lanes in the area because of the high impacts and costs associated with doing so. BRT could be operated within the exitsing six-lane corridor in the rightmost general purpose lane with mixed traffic. The key barrier to implementing BRT is the high cost of constructing and operating the system.

Enhanced transit using the railroad corridor could also be considered. Transport 2020 studied LRT using the railroad corridor and included a recommended alternative for implementation. Whether LRT or an alternative means of transport, the railroad corridor that runs parallel to University Avenue is a

significant opportunity to provide enhanced transit with infrequent stops, relatively fast travel times, and reliable service. The key barrier to implementing enhanced transit along the rail corridor is the high cost of constructing and operating the system.

5.05 MOTOR VEHICLE MODIFICATIONS

For motor vehicle improvements, modifications were grouped into "Build" categories. Low Build are modifications that likely would not require the purchase of additional right-of-way but may include partial reconstruction of an intersection and/or changes to access (restricted movements). Medium Build alternatives likely require additional right-of-way and partial or full reconstruction and/or may include modifications to access but do not include grade separations and are not expected to require building acquisition(s)/relocation(s). High Build alternatives are likely to require additional right-of-way, full reconstruction, building acquisition(s)/relocation(s), and modifications to access and/or include grade-separated roadways.

Appendix F includes the schematic summaries of the modifications that were displayed at the second round of public workshops in September 2013. Also included are more detailed summary tables of the alternatives evaluation results including level of physical impacts, access impacts, and notes about pedestrian and bicycle impacts. Synchro8 traffic modeling software was used to quantitatively evaluate the alternatives. Typically, the operational goal for this type of congested urban corridor is to achieve LOS D or better operations overall and avoid LOS F movements during typical AM and PM peak-hour conditions. The following text is a brief summary of the alternatives and operations.

A. University Avenue and Midvale Boulevard

Under future conditions (115 percent of Base PM peak-hour traffic volumes) without any modifications, the intersection operates at LOS E overall for motor vehicles, including 5 movements at LOS F. The volume to capacity ratio (v/c) for 5 movements exceeds 1.0, and it was greater than 0.9 for an additional 3 movements.

Low Build modifications considered here include changes in lane assignment, signal phasing, and access restrictions.

- LB1–Eliminate the North-South Split Signal Phasing; LOS D overall; 2 LOS F movements.
- LB2–Prohibit Northbound and Southbound Through Movements (NBT, SBT); LOS C overall; 0 LOS F movements.

Medium Build modifications considered here include creating two Tee intersections and expanding to an eight-lane corridor.

- MB1–Create Offset Tee intersections; LOS C/D overall; 0 LOS F movements (similar to Old Sauk Road and Junction Road shown in Figure 5.05-1).
- MB2–Eight-Lane Corridor; LOS C overall; 0 LOS F movements.
- MB3–Eight-Lane Corridor including one Bus/Bike/Right-Turn Lane in Each Direction; LOS E overall; 5 LOS F movements.

