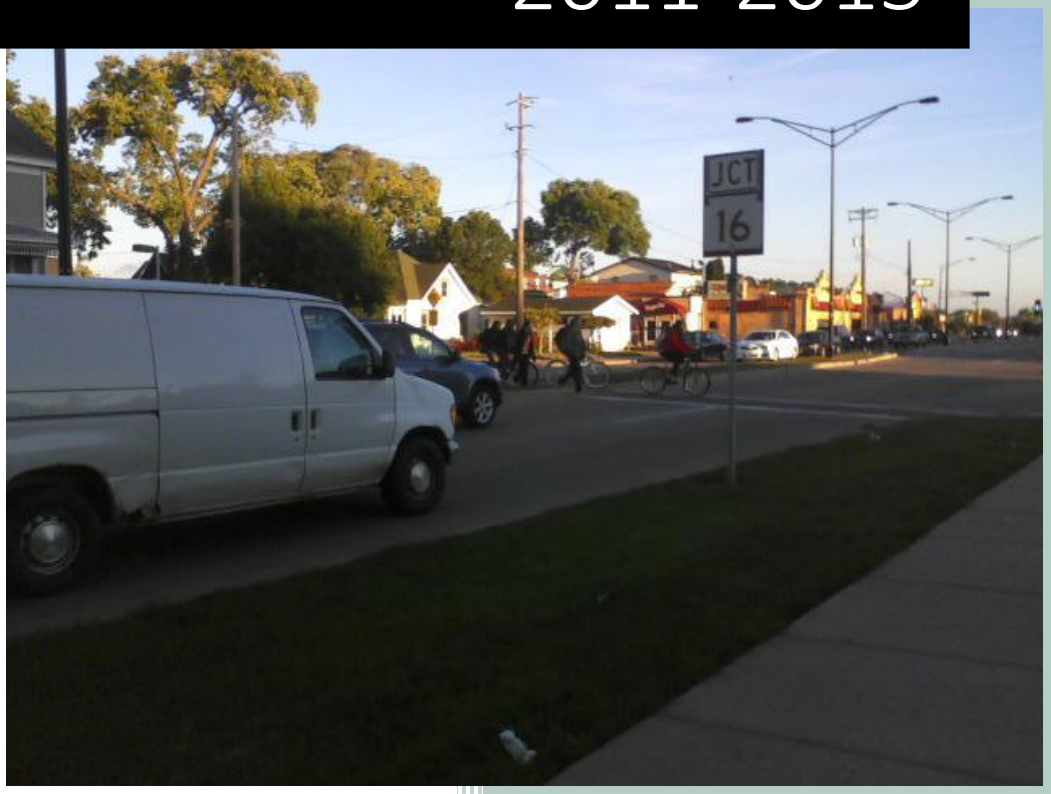
Bicycle and Pedestrian Safety Study 2011-2015



May 19, 2017

La Crosse Area Planning Committee

Bicycle and Pedestrian Safety Study 2011-2015

Conducted by staff of the La Crosse Area Planning Committee

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Introduction

Purpose

The La Crosse Area Planning Committee (LAPC) is the bi-state Metropolitan Planning Organization (MPO) for the La Crosse, WI and La Crescent, MN urbanized area. The LAPC is charged with conducting long- and short-range transportation planning activities for a metropolitan planning area (MPA) that encompasses 12 communities in La Crosse County in Wisconsin, two communities in Houston County in Minnesota, and two communities in Winona County in Minnesota (the City of La Crescent resides in both Houston and Winona Counties), and includes a small section of one community in Vernon County in Wisconsin (see Figure 1):

- City of La Crescent, Houston County and Winona County, MN
- City of La Crosse, La Crosse County, WI
- City of Onalaska, La Crosse County, WI
- Village of Holmen, La Crosse County, WI
- Village of West Salem, La Crosse County, WI
- Town of Barre, La Crosse County, WI
- Town of Bergen, Vernon County, WI (part)
- Town of Campbell, La Crosse County, WI
- Town of Dresbach, Winona County, MN
- Town of Greenfield, La Crosse County, WI
- Town of Hamilton, La Crosse County, WI
- Town of Holland, La Crosse County, WI
- Town of La Crescent, Houston County, MN
- Town of Medary, La Crosse County, WI
- Town of Onalaska, La Crosse County, WI
- Town of Shelby, La Crosse County, WI

Federal law requires that MPOs consider and implement projects, strategies, and services that address 10 planning factors—one of which is to "increase the safety of the transportation system for motorized and non-motorized users." Also, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) encourage MPOs to identify transportation connectivity gaps in accessing essential services such as employment, health care, and schools. The primary goal of this Safety Study is to increase the safety of the transportation system for non-motorized users in the planning area while simultaneously supporting regional goals to increase the number of people biking and walking. This Study will identify high-bicycle-and-pedestrian-crash corridors, intersections, and crossings ("problem areas") and recommend solutions to improve the access, safety, and mobility of non-motorized users in those areas.

A secondary goal for the Study is to aid the City of La Crosse and other communities in the planning area in their applications for traffic safety grants. The Bureau of Transportation Safety (BOTS) within the Wisconsin Department of Transportation (WisDOT) and the Office of Traffic Safety (OTS) within the Minnesota Department of Public Safety award federally-funded grants to organizations that provide services that minimize the number of traffic fatalities and injuries each year. In Wisconsin, the goal is Zero in Wisconsin, Zero Deaths on Wisconsin Roads; in Minnesota, the goal is Toward Zero Deaths.

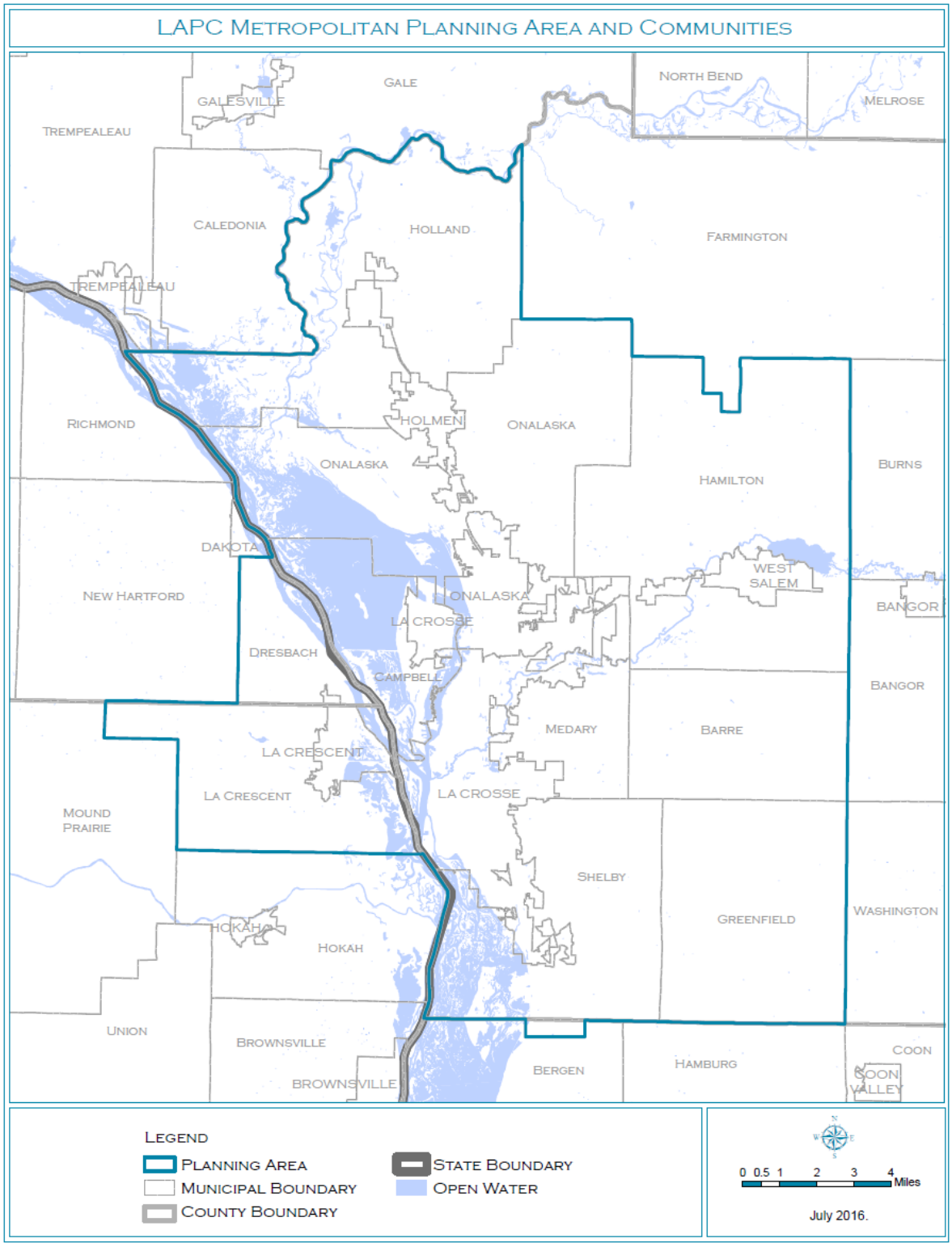

Figure 1: Study Area: The LAPC Metropolitan Planning Area.

Previous Research

The most recent and most notable research found was completed in 2015 by associates of the University of Wisconsin-Milwaukee for the Wisconsin Department of Transportation, Bureau of Transportation Safety.

The *Wisconsin Statewide Pedestrian and Bicycle Crash Analysis: 2011-2013* summarized state-wide crash trends and crash characteristics by type (bicycle or pedestrian) and by severity level, applied a Location-Movement Classification Method (LMCM) to better analyze fatal crashes, and summarized the characteristics of the top 20 fatal and incapacitating injury "hot spots" in the state.

The report concluded that the highest concentrations ("hot spots") of fatal- and incapacitating-injury bicycle and pedestrian crashes occurred along signalized, multilane, arterial roadway corridors in urban and suburban areas with moderate to high levels of pedestrian or bicycle activity.

Bicycle and Pedestrian Laws

State Laws

Wisconsin and Minnesota statutes are similar in most respects regarding the laws pertaining to pedestrians and bicyclists. They both require:

- Vehicles to yield to pedestrians and bicyclists in a marked or unmarked crosswalk at controlled and uncontrolled intersections. At signalized intersections, the pedestrian/bicyclist has the right-of-way when the signal has indicated a "Walk" or is green in the absence of a pedestrian signal.
- Pedestrians to yield to vehicles when crossing at locations other than a crosswalk.
- Bicyclists operating on the sidewalk to yield to pedestrians.
- Bicyclists operating in the roadway to travel on the right side of the road with traffic.
- Pedestrians traveling in the roadway to travel on the left side of the road facing traffic.

Neither state has a requirement that bicyclists operating on a sidewalk must travel on the right with traffic.

The States laws differ slightly with regards to bicyclists riding on sidewalks and pedestrians crossing between intersections. In Wisconsin, a bicycle is defined as a "vehicle" and is prohibited on all sidewalks unless the local authority grants bicyclists the right to do so; in Minnesota, a bicycle is defined as a "device" and is only prohibited on sidewalks in business districts unless otherwise allowed by the local authority. In Wisconsin, pedestrians are allowed to cross at locations between intersections, but they must yield to traffic; in Minnesota, pedestrians are not allowed to cross between adjacent signalized intersections except at a marked crosswalk.

Local Laws

The state bicycle and pedestrian laws are adopted by the local authorities within the planning area, with the following amendments to bicycle travel:

- The City of La Crosse allows bicycles on sidewalks except on those that are within the "downtown," which is defined as the area bound by Cass St, 7th St, La Crosse St, and the Mississippi River.
- The City of La Crescent and the Village of West Salem prohibit bicycles on the sidewalks in their business districts, but their boundaries are not defined.
- The City of La Crescent prohibits bicycles on the roadway when a useable path for bicycles has been provided adjacent to the roadway.

- The City of Onalaska allows bicycles on all of its sidewalks.

The Village of Holmen and the Town of Shelby, which has urbanized sections abutting and enclaved within the City of La Crosse, have adopted the state laws without granting by ordinance the right for bicyclists to operate on sidewalks.

There are no state or local laws that require a bicyclist to walk a bike in a crosswalk.

Please note that in this study users of sidewalks and crosswalks, including bicyclists, are called pedestrians.

Existing Travel Trends

Although we have no source of data to estimate exposure to crash risk, predict crash risk, or calculate intersection crash rates for bicyclists or pedestrians, we generally anticipate that as travel trips and distances by biking and walking increase, the risk of a bicyclist or a pedestrian being involved in a crash also increases. The risk becomes even greater if motor vehicle travel increases as well. Three areas of travel trends we look at to get a general picture of travel behavior and potential conflict and crash risk in the region include means of transportation to work, vehicle miles of travel, and traffic volumes. Because the most recent year for travel trend data is 2014, the five-year time series discussed is 2010-2014.

Means of Transportation to Work

Figure 2 illustrates the mode share in the planning area for means of transportation to work from 2010 to 2014 for workers 16 and older that worked outside of the home. The percent of persons 16 and older that worked outside of the home and drove or carpooled to work by car, truck, or van dropped 0.6 percentage points as those that biked or walked increased by the same. "Other," whose mode share along with transit has remained constant over time, includes motorcycles, taxis, ferries, etc.

While the difference in the number of workers in the planning area from 2010 to 2014 age 16 and older who did not work at home is statistically significant (increased by 1,443 or 2.5%), none of the differences in the estimates of the mode shares were significant because they had large margins of error. Like the planning area as a whole, none of the individual communities, including the City of La Crosse, experienced any significant changes in their mode shares between 2010 and 2014.

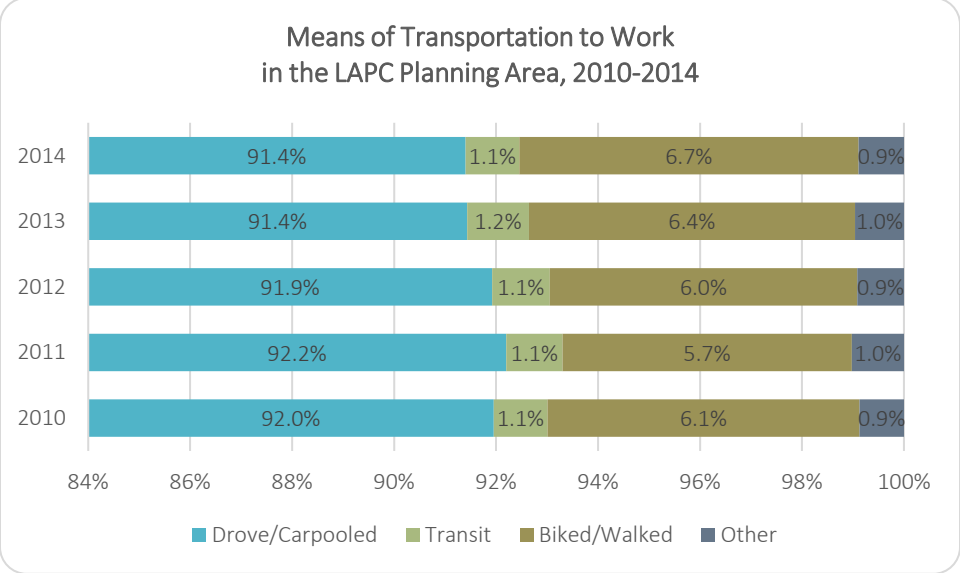

Figure 2: Means of transportation to work in the LAPC planning area, 2010-2014.
Source: B08301 Means of Transportation to Work, American Community Survey.

Figure 3 shows for the planning area and for each community within the planning area the percent of workers 16 and older who did not work at home that biked or walked to work in 2014. Because of the closeness of workers to their jobs, the City of La Crosse tops the list with 12.4% (3,282) of the La Crosse workers walking or biking to work. This equates to 83.6% of the workers in the planning area who walked or biked to work. Shelby, with its proximity to La Crosse came in a distance second with 6.2% (142) of the Shelby workers and 3.6% of the MPA workers walking or biking to work. The City of Onalaska ranked low at 1.3% (114) despite having the second highest population and concentration of workers in the planning area.

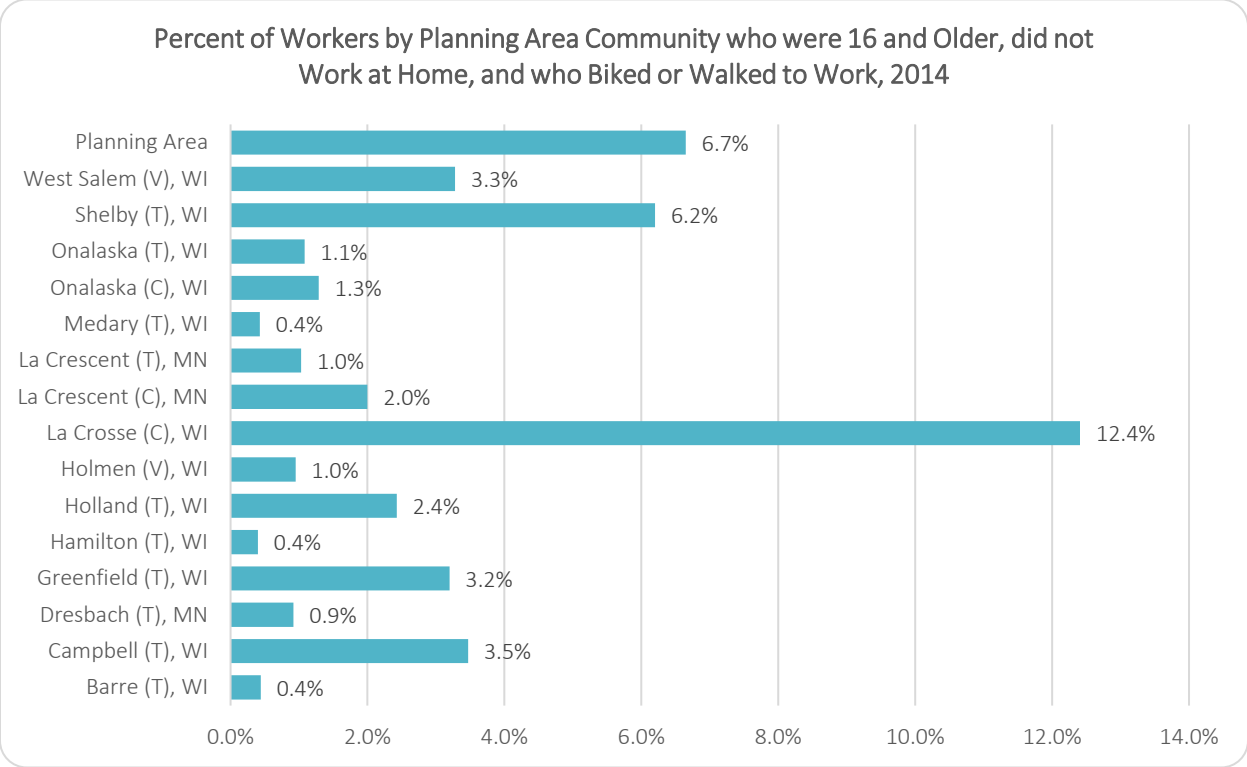

Figure 3: Percent of workers 16 and older that did not work at home and who biked or walked to work, 2014.
Source: B08301 Means of Transportation to Work, 2010-2014 5-yr estimates, American Community Survey.

Vehicle Miles of Travel

Vehicle miles of travel (VMT) is a measure of all miles driven within a specified area (i.e. county) and timeframe. VMT is based on average annual daily traffic (AADT) estimates, but it includes a distance traveled component (the length for each roadway segment where a traffic count is taken). The Wisconsin Department of Transportation (WisDOT), for example, uses data from automatic traffic recorders (ATR), the Highway Pavement Management System (HPMS), and the Wisconsin Department of Revenue (fuel consumption) to estimate VMT annually by county, state, or highway system.

Figure 4 illustrates VMT (in millions) in La Crosse County[1] for 2010-2014. For most of the time period, VMT was on a steady decline, dropping 6.0% from 2010 to 2013. VMT rose again from 2013 to 2014 by 1.2%, most likely due to falling gas prices. The linear trend line shows the general decrease in VMT over time.

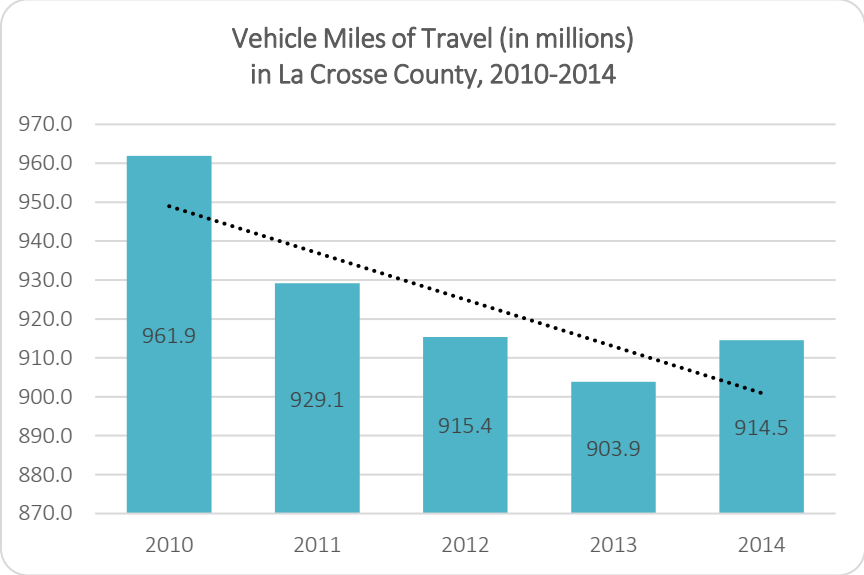

Figure 4: Vehicle miles of travel (in millions) in La Crosse County, 2010-2014.
Source: Wisconsin Department of Transportation.

Traffic Volumes

The Wisconsin Department of Transportation maintains continuous traffic counters at 12 permanent locations along the State Trunk Highway system in La Crosse County. The nine locations on roads where bicyclists and pedestrians are allowed to travel are illustrated in Table 1 along with their annual average daily traffic (AADT) for 2010-2014. As the table shows, traffic counts from 2010 to 2014 have gone down in some locations, up in others, and relatively unchanged in yet others. The greatest increases from 2010 to 2014 occurred along the STH 35 corridor of Lang Dr and West Ave. Traffic volumes changed little from 2013 to 2014, with 5 of the 7 locations with 2013 data experiencing a change of less than 1,000 vehicles. The two locations with the greatest change in real numbers and percent are West Ave north of Mississippi St with a decrease of 7.2% or 1,557 vehicles and Copeland Ave between Grove St and the La Crosse River with an increase of 4.4% or 1,285 vehicles.

[1] The Wisconsin and Minnesota Departments of Transportation only estimate vehicle miles traveled for counties, not municipalities, so we are unable to determine vehicle miles traveled for the planning area. Because the majority of the planning area is in La Crosse County and the City of La Crosse is the major origin and destination for travel trips, we use La Crosse County to demonstrate vehicle miles traveled over time.

TABLE 1: ANNUAL AVERAGE DAILY TRAFFIC AT SELECT[1] CONTINUOUS COUNT LOCATIONS IN LA CROSSE COUNTY

Location	2010	2011	2012	2013	2014	% change 2010-2014	% change 2013-2014
South Ave between Tyler St & Farnam St	19,737	18,106	18,959	No data	19,004	-3.7	-----
USH 14/61 & STH 35 south of Marion Rd	21,450	21,081	21,003	21,045	21,691	1.1	3.1
USH 14 & STH 16 at Stateline Bridge	16,499	16,431	16,411	15,961	16,527	0.2	3.5
STH 16 north of Bluff Pass	35,041	34,651	34,471	34,447	34,385	-1.9	-0.2
Lang Dr north of La Crosse St	19,780	14,774	20,274	No data	20,961	6.0	-----
Rose St south of Livingston St	24,142	23,674	23,774	23,452	23,866	-1.1	1.8
West Ave north of Mississippi St	19,290	19,481	28,322	21,627	20,070	4.0	-7.2
Copeland Ave between Grove St & the La Crosse River	31,242	31,011	30,163	29,119	30,404	-2.7	4.4
STH 35 north of Troy St	13,295	13,596	12,073	13,683	13,662	2.8	-0.2

[1]Locations on roadways where bicyclists and pedestrians are prohibited (i.e. USH 53 and I-90) are excluded from the table.
Source: Wisconsin Department of Transportation.
NOTE: Minnesota does not have any automatic traffic recorders (ATRs) installed along roads within our planning area.

Crash Analysis

Methodology

Crash Data

Bicycle and pedestrian crash records and their supporting reports were obtained for the LAPC metropolitan planning area for the most recent five years that data were available (2011-2015). The source of the data for the Wisconsin portion of the planning area was the online data extraction tool, WisTransPortal, from the Wisconsin Traffic Operations and Safety Laboratory at the University of Wisconsin – Madison. The WisTransPortal system contains a complete database of Wisconsin MV4000 Traffic Accident Extract data, which contains all police-reported crashes in Wisconsin. These data can be queried on variables that flag a crash as a bicycle or a pedestrian crash. Although the data for 2015 are considered "preliminary," meaning the data are subject to ongoing review and editing, they are only being edited for reference point coding and are current otherwise.

The source of the data for the Minnesota portion of the planning area was an Excel file from the Minnesota Department of Transportation. The Minnesota crash data provide numerical codes for each type of roadway user that can be used to query bicycle and pedestrian crashes. (Pedestrians include walkers, runners, skateboarders, roller bladers/skaters, persons using electric mobility devices, etc.)

All parking lot crashes were included in the queries. Crashes that were wholly within parking lots or on private property were removed from analysis. Crashes that occurred on sidewalks at driveways to parking lots (location identified as "parking lot") were retained because they occurred within the roadway right-of-way and were the result of a conflict as a driver attempted to enter/exit traffic. Crashes where a pedestrian was struck by flying debris (2), but was not involved in or a contributing factor of the crash itself, were removed from further analysis. Two records were miscoded as "pedestrian" and corrected. (The narratives clearly referred to bicyclists.)

The crashes retained for further analysis (381) were plotted in a geographic information system (GIS) and corrected for location so that the location of the crash point matched the location discussed in the crash report narrative. This allowed for a more accurate analysis of intersections, corridors, and behavior.

Limitations

A significant limitation to the data is that not all crashes are represented. The reporting criteria themselves exclude many crashes from being reported. A reportable crash is defined as a crash resulting in injury or death of any person; any damage to government-owned, non-vehicle property to an apparent extent of $200 or more; or total damage to property owned by any one person to an apparent extent of $1,000 or more. In order for a crash to be in the database, a crash report must have been completed by a police officer. Because of the reporting criteria, we have no reports of bicyclist-bicyclist or bicyclist-pedestrian crashes.

Other limitations include human error in reporting and data entry, subjective interpretation of crash factors, differences in reporting requirements for Wisconsin and Minnesota, and the absence of fields for common crash characteristics (i.e. cell phone use) that could help assess the safety of roadways. The crash narrative is the best source for clarifying information.

Overview of Crashes in the LAPC Planning Area

Motor Vehicle Crashes

Figure 5 shows the proportion of all motor vehicle crashes that are bicycle and pedestrian crashes (involves a motor vehicle AND a bicyclist or pedestrian) and motor-vehicle-only crashes (involves only one or more motor vehicles). The year with the highest number of bicycle and pedestrian crashes (2012) also had the lowest number of total motor vehicle crashes, thus resulting in a relatively high percentage (3.8%) of all motor vehicle crashes being bicycle or pedestrian crashes.

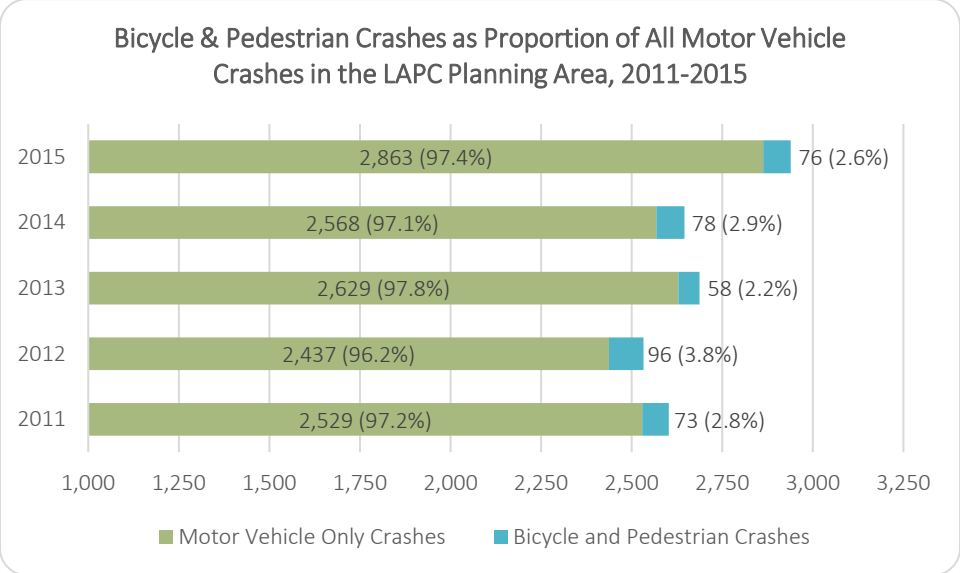

Figure 5: Bicycle and pedestrian crashes as a percent of all motor vehicle crashes in the planning area, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Bicycle and Pedestrian Crashes

Figure 6 illustrates the total number of bicycle and pedestrian crashes occurring in the planning area from 2011-2015. The highest and rather anomalous number of crashes occurred in 2012 with 96—a 31.5% increase from 2011 and 26.0% higher than the 5-year average of 76.2. The following year (2013) experienced the lowest number of crashes (58), with it being 23.9% less than the 5-year average. Because the trend in the number of crashes does not really show a pattern, the trend line in the figure represents a two-year moving-average. The trend line shows the drop in the number of crashes between the highest and lowest years and a subsequent bump back up because of the large increase between 2013 and 2014. If 2016 experiences fewer bicycle and pedestrian crashes than 2015, the trend should flatten out or drop.