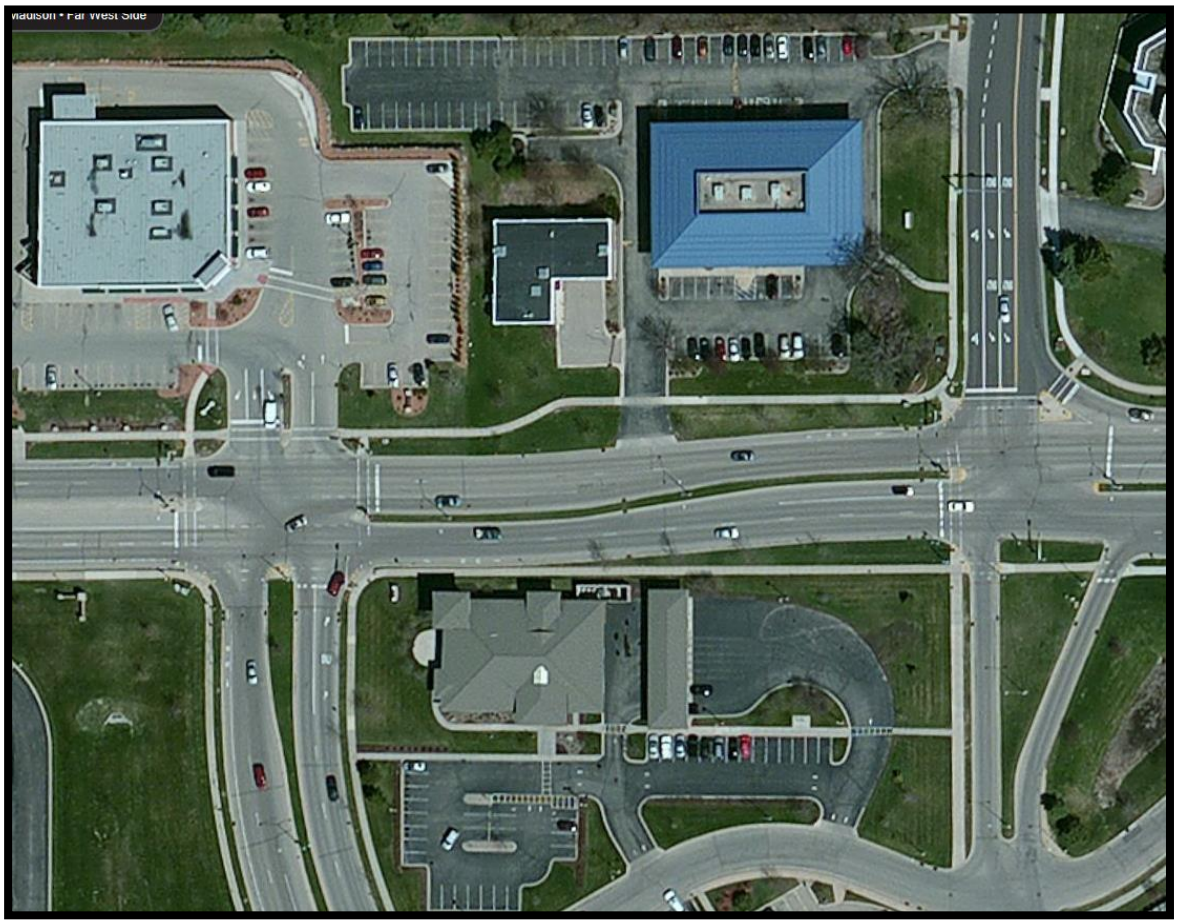


Figure 5.05-1 Offset Tee intersections at Old Sauk Road and Junction Road

High Build modifications considered here include nontraditional at-grade intersections, partial grade separations, and full interchanges.

- HB2–Grade-Separated Northbound Right (NBR) and Westbound Left (WBL); LOS C overall; 0 LOS F movements.
- HB4–Campus Drive Extension with Tight Diamond Interchange; LOS C/B overall; 0 LOS F movements.
- HB5–Grade-Separated Eastbound Through (EBT), NBR, WBL; LOS B/C overall; 1 LOS F movement.
- HB6–Indirect Left-Turn Corridor (Michigan Lefts); LOS C/B/A overall; 0 LOS F movements.

The following additional alternatives were evaluated but dismissed before the second round of public workshops.

- LBA–Provide a Bus/Bicycle/Right-Turn Lane without Roadway Expansion; dedicating one of the three lanes in each direction to buses, bicycles, and right-turning vehicles resulted in unacceptable operations with a modest improvement for bus travel times; peak traffic volumes would need to fall by about 20 percent for this option to achieve reasonable operations, representing 1987 traffic conditions.

- HB1–Diverging Arterial Intersection (Flowmax); poor motor vehicle operations; intimidating/complex bicycle and pedestrian accommodations.

- HB3–Campus Drive Extension with Single-Point Interchange; higher impacts than HB1–Tight Diamond Interchange with negligible benefits.

- HB7–Continuous Flow Intersection; poor bicycle and pedestrian accommodations; large footprint; no significant benefits over other alternatives.

B. University Avenue and Shorewood Boulevard

Under future conditions (115 percent of Base PM peak-hour traffic volumes) without any modifications, the intersection operates at LOS E overall for motor vehicles, including 2 movements at LOS F. The v/c for 2 movements was greater than 1.0.

Low Build modifications considered here include changes in the storage length and lane configurations for the southbound movements, modifications to bicycle and pedestrian accommodations, and various access restrictions.

- LB1A through 1C–Extend SBL Storage, Bicycle and Pedestrian Modifications (see one option in Figure 5.05-2); LOS E overall; 2 LOS F movements.

- LB1D–Extend SBL Storage, Bicycle and Pedestrian Modifications, Prohibit WBL; LOS E overall; 2 LOS F movements.

- LB2–Prohibit NBT and SBT, Bicycle and Pedestrian Modifications; LOS D overall; 1 LOS F movement.

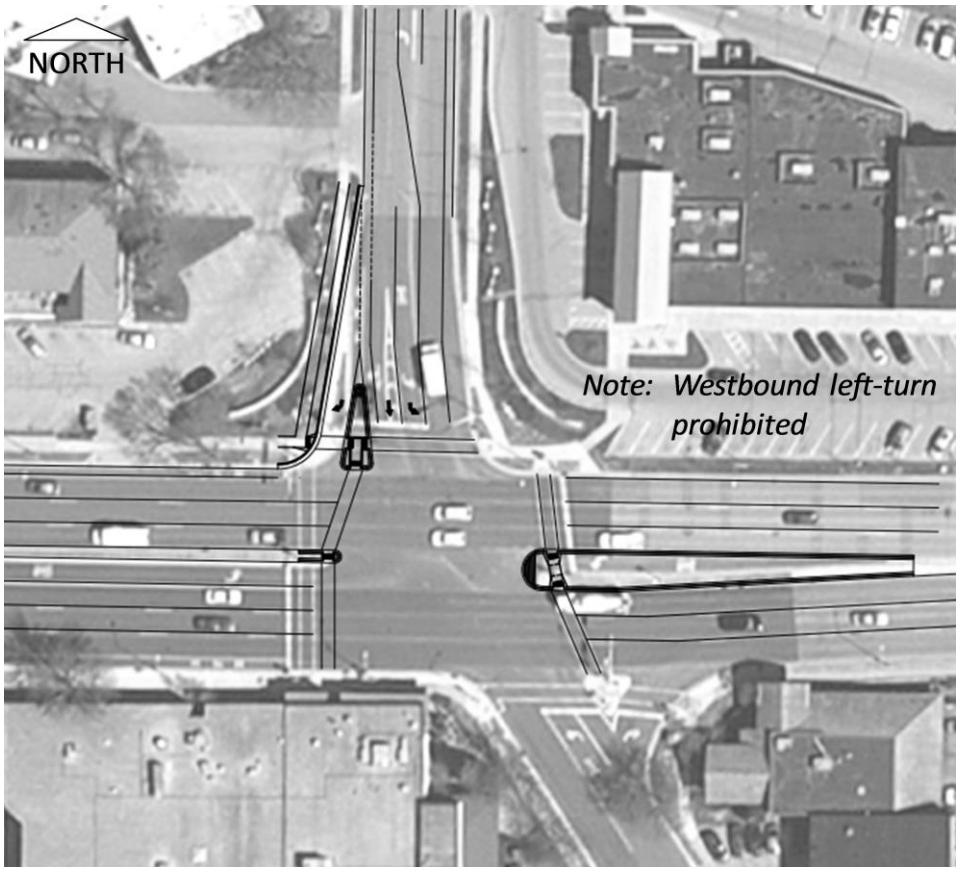


Figure 5.05-2 Possible Shorewood Boulevard Modifications

Medium Build modifications create two Tee intersections.

- MB1–Modify to a Tee Intersection to the North; LOS B/C overall; 0 LOS F movements.

High Build modifications considered here include an eight-lane corridor and a half-diamond interchange.

- HB1–Campus Drive Extension with Half-Diamond Interchange on the North Side (see Figure 5.05-3 for example); LOS A overall; 0 LOS F movements.

- HB2–Eight-Lane Corridor; LOS B overall; 0 LOS F movements.

- HB3–Eight-Lane Corridor including one Bus/Bike/Right-Turn Lane in Each Direction; LOS E overall; 2 LOS F movements.

Figure 5.05-3 Existing Half Diamond Interchange at Highland Avenue and Campus Drive

Additional alternatives were evaluated but dismissed before the second round of public workshops. These are summarized below.

- LBA–Provide a Bus/Bicycle/Right-Turn Lane without Roadway Expansion; dedicating one of the three lanes in each direction to buses, bicycles, and right-turning vehicles resulted in unacceptable operations with a modest improvement for bus travel times; peak traffic volumes would need to fall by about 20 percent for this option to achieve reasonable operations, representing 1987 traffic conditions.

- HB4–Campus Drive Extension with Full Diamond Interchange; may require eight or more business relocations).

- HB5–Indirect Left-Turn Corridor (Michigan Lefts); may require five or more business relocations.

- HB6–Continuous Flow Intersection; may require ten or more business relocations.

C. University Avenue and University Bay Drive/Farley Avenue

Under future conditions (115 percent of Base PM peak-hour traffic volumes) without any modifications, the intersection operates at LOS D overall for motor vehicles, including 1 movement at LOS F. The v/c for 1 movement was greater than 1.0 and it was greater than 0.9 for an additional 1 movement.

The only Low Build modification identified was dismissed before the workshop. This option prohibited the eastbound left turn and instead required this traffic to proceed to Highland Avenue via University Avenue and make a left turn at that intersection. The AM peak-hour traffic volume was too high for the signal at University Avenue and Highland Avenue even if capacity were added, so this option was dismissed.

Medium Build modifications include adding dual left-turn and/or southbound right-turn lanes and creating split Tee intersections.

- MB1–Provide a dual EBL; LOS D overall; 1 LOS F movements.
- MB2–Provide a dual EBL and SBR; LOS C overall; 0 LOS F movements.
- MB3–Modify to a Tee Intersection to the North; LOS C/A; 0 LOS F movements.
- MB4–Eight-Lane Corridor including one Bus/Bike/Right-Turn Lane in Each Direction; LOS D overall; 1 LOS F movement.

High Build modifications considered here include a partial and a full interchange.

- HB1–Campus Drive Extension with Diamond Interchange; LOS C/C overall; 0 LOS F movements.
- HB2–Campus Drive Extension for Westbound Traffic Only; LOS D overall; 2 LOS F movements.

Additional alternatives were evaluated but dismissed before the second round of public workshops. These are summarized below.

- LBA–Provide a Bus/Bicycle/Right-Turn Lane without Roadway Expansion; dedicating one of the three lanes in each direction to buses, bicycles, and right-turning vehicles resulted in unacceptable operations with a modest improvement for bus travel times; peak traffic volumes would need to fall by about 20 percent for this achieve reasonable operations, representing 1987 traffic conditions.
- LB1–Prohibit EBL Movement; causes the downstream intersection at University Avenue and Highland Avenue as well as the Highland Avenue corridor north of University Avenue to operate unacceptably during the AM peak.
- MB4–Modify to a Tee Intersection to the South; causes the downstream intersection at University Avenue and Highland Avenue as well as the Highland Avenue corridor north of University Avenue to operate unacceptably during the AM peak.
- HB3–Expanded at-grade Intersection with Direct Ramp to UW/VA Hospitals; cost prohibitive.

5.06 PUBLIC WORKSHOP NO. 2

The second round of workshops occurred in early fall 2013. Two workshops were held: the first was at the Shorewood Hills Village Hall on September 12; the second was held at Covenant Presbyterian Church on September 23.

A. Format and Workshop No. 2 Materials

The workshops consisted of about a 30-minute presentation including a review of the study scope, background, and current conditions; a summary of the results of the online survey and Workshop No. 1 comments; discussion of the top issues for each workshop location (the Village of Shorewood Hills and the Greater Regent Neighborhood); and a summary of the workshop materials available for review and comment. The presentation was followed by questions and answers. Participants were then given three green dots to apply to the workshop materials where they supported a possible modification, and three red dots to apply to the materials where they did not support a possible modification.