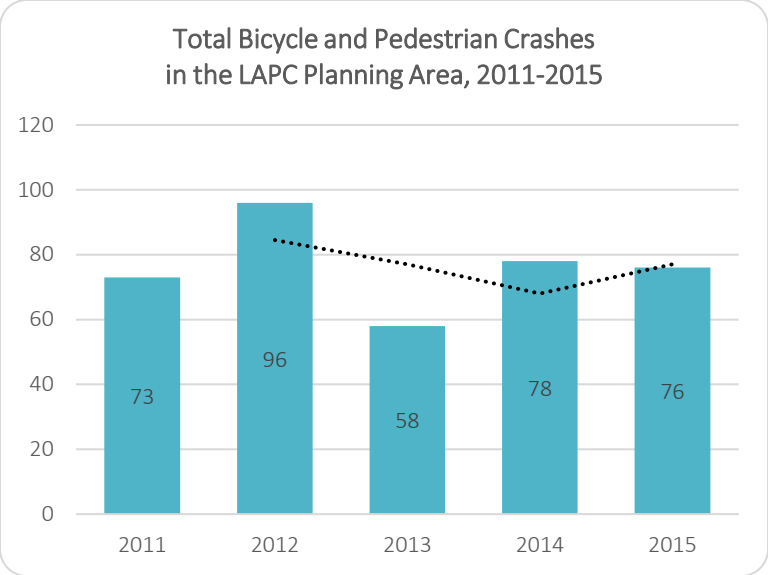

Figure 6: Total bicycle and pedestrian crashes in the LAPC planning area, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Figure 7 illustrates the bicycle/pedestrian crash rates (total 2011-2015 crashes per 1,000 residents as reported by the most recent population estimates from the 2014 American Community Survey) for planning area communities and for the planning area. (The six planning area communities Barre, Dresbach, Greenfield, Hamilton, Medary, and La Crescent township had no reportable bicycle or pedestrian crashes for 2011-2015 and so have been omitted from the chart.)

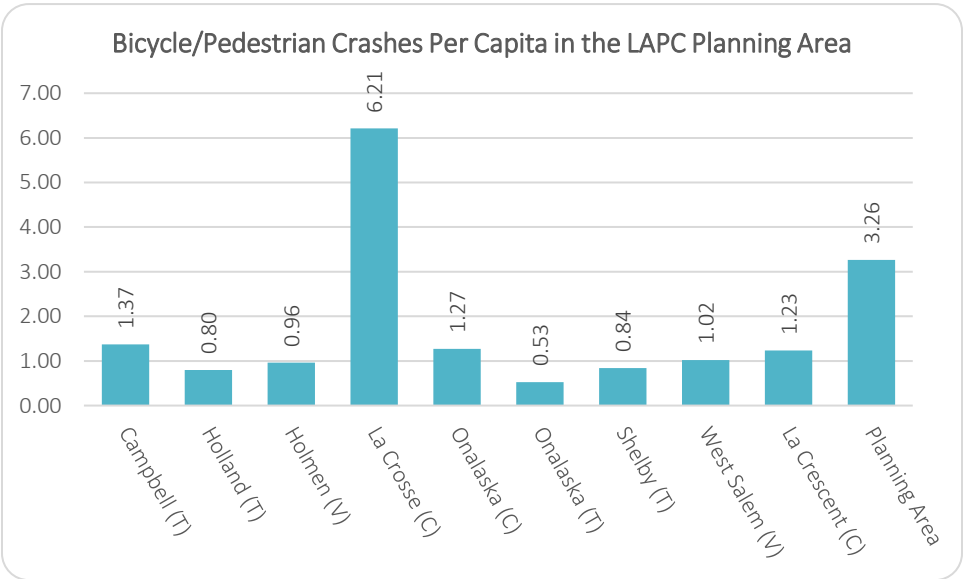

Figure 7: Bicycle/pedestrian crashes per capita in the LAPC planning area.
*Crashes per capita are calculated as the number of crashes for 2011-2015 per 1,000 population (2014).
Planning area communities with no reportable bicycle or pedestrian crashes for 2011-2015 are omitted from the chart.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Figure 8 breaks out the bicycle crashes from the pedestrian crashes by year. Of the 381 bicycle and pedestrian crashes under analysis in the planning area, 209 (54.9%) are bicycle crashes and 172 (45.1%) are pedestrian crashes. The year 2012 experienced the lowest number of pedestrian crashes (28) and the highest number of bicycle crashes (68), with nearly three-quarters of the crashes being bicycle crashes.

The extraordinarily high number of bicycle crashes in 2012 is 65.9% higher than the next highest year (2014) and 134.5% higher than 2013. The number of bicycle crashes, however, is trending downward with 2015 experiencing a decrease of 17.9% from 2011, a decrease of 22.0% from 2014, and a decrease of 23.4% from the 5-year average of 41.8.

In contrast, the number of pedestrian crashes has increased over time, with 2015 experiencing an increase of 29.4% from 2011, an increase of 18.9% from 2014, and an increase of 27.9% from the 5-year average of 34.4.

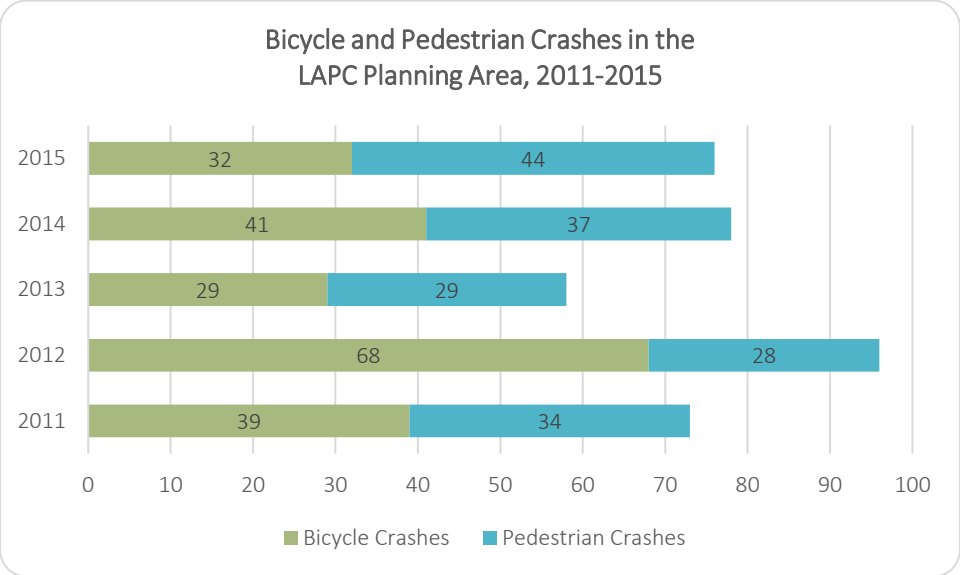

Figure 8: Bicycle and pedestrian crashes in the LAPC planning area, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Crash Statistics

Crash Environment

Location

Of the 381 bicycle and pedestrian crashes analyzed, 255 or 66.9% are intersection-related, 112 or 29.4% occurred on the roadway at non-intersection locations, 14 or 3.7% occurred on a sidewalk within roadway right-of-way as a vehicle was entering or exiting a parking lot or other private property. Five of the crashes (1.3%) were associated with an alley (two were coded as intersection crashes and three were coded as non-intersection crashes). The majority of intersection-related crashes involved bicyclists (149 or 58.4%), while the majority of non-intersection crashes involved pedestrians (61 or 54.5%).

The 235 intersection crashes included 134 bicycle crashes (57.0%) and 101 pedestrian crashes (43.0%). The 134 bicycle crashes involved 28 bicyclists (20.9%) operating in the street—3 of which were illegally riding against traffic. The vast majority of the bicycle crashes at intersections occurred as the bicyclist left the

sidewalk and entered the crosswalk (98 or 73.1%). Of the 98 crosswalk-intersection crashes, 50 (51.0%) occurred as the motor vehicle was making a right turn and 38 of the 50 (76.0%) occurred when the bicyclist was approaching from behind or from the right as the motorist was looking left.

Figure 9 shows the locations of the 381 bicycle and pedestrian crashes in the planning area under analysis in this study. The map illustrates the concentration of bicycle and pedestrian crashes along major roads (collectors and arterials) and in the City of La Crosse, especially in downtown La Crosse (inset). A discussion of corridors and intersections of concern is discussed in more detail later under "Problem Areas."

Roadway Characteristics

The majority of bicycle and pedestrian crashes occurred where the road was not physically divided:

- Not physically divided: 283 or 74.3% (157 or 55.5% bicycle and 126 or 44.5% pedestrian).
- Divided highway without traffic barrier: 36 or 9.4% (18 or 50.0% bicycle and 18 or 50.0% pedestrian).
- Divided highway with traffic barrier: 24 or 6.3% (16 or 66.7% bicycle and 8 or 33.3% pedestrian).
- One-way traffic: 24 or 6.3% (9 or 37.5% bicycle and 15 or 62.5%).
- Parking lot/private property (only those that occurred within roadway right-of-way): 14 or 3.7% (9 or 64.3% bicycle and 5 or 35.7% pedestrian).

Twenty (5.2%) of the crashes occurred where there was a curve in the road (8) or on a hill (15). Three of those crashes met both conditions, with two of the crashes occurring on Bliss Rd (one bicycle and one pedestrian).

Roadway Conditions

Most crashes occurred on dry roads (320 or 84.0%), with 193 or 60.3% of those being bicycle crashes and 127 or 39.7% being pedestrian crashes. Only 59 or 15.5% (43 or 72.9% of which were pedestrian crashes) occurred on icy, snowy, or wet roads. Two of the crashes had the roadway condition reported as "unknown." One crash that involved a bicyclist occurred in a construction zone on a foggy morning in September.

Weather Condition

Thirty-nine or 10.2% of the bicycle and pedestrian crashes (11 bicycle and 28 pedestrian) occurred during inclement weather (foggy, rainy, or snowy).

Light Condition

Nineteen or 5.0% of the 381 bicycle and pedestrian crashes (5 bicycle and 14 pedestrian) occurred when it was dark; 62 (16.3%) occurred when it was dark, but lighted by street lights. Nearly 70% of the crashes that occurred at night where the roadway was lighted involved pedestrians. The majority of the crashes occurred during the day (289 or 75.9%) when most travelers are out and about and 11 (2.9%) occurred at dawn or dusk.

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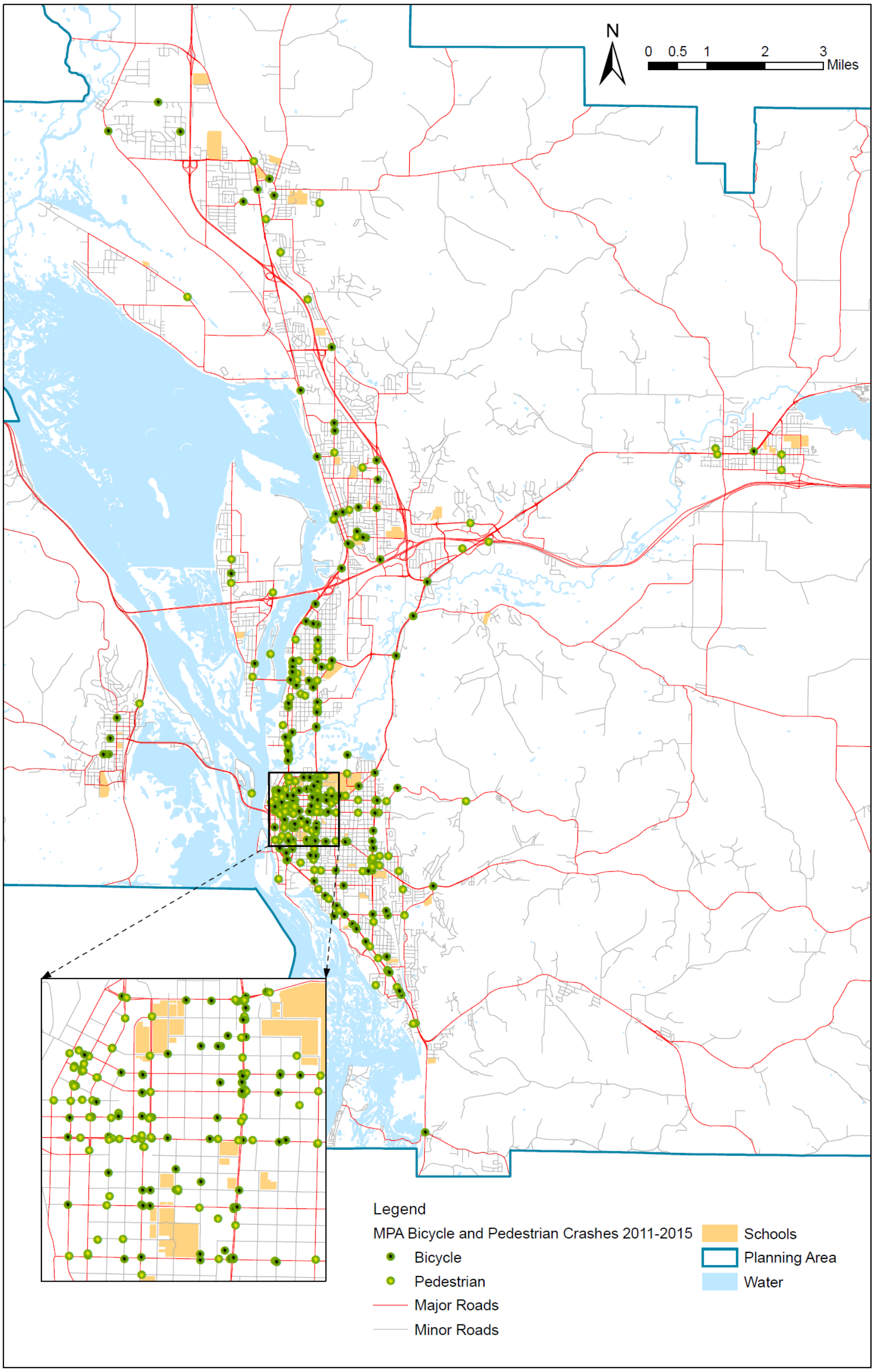

Figure 9: Bicycle and pedestrian crashes in the LAPC planning area, 2011-2015.

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Time Attributes

Month of Year

September experienced the highest number of bicycle and pedestrian crashes from 2011-2015 with 54 (30 bicycle and 24 pedestrian) followed closely by October with 51 (32 bicycle and 19 pedestrian). The two months together experienced 27.6% of all bicycle and pedestrian crashes during this time period. One would expect that with September, October, and November being the first three months of a new school year and the City of La Crosse being home to three institutions of higher learning that the number of bicyclists and pedestrians involved in crashes in La Crosse is likely to be higher during those semester months than during the summer months of June, July, and August, but this does not prove to be the case. The number and percent of bicycle and pedestrian crashes occurring in the City of La Crosse in September, October, and November (108 or 85.7% of the 126 that occurred in the planning area) is virtually the same as for June, July and August (99 or 81.1% of 122.

The least number of crashes occurred in February with 12 (1 bicycle and 11 pedestrian) and March with 17 (7 bicycle and 10 pedestrian).

Day of Week

Figure 10 shows the distribution of bicycle and pedestrian crashes in percent that occurred in the planning area for 2011-2015. Not surprisingly, weekdays—when workers and students are walking, biking, and driving to their destinations—experience the greatest shares of crashes. Friday has the greatest share of the weekday and overall crashes (18.4%), while Wednesday has the lowest weekday share and just slightly more than that for Saturday. Sunday has the lowest share of crashes.

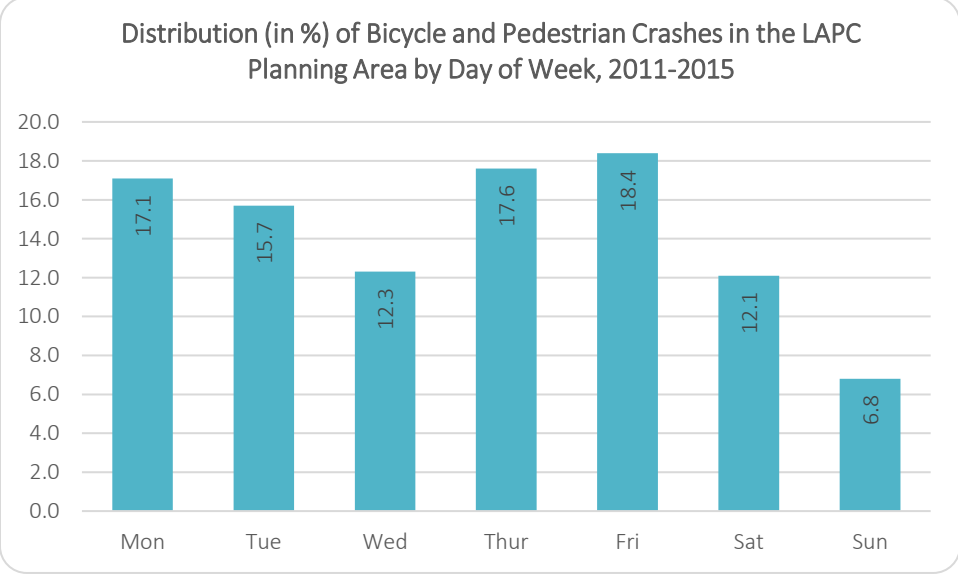

Figure 10: Distribution of bicycle and pedestrian crashes in the LAPC planning area by day of week, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Time of Day

Figure 11 shows the number of bicycle and pedestrian crashes by the time of day that the crashes occurred. The most notable peak occurs between the hours of 3:00 pm and 7:00 pm. The portion of the peak from 3:00 pm to 6:00 pm is virtually identical to the afternoon motor-vehicle crash peak seen in Figure 12. The number of bicycle and pedestrian crashes as a percent of all motor vehicle crashes is 3.6%, 3.5%, and 3.5%, respectively, for those hours of the day, which suggests that higher numbers of bicyclists and pedestrians are traveling at the same time as higher volumes of motor vehicles. However, the percent of motor vehicle crashes that are bicycle and pedestrian crashes jumps to 6.5% between 6:00 pm and 7:00 pm, with the majority of those occurring when it was daylight (27 of 37 or 73.0%).

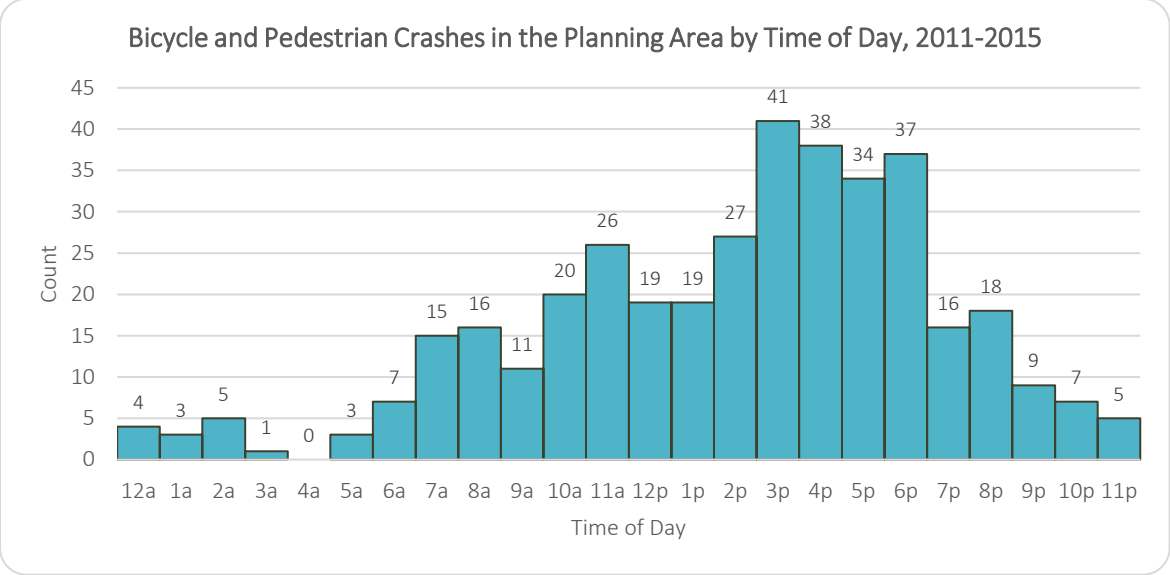

Figure 11: Bicycle and Pedestrian Crashes in the Planning Area by Time of Day, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

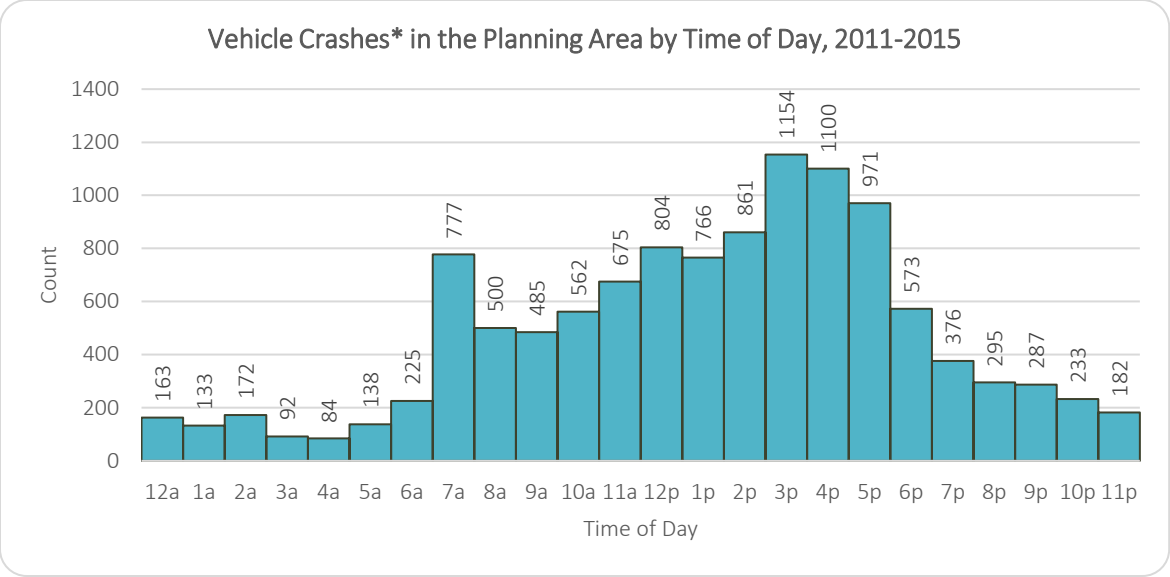

Figure 12: Vehicle crashes in the planning area by time of day, 2011-2015.
*Excludes deer crashes. *Source:* WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Human Factors

Age

Age can be a factor in why a crash occurred and in the severity of injury. Children (age 14 and younger) are still growing and are vulnerable to injury. Young drivers (age 15-24) have limited experience driving compared to older drivers which may result in a higher proportion of crashes among drivers within that age range. Senior drivers (age 65 and older), on the other hand, are likely very experienced drivers, but they may suffer from the typical characteristics of aging like slower reflexes, reduced hearing, and reduced flexibility that can contribute to a crash. Seniors are also more susceptible to serious injury as bone density decreases with age. Injuries are classified as fatal, incapacitating, non-incapacitating, and possible.[2]

Children were involved in 61 crashes (44 bicyclists and 17 pedestrians)resulting in 8 incapacitating injuries, 35 non-incapacitating injuries, and 15 possible injuries.

High school age persons ("teen" persons age 15-18) were involved in 57 crashes—20 as drivers, 15 as pedestrians, and 26 as bicyclists—resulting in 1 pedestrian fatality and 60 injuries (1 incapacitating, 25 non-incapacitating, and 34 possible injuries). Three of the teen drivers were injured (two incurred a non-incapacitating injury and one incurred a possible injury). Seven of 11 crashes where one or more citations were issued were issued to teen drivers.

[2] The law enforcement in Wisconsin and Minnesota use the "KABCO" injury scale, which was developed by the National Safety Council (NSC), to classify crash injuries. "K" represents a fatality (any injury received in a traffic crash that results in death within 30 days of the crash), "A" represents an incapacitating injury (any injury other than a fatal injury that prevents the injured person from walking, driving, or from performing other activities that he/she performed before the crash), "B" represents a non-incapacitating injury (any injury, other than fatal or incapacitating, that is evident at the scene), "C" represents a possible injury (any injury that that is not observable or evident at the scene, but is claimed by the individual or suspected by the law enforcement officer), and "O" represents no apparent injury.

College-age persons ("young" persons age 19-24) were involved in 129 crashes—74 as drivers, 52 as bicyclists, and 27 as pedestrians. One crash resulted in a pedestrian fatality, 8 resulted in an incapacitating injury, 37 resulted in a non-incapacitating injury, and 27 resulted in a possible injury. Thirty-eight of the 51 crashes where one or more citations were issued were issued to young drivers, mainly for failure to yield.

Seniors were involved in 82 crashes—58 as drivers, 17 as pedestrians, and 7 as bicyclists. Sixteen of the 17 pedestrians were injured, resulting in 1 fatality, 3 incapacitating injuries, 10 non-incapacitating injuries, and 2 possible injuries. All seven of the senior bicyclists were injured, with one incapacitating injury, five non-incapacitating injuries, and one possible injury. Thirty-two of the 58 crashes resulted in one or more citations, with the senior drivers receiving citations in 28, mostly for failure to yield.

Alcohol or Drug Involvement

Thirty-two or 8.4% of the crashes involving bicycles or pedestrians reported someone having used alcohol or drugs. Thirteen of these were reported to have alcohol or drugs as a contributing factor in the crash. Two of the 13 involved young drivers (one was 21 and one was 22). "Driver condition" was reported for six drivers, three bicyclists, and four pedestrians.

Driver Actions[3]

Of the 381 bicycle and pedestrian crashes in the planning area, 370 involved one vehicle and 11 involved 2 or more vehicles. Of the 370 crashes that involved only one vehicle, 185 drivers were going straight, 94 were making a right turn (2 were turning on red), 52 were making a left turn, 21 were slowing or stopped, 9 were backing, 3 were negotiating a curve, 3 were classified as "other," 2 were merging, and 1 was unknown. The proportion of bicycle crashes to pedestrian crashes among crashes where the driver was going straight is 54.6% to 45.4%. Right-turn crashes were dominated by bicycle crashes (69 of 94 or 73.4%), with 64 of the 69 (92.8%) bicyclists operating on the sidewalk, in the crosswalk, or entering the crosswalk. Left-turn crashes were dominated by pedestrian crashes, with 34 of the 52 (65.4%) crashes involving pedestrians.

Of the 11 multivehicle crashes, the drivers in two separate crashes each hit several cars before striking a pedestrian (two pedestrians in one crash and one in the other). One of the 11 crashes involved a driver who was forced off the road and subsequently struck three pedestrians. Four of the crashes involved a first vehicle stopped for a bicyclist/pedestrian (none of whom where struck) getting hit by another vehicle and the final four crashes involved a vehicle being pushed into the bicyclist (1) or pedestrian (3).

Failure to yield the right of way was the most common driver action recorded as a contributing factor in a crash (166 of 381 or 43.6%) followed by inattentive or distracted driving (78 or 20.5%). Thirty (7.9%) crashes involved disregarding the traffic control, 17 (4.5%) involved driver condition, and 13 (3.4%) involved driving too fast for conditions. The balance of the crashes with a contributing factor reported involved unsafe backing (8), failure to keep the vehicle under control (8), following too close (6), speeding (4), driving left of center (3), and improper overtake (1).

Hit and Run[4]

Of the 375 Wisconsin planning area crashes involving bicyclists and pedestrians, 58 or 15.5% were hit-and-run, with 22 or 37.9% involving bicyclists and 36 or 62.1% involving pedestrians. No children under the age of 10

[3] Even though a driver action may be reported, this does not necessarily equate to a citation being issued.

[4] The Minnesota crash file does not identify if a crash involves a hit-and-run, thus, the statistics are derived using the total number of bicycle and pedestrian crashes that occurred in the Wisconsin portion of the planning area (375). One of the crashes, however, had no information for many of the fields, making it appear to be a hit-and-run crash.

were struck, but 8 children between the ages of 10 and 14 were victims in a hit-and-run crash. Half (4) of the children incurred non-incapacitating injuries and two incurred possible injuries.

Enforcement

Citations[5]

Of the 375 Wisconsin planning area crashes involving bicyclists and pedestrians, citations were issued in 194 crashes (51.7%) to 139 drivers of motor vehicles, 34 bicyclists, and 25 pedestrians. Both parties were cited in four crashes—three involved bicyclists and one involved a pedestrian. Among those cited, the most significant contributing factor for drivers of motor vehicles was the failure to yield (85 or 61.2%) followed by inattentive driving (41 or 29.5%). The most significant contributing factors for bicyclists were failure to yield (23 or 67.6%), "other" (23 or 67.6%), disregarding the traffic control (15 or 44.1%), inattentive driving (8 or 23.5%), and riding too fast for conditions (4 or 11.8%). "Other" includes crossing mid-block, entering the roadway without yielding to traffic, riding the wrong direction in traffic, and riding into a vehicle. Pedestrians most often darted into the road or made a sudden movement into traffic (11 or 44.0%) or failed to yield to traffic (6 or 24.0%).

Eighteen (69.2%) of the 26 bicycle crashes that occurred in downtown La Crosse occurred as a bicyclist was either riding on the sidewalk at an alley or parking ramp entrance/exit or riding in or entering a crosswalk. Only 3 of the 18 bicyclists (16.7%) were issued an ordinance citation (2) or a warning (1) for violating the City's ordinance prohibiting bicycles on sidewalks in downtown La Crosse.

Crash Severity

Because bicyclists and pedestrians are physically exposed, they are more likely to incur a serious injury or even death in a crash than will the driver of a motor vehicle. Of the 381 bicycle and pedestrian crashes analyzed here, 25 (6.6%) involved only property damage (i.e. to the bicycle or car), 6 (1.6%) resulted in a fatality, 47 (12.3%) resulted in an incapacitating injury, 187 (49.1%) resulted in a non-incapacitating injury, and 110 (28.9%) resulted in a possible injury. Figure 13 illustrates the number of bicycle and pedestrians by injury severity by year for the planning area. Pedestrian crashes made up 57.4% of incapacitating injury crashes, 42.2% of non-incapacitating injury crashes, 40.9% of possible injury crashes, and 100.0% of fatal crashes.

[5] The Minnesota crash file does not include information about citations, thus, the statistics reflect citation information for the bicycle and pedestrian crashes that occurred in the Wisconsin portion of the planning area (375).