Appendix F includes the materials provided at the second round of public workshops, including the results of the dot exercise.

B. Summary of Public Comments

The public comments received at the workshops favored pedestrian, bicycle, and transit improvements. Table 5.06-1 shows the most common comments received.

Goal/Concern	Greater Regent Neighborhood		Village of Shorewood Hills	
	No. Comments	Rank	No. Comments	Rank
Improve pedestrian and bicycle connections/ crossings.	7	1	2	5
Reduce car usage/improve transit.	5	2	5	1
Eliminate options with grade separations/plan for reasonable improvements.	4	3	2	3
Reduce commuter parking in neighborhoods/provide park and rides.	3	4	2	3
Improve safety	-	-	3	2

Table 5.06-1 Summary of Most Common Comments from the Second Round of Public Workshops

In addition to the written comments, the results of the dot exercise favored bicycle, pedestrian, and lower impact motor vehicle improvements and opposed the higher build motor vehicle improvements such as an eight-lane corridor and alternatives that include grade separations.

SECTION 6
RECOMMENDATIONS, PUBLIC MEETING, FUNDING, AND NEXT STEPS

6.01 RECOMMENDATIONS

Based on stakeholder feedback and planning level evaluation of possible modifications, the study team developed a Guiding Theme and three Primary Goals. These were considered when developing the list of recommendations.

A. Theme and Goals

Table 6.01-1 lists the Guiding Theme and Primary Goals developed by the study team.

Guiding Theme	
Considering the high physical and environmental impacts and total project costs associated with significant motor vehicle capacity expansion (an eight-lane corridor or grade separations), primarily seek options to reduce demand for peak-hour single occupant motor vehicle (SOMV) travel and/or improve conditions for alternate modes without a severe detriment to car and bus travel.	
Primary Goals	
Goal TR: (Transit)	Provide exclusive and/or prioritized transit that moves high volumes of people within this portion of the University Avenue transportation corridor.
Goal AC: (Access)	Improve access (options for both ingress and egress) to the west UW campus and VA medical complex areas.
Goal PB: (Pedestrian/Bicycle)	Improve the connectivity and comfort level of bike and pedestrian travel in the study area.

Table 6.01-1 Guiding Theme and Primary Goals

The study recommendations on the whole are intended to align with the Guiding Theme. Each recommendation is also anticipated to advance at least one of the Primary Goals.

B. Recommendations

Based on the planning level evaluation of the proposed modifications, each recommendation was designated as Nearer Term or Longer Term. Nearer-Term improvements are generally those that have lower impacts and/or lower costs. Longer-Term improvements have moderate to high impacts or costs and therefore will likely need to be completed as part of a larger overall initiative or design and construction project.

Appendix G includes a matrix of the recommendations including comments about which goals are advanced, the level of physical impacts, implementation costs, and additional notes.

1. Nearer-Term Recommendations

   a. Demand Management

   - N1–Incentivize employer participation.
   - N2–Stagger start and stop times of major employers.
   - N3–Develop park and ride facilities at key locations and/or develop a program that creates disbursed park and ride functionality.

b. University Avenue and Segoe Road

- N4–Provide enhanced crosswalk markings across the west and east legs of the intersection.

c. University Avenue and Hilldale Way

- N5–Add a crosswalk on the west side of the intersection and add a center refuge area for pedestrians and bicycles.
- N6–Monitor operations and consider restricting access to left-in only for eastbound motor vehicles (eliminate the southbound left (SBL) movement).

d. University Avenue and Midvale Boulevard

- N7–Provide enhanced crosswalk markings across all four legs of the intersection.
- N8–Investigate the feasibility, benefits, and costs of constructing an eastbound transit queue jump in the eastbound right (EBR)-turn lane.

e. University Avenue and Highbury Road

- N9–Add a westbound left-turn bay.

f. University Avenue and Blackhawk Avenue

- N10–Consider access restrictions to left-in only for eastbound and westbound motor vehicles [eliminate the northbound left (NBL) and SBL movements].
- N11–Install a partial signal with a center pedestrian and bicycle refuge area, similar to the partial signal at Ridge Street/Marshall Court.

g. University Avenue and Shorewood Boulevard

- N12–Install Flashing Yellow Arrow (FYA) signal heads for the permitted NBL, SBL, EBL, and westbound left (WBL) movements.
- N13–Provide enhanced crosswalk markings across all four legs of the intersection.
- N14–Investigate opportunities for additional pedestrian signal lead conditions.

- N15–Evaluate addition “Stop Here on Red” signage at the eastbound stop bar if eastbound vehicles continue stopping in the crosswalk on the west side of the intersection after the recent installation of the enhanced markings.

- N16–Reconstruct the southbound approach to provide a median refuge separating the southbound right (SBR) from the southbound through (SBT) and SBL movements. Also, consider prohibiting the WBL movement and replace the small turn bay with a large pedestrian refuge area (see Figure 6.01-1). The Village has indicated some concerns with the impacts associated with the reconfiguration. It may be possible to provide one channelized southbound right-turn and one shared southbound through/left-turn lane since the southbound through motor vehicle traffic volume is low. Additional investigation is recommended during design.

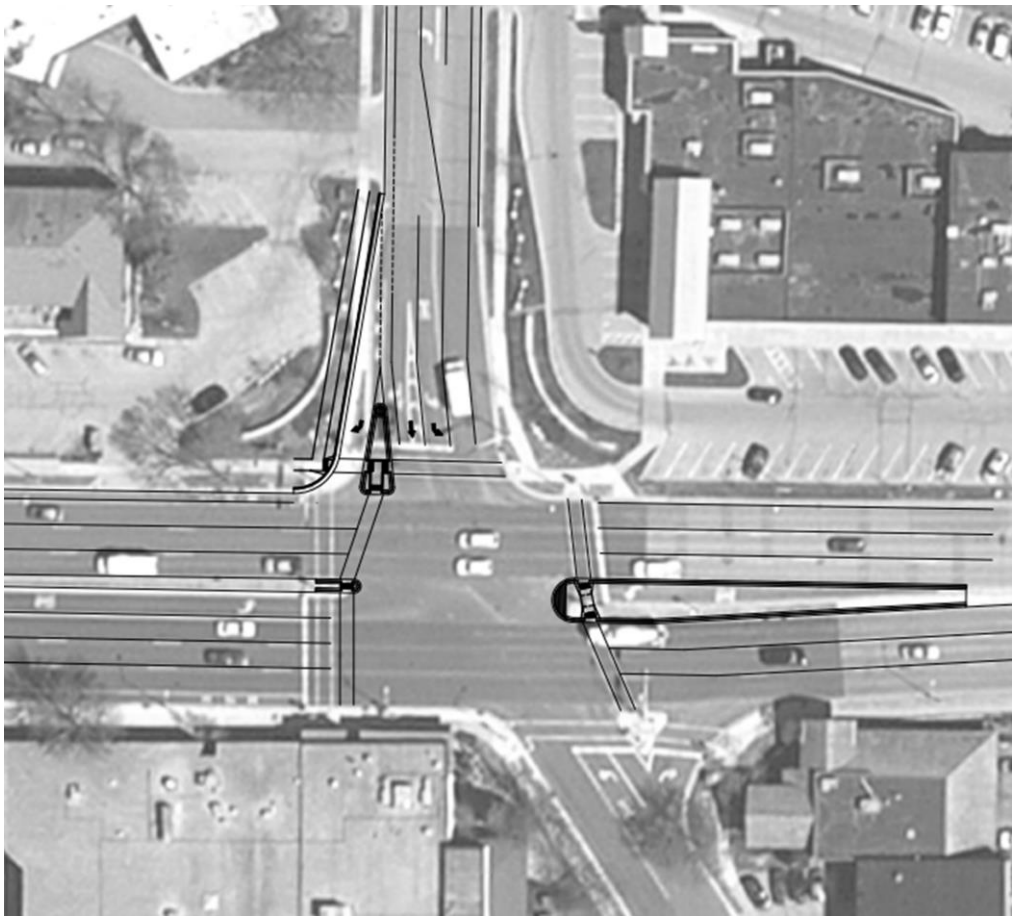


Figure 6.01-1 Possible Modifications at Shorewood Boulevard

h. University Avenue and University Bay Drive/Farley Avenue

- N17–Install FYA signal heads for the permitted NBL, SBL, EBL, and WBL movements.
- N18–Provide enhanced crosswalk markings across all four legs of the intersection.
- N19–Investigate opportunities for additional pedestrian signal lead conditions.

i. University Avenue and Highland Avenue

- No Nearer-Term modifications are recommended.

j. Highland Avenue and Westbound Campus Drive

- N20–Install bicycle signal heads at the path crossing north of the railroad tracks.

k. University Avenue and Walnut Street

- No Nearer-Term modifications are recommended.

l. Additional University Avenue Corridor Strategies

- N21–Investigate the feasibility, benefits, and costs of installing adaptive signal control and/or transit signal priority from Segoe Road to Highland Avenue.
- N22–Initiate a public outreach campaign to improve driver awareness of bicycles and pedestrians city wide.
- N23–Investigate the feasibility of removing U-turn restrictions at additional locations along the corridor to supplement left-out delays and/or access prohibitions.

m. Village of Shorewood Hills

- N24–Complete the missing portions of the east-west bike path between Shorweood Boulevard and University Bay Drive.
- N25–Prepare for participation in the upcoming reconstruction of University Avenue Corridor from east of Shorewood Boulevard through and including the University Bay Drive/Farley Avenue intersection and University Bay Drive north of University Avenue.

n. Greater Regent Neighborhood

- N26–Add on-street bike accommodations/markings to Franklin Avenue from Speedway Road to University Avenue and consider designating this portion of street as a Bicycle Boulevard.

o. University of Wisconsin–Madison

- N27–Continue aggressive Travel Demand Management (TDM) strategies, and combine them with City, Village, and regional TDM efforts.

- N28–Prepare for participation in the reconstruction of University Bay Drive north of University Avenue.

p. Additional Recommendations

- N29–City, Village, and UW staff should engage VA Hospital representatives and begin developing mutually beneficial transportation solutions, particularly in anticipation of the upcoming reconstruction of University Bay Drive and the intersection at University Avenue.

2. Longer-Term Recommendations

a. Travel Demand Management

- L1–Investigate regional strategies that incentivize choices that make better use of transportation infrastructure such as lane pricing, cordon line pricing, a sales tax to fund transportation infrastructure, and transportation impact fees.

- L2–Institute a formalized commuter ride sharing program.

b. University Avenue and Segoe Road

- L3–Coordinate long-term plans at this intersection with potential redevelopment of the Hill Farms state office building site.

c. University Avenue and Hilldale Way

- L4–Install a partial signal with a center pedestrian and bicycle refuge area, similar to the partial signal at Ridge Street/Marshall Court.