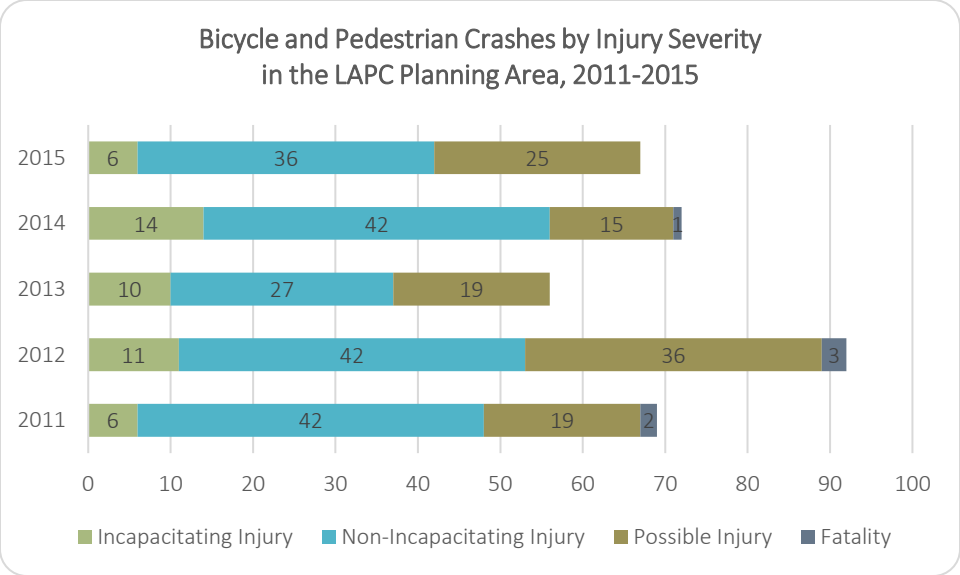

Figure 13: Bicycle and pedestrian crashes by injury severity in the LAPC planning area, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Fatal Injuries

With an average of 1.2 fatalities per year for 2011-2015, the planning area experienced 6 fatalities (Table 2)—all pedestrians and all in the City of La Crosse. None of the drivers of motor vehicles were cited, but one was reported for failure to yield to a pedestrian who disregarded the traffic control. This fatal crash occurred at 6:00 am at the lighted intersection of West Ave and State St on a snowy Monday in December. The most common factors among the fatal crashes are poor visibility (darkness, dark clothing, and being blocked from view) and the pedestrian crossing at a location other than the intersection. All of the drivers were going straight.

Although not reported as a driver factor, speeding may have been a factor in five of the six fatalities that occurred on facilities with a posted speed limit of 25 mph. According to the 2007 study, *Bicyclist Injury Severities in Bicycle-Motor Vehicle Accidents*,[6] the chance of a bicyclist fatality doubles at motor vehicle speeds of 30 mph, increases by a factor of 11 at 40 mph, and increases by a factor of 16 at 50 mph. Other studies conducted in England and Australia state the risk differently. Both studies state that the odds of a pedestrian death at 20 mph is about 5%. The English report states that the odds of fatality increase to 45% at 30 mph and to 85% at 40 mph,[7] while the Australian report states that the odds of fatality increase to 37% at 30 mph and

[6] JK Kim, Kim S, GF Ulfarsson, LA Porello, *Accident Analysis & Prevention* 39 (2007): 238-251. Reference and citation obtained from Matthew Cushing et al, "Vision Zero in the United States Versus Sweden: Infrastructure Improvement for Cycling Safety, Cushing Matthew," *American Journal of Public Health* 106 (2016): 2179.
[7] *Killing Speed and Saving Lives*, UK Dept. of Transportation, London, England. See also Limpert, Rudolph. Motor Vehicle Accident Reconstruction and Cause Analysis. Fourth Edition. Charlottesville, VA. The Michie Company, 1994, p. 663.

to 83% at 40 mph.[8] While *speed* is surely a factor in the Mormon Coulee Rd / 33rd St fatality, *speeding* may not be as the speed limit on this segment is 40 mph.

TABLE 2: FATAL PEDESTRIAN[1] CRASHES IN THE PLANNING AREA, 2011-2015

Crash Location (on/at street)	Speed Limit (on/at street)	Distance from Intersection	Road Condition	Weather Condition	Light Condition[2]	Contributing Factors/ Comments[3]
Mormon Coulee Rd/ 33rd St S	40 mph/ 25 mph	0 feet	Wet	Cloudy	Lighted	49-yr-old blind man crossing at 5:00 am in dark clothing
Cass St/5th Ave	25 mph/ 25 mph	150 feet	Wet	Cloudy	Dark	74-yr-old man crossing midblock in dark clothing at a location with no street lighting
La Crosse St/ Oakland St	25 mph/ 25 mph	50 feet	Dry	Clear	Dark	23-yr-old student dashed into traffic outside crosswalk
West Ave/ King St	25 mph/ 25 mph	50 feet	Dry	Cloudy	Daylight	55-yr-old man crossed outside crosswalk; only 1 lane stopped; traffic blocked view
West Ave/ State St	25 mph/ 25 mph	0 feet	Snow	Snow	Lighted	51-yr-old woman disregarded traffic control struck by driver who failed to yield
Farnam St/ 26th St	25 mph/ 25 mph	100 feet	Dry	Clear	Daylight	17-yr-old made sudden mid-block movement into traffic; drugs

[1]The planning area experienced no fatal bicycle crashes during the 2011-2015 time period.
[2]"Lighted" means the crash occurred at night at a location with street lights; "dark" means the crash occurred at night at a location that was unlit.
[3]Contributing factors and comments were derived from the MV4000 crash records and the crash reports.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT. NOTE: No fatalities occurred in the Minnesota portion of the planning area.

Incapacitating Injuries

An incapacitating injury is an injury other than a fatal injury that prevents the injured person from walking, driving, or from performing other activities that he or she performed before the crash. Incapacitating injuries are also known as serious injuries. Figure 14 shows the proportions by type of crash (bicycle or pedestrian) for incapacitating-injury crashes by year. Pedestrian crashes made up 57.4% of all incapacitating-injury crashes in the planning area for 2011-2015. The total number of incapacitating-injury crashes in 2015 decreased 57.1% from the 5-year peak in 2014 and 36.2% from the 5-year average of 9.4, and remained unchanged when compared to 2011.

[8] *Vehicle Speeds and the Incidence of Fatal Pedestrian Collisions*, prepared by the Australian Federal Office of Road Safety, Report CR 146, October 1994, by McLean AJ, Anderson RW, Farmer MJB, Lee BH, Brooks CG.

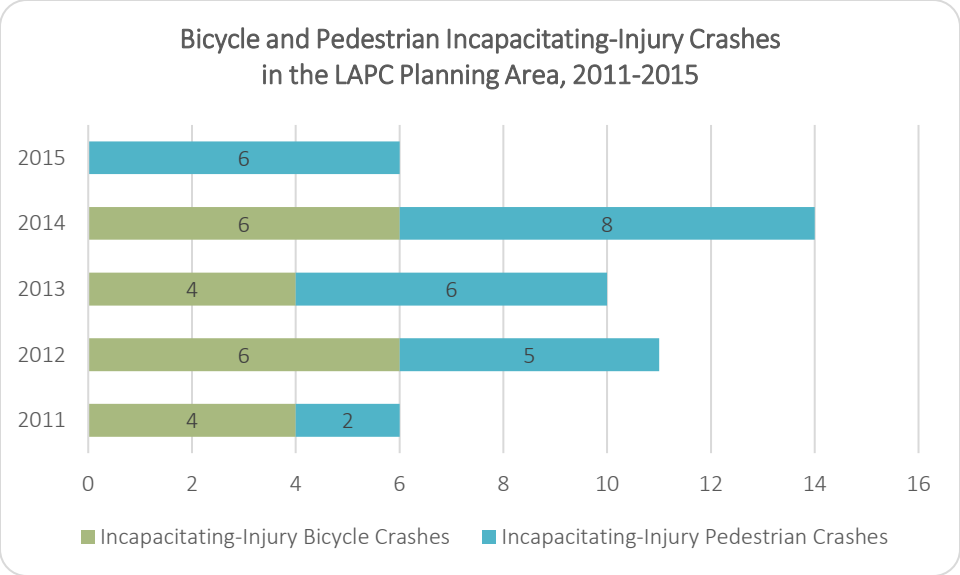

Figure 14: Bicycle and pedestrian incapacitating-injury crashes in the LAPC planning area, 2011-2015.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT.

Table 3 details the characteristics of the 20 bicycle crashes that resulted in an incapacitating injury. Fourteen (70%) occurred at intersections. Only two of the crashes involved non-dry pavement; none of the crashes occurred during inclement weather; and only one occurred at night, but the area was lit. Three of the crashes could be attributed to environmental factors (vision impaired by bushes, sun, or elevation), while 17 crashes resulted from human factors. Driver condition was considered a factor in two of the crashes (one unknown cause and one alcohol-related). Another crash was flagged for a bicyclist's use of alcohol, but driver condition was not recorded as a factor in the crash. One bicyclist was reported to have worn a helmet.

Half of the crashes resulted in one or more parties being cited. Six bicyclists and five drivers of motor vehicles were cited (both parties were cited in one crash) most commonly for failure to yield and disregarding the traffic control. The majority of the 20 bicyclists also tended to ride on sidewalks and in crosswalks (14 or 70%).

Table 4 details the characteristics of the 27 pedestrian crashes that resulted in an incapacitating injury. Eighteen (67%) occurred at intersections. Unlike the incapacitating-injury bicycle crashes where all but two (10%) occurred during the day, 44% of the incapacitating-injury pedestrian crashes occurred at night where it was dark or lit by street lamps. Dark clothing was suggested as a factor in two of those crashes. Neither weather nor roadway conditions were a significant factor. Only four of the crashes experienced weather that was snowy, rainy, or foggy and only six of the crashes experienced roadway conditions that were not dry. Three of those crashes experienced adverse conditions for both factors.

Most of the pedestrian crashes (21 or 78%) resulted in either the driver (14) or the pedestrian (7) being cited. Drivers were most often cited for failure to yield to a pedestrian and inattentive driving while pedestrians were most often cited for darting into the road and failure to yield right-of-way. Three of the crashes occurred on high-speed facilities—on one of which pedestrian use is prohibited. The pedestrians were cited in all three incidences—two for darting into the road and one for just standing in the road. Alcohol was involved in the two crashes where the pedestrians darted into the road. Not surprisingly, the driver was going straight in the majority of the incapacitating injury crashes (31 of 66.0%).

TABLE 3: INCAPACITATING-INJURY BICYCLE CRASHES IN THE PLANNING AREA, 2011-2015

Crash Location (on/at street)	Speed Limit (on/at street)	Distance from Intersection	Road Condition	Weather Condition	Light Condition[1]	Contributing Factors/Comments[2]	Bicyclist Operation
Jackson St/ West Ave	25 mph/ 25 mph	0 feet	Dry	Cloudy	Lighted	Bicyclist disregarded the traffic control and ran the red light; bicyclist cited	As vehicle in street
Caledonia St/ Logan St	25 mph/ 25 mph	0 feet	Wet	Clear	Daylight	Bicyclist failed to yield right-of-way: exited sidewalk & collided with car; bicyclist cited	As pedestrian in crosswalk
Losey Blvd/ Winnebago St	30 mph/ 25 mph	100 feet	Dry	Clear	Daylight	Bushes blocked view of vehicle and bicyclist on sidewalk; no citations issued	As pedestrian on sidewalk
4th Ave/Main St (STH 157)	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Sun in the eyes of the driver; no citations issued	As pedestrian in crosswalk
Bice Ave/Van Dunk Pl	25 mph/ 25 mph	250 feet	Dry	Clear	Daylight	7-yr old bicyclist exited driveway into road without looking; no citations issued	Exiting driveway (no sidewalks)
Cass St/7th St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Hit and run; rear tire of bicycle was struck	As pedestrian in crosswalk
West Ave/ Barlow St	25 mph/ 25 mph	0 feet	Dry	Cloudy	Daylight	Bicyclist struck in crosswalk by driver who failed to yield; no citations issued	As pedestrian in crosswalk
Main St/West Ave	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Bicyclist disregarded traffic control; no citations issued	As pedestrian in crosswalk
Buchner Pl/ Copeland Ave	25 mph/ 30 mph	200 feet	Dry	Clear	Daylight	Bicyclist cited for making sudden movement into traffic	Exiting parking lot
9th Ave/Green Bay St	25 mph/ 25 mph	0 feet	Wet	Cloudy	Dusk	13-yr old bicyclist disregarded traffic control; no citations issued	As vehicle in street

[1]"Lighted" means the crash occurred at night at a location with street lights; "dark" means the crash occurred at night at a location that was unlit.
[2]Contributing factors and comments were derived from the MV4000 crash records and the crash reports.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT. NOTE: No incapacitating injury bicycle crashes occurred in the Minnesota portion of the planning area.

TABLE 3: INCAPACITATING-INJURY BICYCLE CRASHES IN THE PLANNING AREA, 2011-2015 (continued)

Crash Location (on/at street)	Speed Limit (on/at street)	Distance from Intersection	Road Condition	Weather Condition	Light Condition[1]	Contributing Factors/Comments[2]	Bicyclist Operation
Old CTH NA/ CTH XX	35 mph/ 35 mph	5000 feet	Dry	Clear	Daylight	Reduced visibility (hill); no paved shoulder; no citations issued	As vehicle in street
Cass St/3rd St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Bicyclist rode into side door of right-turning vehicle; no citations issued	As pedestrian in crosswalk
West Ave/La Crosse St	25 mph/ 25 mph	50 feet	Dry	Cloudy	Daylight	Driver cited for failure to yield	As pedestrian on sidewalk
River Bend Rd/ Copeland Ave	25 mph/ 30 mph	0 feet	Dry	Cloudy	Daylight	Driver turning right on red struck bicyclist moving at high rate of speed; no citations	As pedestrian in crosswalk
Oakland St/La Crosse St	25 mph/ 25 mph	0 feet	Dry	Cloudy	Daylight	Driver cited for failure to yield	As pedestrian in crosswalk
West Ave/ Ferry St	25 mph/ 25 mph	50 feet	Dry	Clear	Daylight	Driver cited for driver condition (unknown cause); crossed lanes & struck bicyclist	As pedestrian in crosswalk
Copeland Ave	30 mph	0 feet[3]	Dry	Cloudy	Daylight	Driver exiting from business cited for failure to yield to bicyclist on sidewalk	As pedestrian on sidewalk
Copeland Ave/ Causeway Blvd	30 mph/ 25 mph	0 feet	Dry	Cloudy	Daylight	Bicyclist cited for traveling too fast for conditions; alcohol involved	As pedestrian in crosswalk
Weston St/ East Ave	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Bicyclist and driver cited for failure to yield	As vehicle in street
2nd Ave/Troy St	50 mph/ 25 mph	0 feet	Dry	Cloudy	Daylight	Bicyclist cited for failure to yield and for driver condition (alcohol)	As vehicle in street

[1]"Lighted" means the crash occurred at night at a location with street lights; "dark" means the crash occurred at night at a location that was unlit.
[2]Contributing factors and comments were derived from the MV4000 crash records and the crash reports.
[3]This crash occurred at the exit of a parking lot for a private business and so is recorded in the crash record as a parking lot crash. Parking lot crashes are not measured from an intersection like on-street crashes and thus have "0" recorded for the intersection distance.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT. NOTE: No incapacitating injury bicycle crashes occurred in the Minnesota portion of the planning area.

TABLE 4: INCAPACITATING-INJURY PEDESTRIAN CRASHES IN THE PLANNING AREA, 2011-2015

Crash Location (on/at street)	Speed Limit (on/at street)	Distance from Intersection	Road Condition	Weather Condition	Light Condition[1]	Contributing Factors/Comments[2]
South Ave/16th St	30 mph/ 25 mph	50 feet	Snow	Snow	Daylight	Driver struck pedestrian in marked crosswalk; highway factors contributed to crash; no citations
Main St/21st St	25 mph/ 25 mph	0 feet	Dry	Cloudy	Lighted	Driver cited for failure to yield to a pedestrian in a crosswalk
4th St S/Cameron Ave	30 mph/ 25 mph	100 feet	Dry	Cloudy	Daylight	Pedestrian cited for crossing outside of a crosswalk
Losey Blvd/State Rd	30 mph/ 25 mph	50 feet	Dry	Clear	Lighted	First driver cited for multiple offenses; second driver forced off road striking three pedestrians
West Ave/Winnebago St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Driver cited for inattentive driving after striking pedestrian in crosswalk
Market St/10th St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Driver cited for obstructed windshield (frost) and inattentive driving
State St/Campbell Rd	25 mph/ 25 mph	100 feet	Wet	Rain	Lighted	Driver cited for failure to yield to a pedestrian in a crosswalk; heavy rain may have been a factor
George St/Rublee St	25 mph/ 25 mph	100 feet	Dry	Clear	Daylight	Five-year-old ran into the street from between two parked cars; no citations
Cass St/16th St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Driver cited for failure to yield to a pedestrian in a crosswalk
Clinton St/Caledonia St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Driver cited for failure to yield to a pedestrian in a crosswalk

[1]"Lighted" means the crash occurred at night at a location with street lights; "dark" means the crash occurred at night at a location that was unlit.
[2]Contributing factors and comments were derived from the MV4000 crash records and the crash reports.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT. NOTE: No incapacitating-injury pedestrian crashes occurred in the Minnesota portion of the planning area.

TABLE 4: INCAPACITATING-INJURY PEDESTRIAN CRASHES IN THE PLANNING AREA, 2011-2015 (continued)

Crash Location (on/at street)	Speed Limit (on/at street)	Distance from Intersection	Road Condition	Weather Condition	Light Condition[1]	Contributing Factors/Comments[2]
Ferry St/9th St	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Driver cited for inattentive driving and operating a vehicle left of center
Losey Blvd/Redfield St	30 mph/ 25 mph	0 feet	Dry	Clear	Daylight	View of pedestrian blocked by vehicles in adjacent lane; no citations
CTH Z/CTH ZN	55 mph/ 55 mph	1000 feet	Dry	Cloudy	Dark	Pedestrian cited for standing in the middle of the road; pedestrian also wore dark clothing
Cass St/4th St	25 mph/ 25 mph	200 feet	Dry	Cloudy	Lighted	Pedestrian cited for darting into the road and failure to yield right-of-way; alcohol was present
Cass St/7th St	25 mph/ 25 mph	0 feet	Snow	Clear	Lighted	Driver cited for failure to yield to a pedestrian in a crosswalk and for having a frosted windshield
3rd St/Jay St	25 mph/ 25 mph	0 feet	Wet	Cloudy	Daylight	Driver cited for failure to yield to a pedestrian in a crosswalk
Losey Blvd/Main St	30 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Driver cited for inattentive driving and failure to yield to a pedestrian in a crosswalk
State St/17th St	25 mph/ 25 mph	200 feet	Dry	Clear	Daylight	Driver cited for failure to yield to a pedestrian in a crosswalk
I-90/Mile Marker 6	65 mph/ 65 mph	50 feet	Dry	Fog	Dark	Pedestrian cited for darting into road; alcohol present
STH 16/Heritage Blvd	45 mph/ 25 mph	0 feet	Dry	Cloudy	Dark	Pedestrian cited for darting into road; alcohol present

[1]"Lighted" means the crash occurred at night at a location with street lights; "dark" means the crash occurred at night at a location that was unlit.
[2]Contributing factors and comments were derived from the MV4000 crash records and the crash reports.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT. NOTE: No incapacitating-injury pedestrian crashes occurred in the Minnesota portion of the planning area.

TABLE 4: INCAPACITATING-INJURY PEDESTRIAN CRASHES IN THE PLANNING AREA, 2011-2015 (continued)

Crash Location (on/at street)	Speed Limit (on/at street)	Distance from Intersection	Road Condition	Weather Condition	Light Condition[1]	Contributing Factors/Comments[2]
CTH MW/Heritage Ln	25 mph/ 25 mph	600 feet	Dry	Clear	Daylight	Driver cited for unsafe backing and inattentive driving after hitting pedestrian walking on shoulder
Viking Ave/Viking Ct	25 mph/ 25 mph	0 feet	Dry	Clear	Daylight	Unknown; ongoing investigation
Cass St/6th St	25 mph/ 25 mph	0 feet	Dry	Cloudy	Lighted	Driver cited for hit and run, exceeding the speed limit, and failure to have control of his vehicle
George St/Gohres St	25 mph/ 25 mph	200 feet	Wet	Cloudy	Dark	Pedestrian crossed mid-block and failed to yield right-of-way; not cited
Mormon Coulee Rd/Losey Blvd	40 mph/ 30 mph	50 feet	Wet	Rain	Lighted	Pedestrian cited for disregarding traffic signal and crossing outside of crosswalk
Cass St/5th Ave	25 mph/ 25 mph	50 feet	Dry	Clear	Daylight	Pedestrian was cited for walking in the street not facing traffic
West Ave/Green Bay St	25 mph/ 25 mph	0 feet	Dry	Cloudy	Lighted	Pedestrian wearing black and smelling of intoxicants failed to yield the right-of-way; no citations issued

[1]"Lighted" means the crash occurred at night at a location with street lights; "dark" means the crash occurred at night at a location that was unlit.
[2]Contributing factors and comments were derived from the MV4000 crash records and the crash reports.
Source: WisTransPortal System, U.W. Madison TOPS Lab; MnDOT. NOTE: No incapacitating-injury pedestrian crashes occurred in the Minnesota portion of the planning area.

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Problem Corridors and Intersections

Problem areas were identified by mapping the locations of bicycle and pedestrian crashes for the years 2011-2015. These areas were further defined into problem corridors and problem intersections by density and occurrence criteria. Problem corridors are defined as segments of road with a crash density of 10 or more bicycle and pedestrian crashes within a ½-mile segment of road (about 6 blocks) or 20 or more per mile for the five-year period. Problem intersections are defined as intersections averaging one or more bicycle or pedestrian crashes per year (5 or more for the 5-year period). Additional data gathering occurred at the intersection locations that averaged one or more bicycle or pedestrian crashes per year.

Of the 381 bicycle and pedestrian crashes, 315 (82.7%) occurred along a major road and 249 (65.4%) occurred within ½-mile of a school. The most visible crash patterns not surprisingly occur along major roads in the City of La Crosse (Figure 15).

After applying the criteria discussed above, we identified six problem corridors and six problem intersections that exhibit the highest concentrations of bicycle and pedestrian crashes in the planning area—all of which are in the City of La Crosse where we have the greatest potential for conflict between motor vehicles and bicyclists and pedestrians (high traffic counts coupled with high numbers of bicyclists and pedestrians). The problem corridors include:

- **West Ave** between La Crosse St and Jackson St (30 per ½-mile between La Crosse St and King St; 15 per ½-mile between Cass St and Jackson St; 45 for the 1.1-mile corridor that includes the block between King St and Cass St);
- **3rd St** between State St and King St (15 per ½-mile);
- **State St** between West Ave and Campbell Rd (12 per ½-mile);
- **Jackson St** between 6th St and West Ave (12 per ½-mile);
- **Cass St** between 3rd St and 8th St (11 per ½-mile); and,
- **Losey Blvd** between Jackson St and Green Bay St (11 per ½-mile).

The crashes-per-½-mile criterion for the State St, Jackson St, and Losey Blvd corridors is only met as a result of the high number of crashes at the West Ave/State St, West Ave/Jackson St, and Losey Blvd/State Rd intersections, which are identified and discussed as problem intersections, and thus are dropped from further discussion. The problem intersections identified include:

- West Ave and Jackson St (8 bicycle and pedestrian crashes for 2011-2015 or 1.6 crashes per year);
- West Ave and Main St (6 crashes or 1.2 per year);
- West Ave and Badger St (6 crashes or 1.2 per year);
- West Ave and State St (5 crashes or 1.0 per year);
- West Ave and La Crosse St (5 crashes or 1.0 per year);
- Losey Blvd and State Rd (5 crashes or 1.0 per year); and,
- 3rd St and Pearl St (5 crashes or 1.0 per year).

Although the 3rd St/Pearl St intersection meets the minimum criteria to be addressed as a problem intersection, the characteristics of the crashes in this unsignalized intersection (more weekend and very early morning) suggested it was best addressed within the context of the 3rd St corridor, which is a popular destination for adults, especially college students.

In order to compare problem intersections with different motor vehicle, bicycle, and pedestrian volumes, we developed a methodology that used WisDOT time-of-day and day-of-week traffic percentages to calculate a

crash index for each intersection. Staff first conducted a count of bicycle and pedestrian crossings for a two-hour period of time from 7:00 am to 9:00 am at each of the identified problem intersections. Traffic data were then obtained for the same two-hour period for the respective day of the week that the count of bicycle and pedestrian crossings was conducted. These data allowed us to calculate an exposure rate (Crossings per Vehicle) and thus a Crash Rate for assessing the *relative* unsafe-ness of each problem intersection. The data inputs and resulting crash rates for the problem intersections are summarized in Table 5. The table shows that while the West Ave/Jackson St intersection has the highest annual crash average (1.6 crashes per year or 8 crashes for the 5 year period), it has the second highest crash rate of 64.0. The Losey Blvd/State Rd intersection has the highest crash rate at 500.0 because it experienced 5 crashes in 5 years with very little bicycle and pedestrian activity. The West Ave/Badger St intersection experienced one more crash than did the Losey Blvd/State Rd intersection, yet, came in with the lowest crash rate of 8.6. This is because the crossing at Badger St has so many more users.

TABLE 5: INTERSECTION ACTIVITY AND CRASH INDEX FOR PROBLEM INTERSECTIONS

	Day of Week	Total Crossings[1]	Intersection AADT[2]	Intersection 2-Hr Traffic[3]	Crossings per Vehicle[4]	Annual Crash Average[5]	Crash Index[6]
Losey Blvd & State Rd	Thursday	9	33,900	4,204	0.002	1.0	500.0
West Ave & Jackson St	Monday	69	21,600	2,743	0.025	1.6	64.0
West Ave & Main St	Tuesday	86	24,600	3,125	0.028	1.2	42.9
West Ave & La Crosse St	Tuesday	111	28,300	3,594	0.031	1.0	32.3
West Ave & State St	Thursday	136	22,700	2,815	0.048	1.0	20.8
West Ave & Badger St[7]	Monday	356	20,000	2,540	0.140	1.2	8.6

[1]Total bicycle and pedestrian crossings during a two-hour count from 7:00 am to 9:00 am.
[2]Total estimated from summing the AADT counts from one approach from each street (using the closest and most recent count to the intersection available). *Source:* Interactive Traffic Count Map, Wisconsin Department of Transportation.
[3]The averaged 2014 annual hourly day of week percentages for 7:00 am and 8:00 am (hours of bicycle and pedestrian counts) from the continuous counters on West Ave north of Mississippi St and north of La Crosse St were used to estimate the 2-hour traffic through each intersection. The averaged percentage by day of week and time of day the bicycle and pedestrian count was conducted determined the percentage used. The averaged percentages from the two counters for Monday, Tuesday, and Thursday for 7:00 am were 7.5, 7.6, and 7.4, respectively, and for 8:00 am were 5.2, 5.1, and 5.0, respectively. The 2-hour vehicular traffic for West Ave and Jackson St, for example, was estimated thusly: (Intersection AADT x 7:00 am percentage for Monday) + (Intersection AADT x 8:00 am percentage for Monday) = (21,600 x 0.075) + (21,600 x 0.052). In lieu of no continuous counter data on Losey Blvd or State Rd, the West Ave Thursday percentages were applied. *Source:* Annual Hourly Day of Week Percentages for 2014, Wisconsin Continuous Count Data, Wisconsin Department of Transportation.
[4]The number of bicycle and pedestrian crossings per motor vehicle: Crossings per vehicle = total crossings / intersection 2-hr traffic.
[5]The average number of bicycle and pedestrian crashes per year, 2011-2015.
[6]A crash index is calculated in order to compare intersections with differing variable values. This allows us to determine if the number of crashes is correlated to a high number of bicyclists and pedestrians (exposure) or if there might be something else going on. The crash index is calculated such that crash index = annual crash average / crossings per vehicle.
[7]Because no traffic counts are available for Badger St to estimate an intersection AADT, the total bicycle and pedestrian crossings and AADT are for West Ave only. The intersection 2-hr traffic is calculated using the 20,000 West Ave AADT. An additional 55 crossings occurred across Badger St (5 northbound bicyclists; 4 southbound bicyclists; 13 northbound pedestrians; and 33 southbound pedestrians).

The following discussions provide an overall description of each problem intersection and corridor, and detailed discussions of their traffic control (motor vehicle and pedestrian), traffic counts (motor vehicle, bicycle, and pedestrian), transit services, land uses, and crash histories. The Losey Blvd/State Rd intersection has been estimated to have the highest crash index among the problem intersections identified for further analysis and so being isolated and not part of a larger corridor issue, it is discussed first. In addition, the Wisconsin Department of Transportation identified the West Ave, 3rd St, and Cass St corridors as roads with crash rates greater than the statewide average. This analysis was conducted for a Planning and Environment Linkages (PEL) study being conducted in the area and for the update of the LAPC 2015 metropolitan transportation plan.

Because West Ave has been identified as the most problematic corridor, it and its problem intersections are discussed next ordered geographically from north to south.

- Losey Blvd and State Rd Intersection
- West Ave between La Crosse St and Jackson St
- West Ave and La Crosse St Intersection
- West Ave and Badger St Intersection
- West Ave and State St Intersection
- West Ave and Main St Intersection
- West Ave and Jackson St Intersection
- Other crashes on West Ave between La Crosse St and Jackson St
- 3rd St between State St and King St
- Cass St between 3rd St and 8th St.

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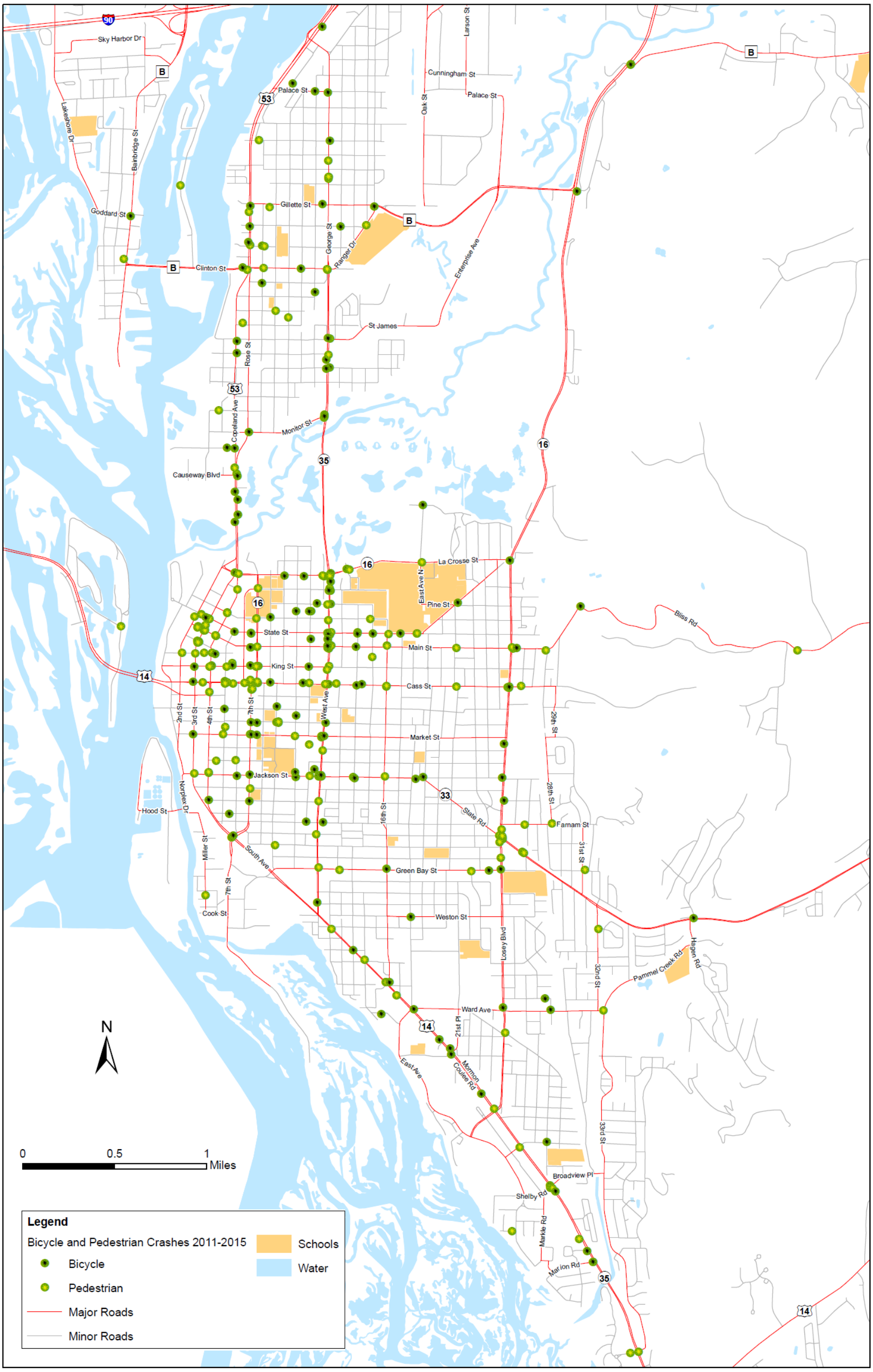

Figure 15: Bicycle and pedestrian crash occurrences along major roads in La Crosse, 2011-2015.

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Losey Blvd & State Rd Intersection

Description

Figure 17 illustrates the configuration of the intersection and the locations of the three bicycle (yellow and black symbols) and three pedestrian (yellow and red symbols) crashes[9] for 2011-2015, and the location of an MTU transit stop (blue bus symbol). All of the approaches are five-lanes wide that include two lanes in each direction, dedicated left-turn lanes, and medians to separate conflicting traffic flow. The posted speed limit is 30 mph for Losey Blvd and 25 mph for State Rd. Speeds on both of these facilities, however, often exceed 35 mph. Because this intersection is skewed, two of the corners have very large turning radii (about 125 degrees) that make it easy for drivers to turn without slowing.

Accommodations for pedestrians include marked, but faded, standard crosswalks (two parallel lines) connecting to perpendicular curb ramps (aligned with the direction of the crosswalk) at the northeast and southwest corners and to diagonal ramps (directed toward the intersection) at the northwest and southeast corners. The crosswalks and ramps are well aligned with the path of the sidewalks; however, they make the walking distances very long. The longest crossing distance for Losey Blvd is about 114 feet in the south crosswalk and for State Rd is about 102 feet in the west crosswalk.

There are no accommodations for bicyclists. The location of the pedestrian button is also inconveniently placed for bicyclists operating as pedestrians to push the activation while being positioned to cross the street.

Traffic Control

The traffic control for the Losey Blvd/State Rd intersection is an actuated signal control where the time for each phase is controlled by detector actuations. Figure 16 illustrates the range of green time from minimum green to maximum green in seconds for each of the turning movements. Because this signal is actuated, the green times can be extended to the maximum green time if traffic volumes warrant. All approaches have protected left-turn phases with a minimum green of 5 seconds; however, a left-turn phase can be eliminated in the absence of traffic. Through-traffic on Losey Blvd can have as little as 20 seconds of green time to as much as 60 seconds before a 3.5-second yellow is triggered, followed by a 1.5-second red clearance. Through-traffic on State Rd, which has lower volumes than Losey Blvd, can have as little as 10 seconds of green time to as much as 45 seconds. The yellow change for all protected left-turn phases is 3 seconds and for all through phases is 3.5 seconds. The red clearance phases, which allow vehicles to clear the intersection before cross traffic is given the green, are 1.5 seconds. When all phases are considered, the cycle length of this intersection in the presence of traffic could range from a minimum of 56 seconds to a maximum of 171 seconds. (See Appendix A for the vehicle basic and pedestrian timings for this intersection.) According to the City Engineer, however, the signal is programmed for a 100-second cycle.

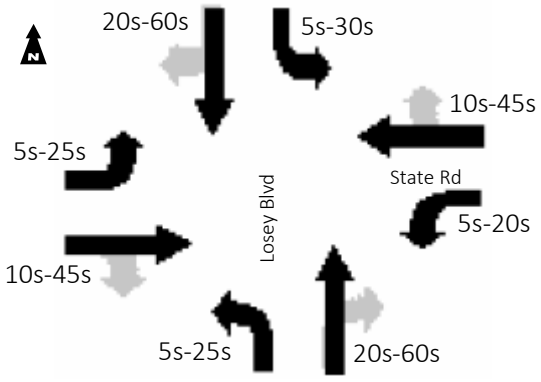

Figure 16: Green time in seconds for the Losey Blvd/State Rd intersection.

[9] Although the intersection experienced three bicycle and two pedestrian crashes, the sixth crash is worth discussing in that it is close to the intersection and resulted in incapacitating injuries of three pedestrians. This crash was not included in the calculation of the crash rate for the Losey Blvd/ State Rd intersection.

Because this intersection is so large, pedestrian signal timing includes a 15-second pedestrian-activated "walk" interval for all crossings and a 28-second flashing "don't walk" or "clearance" interval. A steady "don't walk" interval corresponds to the 3.5-second yellow interval and continues through the red interval for motor vehicle traffic. Total curb-to-curb clearance time (flashing "don't walk" time plus the yellow time) is 31.5 seconds to cross either Losey Blvd or State Rd, which calculates to 3.6 feet per second (ft/s) to cross Losey Blvd at its widest crossing and 3.2 ft/s to cross State Rd. Pedestrians (which include bicyclists operating on sidewalks and in crosswalks) must push the pedestrian activation button (or "beg" button as it's called in Edmonton, Canada) in order to receive a "walk" signal.

Traffic Counts

The 2014 AADT for count locations closest to the intersection is 24,800 on Losey Blvd between Farnam St and State Rd (down from 25,900 in 2011) and 9,100 on State Rd between 23rd St and Losey Blvd (down from 10,500 in 2011). The intersection is estimated to experience an average of 24,800 + 9,100 = 33,900 vehicles per day.

Bicycle and pedestrian crossing counts were conducted on Thursday, October 20 from 7:00 am to 9:00 am. The two-hour count totaled only 9 crossings—3 bicycle and 6 pedestrian. All three bicyclists crossed in the crosswalk and none of them dismounted. The south crosswalk experienced the most crossings with 5 (55.6%) followed by the west crosswalk with 2 (22.2%). The north and east crosswalks each had one crossing. (See Table A in Appendix B for more details.) The corresponding two-hour motor vehicle count for this day of the week and time of day was estimated to be 4,204 as reported earlier in Table 5.

Transit

The La Crosse Municipal Transit Utility (MTU) is the fixed-route transit provider for the City of La Crosse. Four MTU buses from two routes (Route 2 Green Bay St and Route 4 Losey Blvd) pass through this intersection each hour between the hours of 5:00 am and 6:00 pm. The closest bus stop to this intersection is located on Losey Blvd at State Rd for Route 2 Green Bay St outbound from downtown La Crosse and for Route 4 Losey Blvd inbound to downtown La Crosse. Another MTU stop is just north of State Rd at K-Mart, just outside the northern edge of Figure 17.

Land Use

The land uses adjacent to the intersection illustrated in Figure 17 include a restaurant, a travel agency, a big-box retailer (K-Mart), and two strip malls—one significantly larger (Village Shopping Center) than the other. Just to the east of the Village Shopping Center, which includes several eateries, retailers, and service establishments, lies Festival Foods. Central High School claims the block south of Festival and the shopping center. Single-family housing dominates the areas north and east of the commercial establishments.

Crash Statistics

The Losey Blvd/State Rd intersection has the highest crash index (500.0) among the identified problem intersections—7.8 times greater than the next highest crash index of 64.0 for the West Ave/Jackson St intersection. The Losey Blvd/State Rd intersection experienced three bicycle and two pedestrian crashes during the 2011-2015 time period, averaging to 1.0 crash per year.

All of the crashes occurred in a crosswalk (Figure 17), with four of the five occurring in the east (one pedestrian and one bicyclist) and west (two bicyclists) crosswalks to cross State Rd.

Table 6 summarizes environmental conditions, time factors, and person characteristics of the five crashes that occurred in this intersection as well as one multi-pedestrian crash that occurred just south of the intersection. The crash # in the table corresponds to the location number in Figure 17.

One of the five intersection crashes (#2) as well as the non-intersection crash (#6) occurred when the pavement was wet and the weather was rainy. Crash #2 also occurred when it was dark, but lighted (street lights). Four of the five intersection crashes occurred during good environmental conditions. All but one (#3) occurred between 3:00 pm and 6:00 pm.

Each of the five intersection crashes resulted in one non-incapacitating injury—three during left turns, one during a right turn, and one during a through movement. Two of the intersection crashes were hit-and-run crashes (#3 and #4) and both involved children (age 14 and younger). The non-intersection crash (#6), which was caused by a young (age 19-24) driver, resulted in three incapacitating injuries (pedestrians) and one non-incapacitating injury (driver). One crash involved a senior (age 65 and older) driver and no crashes involved a teen (age 15-18) driver.

Three of the five intersection crashes were due to the driver disregarding the traffic control or failing to yield to a person in the crosswalk (#3, #4, and #5); the other two were due to a bicyclist (#1) and a pedestrian (#2) disregarding the traffic control.

TABLE 6: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING IN THE LOSEY BLVD/STATE RD INTERSECTION

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Dry	Cloudy	Daylight	3 pm	Monday June 2011	26-yr-old driver turning left struck 15-yr-old bicyclist who entered crosswalk on "don't walk"; no citation; non-incapacitating injury
2	Wet	Rain	Lighted[2]	4 pm	Wednesday Dec. 2011	51-yr-old driver turning left struck 57-yr-old pedestrian cited for disregarding the traffic control; non-incapacitating injury
3	Dry	Clear	Dawn	6 am	Tuesday March 2011	Hit-and-run driver going straight disregarded traffic control and struck 13-yr-old pedestrian; non-incapacitating injury
4	Dry	Cloudy	Daylight	3 pm	Thursday July 2011	Hit-and-run driver turning right on red failed to yield to 12-yr-old bicyclist in crosswalk; non-incapacitating injury
5	Dry	Clear	Daylight	6 pm	Thursday June 2012	73-yr-old driver turning left cited for failure to yield 51-yr-old bicyclist; non-incapacitating injury
6*	Wet	Rain	Daylight	6 pm	Friday Sept. 2012	19-yr-old driver cited for multiple violations forced vehicle off road into 3 pedestrians on sidewalk; 3 incapacitating injuries; driver had non-incapacitating injury

[1]The crash number corresponds to the crash location number illustrated in Figure 17.
[2]Dark, but lit by street lights.
*Not an intersection crash, but included because it is illustrated in the figure.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

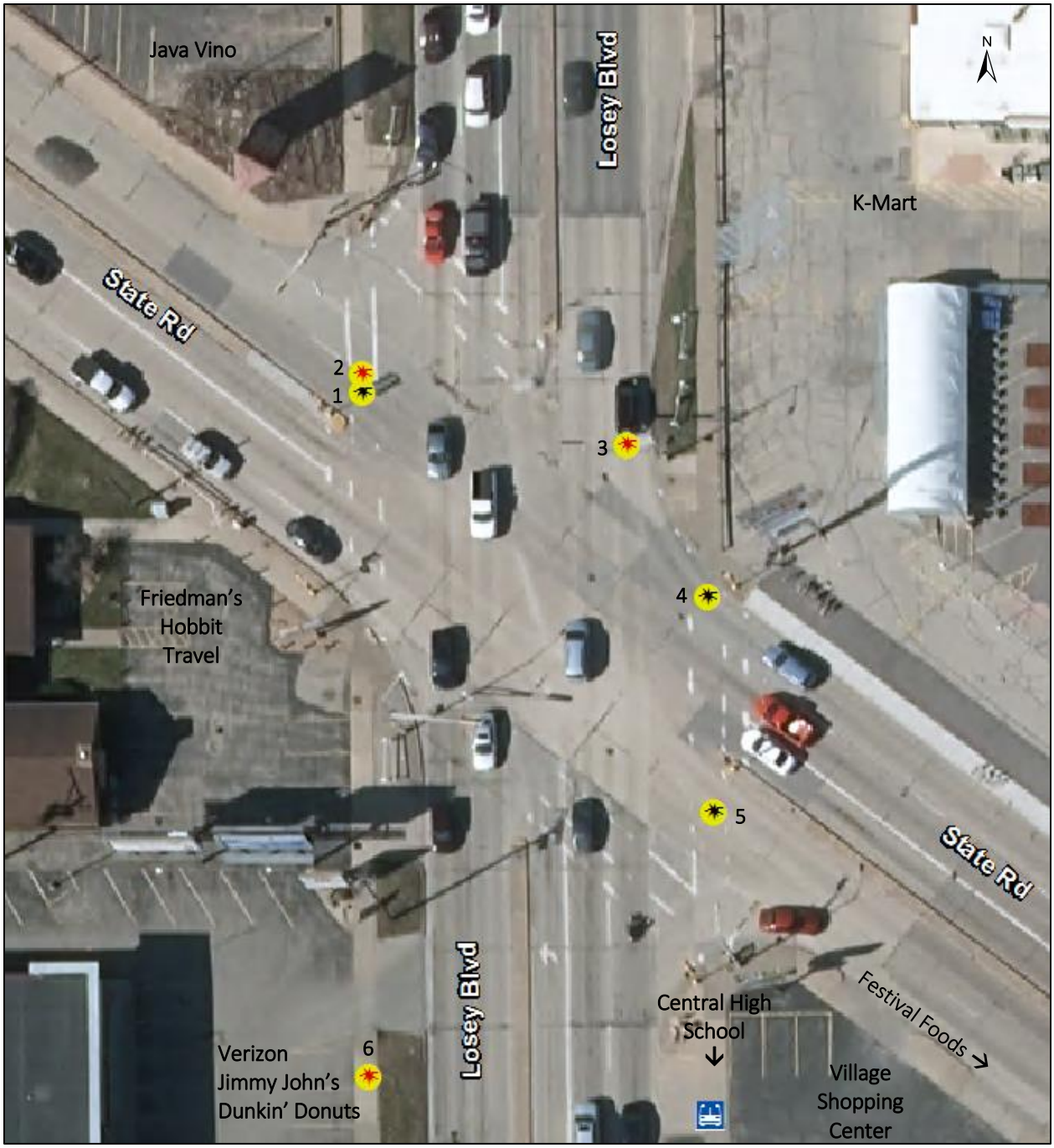

Figure 17: Bicycle and pedestrian crashes at the Losey Blvd/State Rd intersection, 2011-2015.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes.
The bus symbols represent MTU bus stops. The crash location numbers correspond to the crash numbers in Table 6.

West Ave (STH 35) between La Crosse St and Jackson St

Description

West Ave is a four-lane state highway (STH 35) that runs north-south through the City of La Crosse between La Crosse St and South Ave. Virtually all of West Ave north of Adams St is divided by a variable-width median that restricts left turns and cross traffic and directs drivers into dedicated left-turn lanes. Although the posted speed limit is 25 mph along its entire length, motor vehicle speeds often exceed 30 mph.

Pedestrians have a complete sidewalk network, with connecting crosswalks at most intersections, along West Ave. Bicyclists, on the other hand, have no dedicated or protected facility, which results in their riding on the sidewalks. With high traffic volumes and outside lanes too narrow for motor vehicles and bicycles to share the lane, bicyclists opt to ride on the sidewalks where they feel safer.

Traffic Control

Eight of the 26 intersections along West Ave are signalized and 6 occur between La Crosse St and Jackson St. They occur at La Crosse St (STH 16), State St, Main St, Cass St, Market St, and Jackson St (STH 33). The other two signalized intersections on West Ave occur at Green Bay St and South Ave (USH 14/61). A pedestrian signal is located at Pine St. All other intersections are stop sign controlled for the roads intersecting West Ave.

Left-turning vehicular movements from West Ave at signalized intersections are given priority by a green arrow. None of the signalized intersections restrict right-on-red movements. Pedestrians must push a button to activate a "walk" signal at all signalized intersections to cross West Ave and also to cross La Crosse St, Jackson St, and South Ave. A rectangular rapid flashing beacon (RRFB) at Pine St[10] provides additional crossing convenience, but Wisconsin State law only requires motor vehicles to "yield," not stop.

No intersection along West Ave is staffed by a crossing guard or is along a "safe route to school" to aid children in crossing between neighborhoods or between home and school.

Traffic Counts

In 2014 (the most recent data available), the AADT for West Ave ranged from 20,000 between Vine St and State St to 9,600 between Barlow St and Travis St. Both count locations experienced decreases in traffic in 2014 compared to their two previous count years. The count location between Vine St and State St, which is near the north end of West Ave, experienced a 7.4% decrease from 2011 (21,600 AADT) and a 24.2% decrease from 2005[11] (26,400 AADT). The count location between Travis St and Barlow St, which is near the south end of West Ave, experienced a 1.0% decrease from 2011 (97,00 AADT) and a 22.0% decrease from 2008 (12,300 AADT).

The WisDOT continuous counter on West Ave north of Mississippi St counted 20,070 motor vehicles in 2014—a 4.0% increase since 2010 (19,290 vehicles) and a 7.2% decrease since 2013 (21,627 vehicles). The annual hourly day of week (AADW) percentages for 2014 for this counter shows that West Ave has a short weekday travel peak (hourly percent volumes of 7.0% or greater) from 7:00 am to 8:00 am and a longer afternoon peak from 2:00 pm to 5:00 pm. The weekend travel peak occurs roughly between 11:00 am and 5:00 pm. (See Appendix B for the WisDOT chart of AADW percentages for this location.)

[10] In 2016, a pedestrian signal was removed and replaced with a RRFB. Although the RRFB offers only a flashing yellow signal compared to the red light of the pedestrian signal, it offers an immediate response to a pedestrian's activation in contrast to the lengthy wait for the former pedestrian signal.
[11] The WisDOT did not conduct a traffic count at the location between Vine St and State St in 2008.

Transit

No bus route runs the entire length of West Ave and the roughly 1.3-mile segment between State St and Green Bay St has no route. The Route 4 travels on a short segment of West Ave between Badger St and La Crosse St and the Route 5 Valley View travels on West Ave between La Crosse St and State St. Most service to West Ave is provided by cross routes whose bus stops are at or near West Ave.

Land Use

West of West Ave is downtown La Crosse with its shopping, bars, restaurants, and entertainment; Western Technical College (WTC); Viterbo University; Mayo Health System; and a substantial number of rental properties marketed to students. East of West Ave is the University of Wisconsin – La Crosse (UWL) campus, a substantial number of rental properties marketed to students, and many of the City's higher valued single-family homes.

Crash Statistics

WisDOT reconstructed West Ave in 2008 with one of its goals being to improve safety. While the total number of motor vehicle crashes along West Ave decreased by 11.0% between the 5-year period pre-reconstruction (2003-2007) and the 5-year period analyzed in this study (2011-2015), West Ave maintains a crash rate for all motor vehicle crashes higher than the statewide average for similar facilities. The number of bicycle and pedestrian crashes increased 36.1% from 36 (2003-2007) to 49 (2011-2015) and the number of bicycle and pedestrian fatalities doubled from 1 (bicycle crash) to 2 (both pedestrian crashes). Forty-five of the 49 crashes that occurred within the West Ave corridor between La Crosse St and South Ave occurred just within the 1.1-mile stretch between La Crosse St and Jackson St. The little over ½-mile segment between La Crosse St and Cass St experienced twice as many crashes (30) than the ½-mile segment between Cass St and Jackson St (15) and two of those crashes resulted in fatalities. (The two fatalities were two of six pedestrian fatalities that occurred in the planning area.) Five of the 45 crashes between La Crosse St and Jackson St resulted in incapacitating injuries.

Figure 18 illustrates the West Ave segment from La Crosse St to King St. This segment has the highest number of bicycle and pedestrian crashes in the planning area within a ½-mile stretch of road and contains four (circled in red) of the six identified problem intersections in the region. The residential areas between the Western Technical College (WTC) and the University of Wisconsin-La Crosse (UWL) campuses are dominated by multifamily housing marketed to college students. As witnessed during a count of bicyclists and pedestrians at the problem intersections, these students cross West Ave several times each day.

The environmental conditions, time factors, and person characteristics of each crash are summarized in the following sections under its appropriate heading based on location.

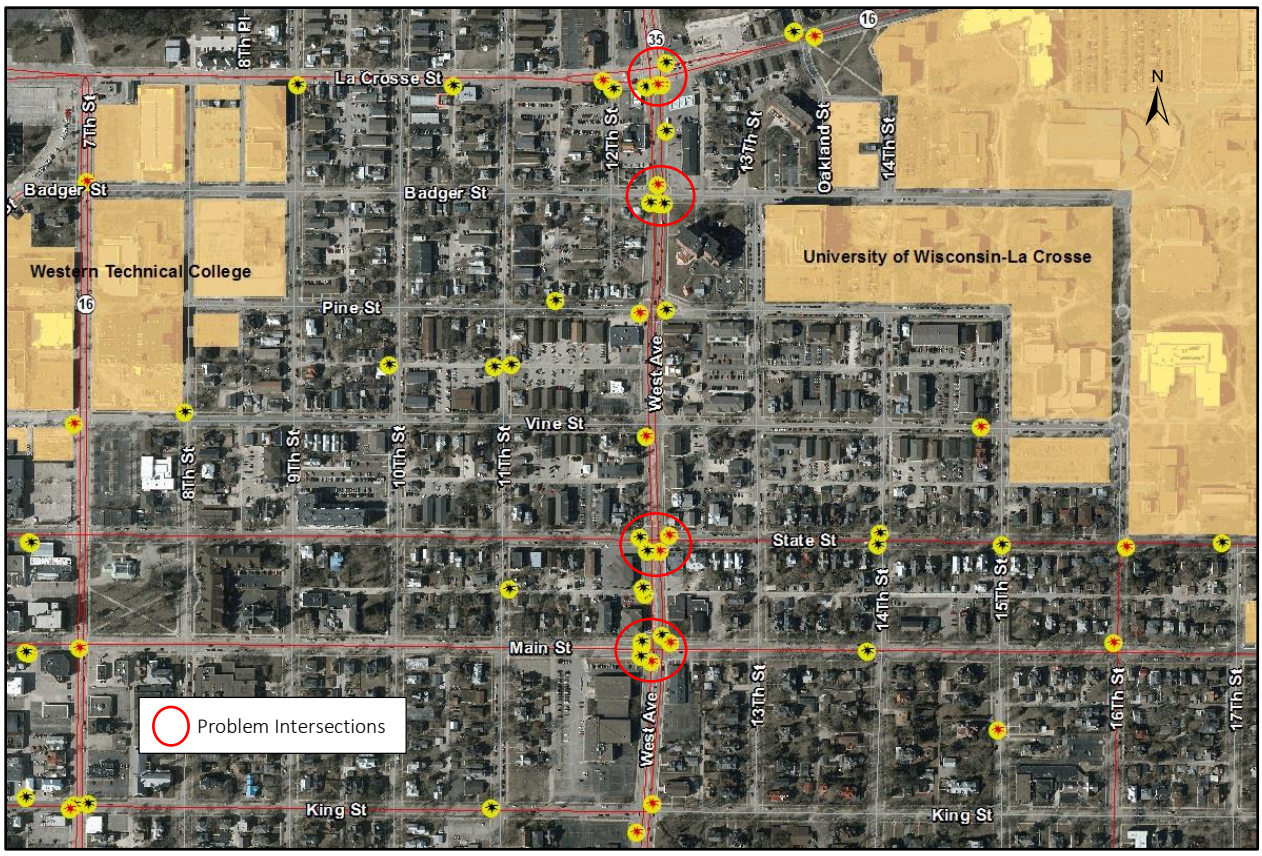

Figure 18: West Ave from La Crosse St to King St.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes.

Figure 19 illustrates the West Ave segment between Cass St and Jackson St. This segment has the second highest number of bicycle and pedestrian crashes in the planning area within a ½-mile stretch of road and contains one (circled in red) of the six identified problem intersections. This section differs from the section between La Crosse St and King St in that 1) nearly all of the destinations are west of West Ave; 2) the majority of the housing east of West Ave is single-family housing; 3) the volume of bicycle and pedestrian crossings is significantly less (as observed while conducting counts); and, 4) the area includes several schools. Cathedral Elementary on the east side of West Ave participates in the Safe Routes to School program.

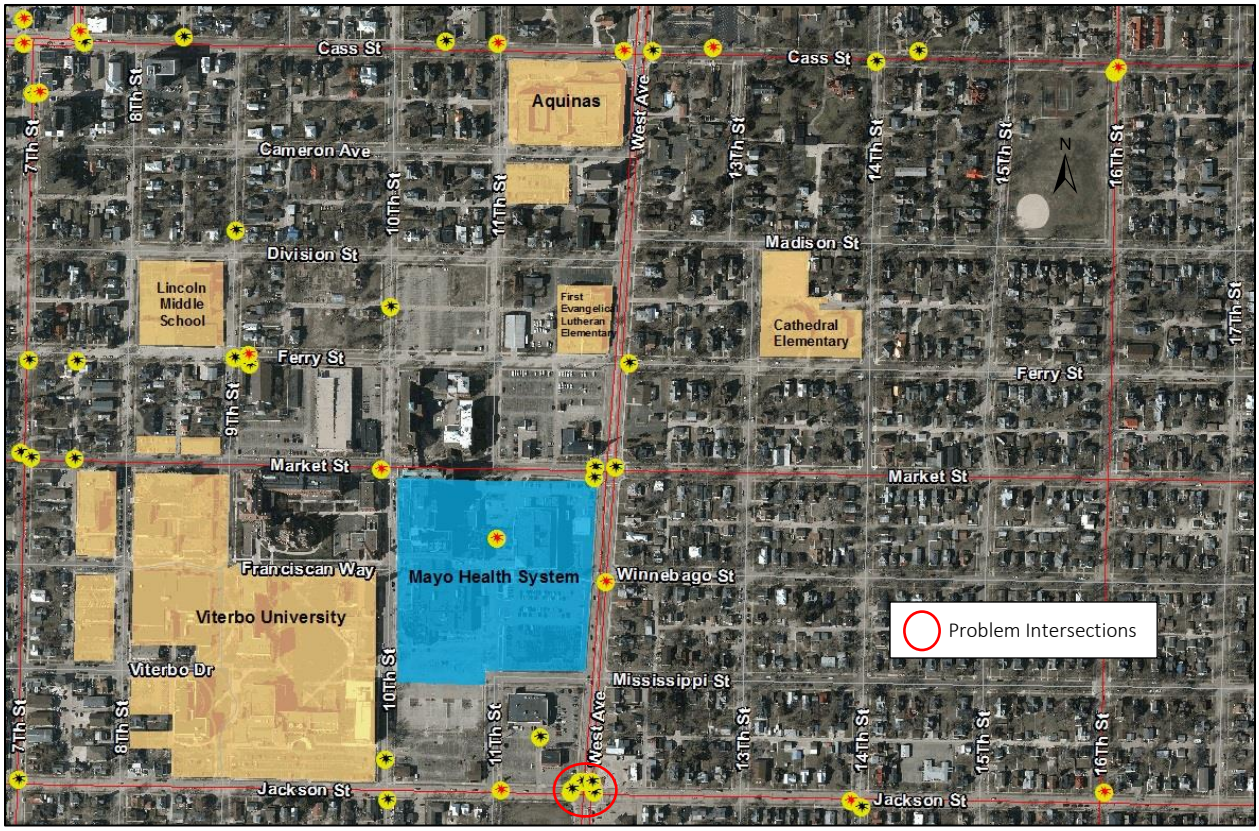

Figure 19: West Ave from Cass St to Jackson St.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes.

West Ave & La Crosse St Intersection

Description

Figure 21 illustrates the configuration of the intersection, its MTU bus stops, the locations of the two bicycle (yellow and black symbols) and three pedestrian (yellow and red symbols) crashes for 2011-2015, and the adjacent land uses. All of the approaches are five-lanes wide that include two lanes in each direction, dedicated left-turn lanes, and medians to separate conflicting traffic flow. The posted speed limit for both West Ave and La Crosse St is 25 mph, but the speed increases to 35 mph on Lang Dr. Typical operating speeds exceed 30 mph on West Ave and La Crosse St, and exceed 40 mph on Lang Dr.

Accommodations for pedestrians include standard crosswalks connecting to perpendicular curb ramps at the southeast and southwest corners of the intersection and to diagonal curb ramps at the northeast and northwest corners. The crosswalks and ramps are offset from the alignment of the sidewalks to minimize in-street walking distance with the large turning radii. The most pronounced offsets narrow the crossing distance for La Crosse St (west of West Ave) from roughly 90 feet down to 72 feet and for West Ave (north of La Crosse St) from 96 feet down to 84 feet.

Bike lanes are present on La Crosse St east of West Ave where parking is not permitted. No bicycle accommodations are present on La Crosse St west of West Ave, however. Parking is allowed on both sides between West Ave and 8th St, reducing the roadway width enough to preclude bike lanes and require vehicles and bicyclists to share lanes.

Traffic Control

The traffic control for the West Ave and La Crosse St intersection is an actuated signal control. Figure 20 illustrates the range of green time from minimum green to maximum green in seconds for each of the turning movements. Because this signal is actuated, the green times can be extended to the maximum green time if traffic volumes warrant. All approaches have protected left-turn phases of a minimum green of 5 seconds and a maximum of 20 seconds for West Ave and a maximum of 30 seconds for La Crosse St. The through-phases for West Ave have a minimum green of 12 seconds and a maximum green of 85 seconds for northbound traffic and a maximum green of 65 seconds for southbound traffic. The through-phases for La Crosse St have a minimum green of 8 seconds and a maximum green of 60 seconds for eastbound traffic and a maximum green of 50 seconds for westbound traffic. When all phases are considered, including the yellow change and the red clearance, the cycle length of this intersection in the presence of traffic can range from a minimum of 46 seconds to a maximum of 211 seconds. (See Appendix A for the vehicle basic and pedestrian timings for this intersection.) According to the City Engineer, however, the signal is programmed for a 70- or 80-second cycle.