- L5–Install a pedestrian overpass when additional redevelopment occurs.

d. University Avenue and Midvale Boulevard

- L6–Reconstruct the intersection with minor additional motor vehicle capacity by adding turn bays for select movements (see Figure 6.01-2).

Figure 6.01-2 Possible Modifications at Midvale Boulevard

e. University Avenue and Blackhawk Avenue

- No Longer-Term modifications are recommended beyond the Nearer-Term recommendation to install a partial signal.

f. University Avenue and Shorewood Boulevard

- No Longer-Term modifications are recommended beyond the Nearer-Term recommendations for improvements to the bicycle and pedestrian crossings.

g. University Avenue and University Bay Drive/Farley Avenue

- L7–Full reconstruction of the intersection in eight to ten years including additional turn lanes, two northbound lanes on University Bay Drive departing the intersection, new sidewalk on the east side, and a generous center refuge at the multiuse path crossing north of the railroad tracks (see Figure 6.01-3). These improvements likely require additional right-of-way on both sides of the street.

- L8–Construct an east-west grade-separated bicycle and pedestrian crossing of University Bay Drive.

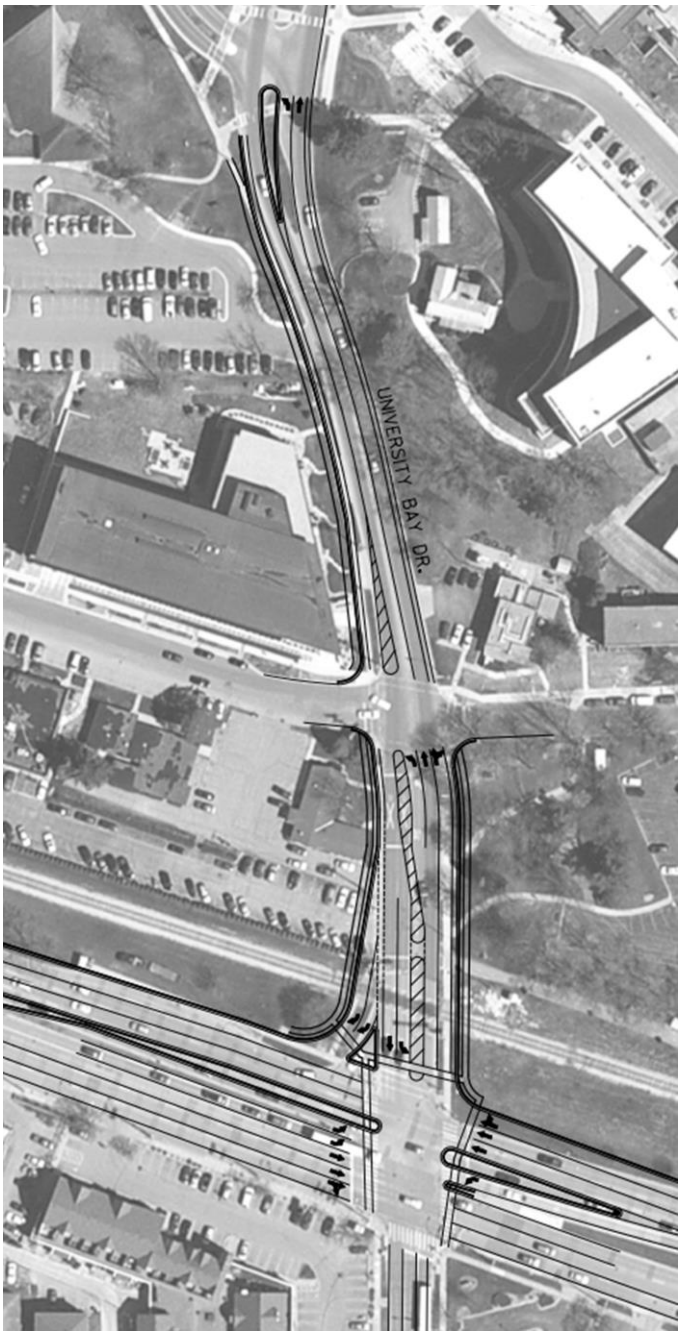


Figure 6.01-3 Possible Modifications at University Bay Drive/Farley Avenue

h. University Avenue and Highland Avenue

- L9–If the Walnut Street jug-handle is implemented (L12), conditions at this intersection may change and warrant future modifications to signal timings and lane designations.

i. Highland Avenue and Westbound Campus Drive

- L10–Construct an east-west grade-separated bicycle and pedestrian crossing of Highland Avenue in the Longer Term.

- L11–Provide additional pedestrian, bicycle, and motor vehicle space on Highland Avenue under the Campus Drive structures by replacing the slope paving with vertical retaining walls.

j. University Avenue and Walnut Street

- L12-Construct a jug-handle configuration for eastbound traffic by allowing right turns from Campus Drive to travel a new street to University Avenue and allowing right turns from this new street onto eastbound Campus Drive.

- L13-Modify the cross section of Walnut Street under Campus Drive from the existing (two 18-foot travel lanes and two 4-foot crosswalks off the back of curb) to provide better pedestrian accommodation (two 14-foot lanes and two 8-foot sidewalks off the back of curb).

k. Additional University Avenue Corridor Strategies

- L14–At the time of corridor reconstruction, reevaluate median or curb-lane running local bus or BRT lanes.