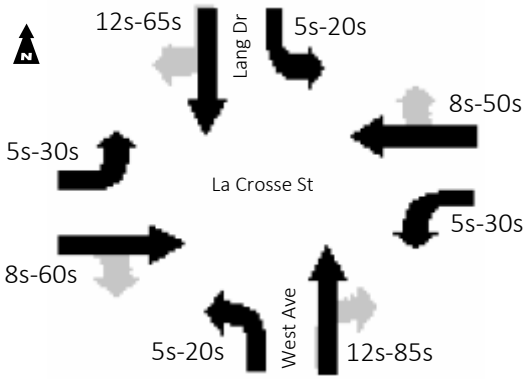

Figure 20: Green time in seconds for the West Ave/La Crosse St intersection.

Pedestrian signal timing includes a 5-second “walk” interval for all crossings at the intersection, a 17-second flashing “don’t walk” or “clearance” interval, and a steady “don’t walk” interval that corresponds to the 3.5-second yellow interval. Total curb-to-curb clearance time is 20.5 seconds for all crossings. The clearance time to cross La Crosse St at its widest crossing calculates to 3.7 ft/s. The clearance time to cross West Ave at its widest crossing (north crossing at Lang Dr) calculates to 4.2 ft/s.

All crossings require pedestrians (and bicyclists operating as pedestrians in the crosswalk) to push a pedestrian button to activate the "walk." The signal poles and their pedestrian activation buttons, however, are inconveniently located for bicyclists to access in relation to the curb ramp and crosswalk.

Traffic Counts

The 2014 AADT for count locations closest to the intersection is 8,300 on La Crosse St between 7th St and 8th St and 20,000 on West Ave between Main St and State St, resulting in an average of 28,300 vehicles through this intersection each day.

Bicycle and pedestrian crossing counts were conducted on Tuesday, October 18 from 7:00 am to 9:00 am. The two-hour count totaled 111 crossings—49 bicycle and 62 pedestrian. (See Table B in Appendix B.) All bicyclists operated in the crosswalks, with none of them dismounting and only some of them pushing the pedestrian button to cross. The south crosswalk experienced the most activity, with 46 crossings, capturing 41.4% of the crossings. The north crosswalk experienced the second highest number of crossings with 26 crossings (23.4%), followed by the west crosswalk with 23 crossings (20.7%), and the east crosswalk with 16 crossings (14.4%). As reported previously in Table 6, the two-hour motor vehicle count for this day of the week and time of day was estimated to be 3,594.

Transit

This intersection is directly served by MTU by three bus stops. The Route 4 Losey Blvd has a stop on La Crosse St at West Ave for outbound passengers to the south side of La Crosse. The Route 5 Valley View has one stop on Lang Dr at La Crosse St for inbound passengers to downtown La Crosse and one stop on West Ave at La Crosse St for outbound passengers to north La Crosse and the Valley View Mall area.

Land Use

The land uses adjacent to the intersection include two eateries (Beef & Etc. and Subway), a coffee shop (Cool Beans), and a gas station/convenience store (Kwik Trip). Student rentals (subdivided houses, apartments above businesses, and apartment buildings) are prevalent along La Crosse St between WTC to the west and UWL to the east and along West Ave south to Main St, and are mixed among commercial enterprises. Off-campus student housing dominates the residential housing stock within ½-mile of the intersection because it is conveniently situated between the WTC and UWL campuses.

Crash Statistics

The West Ave/La Crosse St intersection has the third highest crash index (32.3) among the five identified problem intersections along West Ave. This intersection experienced two bicycle crashes and three pedestrian crashes during the 2011-2015 time period, which averages to 1.0 crash per year.

All of the crashes occurred in a crosswalk, with all but one occurring in the south crosswalk.

Table 7 summarizes characteristics of the five crashes that occurred in this intersection. The crash # in the table corresponds to the location number in Figure 21.

Three of the five crashes occurred when the pavement was wet and the weather was rainy or snowy. Two of the crashes occurred when it was dark, but lighted, including one of the crashes that experienced rain and wet pavement. No fatalities or incapacitating injuries occurred.

Citations were issued in four of the five crashes (#2, #3, #4, and #5). Pedestrians were cited in crashes #2 (disregard traffic control) and #3 (failure to yield) and drivers were cited for failure to yield in crashes #4 and #5. The young driver in crash #4 was also cited for operating a vehicle while intoxicated. No citation was issued

in crash #1 because the matter was turned over to the City of La Crosse attorney as it involved a city transit bus.

Figure 21: Bicycle and pedestrian crashes at the West Ave/La Crosse St intersection, 2011-2015.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes.
The bus symbols represent MTU bus stops. The crash location numbers correspond to the crash numbers in Table 7.

TABLE 7: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING IN THE WEST AVE/LA CROSSE ST INTERSECTION

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Wet	Rain	Daylight	11 am	Saturday May 2011	41-yr old bicyclist struck by driver turning right that was rear-ended by MTU bus; non-incapacitating injury
2	Wet	Snow	Daylight	8 am	Thursday Jan. 2011	27-yr-old driver turning left struck 57-yr-old pedestrian cited for disregarding traffic control; possible injury
3	Wet	Rain	Lighted[2]	9 pm	Sunday Sept. 2011	27-yr-old pedestrian cited for failure to yield to 25-yr-old driver going straight; non-incapacitating injury
4	Dry	Clear	Lighted	3 am	Friday March 2012	21-yr-old driver going straight cited for driver condition and failure to yield to 19-yr-old pedestrian; non-incapacitating injury
5	Dry	Cloudy	Daylight	11 am	Friday March 2011	49-yr-old driver turning right cited for failure to yield to 31-yr-old bicyclist in crosswalk; non-incapacitating injury

[1]The crash number corresponds to the crash location number illustrated in Figure 21.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

West Ave & Badger St Intersection

Description

Figure 23 illustrates the configuration of the intersection and the locations of the four bicycle (yellow and black symbols) and two pedestrian (yellow and red symbols) crashes for 2011-2015. The West Ave approaches have four through-lanes (two in each direction) and a median. Badger St has two traffic lanes (one in each direction) and parking, but traffic is prohibited by the median from going straight across West Ave, restricting motor vehicle movements to right-in and right-out only. The posted speed limit for both West Ave and Main St is 25 mph. Operating speeds can exceed 30 mph, but are typically closer to the posted speed or less because of the close spacing of traffic signals and the high number of bicycle and pedestrian crossings through here.

Pedestrians and bicyclists can cross West Ave at Badger St at a crosswalk enhanced by colored and patterned concrete (Figure 22) bordered by white standard lines. The crosswalk is connected to the sidewalk by perpendicular ramps and crosses through the median, which is about 9-ft wide at this location and serves as a pedestrian refuge. The median, however, does not provide enough capacity to accommodate the high volume of bicycle and pedestrian crossings during peak travel periods. Bicyclists, as seen in the figure, do not dismount and may cause additional conflicts with pedestrians and drivers.

Figure 22: Bicyclists and pedestrians crossing West Ave at Badger St.

Bicycle accommodations include shared road markings ("sharrows") next to parking on both the east and west approaches of Badger St.

Traffic Control

Badger St is controlled by stop signs. A median on West Ave prevents through-traffic on Badger St.

The pedestrian crossing is not enhanced by a pedestrian signal of any kind. A rectangular rapid flashing beacon is present at the next intersection south of here at Pine St.

Traffic Counts

The 2014 AADT for count locations closest to the intersection is 20,000 on West Ave between Main St and State St. No traffic counts are available for Badger St.

Bicycle and pedestrian crossing counts were conducted on Monday, October 17 from 7:00 am to 9:00 am. The two-hour count totaled 411 crossings—129 bicycle and 282 pedestrian. (See Table C in Appendix B.) Many of the bicyclists began by operating in the street on Badger St, but needed to transition to the sidewalk and crosswalk in order to cross West Ave. One bicyclist was riding northbound on West Ave, but transitioned to the crosswalk and sidewalk as he continued north.

The south and only crosswalk for West Ave at Badger St experienced the most crossings at 356 (86.6%). Two pedestrians did, however, begin crossing at what would have been the north crosswalk, cut diagonally to the median, and then completed their crossing north of the designated crosswalk. The remaining 53 crossings occurred north-south across Badger St—31 crossings occurred across the east approach on the UWL side of West Ave and 22 occurred across the west approach on the WTC side. The corresponding two-hour motor

vehicle count for this day of the week and time of day was estimated to be 2,540. (Please note that this excludes traffic from Badger St as there are no traffic counts.)

Transit

MTU does not have any bus stops at this intersection, however, a bus stop for the Route 4 Losey Blvd inbound to downtown La Crosse is one very short block to the east on Badger St and a bus stop for the Route 5 Valley View outbound to Valley View Mall is south of the Route 4 stop on 13th St. Both the Routes 4 and 5 travel through this intersection.

Land Use

The land uses adjacent to the intersection include student rentals on the northwest and southwest corners, the Kwik Trip first illustrated in Figure 18, and Forrest Park, which is an apartment high rise for low-income seniors. Badger St to the east serves as the main artery for the UWL campus whose western-most building is on the southeast corner of Badger St and 13th St. (West Ave is essentially 12th St.) Badger St west to 9th St is lined with student rentals and then transitions into the WTC campus.

Crash Statistics

The West Ave/Badger St intersection has the lowest crash index (8.6) among the six intersections in the planning area identified as averaging one or more bicycle/pedestrian crashes per year. The reason for the low crash index is the high number of crossings taking place without incident. Although this intersection experienced six bicycle- or pedestrian-related crashes during the 2011-2015 time period (averages to 1.2 crashes per year), crash #6 in Figure 23 and Table 8 involved a pedestrian that darted into traffic, resulting in one vehicle rear-ending another. The pedestrian was not physically in the crash.

The other five crashes occurred in the crosswalk to cross West Ave and resulted in two non-incapacitating injuries and three possible injuries. Four of the five were bicycle crashes—all of which occurred in 2012.[12] One common situation is when a vehicle in one lane stops while the vehicle in the neighboring lane does not (#1, #2, #4, #5). All of the crashes involved the driver going straight.

Half of the crashes resulted in a citation. One bicyclist was cited for inattentive driving and failure to yield (#3), one driver for improper overtaking (#4), and one driver for failure to keep the vehicle under control (#6). No citation was issued to a young driver who failed to yield to a bicyclist (#1) because the road condition was considered a possible contributing factor.

All of the crashes involved young bicyclists or pedestrians and two involved young drivers. Four of the six occurred during an hour of the day on a weekday when class was in session. None of the crashes involved teen or senior drivers.

[12] In 2013, LAPC staff conducted a two-hour count and behavioral observation of the West Ave/Badger St intersection to identify why there were so many crashes there. The most likely reasons involved 1) a high volume of motor vehicles stopped for the signal at La Crosse St and queued through the Badger St crossing coupled with 2) bicyclists weaving through the stopped traffic. Queuing of traffic was not observed during the count for this study, but has been observed while traveling through the corridor during the afternoon peak. See Chapter 4 Existing Conditions of *Coulee Vision*, the 2040 long-range transportation plan for more information.

Figure 23: Bicycle and pedestrian crashes at the West Ave/Badger St intersection, 2011-2015.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes. The crash location numbers correspond to the crash numbers in Table 8.

TABLE 8: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING IN THE WEST AVE/BADGER ST INTERSECTION

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Wet	Rain	Daylight	11 am	Monday March 2012	21-yr-old driver going straight failed to yield (not cited) to a 21-yr-old bicyclist in the crosswalk; possible injury
2	Dry	Cloudy	Daylight	12 pm	Friday Oct. 2012	48-yr-old driver going straight struck 21-yr-old bicyclist in crosswalk; traffic backed up; no citation; possible injury
3	Dry	Clear	Daylight	3 pm	Thursday August 2012	57-yr-old driver going straight struck 21-yr-old bicyclist cited for inattentive driving and failing to yield; non-incapacitating injury
4	Dry	Cloudy	Daylight	11 am	Tuesday Dec. 2014	59-yr-old driver going straight cited for improper overtaking and striking 21-yr-old pedestrian; non-incapacitating injury
5	Dry	Clear	Daylight	7 pm	Tuesday April 2012	27-yr-old driver going straight struck 20-yr-old bicyclist; inside lane stopped, outside lane did not; no citations; possible injury
6	Wet	Cloudy	Lighted[2]	8 pm	Saturday Sept. 2013	21-yr-old driver cited for failure to control vehicle after rear-ending vehicle driven by 18-yr-old stopping for pedestrian; no injury

[1]The crash number corresponds to the crash location number illustrated in Figure 23.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

West Ave & State St Intersection

Description

Figure 25 illustrates the configuration of the intersection and the locations of the two bicycle (yellow and black symbols) and three pedestrian (yellow and red symbols) crashes for 2011-2015. The West Ave approaches are five lanes wide that include two lanes in each direction, dedicated left-turn lanes, and medians to separate conflicting traffic flow. The State St approaches are three lanes wide—one lane in each direction and a dedicated left-turn lane. Parking is allowed on both sides of the road away from the intersection. The posted speed limit for both West Ave and Main St is 25 mph. Operating speeds, however, usually exceed the posted limit.

Accommodations for pedestrians include standard crosswalks connecting to perpendicular curb ramps. The crosswalks and ramps are offset from the alignment of the sidewalks to minimize in-street walking distance with the large turning radii. The most pronounced offsets narrow the crossing distance for State St through the west crosswalk from roughly 71 feet down to 46 feet and for West Ave through the north crosswalk from 89 feet down to 68 feet.

Traffic Control

The traffic control for the West Ave and State St intersection is an actuated signal control. Figure 24 illustrates the range of green time from minimum green to maximum green in seconds for each of the turning movements. Because this signal is actuated, the green times can be extended to the maximum green time if traffic volumes warrant. The West Ave approaches have protected left-turn phases of a minimum green of 5 seconds and a maximum of 20 seconds; the State St approaches do not have protected left-turn phases so that green is used to extend the through movement. The through-phases for West Ave have a minimum green of 20 seconds and a maximum green of 30 seconds; the through-phases for State St have a minimum green of 17 seconds and a maximum green of 25 seconds. When all phases are considered, the cycle length of this intersection in the presence of traffic can range from a minimum of 68 seconds to a maximum of 111 seconds. In the absence of traffic on State St, the signal for West Ave as the major street could conceivably stay green. (See Appendix A for the vehicle basic and pedestrian timings for this intersection.) According to the City Engineer, however, the signal is programmed for a 70- or 80-second cycle.

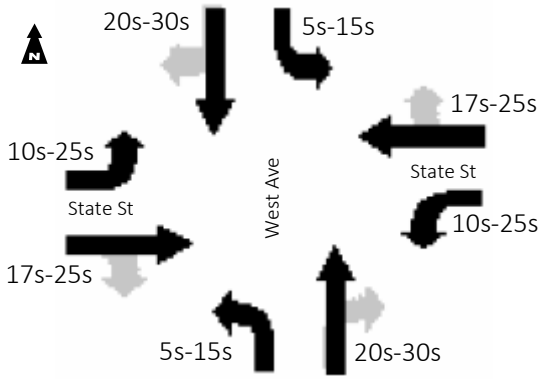

Figure 24: Green time in seconds for the West Ave/State St intersection.

Pedestrian signal timing includes a 6-second “walk” interval for all crossings at the intersection, a 14-second flashing “don’t walk” or “clearance” interval to complete the crossing of Main St, and a 16-second flashing “don’t walk” interval to complete the crossing of West Ave. A steady “don’t walk” interval corresponds to the 3-second yellow interval and the red interval for motor vehicle traffic. Total curb-to-curb clearance time is 21 seconds to cross Main St and 19 seconds to cross West Ave. The clearance time to cross Main St is 3.4 ft/s and to cross West Ave is 3.9 ft/s. All crosswalks—and especially those crossing West Ave—are heavily used by pedestrians and bicyclists destined for the University of Wisconsin-La Crosse and the YMCA.

The pedestrian signal to cross State St automatically generates a “walk” without having to push a button. A pedestrian must push the pedestrian button to activate the “walk” to cross West Ave.

Traffic Counts

The 2014 AADT for count locations closest to the intersection is 2,700 on State St between 11th St and West Ave and 20,000 on West Ave between Main St and State St. The intersection is estimated to experience an average of 2,700 + 20,000 = 22,700 vehicles per day.

Bicycle and pedestrian crossing counts (Table D, Appendix B) were conducted from the Moka parking lot on Thursday, October 13 from 7:00 am to 9:00 am. The two-hour count totaled 136 crossings—54 bicycle and 82 pedestrian. All but one bicyclist operated in a crosswalk and that one bicyclist operated on State St. None of the bicyclists operating in the crosswalk dismounted and only a few pushed the pedestrian activation button. Motor vehicle traffic was very heavy within the parking lot as drivers stopped to get coffee.

The busiest crosswalk during the count was the south crosswalk with 46 crossings (23 bicycle and 23 pedestrian) closely followed by the north crosswalk with 43 crossings (17 bicycle and 26 pedestrian)—a total of 89 crossings of West Ave (65.9% of all crosswalk crossings). North-south crossings of State St had 38 crossings (9 bicycle and 29 pedestrian) in the west crosswalk and only 8 crossings (4 bicycle and 4 pedestrian) in the east crosswalk. The corresponding two-hour motor vehicle count for this day of the week and time of day was estimated to be 2,815 (Table 5).

Transit

The MTU Route 5 Valley View has two bus stops at this intersection—one on West Ave at State St for inbound to downtown La Crosse and one on State St at West Ave for outbound to north La Crosse and the Valley View Mall area.

Land Use

The land uses adjacent to the intersection include rentals marketed to students, the Marine Credit Union and the Moka coffee shop of which both have drive-throughs, and Olsten Staffing Services (Figure 25). State St connects directly to downtown La Crosse, WTC, and UWL. Other schools within a ½-mile buffer of the intersection include Lincoln Middle School, First Evangelical Lutheran Elementary, Cathedral Elementary and Aquinas Middle and High Schools. Only Cathedral Elementary currently participates in a Safe Routes to School (SRTS) program to teach children how to be safe while walking and biking to school and it's roughly ½-mile by sidewalk east and south of the intersection.

Crash Statistics

The West Ave/State St intersection has the second lowest crash index (20.8) among the problem intersections. This intersection experienced two bicycle and three pedestrian crashes during the 2011-2015 time period, averaging 1.0 crashes per year.

Table 9 summarizes characteristics of the five crashes that occurred in this intersection. The crash # in the table corresponds to the location number in Figure 25.

The south crosswalk, which was reported to have experienced the highest number of crossings (46), also experienced most of the crashes (60.0%). The north crosswalk experienced nearly as many crossings (43), but it experienced no crashes.

The only crash that occurred during adverse environmental conditions (#3) resulted in a fatality. The inside lane of traffic had stopped for a pedestrian crossing outside of a crosswalk during a "don't walk" phase while the vehicle in the outside lane continued. Three of the other four crashes resulted in non-incapacitating injuries, with the fourth crash resulting in a possible injury.

Two crashes involved young drivers (#2 and #5) and one crash (#1) involved a senior driver. A citation was issued in crash #5 to the pedestrian for disregarding the traffic control. Four of the five crashes were due to bicyclist or pedestrian error. The fifth crash was a hit-and-run (#4).

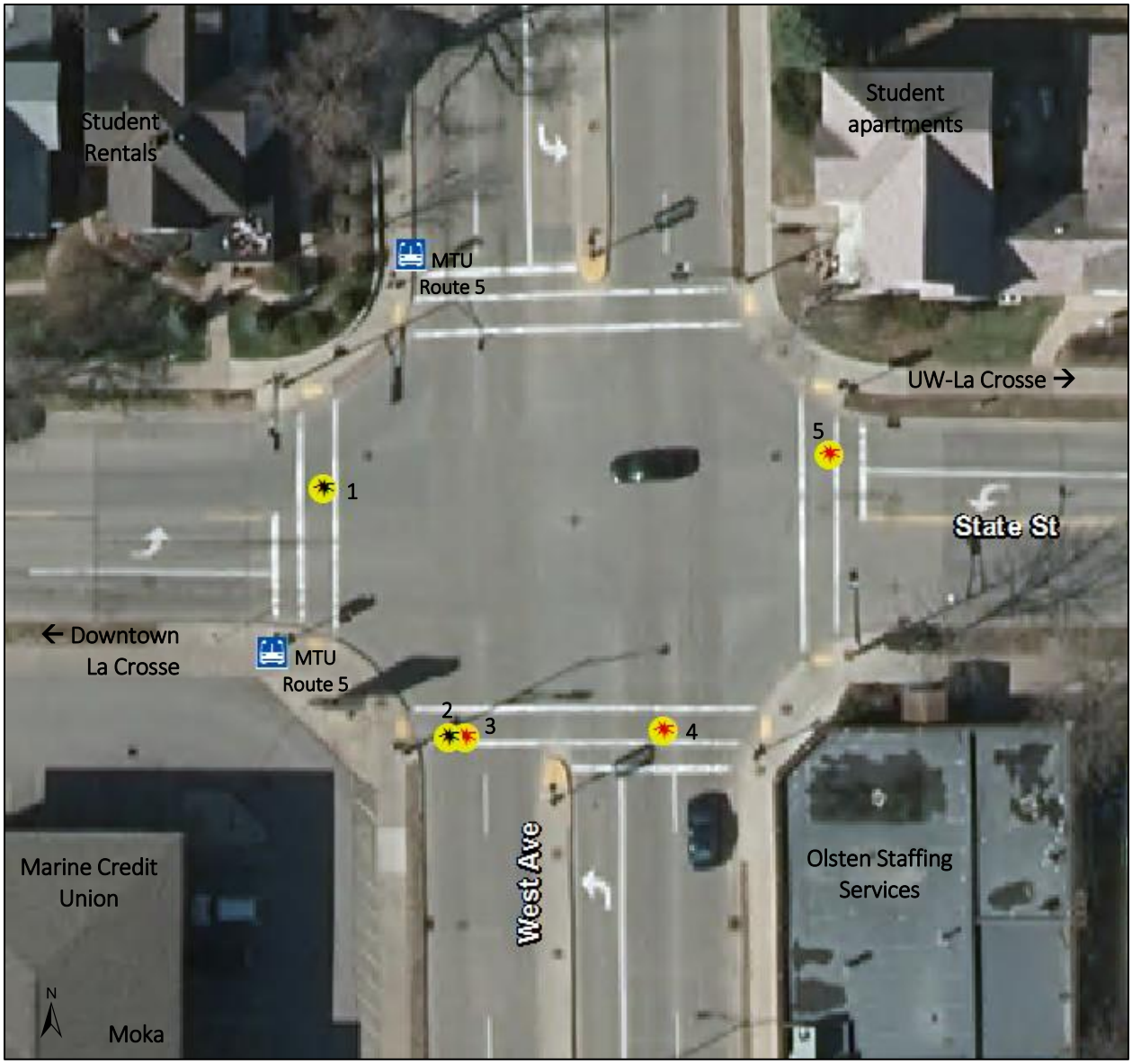

Figure 25: Bicycle and pedestrian crashes at the West Ave/State St intersection, 2011-2015.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes.
The bus symbols represent MTU bus stops. The crash location numbers correspond to the crash numbers in Table 9.

TABLE 9: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING IN THE WEST AVE/STATE ST INTERSECTION

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Dry	Clear	Daylight	1 pm	Tuesday Sept. 2014	86-yr-old driver going straight struck 18-yr old bicyclist who disregarded traffic control; no citations; non-incapacitating injury
2	Dry	Clear	Daylight	9 am	Monday Sept 2011	20-yr-old driver turning left struck 27-yr-old bicyclist who entered crosswalk during the turn; no citations; possible injury
3	Snow	Snow	Lighted[2]	6 am	Monday Dec. 2012	39-yr-old driver going straight struck 51-yr-old pedestrian who disregarded traffic control; no citations; fatality
4	Dry	Cloudy	Daylight	4 pm	Monday Sept. 2014	Hit-and-run crash of 19-yr-old pedestrian who could not complete crossing before signal turned; non-incapacitating injury
5	Dry	Clear	Daylight	5 pm	Thursday March 2013	21-yr-old driver turning right struck 57-yr-old pedestrian cited for intoxication and disregarding traffic control; non-incapacitating injury

[1]The crash number corresponds to the crash location number illustrated in Figure 25.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

West Ave & Main St Intersection

Description

Figure 27 illustrates the configuration of the intersection and the locations of the three bicycle (yellow and black symbols) and three pedestrian (yellow and red symbols) crashes for 2011-2015. All of the approaches are five-lanes wide that include two lanes in each direction, dedicated left-turn lanes, and medians to separate conflicting traffic flow. The posted speed limit for both West Ave and Main St is 25 mph; however, speeds often exceed 30 mph.

Accommodations for pedestrians include standard crosswalks connecting to perpendicular curb ramps. Again, the crosswalks and ramps are offset from the alignment of the sidewalks to minimize in-street walking distance with the large turning radii. The most pronounced offsets narrow the crossing distance for Main St (west of West Ave) from roughly 95 feet down to 72 feet and for West Ave (north of Main St) from 90 feet down to 71 feet.

Bicycle accommodations are limited to curbside sharrows on the Main St approaches.

Traffic Control

The traffic control for the West Ave/Main St intersection is an actuated signal control with identical signal timing (Figure 26) as its neighbor to the north (State St). The West Ave approaches have protected left-turn phases of a minimum green of 5 seconds and a maximum of 15 seconds; the Main St approaches do not have protected left-turn phases so that green is used to extend the through movement. The through-phases for West Ave have a minimum green of 20 seconds and a maximum green of 30 seconds; the through-phases for Main St have a minimum green of 17 seconds and a maximum green of 25 seconds. When all phases are considered, the cycle length of this intersection in the presence of traffic can range from a minimum of 68 seconds to a maximum of 111 seconds. In the absence of traffic on Main St, the signal for West Ave could conceivably stay green. (See Appendix A for the vehicle basic and pedestrian timings for this intersection.) According to the City Engineer, however, the signal is programmed for a 70- or 80-second cycle.

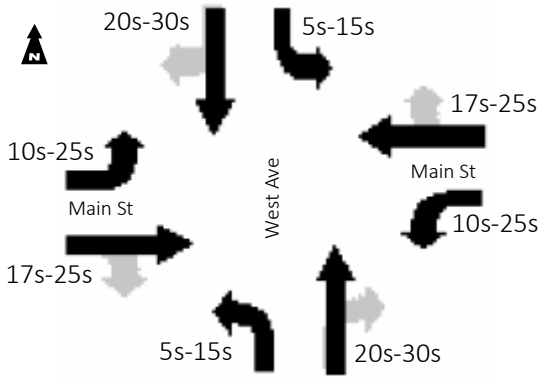

Figure 26: Green time in seconds for the West Ave/Main St intersection.

Pedestrian signal timing includes a 6-second “walk” interval for all crossings at the intersection, an 18-second flashing “don’t walk” or “clearance” interval to complete the crossing of Main St, and a 16-second flashing “don’t walk” interval to complete the crossing of West Ave. A steady “don’t walk” interval corresponds to the 3-second yellow interval and the red interval for motor vehicle traffic. Total curb-to-curb clearance time is 21 seconds to cross Main St and 19 seconds to cross West Ave. The clearance time to cross Main St is 3.4 ft/s and to cross West Ave is 3.9 ft/s. All crosswalks—and especially those crossing West Ave—are heavily used by pedestrians and bicyclists destined for the University of Wisconsin-La Crosse and the YMCA.

The pedestrian signal to cross Main St automatically generates a “walk” without having to push a button. A pedestrian must push the pedestrian button to activate the “walk” to cross West Ave.

Traffic Counts

The 2014 AADT for count locations closest to the intersection is 4,600 on Main St between 11th St and West Ave and 20,000 on West Ave between Main St and State St. The intersection is estimated to experience an average of 4,600 + 20,000 = 24,600 vehicles per day.

Bicycle and pedestrian crossing counts were conducted on Tuesday, October 11 from 7:00 am to 9:00 am. The two-hour count totaled 86 crossings—47 bicycle and 39 pedestrian. Sixteen bicyclists operated in the street (16 crossings of West Ave), but only on Main St. Of the 31 bicyclists operating in the crosswalk, none dismounted and only a few pushed the pedestrian activation button. The west crosswalk experienced the most crossings at 29 (40.8%), the north and south crosswalks experienced the same number of crossings (17 each), while the east crosswalk had the fewest crossings (8). This intersection experienced a large number of joggers who paid little attention to the traffic control. (See Table E in Appendix B.) The corresponding two-hour motor vehicle count for this day of the week and time of day was estimated to be 3,125 (Table 5).

Transit

The closest bus stop to this intersection is located one block north on State St at West Ave for outbound Route 5 Valley View. The inbound Route 5 has a stop on West Ave at State St.

Land Use

The land uses adjacent to the intersection include *The Ave* off-campus student apartments, First Baptist Church, a medical complex devoted to dentistry, and the YMCA (Figure 27). Within ½-mile of the intersection, the most significant destinations include a technical college, a university, three elementary/middle schools, a high school, and the YMCA. Of the elementary/middle schools, only Cathedral currently participates in a SRTS program and it's roughly 0.4 miles east and south of the Main St/West Ave intersection.

Crash Statistics

The West Ave/Main St intersection has the second highest crash index (42.9) among the five identified problem intersections along West Ave. This intersection experienced three bicycle crashes and three pedestrian crashes during the 2011-2015 time period, which averages to 1.2 crashes per year.

All of the crashes occurred in a crosswalk, with half (two bicycle and one pedestrian) occurring in the west crosswalk. (During the two-hour count, the highest number of bicycle and pedestrian crossings (29) occurred in this crosswalk.)

Table 10 summarizes characteristics of the six crashes that occurred in this intersection. The crash # in the table corresponds to the location number in Figure 27.

Two of the six crashes occurred when the pavement was wet and the weather was rainy. Only two of the crashes occurred when it was dark, but lighted (street lights), including one of the crashes that experienced rain and wet pavement. All six crashes occurred between the hours of 1:00 pm and 8:00 pm, with three occurring on a weekday during the school year and one occurring during the weekday afternoon travel peak (2:00 pm-5:00 pm). One of the crashes (#5) resulted in an incapacitating injury to a bicyclist when he entered the crosswalk and rode into a vehicle as it was turning right. The major contributing factor for the crash was the bicyclist disregarding the traffic control.

One crash involved a child and it was a hit-and-run crash (#1). Two crashes involved young drivers (#2 and #3), but only one was to fault (#3). No crashes involved teen or senior drivers.

Despite contributing factors being reported (disregard traffic control, failure to yield, and inattentive driving), only two of the six crashes resulted in citations: one issued to a driver for failure to yield (#3) and one issued to

a bicyclist for failure to yield (#4). Two of the four crashes where no citations were issued were hit-and-run crashes.

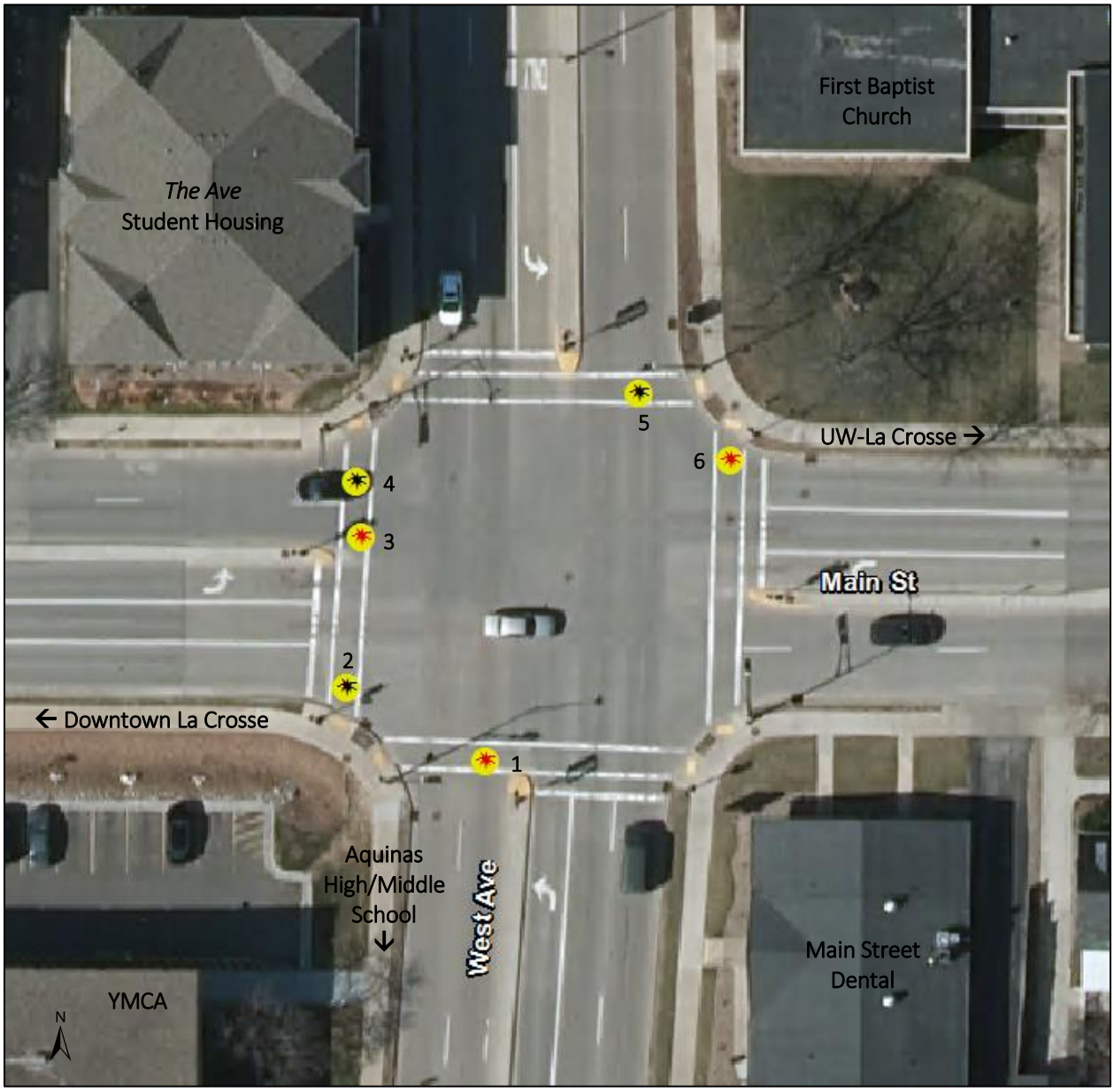

Figure 27: Bicycle and pedestrian crashes at the West Ave/Main St intersection, 2011-2015.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes. The crash location numbers correspond to the crash numbers in Table 10.

TABLE 10: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING IN THE WEST AVE/MAIN ST INTERSECTION

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Dry	Cloudy	Daylight	2 pm	Monday Nov. 2011	Hit & run of 12-yr old pedestrian by driver of unknown age turning right and failing to yield; non-incapacitating injury
2	Dry	Cloudy	Lighted[2]	8 pm	Saturday Oct. 2015	22-yr-old driver turning right struck by 41-yr-old bicyclist entering crosswalk on red; non-incapacitating injury
3	Wet	Rain	Lighted	7 pm	Tuesday Feb. 2012	21-yr-old driver turning left cited for failure to yield to 67-yr-old pedestrian in crosswalk; possible injury
4	Dry	Clear	Daylight	1 pm	Thursday July 2015	36-yr-old driver turning right struck by 56-yr-old bicyclist cited for failure to yield; non-incapacitating injury
5	Dry	Clear	Daylight	6 pm	Tuesday June 2012	28-yr-old driver turning right struck in crosswalk by 27-yr-old bicyclist disregarding traffic control; incapacitating injury
6	Wet	Rain	Daylight	6 pm	Tuesday May 2015	Driver "in 20's" turning right on red struck 54-yr-old pedestrian; hit and run; no injury

[1]The crash number corresponds to the crash location number illustrated in Figure 27.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

West Ave & Jackson St Intersection

Description

Figure 29 illustrates the configuration of the intersection and the locations of the five bicycle (yellow and black symbols) and three pedestrian (yellow and red symbols) crashes for 2011-2015. The West Ave north and south approaches to the intersection each include two through lanes, one left-turn lane, and a 6-ft-wide median to separate opposing traffic streams. The Jackson St approaches include two through lanes in each direction (east and west) through the intersection, after which they merge into single lanes with on-street parking. Although the posted speed limit for both West Ave and Jackson St is 25 mph, motor vehicle speeds often exceed 30 mph.

Accommodations for pedestrians include marked, standard crosswalks. The crosswalks are connected to perpendicular curb ramps, both of which are offset from the alignment of the sidewalks. This requires pedestrians to veer out of the logical path of travel to access the pedestrian button and curb ramp. The offset crossings do narrow the crossing distances for Jackson St from roughly 74 feet down to 50 feet and for West Ave from 86 feet down to 68 feet.

There are no accommodations for bicyclists. The location of the pedestrian button is also inconveniently placed for bicyclists operating as pedestrians to push the activation while being positioned to cross the street.

Traffic Control

The traffic control for the West Ave and Jackson St intersection is an actuated signal control. Figure 28 illustrates the range of green time from minimum green to maximum green in seconds for each of the turning movements. Only the West Ave approaches have protected left-turn phases. These phases have a minimum green of 5 seconds and a maximum green of 15 seconds. Through-traffic on West Ave can have as little as 20 seconds of green time to as much as 30 seconds before a 3.0-second yellow change and a 2.0-second red clearance. Although the vehicle basic timing includes a left-turn phase for Jackson St, the signal only accommodates permissive left turns during the through phase (all Jackson St traffic gets a green at the same time). This allows for a shorter cycle length that ranges from a minimum of 55 seconds to a maximum of 83 seconds. (See Appendix A for the vehicle basic and pedestrian timings for this intersection.) According to the City Engineer, however, the signal is programmed for a 70- or 80-second cycle.

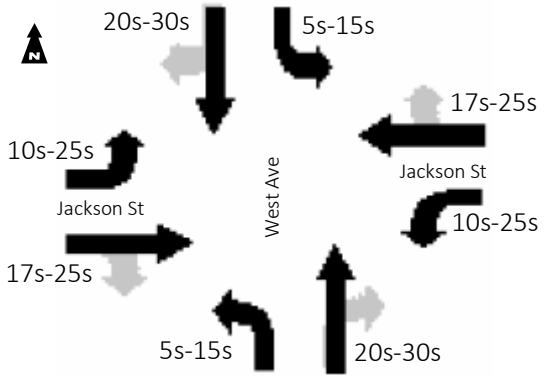

Figure 28: Green time in seconds for the West Ave/Jackson St intersection.

Pedestrian signal timing includes a 6-second “walk” interval for all crossings at the intersection, a 12-second flashing “don’t walk” or “clearance” interval to complete the crossing of Jackson St, and a 17-second flashing “don’t walk” interval to complete the crossing of West Ave. All “walks” are activated by a pedestrian activation button on the traffic signal pole. A steady “don’t walk” interval corresponds to the 3-second yellow interval and the red interval for motor vehicle traffic. Total curb-to-curb clearance time is 15 seconds to cross Jackson St, which calculates to an actual walking speed of 3.3 ft/s, and 20 seconds to cross West Ave, which calculates to 3.4 ft/s.

Traffic Counts

Motor vehicle counts taken in 2014 closest to the intersection occurred on Jackson St between 11th St and West Ave and on West Ave between Jackson St and Johnson St. The annual average daily traffic (AADT) for Jackson St was 8,500; the AADT for West Ave was 13,100. The intersection is estimated to experience an average of 8,500 + 13,100 = 21,600 vehicles per day.

Bicycle and pedestrian crossing counts were conducted on Monday, October 10 from 7:00 am to 9:00 am. The two-hour count totaled 69 crossings—41 bicycle and 28 pedestrian (see Table F in Appendix B). The majority of the crossings (70%) were westbound (31) and northbound (17) toward the major destinations north of Jackson St and west of West Ave (refer back to Figure 18). As reported previously in Table 5, the two-hour motor vehicle count for this day of the week and time of day was estimated to be 2,743.

Transit

The MTU and the Scenic Mississippi River Transit (SMRT) service directly serve the Mayo Health System hospital and clinic at a bus stop on 11th St within the medical campus. Both services utilize Market St and Jackson St west of West Ave for their routes, but only MTU has a bus stop within one block of the Jackson St/West Ave intersection and it is located on 11th St at Jackson St. The MTU does not have any stops at this intersection.

Land Use

The land uses adjacent to the intersection include the Sip 'n Surf Laundromat, Taco John's, Bob's Auto Service, and Powell Park. Within ½-mile of the intersection, the most significant destinations include a hospital, a university, five elementary/middle schools, a high school, and a pharmacy. Of the elementary/middle schools, only Cathedral currently participates in a Safe Routes to School (SRTS) program to teach children how to be safe while walking and biking to school and it's roughly 0.4 miles east and north of the Jackson St/West Ave intersection.

Crash Statistics

As identified in Table 5, the West Ave/Jackson St intersection has the highest crash index (64.0) among the five identified problem intersections along West Ave. This intersection experienced five bicycle crashes and three pedestrian crashes during the 2011-2015 time period, which averages to 1.6 crashes per year.

Seven of the eight crashes occurred in a crosswalk—five (three bicycle, two pedestrian) occurred within the north crosswalk between Sip 'n Surf and Taco John's and two (one bicycle, one pedestrian) occurred within the crosswalk between Powell Park and Sip 'n Surf. The eighth crash involved a bicyclist operating in the street.

Even though the north and south crosswalks experienced roughly the same number of crossings (11 and 10, respectively) during the two-hour count (and one could extrapolate similar activity throughout the day), the north crosswalk experienced significantly more bicycle and pedestrian crashes (5) than did the south crosswalk (0). The likely reason is that the north approach of West Ave and the west approach of Jackson St receive the bulk of the traffic moving through the intersection. Although, we have no intersection counts that include turning movements to support this reasoning, the concentrated land uses northwest of the intersection and the higher traffic counts recorded less than ½-mile upstream (19,800 between Cass St and Cameron Ave) suggest this could be true.

Table 11 summarizes characteristics of the five crashes that occurred in this intersection. The crash # in the table corresponds to the location number in Figure 29.

Three of the eight crashes occurred when the pavement was wet and two of these experienced rain. Half (4) of the crashes occurred when it was dark, but lighted (street lights), including the two crashes that experienced

rain. Seven of the eight crashes occurred on a weekday, with six of the seven also occurring during the school year. Only two of the eight crashes occurred during the weekday travel peaks for West Ave—one during the morning peak (7:00 am to 8:00 am) and one during the afternoon peak (2:00 pm-5:00 pm). One of the crashes (#8) resulted in an incapacitating injury to an 18-yr-old bicyclist who disregarded the traffic control.

Of the seven crashes with recorded ages for the drivers, two involved a senior driver (one cited), four involved a young driver (one cited), and one involved a teen driver (not cited). Half of these (#3, #6, and #7) involved driver error (disregard traffic control and failure to yield to a pedestrian).

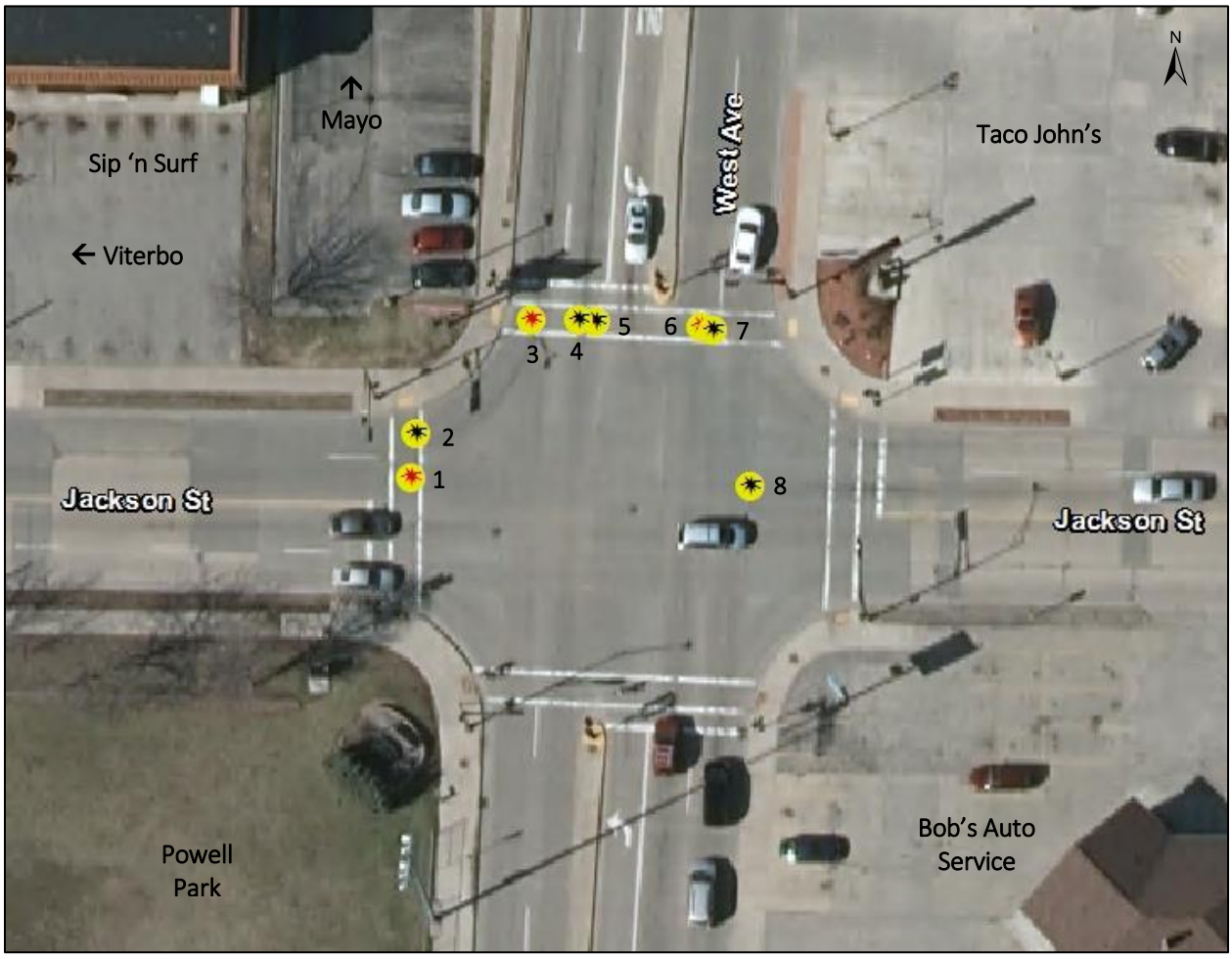

Figure 29: Bicycle and pedestrian crashes at the West Ave/Jackson St intersection, 2011-2015.
Yellow/black symbols represent bicycle crashes and yellow/red symbols represent pedestrian crashes. The crash location numbers correspond to the crash numbers in Table 11.

TABLE 11: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING IN THE WEST AVE/JACKSON ST INTERSECTION

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Dry	Clear	Lighted[2]	5 pm	Monday Nov. 2013	61-yr-old driver turning left cited for inattentive driving & failure to yield to 49-yr-old pedestrian; non-incapacitating injury
2	Dry	Clear	Daylight	6 pm	Tuesday June 2011	Driver of unrecorded age and gender turning right failed to yield to 28-yr-old bicyclist in crosswalk; possible injury
3	Dry	Cloudy	Daylight	7 am	Monday Dec. 2011	22-yr-old driver turning right disregarded traffic control striking 14-yr-old pedestrian who disregarded traffic control; no citations; non-incapacitating injury
4	Wet	Rain	Lighted	7 pm	Friday Oct. 2014	78-yr-old driver turning right struck 14-yr-old bicyclist cited for crossing on “don’t walk”; non-incapacitating injury
5	Wet	Cloudy	Dusk	8 pm	Sunday July 2011	18-yr-old driver struck 13-yr-old bicyclist who disregarded traffic control & failed to yield; non-incapacitating injury
6	Dry	Clear	Daylight	12 pm	Friday March 2012	82-yr-old driver turning left cited for failure to yield to 13-yr-old pedestrian; non-incapacitating injury
7	Wet	Rain	Lighted	6 pm	Tuesday Oct. 2015	23-yr-old driver turning left cited for failure to yield to 71-yr-old bicyclist; possible injury
8	Dry	Cloudy	Lighted	7 pm	Friday Oct. 2011	24-yr-old driver struck 18-yr-old bicyclist cited for disregarding traffic control; incapacitating injury

[1]The crash number corresponds to the crash location number illustrated in Figure 29.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

Other Crashes Along West Ave Between La Crosse St and Jackson St

Table 12 provides the details for the 15 crashes along the problem segment of West Ave between La Crosse St and Jackson St that are not associated with the five problem intersections discussed previously. All but two of the 15 crashes occurred in a crosswalk or on a sidewalk, including eight of the nine bicycle crashes. Three of the 15 crashes were the result of a driver exiting a parking lot (Kwik Trip and Marine Credit Union/Moka); five occurred at signalized intersections (two at Cass St and three at Market St); and one occurred at a crosswalk through a median (Winnebago St).

Only one crash occurred with adverse environmental conditions (wet, rain, and lighted), but this crash also included an intoxicated driver (one of the two crashes involving a driver under the influence) and an intoxicated pedestrian. The other crash with a driver under the influence involved a 26-yr-old driver driving over the median and hitting a bicyclist in the crosswalk.

One crash resulted in a fatality and three crashes resulted in four incapacitating injuries (two in the same crash—a driver and a bicyclist). The driver in the fatal crash at King St was not cited for a violation because the pedestrian was crossing outside of a crosswalk when the driver on West Ave had the right of way (King St is stop controlled, while West Ave is not). Vehicles in the inside lane stopped to let her cross while the driver involved in the crash continued through.

Three of the crashes were hit-and-run crashes, resulting in a possible injury each to a pedestrian and a bicyclist and non-incapacitating injuries to two pedestrians in the same crash.

Only one-third of the crashes occurred during the peak travel periods for motor vehicles (6:00 am-8:00 am and 3:00 pm-6:00 pm) and just over half occurred on a weekday during the school year.

TABLE 12: DETAILS OF OTHER BICYCLE & PEDESTRIAN CRASHES ALONG WEST AVE PROBLEM CORRIDOR

	Environmental Conditions			Time Factors		
Crash Location	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
Kwik Trip	Dry	Cloudy	Daylight	3 pm	Wednesday June 2013	35-yr-old driver looking left to merge north into traffic from parking lot cited for failure to yield to 49-yr-old bicyclist traveling south on sidewalk; incapacitating injury
Pine St (west crosswalk)	Dry	Cloudy	Lighted[1]	9 pm	Saturday Sept. 2011	Hit and run driver reported to have made rolling stop struck 23-yr-old pedestrian; crash reported two days after incident; no citations; possible injury
Pine St (east crosswalk)	Dry	Clear	Lighted	9 pm	Wednesday May 2014	68-yr-old driver going straight cited for failure to yield to 22-yr-old bicyclist in crosswalk cited for "other" (no explanation); non-incapacitating injury
Vine St (south crosswalk)	Dry	Clear	Lighted	12 am	Saturday Sept. 2014	Hit and run driver was inattentive and failed to yield to two 19-yr-old pedestrians; no citation; non-incapacitating injuries
Moka	Dry	Clear	Daylight	5 pm	Friday Sept. 2012	Hit and run driver exiting parking lot struck 21-yr-old bicyclist on sidewalk; possible injury
Alley by Moka	Dry	Clear	Daylight	9 am	Wednesday Nov. 2013	34-yr-old driver turning right and looking left cited for failure to yield to 27-yr-old bicyclist; non-incapacitating injury
King St	Dry	Cloudy	Daylight	7 am	Monday May 2011	42-yr-old driver going straight struck 55-yr-old pedestrian crossing outside crosswalk; fatality
King St (north crosswalk)	Wet	Rain	Lighted	2 am	Sunday Sept. 2013	52-yr-old driver going straight cited for intoxication after striking 22-yr-old intoxicated pedestrian; non-incapacitating injury
Cass St (west crosswalk)	Dry	Cloudy	Daylight	4 pm	Wednesday Jan. 2015	21-yr-old driver turning left cited for failure to yield and inattentive driving for striking 26-yr-old jogger; non-incapacitating injury
Cass St (east crosswalk)	Dry	Cloudy	Daylight	1 pm	Thursday June 2012	59-yr-old driver turning right on red cited for failure to yield to 23-yr-old bicyclist in crosswalk; possible injury
Ferry St (east crosswalk)	Dry	Clear	Daylight	11 am	Sunday June 2014	26-yr-old driver cited for intoxication after driving over median and striking 20-yr-old bicyclist; both had incapacitating injuries
Market St (west crosswalk)	Dry	Clear	Daylight	4 pm	Wednesday Sept. 2012	22-yr-old driver turning right struck 12-yr-old bicyclist in crosswalk; no citations; possible injury
Market St (west crosswalk)	Dry	Clear	Daylight	10 am	Friday August 2012	36-yr-old driver turning right on red cited for failure to yield to 26-yr-old bicyclist in crosswalk; possible injury
Market St (travel lane)	Dry	Clear	Lighted	10 pm	Tuesday April 2015	20-yr-old driver turning left cited for failure to yield to 62-yr-old bicyclist going straight in travel lane; possible injury
Winnebago St (south crosswalk)	Dry	Clear	Daylight	1 pm	Monday May 2012	61-yr-old driver going straight cited for inattentive driving after striking 42-yr-old pedestrian; incapacitating injury

[1]Dark, but lit by street lights.

Source: WisTransPortal System, U.W. Madison TOPS Lab.

3rd St between State St and King St

Description

Third St is a one-way, two-lane facility for southbound USH 53 through downtown La Crosse, with a posted speed limit of 25 mph. Parking is allowed on both sides of the roadway between State St and King St except for half of the block between State St and Main St in front of the Main Street Parking Ramp and the whole block between Pearl St and Jay St in front of the La Crosse Center Parking Ramp. Parking is free and limited to two hours between the hours of 8:00 am and 6:00 pm, Monday through Friday, with the exception of holidays.

Accommodations for pedestrians include a complete sidewalk system connected by faded standard crosswalks at all crossings. All but one of the crosswalks are connected to perpendicular curb ramps and all crosswalks allow for the direct continuation without offset to the opposite sidewalk. The 3rd St/Pearl St intersection has pedestrian bumpouts to shorten the crossing distance for pedestrians crossing Pearl St, but there is no such accommodation to help pedestrians cross 3rd St. Decorative lamp posts are installed at all corners (two per corner) and at regular intervals along the sidewalks.

Accommodations for bicyclists are non-existent, so they ride on the sidewalks even though it is prohibited in the downtown.

Figure 30 illustrates the locations of the 5 bicycle (yellow and black symbols) and 10 pedestrian (yellow and red symbols) crashes for 2011-2015, and the many transit stops (most of which are associated with the Grand River Station transit center) through here.

Traffic Control

Traffic control for this segment of 3rd St includes signalized intersections at State St, Main St, and Jay St and stop-sign-controlled approaches for Pearl St and King St. The traffic signals automatically generate a “walk” when the light turns green without a pedestrian needing to push a button .

Traffic Counts

The AADT for 3rd St was 12,500 in 2014, up from 11,000 in 2011. The AADT for the intersecting roads with counts was 3,300 in 2014 for State St between 3rd St and 4th St (down from 3,600 in 2008), 3,200 in 2011 for Main St between 2nd St and 3rd St (up from 1,500 in 2008), and 1,900 in 2014 for King St between 2nd St and 3rd St (up from 1,800 in 2011).

We have no counts of bicyclists or pedestrians.

Transit

The Grand River Station (GRS) transit center is the transfer location for 6 of MTU’s 10 routes (Route 1 South Ave, Route 2 Green Bay St, Route 4 Losey Blvd, Route 5 Valley View, Route 6 Northside, and Route 10 Apple Express) and the station for the intercity bus service, Jefferson Lines. Before arriving at GRS, the inbound Route 1 Northside stops on 3rd St in the no parking zone in front of the Main St Parking Ramp. In Figure 30, the routes utilize 3rd St, 4th St, Jay St, King St, and State St.

MTU also provides a Safe Ride service designed to provide a safe alternative to driving after drinking with direct connections between the campuses (UWL, WTC, and Viterbo) and downtown La Crosse. Although the service caters to college students, it is available free to anyone. It operates every 15 minutes on Thursdays and Fridays from 10:00 pm to 3:00 am and on Saturdays from 9:00 pm to 3:00 am. The Safe Ride bus loops around the block where the Main St Parking Ramp is located and serves the bus stop on 3rd St at the ramp.

Land Use

The land uses along this short corridor include 20 bars and eateries (pink in Figure 30), 2 parking ramps, a couple of office buildings, and several other retail and service establishments (yellow), with many of the businesses topped by apartments. The GRS discussed above is a significant transportation hub in downtown La Crosse as well as the home for several businesses and 72 rental apartments.

Crash Statistics

Two-thirds (10) of the 15 bicycle and pedestrian crashes (illustrated in Figure 30 and summarized in Table 13) that occurred on 3rd St between State St and King St were pedestrian crashes. Two crashes resulted in no injuries (# 1 and #4), seven crashes resulted in possible injuries (#2, #5, #7, #9, #10, #12, and #13), six crashes resulted in non-incapacitating injuries (#3, #6, #8, #11, #12, and #15), and one resulted in an incapacitating injury (#14). The incapacitating injury was incurred by a 55-yr-old woman struck by a left-turning city bus.

No fatal crashes occurred. The crashes at locations #9, #11, and #12 each involved two pedestrians incurring injuries (two possible injuries in crash #9, two non-incapacitating injuries in crash #11, and one non-incapacitating injury and one possible injury in crash #12). The crashes at #9 and #12 also involved young drivers who were cited for inattentive driving and following too close (#9) and for failure to yield (#12). The two crashes that involved senior drivers each resulted from a bicyclist riding into them. None of the crashes involved teen drivers.

Eight of the crashes involved the driver turning left (one of which resulted in the incapacitating injury), six of the crashes involved the driver going straight, and one of the crashes involved the driver turning right. The driver was cited in 11 of the crashes, mainly for failure to yield (7 of the crashes) and for driver condition (4 of the crashes). In the three crashes where the bicyclist was at fault, no one was cited. Two, however, left the scene.

Six of the crashes occurred on wet or snowy pavement, with four of those also occurring during inclement weather. Three of the four occurred when it was dark, but lighted. Eight of the crashes occurred during the day, with the sun being a possible contributing factor in one. None of the crashes occurred where it was dark.

Only three of the crashes occurred during the travel peak for their respective day of the week. More than half (8) of the crashes occurred after 6:00 pm on the popular drinking days of Thursday, Friday, and Saturday.

Figure 30: Bicycle and pedestrian crashes along the 3rd St corridor between State St and King St, 2011-2015.
The figure illustrates the bicycle (black/yellow) and pedestrian (red/yellow) crashes, other crashes that are not along the corridor (pink/black), MTU bus stops (bus symbols), and the most popular land uses along and near the corridor. Eating and drinking establishments are in pink and retail and service establishments are in yellow.
The crash location numbers correspond to the crash numbers in Table 13.