- L15–If not implemented in the Nearer Term, investigate the feasibility, benefits, and costs of installing adaptive signal control and/or transit signal priority from Segoe Road to Highland Avenue.

- L16–Consider additional measures to communicate a more urban/multimodal character for the corridor from Segoe Road to Farley Avenue as opportunities arise such as narrower motor vehicle lane widths; entry features eastbound at Segoe Road and westbound at University Bay Drive; additional median landscaping; specialized lighting and/or other treatments.

l. Village of Shorewood Hills

- No Longer-Term modifications are recommended beyond the Nearer-Term recommendations to complete the missing portions of the east-west bike path and prepare for the upcoming reconstruction of University Avenue and University Bay Drive.

m. Greater Regent Neighborhood

- L17–Construct a pedestrian and bicycle overpass of Campus Drive near Chamberlain Avenue.
- L18–Add additional on-street bike accommodations/markings to Kendall Avenue, Bluff Street, Blackhawk Avenue, and Regent Street from Franklin Avenue to Midvale Boulevard.
- L19–Add a crosswalk crossing Midvale Boulevard at the unsignalized Hilldale Mall entrance north of Heather Crest to the south side of the intersection.

6.02 SUMMARY PUBLIC MEETING

The final public meeting was held on February 24, 2014, at the UW Credit Union community room in Shorewood Hills.

A. Format and Public Meeting Materials

The public meeting included a 40-minute presentation, which reviewed the study scope, background, and current conditions; summarized the results of the online survey, Workshop No. 1 and Workshop No. 2; outlined the Guiding Theme and three Primary Goals that had been developed since the previous outreach activities; briefly summarized the draft study recommendations; and summarized the materials available for review and comment. The presentation was followed by questions and answers.

Appendix H includes the materials provided at the public information meeting.

B. Summary of Public Comments

The public comments received at the workshops were generally favorable. Some of the comments resulted in consideration of revisions to the recommendations. These are summarized in the list that follows.

1. Provide additional pedestrian lead signal phasing/timing at Shorewood Boulevard

One stakeholder provided a detailed field review of the existing signal phasing and timing at the Shorewood Boulevard intersection and proposed that some of the green time provided to the northbound and southbound motor vehicle traffic be reallocated as a pedestrian lead phase (where a walk signal is provided for pedestrians while all other signals serving motor vehicles remain red) serving both the east and west crosswalks. Currently, the signal provides a lead pedestrian phase for the east crosswalk only.

The information provided at the meeting included field-measured signal phase lengths and, for the most part, accurately represented current conditions. There were, however, some inaccuracies including the assumption that the length of the north and south phase is dictated

solely by whether or not a pedestrian button is pushed. In reality, loop detectors in the pavement also contribute to determining the total length of the signal phases based on the presence or absence of motor vehicles (i.e., the signal uses actuated-coordinated operation).

The study team reviewed the proposal and, at this time, has not included the addition of pedestrian lead timings for the west crosswalk. First, crash data does not indicate a significant history of vehicle-pedestrian crashes in the west crosswalk at the intersection (zero crashes in the last ten years). Second, adding the pedestrian lead phase for the west crosswalk could increase delays for northbound and southbound drivers potentially leading to riskier driver behavior. Finally, several study recommendations already seek to improve compliance and awareness at this intersection including enhanced markings, adding flashing yellow arrow signal heads, and modifications to the southbound intersection approach. The team feels the current recommendations strike an appropriate balance between all modes using the intersection.

2. Add a westbound left-turn bay at the intersection of Highbury Road.

Crash data indicates that several rear-end crashes have occurred at this location. It is not clear that they are completely attributable to the lack of a westbound left-turn lane. However, considering the long-term vision for the corridor of eliminating left turns to University Avenue from uncontrolled locations and instead encouraging right turns followed by downstream U-turns, adding a westbound left-turn bay at Highbury Road would be consistent. The study team added this as recommendation N-9

3. Reconsider relocating the Midvale Boulevard crosswalk at Hilldale Mall from the north side to the south side since the northbound left-turn volume is likely higher than the southbound u-turn volume.

The recommendation to relocate this crosswalk is in response to concerns about u-turning vehicles failing to yield to pedestrians in the crosswalk. While the southbound motor vehicle u-turn volume is less than the northbound motor vehicle left-turn volume entering the Mall, northbound drivers are more likely to see pedestrians in a crosswalk while southbound u-turning vehicles may be more apt to fail to see a pedestrian. The recommendation has been modified to maintain the north crosswalk while adding a south crosswalk. Because doing so will require installation of curb ramps and relocation of storm sewer inlets, it has been changed from a near-term to a long-term recommendation (L-19).

4. Make sure that any changes to University Bay Drive or Walnut Street do not make things worse for pedestrians.

Based on this comment and the potential for adding eastbound motor vehicle access to/from Campus Drive that would be served by Walnut Street, the study team reevaluated current conditions at the Walnut Street underpass of Campus Drive. Currently, Walnut Street appears to be 36 feet wide from face of curb to face of curb, while the sidewalk is at the back of curb and is only 4 feet wide on each side. We added recommendation L-13 to modify the cross section and provide wider sidewalks on both sides by reducing the lane widths.

6.03 OVERVIEW OF FUNDING OPPORTUNITIES

The study team reviewed funding opportunities as part of this project. Appendix I includes more detailed information. Significant investments in transportation infrastructure serving the Study Area will require federal and/or state funding assistance.