TABLE 13: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING ALONG THE 3RD ST CORRIDOR BETWEEN STATE ST AND KING ST

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Dry	Clear	Daylight	10 am	Wednesday Sept. 2011	Hit-and-run bicyclist entering crosswalk disregarded the traffic control and struck right-turning vehicle of 72-yr-old driver
2	Dry	Cloudy	Lighted[2]	2 am	Friday October 2013	43-yr-old driver cited for improper left turn and striking 22-yr-old pedestrian in crosswalk; possible injury
3	Wet	Rain	Daylight	11 am	Wednesday Dec. 2015	42-yr-old driver turning left cited for failure to yield struck 57-yr-old pedestrian with "walk"; non-incapacitating injury
4	Dry	Cloudy	Daylight	4 pm	Friday Sept. 2011	25-yr-old driver cited for 5 violations (hit & run, intoxication, others) struck 25-yr-old pedestrian on sidewalk while exiting ramp
5	Wet	Rain	Lighted	10 pm	Saturday October 2011	18-yr-old bicyclist following too close rear-ended truck of 66-yr-old driver stopping for traffic; no one cited; possible injury
6	Dry	Cloudy	Lighted	10 pm	Saturday August 2014	32-yr-old driver turning left cited for failure to yield to 23-yr-old pedestrian cited for disorderly conduct (alcohol present); non-incapacitating injury
7	Snow	Snow	Lighted	1 am	Friday January 2013	39-yr-old driver turning left cited for driver condition, hit-and-run, and failure to yield to 71-yr-old pedestrian; possible injury
8	Dry	Cloudy	Daylight	4 pm	Wednesday October 2012	39-yr-old driver turning left cited for inattentive driving and failure to yield to a 35-yr-old bicyclist in the crosswalk; no ordinance citation; non-incapacitating injury
9	Wet	Cloudy	Lighted	8 pm	Saturday October 2012	20-yr-old driver cited for inattentive driving/following too close after rear-ending right-turning vehicle stopped for and pushed into two pedestrians; two possible injuries
10	Dry	Cloudy	Daylight	11 am	Thursday April 2014	58-yr-old driver struck bicyclist who left scene; unsure of bicyclist's location (crosswalk or street); possible injury
11	Snow	Snow	Lighted	2 am	Saturday January 2011	27-yr-old driver cited for 7 violations struck two pedestrians; non-incapacitating injuries

Continued…

TABLE 13: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING ALONG THE 3RD ST CORRIDOR BETWEEN STATE ST AND KING ST (continued)

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
12	Dry	Clear	Daylight	8 pm	Thursday June 2015	24-yr-old driver turning left cited for failure to yield to two pedestrians in crosswalk; sun may have been factor; 1 non-incapacitating injury (age 60) and 1 possible injury (age 57)
13	Dry	Clear	Dusk	6 pm	Saturday Sept. 2013	40-yr-old driver making left turn cited for failure to yield, inattentive driving, and driver condition after striking 32-yr-old pedestrian in crosswalk; possible injury
14	Wet	Cloudy	Daylight	4 pm	Tuesday Feb. 2014	50-yr-old MTU bus driver turning left cited for failure to yield to 55-yr-old pedestrian in crosswalk; incapacitating injury.
15	Dry	Cloudy	Daylight	12 pm	Saturday July 2012	Vehicle of 59-yr-old driver was struck by 23-yr-old bicyclist entering crosswalk; no one cited; non-incapacitating injury

[1]The crash number corresponds to the crash location number illustrated in Figure 30.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

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Cass St between 3rd St and 8th St

Description

Cass St is a one-way, two-lane facility between the Main Channel bridge and 4th St, a two-way, four-lane facility between 4th St and 7th St, and a two-way, two-lane facility east of 7th St. Cass St west of 7th St is also STH 16. While the approaches for 3rd St, 4th St, and 5th Ave align at Cass St, the north approaches of 6th St, 7th St (STH 16), and 8th St are offset east 150 feet, 160 feet, and 170 feet, respectively, from their south approaches. Parking is prohibited between the Main Channel bridge and 7th St (STH 16). The posted speed limit is 25 mph. The close spacing of the traffic signals seems to moderate operating speeds to within the posted limit.

Accommodations for pedestrians include a complete sidewalk system. The signalized intersections at 3rd St and 4th St include crosswalks of colored and textured concrete outlined by standard white lines except for the west leg of Cass St at 4th St where there is no crosswalk or curb ramps to connect the opposite sidewalks. Faded standard crosswalks are present at all crossings at 5th Ave and at 7th St (STH 16), at two crossings at the south approach of 6th St (one of 6th St and one of Cass St), at one crossing of 6th St at the north approach, and at two crossings at the south approach of 7th St (not STH 16). There are no marked crosswalks for either approach of 8th St. Although pedestrian-scale lighting is not present within this segment, decorative lamp posts illuminate all corners at 3rd St and 4th St, and at the north corners of 5th Ave. Typical snakehead lamps illuminate the south corners of 5th Ave and the intersections at 6th St and 7th St. The 8th St intersections have one lamp each and they are on the far side of the approaches at Cass St.

Accommodations for bicyclists include a bike lane on the north side of one-way, westbound Cass St between 4th St and 3rd St. In 2017 the WisDOT plans to construct bicycle lanes as part of its reconstruction and lane reduction project (four through-lanes reduced to two through-lanes and a center turn lane) of Cass St between 4th St and 7th St.

Figure 31 illustrates the segment of Cass St between 3rd St and 8th St and the locations of the bus stops and of the four bicycle and seven pedestrian crashes for 2011-2015.

Traffic Control

Traffic control within the 3rd St to 8th St segment of Cass St includes signalized intersections at 3rd St (USH 53), 4th St (USH 53), 5th Ave, and 7th St (STH 16) and stop-sign-controlled approaches at 6th St, 7th St south of Cass St, and 8th St. Right-on-red is not prohibited at any of the signalized intersections and left-on-red is allowed at 4th St and Cass St. In 2017, the WisDOT plans to construct a roundabout at 7th St to address safety issues at to realign the two segments of 7th St.

Traffic Counts

Motor vehicle counts taken along this segment in 2014 included 6,600 between 3rd St and 4th St, 7,500 between 4th St and 5th Ave, and 7,800 between 7th St (STH 16) and 8th St. The sections between 3rd St and 4th St and between 7th St and 8th St experienced decreases in AADT from their previous years of 2011 and 2008. Only the section between 4th St and 5th Ave experienced an increase, with the AADT in 2014 being 15.4% higher than in 2011 and 29.3% higher than in 2008.

We have no counts of bicyclists or pedestrians.

Transit

The MTU operates its Route 2 Green Bay St on Cass St between 4th St and 16th St and its Route 5 Valley View inbound between 6th St and 4th St. The segment between 3rd St and 8th St includes three bus stops—one at 5th Ave for inbound Route 2 and Route 5 to downtown and two at 8th St (one for inbound and one for outbound Route 2 Green Bay St).

Land Use

Land uses along here include a manufacturer, a grocer, two gas stations/convenience stores, a bank, a pharmacy, additional retail and service establishments, several apartment buildings, and several properties converted from single-family homes to multifamily rentals.

Crash Statistics

Figure 31 illustrates the Cass St bicycle and pedestrian crashes, other bicycle and pedestrian crashes, and MTU bus stops. The crash location numbers correspond to the crash numbers in Table 14.

Four bicycle and seven pedestrian crashes occurred on Cass St between 3rd St and 8th St from 2011-2015. The four bicyclists were crossing in a crosswalk while more than half (4) of the pedestrians were crossing outside of a crosswalk. Three of the four bicyclists were struck by a right-turning vehicle, resulting in one incurring an incapacitating injury (#1) and one incurring a possible injury (#3). The fourth bicyclist incurred an incapacitating injury as a victim in a hit-and-run crash (#10). Three of the four pedestrians crossing outside of the crosswalk incurred incapacitating injuries (#2, #5, and #7), while the fourth (a senior) incurred a fatal injury (#6). The fatal crash resulted from a number of factors: The pedestrian wore dark clothing and crossed mid-block at night at a location with no lighting, and the pavement was wet.

More than half (6) of the crashes occurred during the day and an additional four occurred where it was lighted. Only four of the 11 crashes occurred during their day-of-the week travel peak (one during the morning weekday travel peak and three during the weekday afternoon peak).

Three of the 11 drivers were young drivers all of whom were cited for various violations (#4, #7, and #9). Two were seniors; neither were cited. No children or teens were involved in any of these crashes.

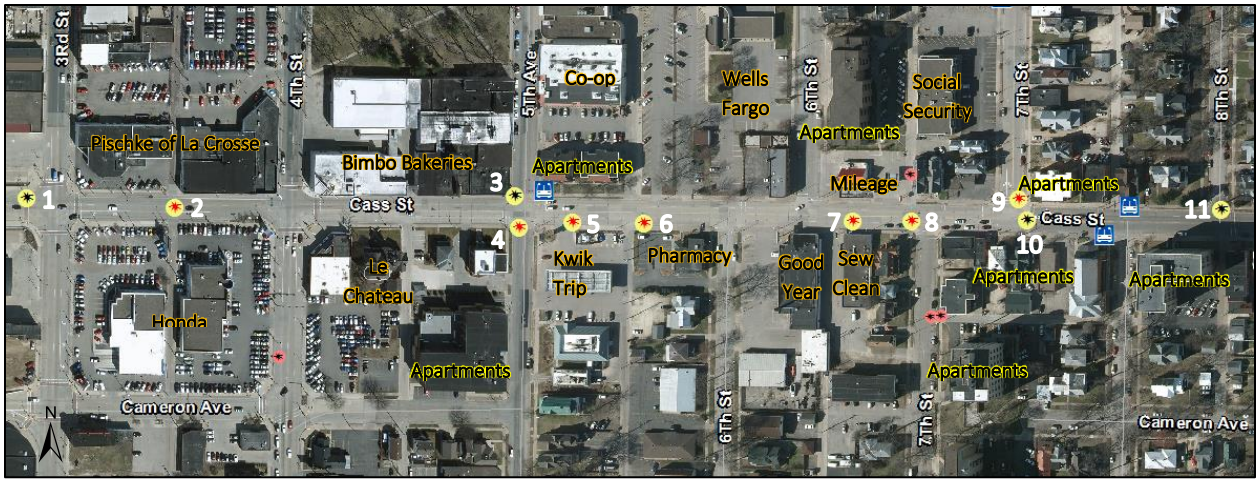

Figure 31: Bicycle and pedestrian crashes along the Cass St corridor between 3rd St and 8th St, 2011-2015.
The figure illustrates the bicycle (black/yellow) and pedestrian (red/yellow) crashes, other crashes that are not along the corridor (pink/black), and MTU bus stops (bus symbols).
The crash location numbers correspond to the crash numbers in Table 14.

TABLE 14: DETAILS OF BICYCLE & PEDESTRIAN CRASHES OCCURRING ALONG THE CASS ST CORRIDOR BETWEEN 3RD ST AND 9TH ST

	Environmental Conditions			Time Factors		
Crash #[1]	Road	Weather	Light	Time of Day	Day, Month, Year	Person Characteristics
1	Dry	Clear	Daylight	1 pm	Friday Sept. 2013	Vehicle of 63-yr-old driver turning right struck by 61-yr-old bicyclist entering crosswalk; no one cited; incapacitating injury
2	Dry	Cloudy	Lighted[2]	6 pm	Monday Dec. 2014	51-yr-old impaired pedestrian cited for failure to yield after stepping into traffic and getting struck by vehicle of 74-yr-old driver; incapacitating injury
3	Dry	Cloudy	Daylight	12 pm	Friday October 2013	49-yr-old bicyclist entering crosswalk on "walk" struck by 75-yr-old driver making right-on-red; no citations (blind corner; bicyclist riding fast); possible injury
4	Dry	Clear	Daylight	5 pm	Monday March 2015	24-yr-old driver turning left cited for failure to yield to 24-yr-old pedestrian; possible injury
5	Dry	Clear	Daylight	8 am	Saturday August 2015	89-yr-old driver struck 71-yr-old pedestrian crossing outside of crosswalk; pedestrian cited; incapacitating injury
6	Wet	Cloudy	Dark	10 pm	Tuesday Sept. 2014	60-yr-old driver going straight struck 74-yr-old pedestrian crossing midblock in dark clothing; no citations; fatality
7	Dry	Cloudy	Lighted	2 am	Sunday Feb. 2015	22-yr-old driver cited for hit-and-run, speeding, and failure to keep vehicle under control struck 27-yr-old impaired pedestrian; incapacitating injury
8	Wet	Cloudy	Lighted	7 pm	Sunday August 2014	30-yr-old driver struck 55-yr-old pedestrian (alcohol present) cited for darting into road; non-incapacitating injury
9	Snow	Clear	Lighted	12 am	Tuesday January 2014	20-yr-old driver turning left with frosted windshield (cited) struck 22-yr-old pedestrian in crosswalk; incapacitating injury
10	Dry	Clear	Daylight	2 pm	Friday June 2012	Hit-and-run driver struck 23-yr-old bicyclist in rear tire; incapacitating injury
11	Dry	Clear	Daylight	3 pm	Monday Dec. 2013	88-yr-old driver turning right struck 31-yr-old bicyclist in crosswalk; driver admitted fault; no citations; property damage only

[1]The crash number corresponds to the crash location number illustrated in Figure 31.
[2]Dark, but lit by street lights.
Source: WisTransPortal System, U.W. Madison TOPS Lab.

Summary of Findings

Description

Not surprisingly, the "problem" areas in the planning area all reside within the City of La Crosse where we have the highest levels of bicycle and pedestrian activity and high vehicular volumes. They include the West Ave (STH 35) corridor between La Crosse St (STH 16) and Jackson St (STH 33), the 3rd St (USH 53) corridor between State St and King St, the Cass St (STH 16) corridor between 3rd St and 8th St (STH 16 follows Cass St west of 7th St), and the intersection at Losey Blvd and State Rd (STH33).

The most problematic corridor is West Ave between La Crosse St and Jackson St. It experienced 45 bicycle and pedestrian crashes, including 2 fatal crashes, in five years (2011-2015) and includes five of the six problem intersections identified in the area. The crash rate for all motor vehicle crashes for this section of West Ave was last calculated for WisDOT using 2009-2013 crash data. The analysis concluded that the crash rate was higher than the state-wide average for similar facilities.

West Ave is a state highway that runs north-south through south La Crosse. It has commercial businesses and high-density residential on both sides between La Crosse St and Main St, and then transitions to primarily commercial on the west side south to Jackson St. Residential neighborhoods dominate the areas east of West Ave south of Main St and the areas west of West Ave south of Jackson St. The destinations to the west of West Ave, including downtown La Crosse, attract residents from the residential neighborhoods east of the facility, but its unfriendliness to bicyclists and pedestrians has resulted in some neighborhood residents driving their short distances because they feel unsafe walking or biking across West Ave.[13] The University of Wisconsin-La Crosse is the major destination on the east side of West Ave and attracts hundreds of biking and walking students living in the student rentals west of West Ave.

The 3rd St corridor between State St and King St is a US highway that runs roughly north-south through downtown La Crosse. It is a commercial corridor with 20 bars, pubs, and eateries, two parking ramps, and several other retail and commercial enterprises. This area has a high level of pedestrian activity at all hours of the day, but it is especially busy on Thursday, Friday, and Saturday nights as it is *the* destination for college students. This segment of 3rd St experienced 15 bicycle and pedestrian crashes in five years and had the highest number and percent of crashes involving alcohol. It also includes the high-crash intersection at Pearl St (five crashes over the five years).

The Cass St corridor between 3rd St and 8th St includes retail, manufacturing, and service industries as well as multifamily residential. Cass St serves as a major east-west corridor between downtown La Crosse, West Ave, and Losey Blvd. The Mileage convenience store and gas station is a destination for not only drivers but also pedestrians and bicyclists looking to purchase minor food stuffs and cigarettes. This segment experienced 11 bicycle and pedestrian crashes, including one fatal crash, during the five years spanning 2011-2015.

The Losey Blvd and State Rd intersection is an isolated problem intersection that is not part of a larger corridor issue. Losey Blvd is the major north-south facility on the east side of La Crosse and State Rd is the major east-west facility between west La Crosse and the rural areas east of La Crosse. This intersection is surrounded by high-traffic retail and restaurant establishments and is within one block of a large urban high school. It experienced five crashes during the five years spanning 2011-2015 and is estimated to have the highest crash index among the six problem intersections in the region.

[13] I have spoken with women who live within a few blocks of the YMCA who drive the few blocks because they feel unsafe walking or biking across West Ave.

Traffic Control

Five of the six problem intersections are signalized and actuated by vehicle detectors so that green times can be extended during periods of high traffic volumes. This results in cycle lengths (the time required for a complete sequence of green, yellow, and red indications) that vary as traffic volumes vary.

The National Association of City Transportation Officials (NACTO) in its *Urban Street Design Guide* (USDG) recommends for urban areas short cycle lengths of 60-90 seconds, which permit frequent gaps and consistent crossing opportunities for pedestrians. As illustrated in Table 15, which summarizes the signal phasing at the identified problem intersections that are signalized, the green extensions can result in a cycle time as high as 2.3 times (West Ave and La Crosse St) the recommended maximum length of 90 seconds. Four of the five signalized intersections allow green extensions up to maximums that will increase the cycle length beyond the recommended 90 seconds. According to the City Engineer, however, the Losey Blvd/State Rd intersection is programmed for a 100-second cycle and the intersections along West Ave at a 70- to 80-second cycle.

TABLE 15: SIGNAL PHASING FOR THE SIGNALIZED PROBLEM INTERSECTIONS

Intersection	Total Cycle Signal Indications[1] (in seconds)			Cycle Length[2,3]
	Green[3]	Yellow	Red	(in seconds)
Losey Blvd and State Rd	40 - 155	13	3	56 – 171
West Ave and La Crosse St	30 - 195	13	3	46 – 211
West Ave and State St	52 - 95	12	4	68 – 111
West Ave and Main St	52 - 95	12	4	68 – 111
West Ave and Jackson St[4]	42 - 70	9	4	55 – 83

[1]The time in seconds per cycle (time required for a complete sequence of indications).
[2]Because traffic movements are mirrored (phases 1 and 5, 2 and 6, 3 and 7, and 4 and 8 go simultaneously), the cycle length at a signalized intersection is equal to the green indications for the protected left turns plus the green indications for the through-movements plus the yellow change indications plus the all-red indications for phases 1 – 4 (or 5 – 8) of the eight-phase basic timing set for the signals in this study. See Appendix A.
[3]All of the signals are actuated so that the time for each phase is controlled by detector actuations, which allow for an extension of the green indication up to a maximum time in seconds. The variable "green" time, which is given as a range from minimum to maximum, results in a variable cycle length, also given as a range from minimum to maximum.
[4]Jackson St does not experience a protected left-turn phase, thus the cycle length is equal to the sum of the green, yellow, and red for phases 1 (protected left for West Ave), 2 (through-traffic for West Ave), and 4 (through- and permissive-left) for Jackson St.

Table 16 illustrates the pedestrian crossing characteristics at the longest crossing of the two approaches for each road of the intersection. The walk duration is the time in seconds where the pedestrian indicator presents a "walk," the clearance duration is the time in seconds where the pedestrian indicator presents a flashing "don't walk," and the yellow duration is the time in seconds where the pedestrian indicator presents a solid "don't walk." The solid "don't walk" is maintained until the adjacent vehicle through-traffic receives the green or, in the case of crossings that require a pedestrian activation, when a pedestrian has activated the "walk." To receive a "walk," the pedestrian activation (or "beg") button must also be pushed to cross West Ave, La Crosse St, Losey Blvd, or State Rd. Good timing is essential if the pedestrian wants to avoid waiting through another cycle.

The Manual on Uniform Traffic Control Devices (MUTCD) states that the "walk interval should be at least 7 seconds in length so that pedestrians will have adequate opportunity to leave the curb or shoulder before the

pedestrian clearance time begins." The Manual allows for a walk interval of as short as 4 seconds in cases where pedestrian volumes and characteristics do not require a 7-second walk interval. The USDG states that a 7-second walk interval is "critical" for pedestrian crossings at signalized intersections. The "walk" duration is less than the recommended time at all but the Losey Blvd and State Rd crossings.

The USDG states that adequate crossing time should be taken into account based on a crossing speed between 2.5-3.5 feet per second. Work by Laplante and Kaeser as referenced in the FHWA's *Signal Timing Manual* suggests using 3.5 ft/s to calculate the pedestrian clearance (flashing don't walk and yellow) duration for curb to curb clearance. When considering the crossing durations and distance, the walking speed is higher than the recommended walking speed for five of the crossings (Losey Blvd at State Rd, La Crosse St at West Ave, West Ave at La Crosse St, West Ave at State St, and West Ave at Main St).

Pedestrian crossings for La Crosse St at West Ave, West Ave at La Crosse St, West Ave at State St, and West Ave at Main St have too-short walk durations (less than 7 seconds) *and* have too-fast walking speeds (greater than 3.5 feet per second) to provide for adequate time for pedestrians to cross—especially for those with mobility challenges. Those same crossings also require a pedestrian to press the activation button to receive a "walk," which can be challenging to bicyclists who must reposition themselves to align with the curb ramp and crosswalk.

Observations made during the intersection counts showed that bicyclists did not dismount to cross in a crosswalk nor did they typically press the activation button. Bicyclists most often pressed the button at the West Ave and Jackson St intersection. Table 16 also reports the number of pedestrian crossings, with bicycle pedestrians in parentheses. While pedestrian crossings typically exceeded bicycle-pedestrian crossings, this was not the case for the West Ave and Jackson St intersection.

TABLE 16: PEDESTRIAN CROSSING CHARACTERISTICS AT THE PROBLEM INTERSECTIONS THAT ARE SIGNALIZED

Pedestrian Crossing	Walk Duration[1]	Clearance Duration[1]	Yellow Duration[1]	Walk Distance[2]	Walking Speed[3]	Pedestrian Activated[4]	Pedestrian Crossings[5]
Losey Blvd at State Rd	15.0 sec	28.0 sec	3.5 sec	114 ft	3.6 ft/s	Yes	4 (1)
State Rd at Losey Blvd	15.0 sec	28.0 sec	3.5 sec	102 ft	3.2 ft/s	Yes	2 (2)
La Crosse St at West Ave	5.0 sec	17.0 sec	3.5 sec	75 ft	3.7 ft/s	Yes	20 (19)
West Ave at La Crosse St	5.0 sec	17.0 sec	3.5 sec	86 ft	4.2 ft/s	Yes	42 (30)
State St at West Ave	6.0 sec	14.0 sec	3.0 sec	50 ft	2.9 ft/s	No	33 (13)
West Ave at State St	6.0 sec	14.0 sec	3.0 sec	70 ft	4.1 ft/s	Yes	49 (40)
Main St at West Ave	6.0 sec	18.0 sec	3.0 sec	72 ft	3.4 ft/s	No	18 (19)
West Ave at Main St	6.0 sec	16.0 sec	3.0 sec	75 ft	3.9 ft/s	Yes	21 (12)
Jackson St at West Ave	6.0 sec	12.0 sec	3.0 sec	50 ft	3.3 ft/s	Yes	9 (17)
West Ave at Jackson St	6.0 sec	17.0 sec	3.0 sec	68 ft	3.4 ft/s	Yes	19 (22)

[1]The walk, clearance, and yellow durations were obtained from pedestrian timing data from the City of La Crosse.
[2]The walk distance is an estimate as measured from curb to curb within the crosswalk using the measurement tool in ArcGIS. The value reflects the longer of the two crosswalk distances.
[3]The estimated walking speed is calculated by dividing the walk distance from curb to curb by the sum of the clearance duration (flashing "don't walk") and the yellow duration.
[4]Whether or not a pedestrian activation button must be pushed to obtain a "walk."
[5]Pedestrian crossings that occurred on a weekday between the hours of 7:00 am and 9:00 am. Parenthetical data are bicyclists operating as pedestrians in the crosswalk. See Appendix A.
NOTE: The West Ave/Badger St intersection is excluded because it is not a signalized intersection.

Traffic Counts

Table 17 displays the average annual daily traffic (AADT) for traffic count locations along the problem corridors as well on the closest roadway segment to a problem intersection. Two of the counts are conducted with continuous counters, which will provide an annual count, while the rest are conducted with tube counters set out for a set duration (i.e. one week) and the counts extrapolated to the year. Because tube counts are not conducted annually, the years for AADT in Table 17 are the three most recent years tube counts were taken.

As illustrated in the table, motor vehicle traffic counts increased from 2008-2014 in 7 of the 14 locations with data for all three years. In contrast, 11 of the 15 locations with complete data for 2011-2014 experienced decreases in traffic. Only Lang Dr north of La Crosse St, 3rd St between State St and Main St, and Cass St between 4th St and 5th Ave experienced increases in traffic for both time periods.

The change in the counts taken in 2014 from those taken in 2011 (within the time frame of this study) shows that traffic on West Ave between La Crosse St and Main St decreased. The traffic counts on West Ave nearest to the Jackson St intersection went up at the continuous counter location north of Mississippi St and went down at the tube count location south of the intersection between Jackson St and Johnson St.

TABLE 17: CHANGE IN AVERAGE AADT AT COUNTER LOCATIONS WITHIN OR NEAR IDENTIFIED PROBLEM AREAS

Location Count was Taken[1]	Average Annual Daily Traffic (AADT)				
	Year[2]			Change	
	2008	2011	2014	'08-'14	'11-'14
Lang Dr north of La Crosse St (continuous counter)[3]	17,886	14,774	20,961	↑	↑
La Crosse St between 7th St and 8th St	10,300	10,800	8,300	↓	↓
La Crosse St between East Ave and 17th St	12,200	No data	10,200	↓	-----
West Ave between Vine St and State St	No data	21,600	20,000	-----	↓
West Ave between Main St and State St	18,400	21,200	20,000	↑	↓
State St between 11th St and West Ave	No data	3,200	2,700	-----	↓
Main St between 11th St and West Ave	4,600	5,000	4,600	↔	↓
West Ave between Main St and King St	17,100	20,200	20,100	↑	↓
West Ave north of Mississippi St (continuous counter)	No data	19,481	20,070	-----	↑
Jackson St between 11th St and West Ave	15,300	No data	8,500	↓	-----
West Ave between Jackson St and Johnson St[3]	12,800	13,900	13,100	↑	↓
3rd St between State St and Main St	12,400	11,000	12,500	↑	↑
Cass St between 3rd St and 4th St	7,400	6,800	6,600	↓	↓
Cass St between 4th St and 5th Ave	5,800	6,500	7,500	↑	↑
Cass St between 7th St and 8th St	8,200	8,000	7,800	↓	↓
Losey Blvd between Farnam St and State Rd	29,500	25,900	24,800	↓	↓
State Rd between 22nd St/23rd St and Losey Blvd	No data	10,500	9,100	-----	↓
State Rd between Losey Blvd and 26th St	13,400	14,400	No data	↑	-----

[1]The Wisconsin Department of Transportation obtains traffic counts from continuous counters that provide, as the name implies, continuous counts and from tube or radar counters that are installed at a desired location for a specific period of time. Only two of the locations are from continuous counters (noted above).
[2]Because tube or radar counts are not taken annually, the years illustrated are from the three most recent years available.
[3]These count locations are outside the problem corridor, but are within the roadway segment immediately adjacent to a problem intersection.

Table 18 summarizes the crosswalk activity for each of the six problem intersections. The bicycle and pedestrian counts were conducted for each intersection for a two-hour period from 7:00 am to 9:00 am on a Monday, Tuesday, or Thursday during the weeks of October 10 and October 17, 2016.

Not surprisingly, the north and south crosswalks (east-west travel) most in line with UWL experienced the most activity. East-west crossings of West Ave comprised 64.9% of all intersection crossings at La Crosse St, 87.1% of crossings at Badger St, and 65.9% of crossings at State St. While the total crossings for five of the six intersections were dominated by pedestrians, the West Ave and Jackson St intersection experienced 42.9% more bicycle crossings than pedestrian crossings. This is likely due to the distances between origins and destinations being greater than one may want to walk.

TABLE 18: SUMMARY OF BICYCLE AND PEDESTRIAN CROSSWALK ACTIVITY

	Intersection Crosswalk Crossings									
	North		South		East		West		Total	
Intersection	Bike	Ped	Bike	Ped	Bike	Ped	Bike	Ped	Bike	Ped
West Ave/La Crosse St	4	22	26	20	8	8	11	12	49	62
West Ave/Badger St[1]	N/A (2)		120	236	8	23	1	21	129	282
West Ave/State St[2]	17	26	23	23	4	4	9	29	53	82
West Ave/Main St[3]	7	10	6	11	3	5	16	13	32	39
West Ave/Jackson St[4]	13	15	9	4	8	2	10	7	40	28
Losey Blvd/State Rd	1	0	1	4	0	1	1	1	3	6

[1]Two pedestrians crossed where there was no crosswalk.
[2]One bicyclist operated in the street on State St.
[3]Fifteen bicyclists operated in the street, but only on Main St.
[4]One bicyclist operated in the street. He made a left turn from northbound West Ave to westbound Jackson St.
Please note that these totals exclude bicyclists who operated in the street. Also, be aware that the number of bicycle and pedestrian crossings exceeds the number of bicyclists and pedestrians because many made multiple crossings (i.e. one pedestrian crossed southbound then eastbound (two crossings)). The number of crossings being made speaks more to exposure than does sheer presence.

Crash Statistics

Seventy-seven bicycle (37) and pedestrian (40) crashes occurred within the problem corridors and intersections identified in this study. (This includes the non-intersection crash just south of the Losey Blvd/State Rd intersection.) Not quite one-third of the crashes occurred during one of the day-of-the-week peak-travel times (25 or 32.5%), which for weekdays are 7:00 am to 8:00 am and 2:00 pm to 5:00 pm and for weekends are 11:00 am to 3:00 pm on Saturday and 11:00 am to 5:00 pm on Sunday (see Appendix B).

Environmental factors did not play a significant role in the crashes. Most of the crashes occurred on dry pavement (54 or 70.1%), when the weather was clement (61 or 79.3%), and at a time of day with natural lighting (daylight, dawn, dusk: 50 or 64.9%) or at a location that was lighted by street lights (26 or 33.8%). Only one crash occurred where it was dark and the crash resulted in a fatality.

Seventy of the 77 crashes resulted in one or more injuries. Twelve of the crashes were incapacitating injury crashes, which resulted in 14 incapacitating injuries; 35 of the crashes were non-incapacitating injury crashes, resulting in 36 non-incapacitating injuries; and 20 of the crashes were possible injury crashes, resulting in 21

possible injuries. Three crashes resulted in a fatality—all pedestrians. Of the five seniors involved in crashes as a bicyclist or a pedestrian, one incurred a fatal injury (the same fatality that occurred at a dark location) and one incurred an incapacitating injury. The other three incurred possible injuries.

More than twice as many teen (age 15-18) and young (age 19-24) drivers were involved in crashes than were senior (age 65 and older) drivers (20 versus 9), with 14 or 70.0% of the teen/young drivers being cited for a violation and 3 or 33.3% of the senior drivers being cited.

Drivers were going straight in 37 or 48.1% of the crashes, with 22 or 59.5% involving pedestrians; 21 or 27.3% were turning left; and 19 or 24.7% were turning right. Nearly three-quarters of the 21 left-turn crashes (15 or 71.4%) involved pedestrians and among the six bicyclists only one was operating in the street.

Of the 19 right-turn crashes, all of the bicyclists involved (16 or 84.2%) were operating in or entering the crosswalk. Six of the bicyclists were at-fault, five of whom rode into the motor vehicle. Four of the 10 drivers at-fault were turning right-on-a-red (as determined from the narratives), all 10 of whom failed to yield to a pedestrian in a crosswalk. Only 3 of the 19 right-turn crashes involved pedestrians.

The Cass St corridor between 3rd St and 8th St experienced the highest proportion of fatal and incapacitating injury crashes among the three corridors analyzed. More than half (6 of 11 or 54.5%) of the crashes resulted in incapacitating injury and one (9.0%) resulted in fatality. Of the crashes along the West Ave corridor between La Crosse St and Jackson St, 5 (11.1%) of 45 total crashes resulted in incapacitating injury and 2 (4.4%) resulted in fatality. The 3rd St corridor between State St and King St experienced the least number of severe-injury crashes, with only 1 of 15 resulting in incapacitating injury and none experiencing fatal injury.