A. Joint Funding

Investing in an enhanced transit system serving the Study corridor will require a creative and collaborative funding structure. Often this occurs through creation of a Regional Transit Authority (RTA) with the power to levy fees and/or impose taxes granted by the state legislature. Legislation was enacted for RTAs in Wisconsin about five years ago but was repealed in 2012. In early 2014, a bipartisan bill was introduced in the State Senate calling for creation of an RTA in the Fox Valley. The RTA issue continues to be a politically charged one within the state.

As an alternative to an RTA, state legislation allows for the creation of an Intergovernmental Commission (IC) through the drafting of an Intergovernmental Agreement (IA). The structure of the IC is agreed to in the IA, and such an entity could be created by the City of Madison, Village of Shorewood Hills, and UW. The IC would have no broader powers than the individual powers of the participating entities and does not isolate them from liabilities. An IC can distance the individual parties from politically charged issues.

There are two ways that funds could be raised by an IC. First, fees can be imposed by Madison and Shorewood Hills pursuant to their “police powers.” The fees cannot be in excess of actual costs. UW also has fee powers through tuition and as an employer. Second, Madison and Shorewood Hills can tax real estate.

Another option being used increasingly around the country is the creation of a Public Private Partnership (P3). The specific requirements of the participating entities varies from project to project. Generally speaking, a private entity or partnership funds a significant portion of the planning, design, and construction costs of the public infrastructure, in exchange for revenue and/or tax benefits accrued as a result of the project. Recent examples include the Denver Union Station Transit/Multimodal Development and the Hiawatha Light Rail Transit in Minneapolis/St. Paul, Minnesota.

B. Federal, State, and Local Grants, Loans, and Programs

There are dozens of programs available to assist entities with funding transportation infrastructure. Those that are the more likely candidates to be used for the modifications recommended in this study are summarized in Table 6.03-1.

Entity	Program	Eligibility	Notes
United States Department of Transportation	Surface Transportation Program (STP)	Primary source of flexible funding for transit and roadway improvements.	▪ WisDOT distributes these federal funds via their Local Program. ▪ Major Collector or higher classification.
	Urbanized Area Formula Grant Program	Transit grants for areas with populations greater than 50,000.	▪ WisDOT distributes these federal funds. ▪ Metro Transit already participates.
	Bus and Bus Facilities Program	Grants for buses and bus-related facilities.	▪ WisDOT distributes these federal funds. ▪ Criteria include consistency with plans, age and deferred maintenance, and commitment of local share.
	New Starts/ Small Starts Program	Primary source of funding for locally planned, implemented, and operated major transit investments.	▪ Selection is by the Federal Transit Authority (FTA). ▪ Criteria include mobility improvements, environmental benefits, cost-effectiveness, operating efficiencies, and transit supportive land use and future patterns.
	Alternatives Analysis Program	Used to assist local governments in conducting alternatives analyses.	▪ Eligible projects must include at least one alternative that is a new fixed guide-way transit system.
	Transportation Alternatives Program	New designation for pedestrian, bicycle, safe routes to school, and transportation enhancements projects.	▪ WisDOT distributes these federal funds. ▪ Criteria include commitment of 20 percent local share, detailed cost estimate, proactive consideration of issues that often impact schedule including historic resources, contaminated soils, and impacts to railroad right-of-way.
Wisconsin Department of Transportation	Transportation Economic Assistance (TEA)	Attract and retain Wisconsin employers.	▪ Requires 50 percent match (can be any combination of private, local, federal, or in-kind services).

Table 6.03-1 Candidate Funding Sources for Study Recommendations

6.04 CONCLUSIONS AND POSSIBLE NEXT STEPS

The Study Area including the Village of Shorewood Hills, the Greater Regent Neighborhood, and the west campus of the UW is a desirable place to live and work. It is anticipated that development and redevelopment in the Study Area will continue to increase the demand for transportation for the foreseeable future as residences, jobs, and services continue to be added. This growth is part of local plans and is a healthy prospect for the City, Village, and University. Some of the natural amenities that contribute to livability in the area such as Lakes Mendota and Wingra, the UW Arboretum, and the parks and golf courses on the near west side also create transportation challenges.

Mobility along University Avenue is important to the success of area businesses and UW. Significant motor vehicle capacity expansion (constructing an eight-lane corridor or extending Campus Drive to the west by adding grade separations and interchanges) would have significant impacts and costs both physically and in terms of livability. Therefore, the study team settled on an overall goal for the corridor that focuses on improving conditions for pedestrian, bicycle, and transit travel while minimizing negative impacts on motor vehicle travel.

The study team believes the recommendations are achievable and when taken together will communicate and enhance the multimodal nature of the corridor. The primary next steps in implementing the recommendations include the following:

1. Continue to advocate for a RTA with state lawmakers to advance enhanced (preferably exclusive right of way) transit serving the Study Corridor.

2. Consider investigating the creation of an Intergovernmental Commission if RTA legislation is unlikely in the Nearer Term.

3. Implement a means to incentivize participation in regional Travel Demand Management solutions.

4. Considering the importance of efficient travel in the Study Area, make improvements to east-west and north-south bicycle connections a high priority when selecting which future projects areawide should be implemented.

5. Continue to require improvements that balance bicycle, pedestrian, transit, and motor vehicle needs as part of the development/redevelopment review and approval process.

6. Implement the access modifications proposed in this report (partial signals) and do not allow new full-access signals along the Study Corridor.