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Safety Countermeasures

The enforcement and engineering safety countermeasures set out here are directed to the City of La Crosse Planning, Engineering, and Police Departments and the Wisconsin Department of Transportation where appropriate. They were developed with the goals of 1) eliminating bicycle and pedestrian fatal and incapacitating-injury crashes, 2) reducing all bicycle and pedestrian crashes, 3) improving the bicycle- and pedestrian-friendliness of the problem corridors and intersections, and 4) increasing compliance with existing traffic laws. The NACTO USDG and the FHWA guide *PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System* were referenced for many of the recommendations presented.

West Ave between La Crosse St and Jackson St

Reduce Operating Speeds

As discussed earlier in this study, the odds of a pedestrian (or a bicyclist) incurring a fatal injury goes up drastically with increase in motor vehicle speed (Figure 32). Two of the six fatal crashes in the planning area occurred on West Ave, which has a posted speed limit of 25 mph, at State St and at King St. Both of the crashes involved the motorist going straight.

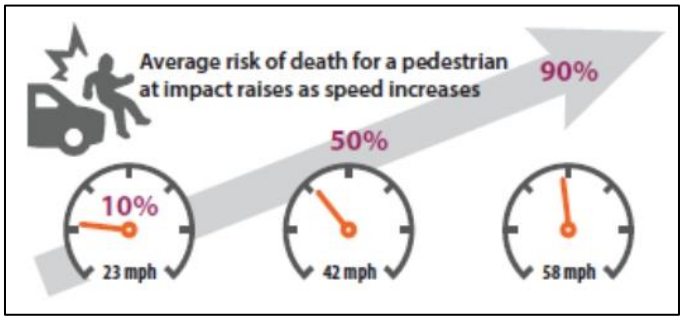

Figure 32: Odds of fatal pedestrian crash by speed of vehicle.
Source: Federal Highway Administration.

In keeping with the goal of "Zero Deaths" in Wisconsin and Minnesota, the LAPC has a goal of zero bicycle and pedestrian deaths in its planning area. Reducing motor vehicle operating speeds to posted speed limits will help achieve this goal. Operating speeds can be reduced to posted speeds through several initiatives:

1. **Targeted enforcement and education.** Law enforcement should set up a schedule of targeted enforcement activities as a matter of course. This includes enforcing yielding to a pedestrian in a crosswalk, educating bicyclists about riding too fast on sidewalks, and encouraging crosswalk users to push the pedestrian activation button. These activities need officers patroling in a vehicle, on a bicycle, and on foot.
2. **Self-enforcement.** Install radar speed signs to alert drivers of their operating speeds.
3. **Traffic calming.** Construct a raised intersection with high visibility crosswalks (Figure 33) at King St where there was one pedestrian fatality. It would serve to slow traffic, alert drivers to the presence of pedestrians, and supplement the City's bike plan for constructing a median and pedestrian islands at West Ave.

Figure 33: Rendering of a raised intersection.

Adjust Signal Timing

According to the NACTO Urban Street Design Guide, "Pedestrian non-compliance increases with relative detour and delay. Delays exceeding 40 seconds at signalized crosswalks and 20 seconds at unsignalized or yield-controlled crosswalks may cause risk-taking behavior. Countdown signals and shorter cycle lengths can help to increase compliance, and may be paired with other strategies." The City of La Crosse should adjust signal timings along West Ave to meet NACTO recommendations and MUTCD requirements that encourage compliance for crossing at signalized intersections to include:

1. **Short cycle lengths** for urban areas of 60 – 90 seconds at all times (not just when traffic is light).
2. **A minimum seven-second "walk" phase** at all signalized intersections to allow for enough additional time to achieve a 3.5-ft/s curb-to-curb clearance time (refer back to Table 16).

Enhance Crossings

Observations made during the intersection counts of bicyclists and pedestrians revealed that most bicyclists ride on the sidewalks and use the crosswalks to cross a road. They do not dismount (which is not required) or push the pedestrian activation button prior to crossing. As a result, the majority of right-turn crashes occurring along the problem corridors were bicycle crashes (16 of 19 or 84.2%). A couple of factors contribute to this occurrence: 1) drivers pull up past the stop bar and through the crosswalk without checking the sidewalks; and, 2) bicyclists often do not slow down as they enter the crosswalk. Figure 34 shows a vehicle stopped in the crosswalk on Main St at a red light at West Ave while a bicyclist crosses on a green light. The bicyclist was traveling at a high speed and did not slow as he entered the crosswalk.

Figure 35 shows vehicles blocking the crosswalk on Main St while stopped at a red light at West Ave. Because the driver's view of approaching traffic from the stop bar is blocked by the building on the corner, she just continued driving up through the crosswalk without checking the sidewalk to see down the travel lane. Five of the six bicycle and pedestrian crashes at Main St were right-turn crashes.

Figure 34: Bicyclist crossing Main St at West Ave.

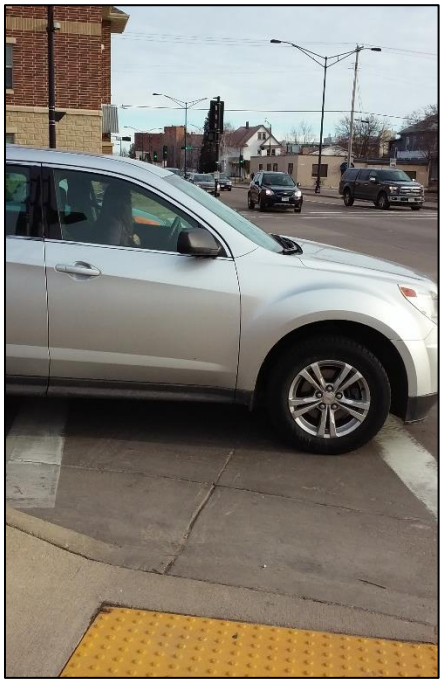

Figure 35: Motorist turning right-on-red blocks crosswalk.

To emphasize the presence of bicyclists and pedestrians, to encourage compliance of traffic laws, and to reduce right-on-red conflicts, the WisDOT and the City of La Crosse should install:

1. **High visibility crosswalks** like the continental style illustrated in Figure 36 at the West Ave intersections with La Crosse St, State St, Main St, and Jackson St.
2. **Cameras** at all signalized intersections that detect bicyclists operating in the street.
3. **Curb extensions** on Main St at West Ave. Right-turning traffic will have to share with through traffic and will need to take slower, tighter turns with the reduced curb radii.
4. **Countdown pedestrian signals** (Figure 37) at all signalized intersections on West Ave.

Figure 36: Continental crosswalk.


Figure 37 : Countdown pedestrian signal.

Although the West Ave and Badger St intersection has a relatively low crash index, the high number of bicyclists and pedestrians crossing at that location could warrant a grade-separated crossing, which would eliminate any conflicts between West Ave motor vehicle traffic and bicyclists and pedestrians and reduce conflicts between bicyclists and pedestrians. The feasibility of a grade-separated crossing would need to be determined.

Install Bicycle Facilities

The dominance of bicycle crashes in right-turn crashes in the area substantiate the conclusions of other studies that state that riding a bicycle on the sidewalk is less safe than riding on the street. Drivers attempting to turn right at a red light are looking for oncoming vehicles to their left, not bicyclists and pedestrians to their right. Bicyclists in the La Crosse area, however, generally ride on the sidewalk regardless of traffic volumes, but tend to ride in the street more often when bicycle accommodations are available. As observed during the bicycle and pedestrian counts, 15 or 31.9% of the 47 bicycle crossings of West Ave at Main St, on which there are shared road markings ("sharrows"), occurred in the street. Compared to State St, which has no bicycle accommodations, only 1 of the 53 bicycle crossings occurred in the street. (Although La Crosse St has bike lanes on the east side of West Ave, no bicyclists used the street during the count, likely because there are no bike lanes on the west side, the bike lanes on the east side are in disrepair, and there is no guidance through this large intersection.)

To encourage street riding and thus reduce the odds of right-turn bicycle crashes and conflicts with pedestrians, the following should be installed:

1. **Bike accommodations**, preferably buffered bike lanes where space can be made available, on La Crosse St, State St, Main St, and Jackson St as recommended in local and regional bicycle plans. Buffered bike lanes should especially be installed on West Ave, but this can only occur if the facility undergoes a road diet.
2. **A north crossing of West Ave at Badger St in line with the sharrows** so bicyclists operating westbound on Badger St can continue to do so and not conflict with the bicyclists and pedestrians in the existing crosswalk. The existing median storage should be widened to accommodate the large numbers of bicyclists and pedestrians currently crossing there (refer back to Figure 22).

Put West Ave on a Diet

West Ave should be converted from a four-lane divided highway to a three-lane neighborhood street with narrow through-lanes, a center-turn lane, and a buffered bike lane (Figure 38) that could be shared with right-turning vehicles (Figure 39). The roadway varies in width from 50 feet to 65 feet. A grade-separated facility at Badger St may be necessary to eliminate bicycle and pedestrian conflicts with motor vehicle traffic that may queue through that intersection.

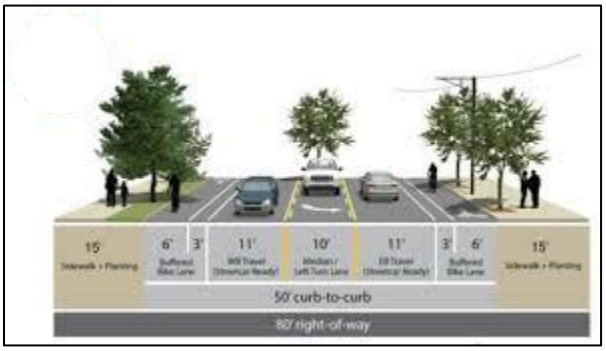

Figure 38: Road diet with buffered bike lanes.

According to the Federal Highway Administration (FHWA), road diets with AADTs above 20,000 vehicles are likely to increase traffic congestion to the point of diverting traffic to alternative routes. AADTs on West Ave decreased from 2011-2014 (refer back to Table 17) and seem to hover around the 20,000 vehicle threshold. The AADT could decrease substantially depending on what Mayo Health System plans for its La Crosse campus when its Sand Lake Rd campus in Onalaska is completed. The City of La Crosse may have an opportunity for transit-oriented development in this corridor that would support the MTU Transit Development Plan recommendation for an express bus route on West Ave. The buffered bike lane could be shared in the future with transit like that illustrated in Figure 40. The LAPC long-range plan also recommends reserving right-of-way for bus rapid transit.

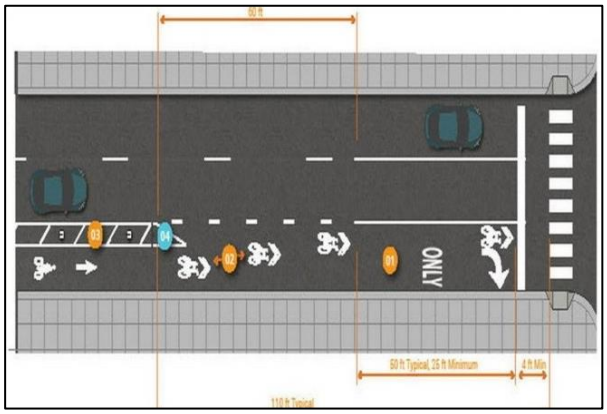

Figure 39: Buffered bike lane transitioning to shared right-turn lane.
Source: NACTO Urban Street Design Guide.

Reducing West Ave from a four-lane facility to a three-lane facility has the potential to reduce all crashes by 29%,[14] reduce right-turn crashes by getting bicyclists off the sidewalks, make pedestrians crossing West Ave and bicyclists riding parallel to West Ave more visible, and make the facility all-around more bicycle-, pedestrian-, and neighborhood-friendly. Accommodations for left-turning bicyclists would need to be incorporated at signalized intersections where a high volume of bicycle left turns could be anticipated (i.e. State St and Main St).

Figure 40: Shared bus and bike lane in Baltimore, MD.
Source: Ariel Godwin, Southern Georgia Regional Commission.

[14] Based on the history of safety studies, installing a road diet can lead to an expected crash reduction of 19% to 47%. See *Road Diet Informational Guide*, FHWA, for a detailed discussion of road diet safety evaluations and crash modification factors.

3rd St between State St and King St

The characteristics of the crashes seem to be more a function of the late-night drinking culture than of the operations of the facility. Improving the visibility of bicyclists and pedestrians could help reduce bicycle and pedestrian crashes in this corridor.

1. **Install high visibility continental-style or decorative crosswalks** at State St, Main St, and Pearl St.
2. **Install a bike lane on 3rd St** to encourage bicyclists to ride in the street where they'll be seen rather than on the sidewalk where visibility can be cut off by buildings and parked cars.
3. **Increase the number of police officers on foot in the downtown area** to enforce the City ordinance prohibiting bicycle riding on the sidewalks downtown and to provide a presence to discourage driving after drinking.
4. **Add onstreet parking** on the west side of 3rd St between Pearl St and Jay St.

Cass St between 3rd St and 8th St

Cass St between 4th St and 7th St is being reconstructed in 2017 as a three-lane facility (two through lanes and one center turn lane) with bike lanes. The jogged intersections of 7th St with Cass St are being realigned through a single-lane roundabout (Figure 41). This will eliminate a traffic signal and allow for the free-flow movement of traffic through the 7th St intersection . Single-lane roundabouts have been shown to improve the safety of all users by eliminating the number of conflict points and by slowing traffic. But it remains to be seen if the change from a stop-controlled intersection to one that is free-flow will in fact decrease pedestrian and bicycle fatal and incapacitating injuries in this corridor. Vehicles will no longer have to stop, making acceleration to a higher speed easier and faster.

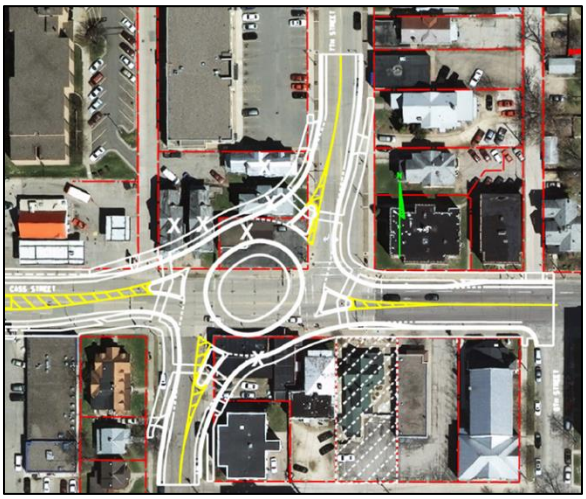

Figure 41: Drawing of a roundabout at 7th St & Cass St.
Source: Wisconsin Department of Transportation public meeting presentation materials.

Additional street lighting and high visibility crosswalks should be installed to better alert drivers to the presense of pedestrians. The travel lanes should be narrow to slow operating speeds and the bike lanes should be buffered to encourage bicyclists to use the street instead of the sidewalk.

Losey Blvd and State Rd Intersection

Although this intersection experienced the lowest level of bicycle and pedestrian activity among the intersections counted, its five-year crash total and user volumes resulted in it having the highest bicycle and pedestrian crash index. The intersection is very large and skewed, resulting in some turns being made fast because the turning radii are so large (about 125 degrees) and other turns being made very slow because the turning radii are so small (about 55 degrees). Treatments recommended under the existing geometry constraints of the intersection include:

1. **Programming the signal to include a pedestrian lead phase.** Because this intersection is dominated by left-turn crashes on the obtuse turns, a pedestrian lead phase would allow pedestrians to get out ahead of left-turning vehicles.
2. **Converting State Rd to a three-lane facility with buffered bike lanes** to slow traffic and to encourage bicyclists to use the road.
3. **Installing high visibility crosswalks** at all crossings.
4. **Installing pedestrian countdown signals.**
5. **Installing cameras that detect bicyclists operating in the street.**

Eliminating the skew and reducing walking distances should be considered during future reconstruction.

Appendix A

Vehicle Basic Timing and Pedestrian Timing

The traffic controls discussed here are actuated signal controls where the time (in seconds) for each phase is controlled by detector actuations. While the green time is set for a minimum amount of time, it can be extended between the minimum to a defined maximum green time, depending on traffic conditions. When the green time is extended during any one phase, the cycle length (green time plus yellow change plus red clearance of the independent phases) is also lengthened.

Common practice in the La Crosse area is for phases to be mirrored from those shown in Figure 42. For example, the protected left turns for Losey Blvd (phase 1 and phase 5 for the north/south main street) receive a green arrow at the same time after which they can *permissively* turn left during a gap in traffic while the through traffic on Losey Blvd has the green (phases 2 and 6). The cycle length of the intersection under this scenario is the sum of the green, the yellow change, and the red clearance for phases 1/5, 2/6, 3/7, and 4/8.

Pedestrian timings (P 1-8 in the figure) are set to correspond to the adjacent vehicle through-movements (phases 2, 4, 6, and 8) and consist of a "walk," a pedestrian clear (flashing "don't walk"), and a solid "don't walk," which corresponds to the yellow change, red clearance, and solid red. In some situations where slower walkers may be common, the pedestrian timing may be "actuated" to allow for an extended pedestrian clear. None of the signals addressed in this study have that capability and most require pushing a pedestrian activation button.

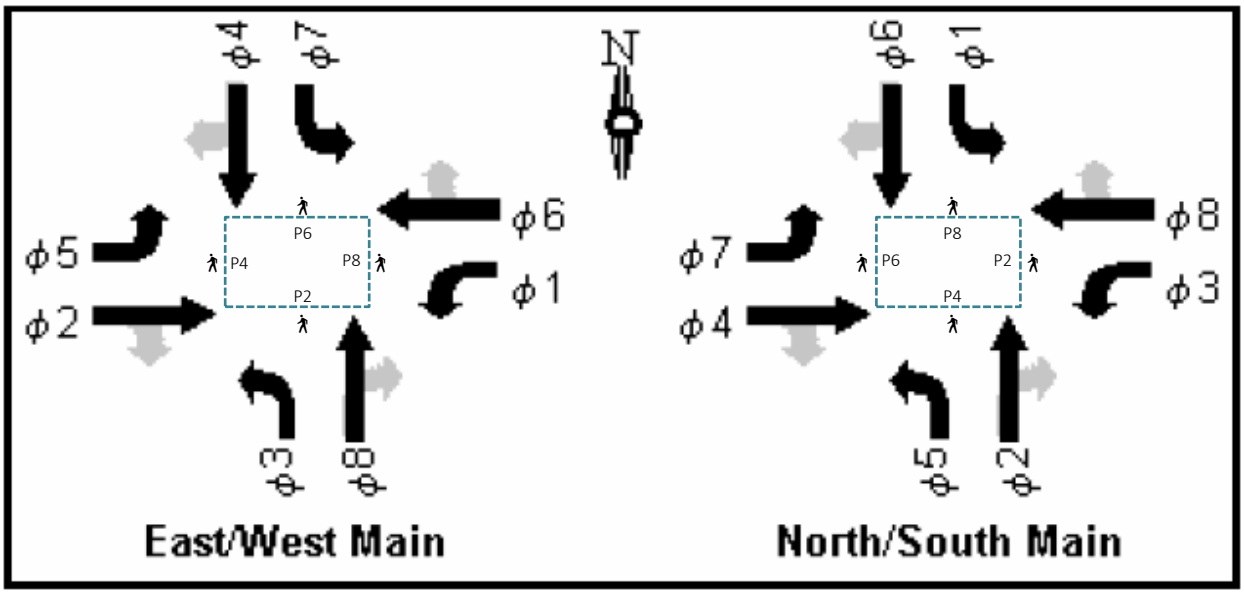

Figure 42: Typical phase numbering scheme for individual movements around an intersection.
Sources: Signal Timing, Wisconsin Department of Transportation; *Signal Timing Manual*, Federal Highway Administration.

The following vehicle basic timing and pedestrian timing for the intersections of Losey Blvd and State Rd, West Ave and La Crosse St, West Ave and State St, West Ave and Main St, and West Ave and Jackson St were provided by the City of La Crosse.

Losey Blvd and State Rd

Vehicle Basic Timing

The cycle length for this intersection ranges from a minimum of 56 seconds to a maximum of 171 seconds. According to the City Engineer, the signal is programmed for a 100-second cycle.

Phase	1	2	3	4	5	6	7	8
Minimum Green	5	20	5	10	5	20	5	10
Passage	1.5	3	1.5	1.5	1.5	3	1.5	1.5
Maximum 1	30	60	20	45	25	60	25	45
Maximum 2	30	60	20	45	25	60	25	45
Yellow Change	3	3.5	3	3.5	3	3.5	3	3.5
Red Clearance	0	1.5	0	1.5	0	1.5	0	1.5

Pedestrian Timing

Phase	1	2	3	4	5	6	7	8
Walk	0	15	0	15	0	15	0	15
Pedestrian Clear	0	28	0	28	0	28	0	28

West Ave and La Crosse St

Vehicle Basic Timing

The cycle length for this intersection ranges from a minimum of 46 seconds to a maximum of 211 seconds. According to the City Engineer, the signal is programmed for a 70- or 80-second cycle.

Phase	1	2	3	4	5	6	7	8
Minimum Green	5	12	5	8	5	12	5	8
Passage	1.6	4.4	1.5	1.8	1.5	4.4	1.5	1.8
Maximum 1	20	85	30	60	20	65	30	50
Maximum 2	20	85	30	60	20	65	30	50
Yellow Change	3.0	3.5	3.0	3.5	3.0	3.5	3.0	3.5
Red Clearance	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5

Pedestrian Timing

Phase	1	2	3	4	5	6	7	8
Walk	0	5	0	5	0	5	0	5
Pedestrian Clear	0	17	0	17	0	17	0	17

West Ave and State St

Vehicle Basic Timing

The cycle length for this intersection ranges from a minimum of 68 seconds to a maximum of 111 seconds. According to the City Engineer, the signal is programmed for a 70- or 80-second cycle.

Phase	1	2	3	4	5	6	7	8
Minimum Green	5	20	10	17	5	20	10	17
Passage	4	5	4	5	4	5	4	5
Maximum 1	15	30	25	25	15	30	25	25
Maximum 2	99	99	99	99	99	99	99	99
Yellow Change	3	3	3	3	3	3	3	3
Red Clearance	0	2	0	2	0	2	0	2

Pedestrian Timing

Phase	1	2	3	4	5	6	7	8
Walk	0	6	0	6	0	6	0	6
Pedestrian Clear	0	14	0	14	0	14	0	14

West Ave and Main St

Vehicle Basic Timing

The cycle length for this intersection ranges from a minimum of 68 seconds to a maximum of 111 seconds. According to the City Engineer, the signal is programmed for a 70- or 80-second cycle.

Phase	1	2	3	4	5	6	7	8
Minimum Green	5	20	10	17	5	20	10	17
Passage	4	5	4	5	4	5	4	5
Maximum 1	15	30	25	25	15	30	25	25
Maximum 2	99	99	99	99	99	99	99	99
Yellow Change	3	3	3	3	3	3	3	3
Red Clearance	0	2	0	2	0	2	0	2

Pedestrian Timing

Phase	1	2	3	4	5	6	7	8
Walk	0	6	0	6	0	6	0	6
Pedestrian Clear	0	18	0	16	0	18	0	16

West Ave and Jackson St

Vehicle Basic Timing

Because Jackson St does not have a protected left-turn phase, phases 3 and 7 are skipped and the cycle length ranges from a minimum of 55 seconds to a maximum of 83 seconds. According to the City Engineer, the signal is programmed for a 70- or 80-second cycle.

Phase	1	2	3	4	5	6	7	8
Minimum Green	5	20	10	17	5	20	10	17
Passage	4	5	4	5	4	5	4	5
Maximum 1	15	30	25	25	15	30	25	25
Maximum 2	99	99	99	99	99	99	99	99
Yellow Change	3	3	3	3	3	3	3	3
Red Clearance	0	2	0	2	0	2	0	2

Pedestrian Timing

Phase	1	2	3	4	5	6	7	8
Walk	0	6	0	6	0	6	0	6
Pedestrian Clear	0	12	0	17	0	12	0	17

Appendix B

Intersection Observation and Count Summaries

Losey Blvd and State Rd

A count of bicyclist and pedestrian crossing movements was conducted from 7:00 am to 9:00 am on Thursday, October 20, 2016. Table A summarizes the crossing movements by hour and by user type.

TABLE A: BICYCLE AND PEDESTRIAN CROSSINGS THROUGH THE LOSEY BLVD/STATE RD INTERSECTION[1]

	Movement				
	Northbound	Southbound	Eastbound	Westbound	Total
7:00 am – 8:00 am					
Bicyclists	0	0	0	2	2
Pedestrians	0	2	1	2	5
Subtotal	*0*	*2*	*1*	*4*	*7*
8:00 am – 9:00 am					
Bicyclists	0	1	0	0	1
Pedestrians	0	0	1	0	1
Subtotal	*0*	*1*	*1*	*0*	*2*
Total	**0**	**3**	**2**	**4**	**9**

[1]The count was taken on Thursday, October 20, 2016 from 7:00 am to 9:00 am.

Although this count occurred on a day when Central High School was in session, very little bicyclist and pedestrian activity occurred compared to other intersections. Crossings by high school students are concentrated at Green Bay St, which is right at the high school. The Losey Blvd/Green Bay St intersection is also significantly smaller and more pedestrian friendly than the Losey Blvd/State Rd intersection. None of the bicyclists used the travel lanes; they all crossed in a crosswalk.

The most used crosswalk was the south crosswalk with 5 crossings (1 bicycle and 4 pedestrian) followed by the west crosswalk with two crossings (1 bicycle and 1 pedestrian). The north and east crosswalks each had one crossing—1 bicycle (north) and 1 pedestrian (east).

West Ave and La Crosse St

A count of bicycle and pedestrian crossing movements was conducted from 7:00 am to 9:00 am on Tuesday, October 18, 2016. Table B summarizes the crossing movements by hour and by user type.

TABLE B: BICYCLE AND PEDESTRIAN CROSSINGS THROUGH THE LA CROSSE ST/WEST AVE INTERSECTION[1]

	Movement				
	Northbound	Southbound	Eastbound	Westbound	Total
7:00 am – 8:00 am					
Bicyclists	0	8	11	4	23
Pedestrians	4	8	16	4	32
Subtotal	*4*	*16*	*27*	*8*	*55*
8:00 am – 9:00 am					
Bicyclists	4	7	11	4	26
Pedestrians	1	7	15	7	30
Subtotal	*5*	*14*	*26*	*11*	*56*
Total	**9**	**30**	**53**	**19**	**111**

[1]The count was taken on Tuesday, October 18, 2016 from 7:00 am to 9:00 am.

All bicyclists operated in the crosswalk. The most heavily used crossing was the south crosswalk with 46 crossings 26 bicycle and 20 pedestrian). The next busiest crossing was the north crosswalk with 26 crossings (4 bicycle and 22 pedestrian). The west crosswalk experienced 11 bicyclists and 12 pedestrians, and the east crosswalk experienced 8 of each.

All of the pedestrian crossings need to be activated to get the "walk." The signal poles at the southeast and southwest corners of the intersection and their pedestrian activation buttons are closer to the curb ramps than those at the northeast and northwest corners, making it easier for bicyclists to activate the "walk." The curb ramps at the northeast and northwest corners are also diagonal ramps, which are not recommended because they direct users toward the center of the intersection and are difficult for bicyclists to maneuver to after activating the pedestrian signal. A fair number of bicyclists and pedestrians (did not count) did push the button. The "walk" phase appeared very short though (the "walk" started flashing while the pedestrian was still in the outside travel lane).

A significant number of bicyclists and pedestrians (did not count) crossed La Crosse St at 11th St and at 12th St and cut behind Subway. They likely crossed at Badger St.

This intersection, like at Jackson St, appeared to experience faster vehicles and more red-light running.

West Ave and Badger St

A count of bicycle and pedestrian crossing movements was conducted from 7:00 am to 9:00 am on Monday, October 17, 2016. Table C summarizes the crossing movements by hour and by user type.

TABLE C: BICYCLE AND PEDESTRIAN CROSSINGS THROUGH THE BADGER ST/WEST AVE INTERSECTION[1]

	Movement				
	Northbound	Southbound	Eastbound	Westbound	Total
7:00 am – 8:00 am					
Bicyclists	1	1	48	6	56
Pedestrians	5	17	101	8	131
Subtotal	*6*	*18*	*149*	*14*	*187*
8:00 am – 9:00 am					
Bicyclists	4	3	60	6	73
Pedestrians	8	16	110	17	151
Subtotal	*12*	*19*	*170*	*23*	*224*
Total	**18**	**37**	**319**	**37**	**411**

[1]The count was taken on Monday, October 17, 2016 from 7:00 am to 9:00 am.

The Badger St/West Ave intersection is access controlled by a median that prevents vehicular cross-traffic for Badger St. One crosswalk across the south approach (northbound West Ave) allows bicyclists and pedestrians to cross through the median; thus all of the east-west crossings (356—120 bicycle and 236 pedestrian) occurred here. Two pedestrians crossed at an angle to the median outside of any crosswalk an 53 crossings occurred north-south across Badger St. The east crosswalk experienced 31 crossings (8 bicycle and 23 pedestrian); the west crosswalk experienced 22 crossings (1 bicycle and 21 pedestrian).

All bicyclists must use the crosswalk as there is no means to cross if the bicyclist is operating in the street on Badger St. The crosswalk is too narrow to accommodate bicyclists and pedestrians.

During a count in 2013 of bicyclists and pedestrians at this location, motor vehicle traffic stopped at La Crosse St was observed to be queued through the Badger St crossing. Bicyclists and pedestrians were seen to weave their way through the stopped vehicles. This was not observed during this count. The count in 2013 took place from 7:30 am to 9:30 am on Thursday, September 19.

West Ave and State St

A count of bicycle and pedestrian crossing movements was conducted from 7:00 am to 9:00 am on Thursday, October 13, 2016. Table D summarizes the crossing movements by hour and by user type.

TABLE D: BICYCLE AND PEDESTRIAN CROSSINGS THROUGH THE STATE ST/WEST AVE INTERSECTION[1]

	Movement				
	Northbound	Southbound	Eastbound	Westbound	Total
7:00 am – 8:00 am					
Bicyclists	6	1	21	5	33
Pedestrians	16	6	26	2	50
Subtotal	*22*	*7*	*47*	*7*	*83*
8:00 am – 9:00 am					
Bicyclists	4	2	12	3	21
Pedestrians	7	4	17	4	32
Subtotal	*11*	*6*	*29*	*7*	*53*
Total	**33**	**13**	**76**	**14**	**136**

[1]The count was taken on Thursday, October 13, 2016 from 7:00 am to 9:00 am.

Because of visibility issues with a large sign and parking/moving vehicles in the Moka parking lot, I was unable to see which bicyclists and pedestrians made more than one crossing to determine the number of bicyclists and pedestrians using the intersection. Volumes were also an issue with being able to keep up.

Only one bicyclist operated in the street and she was eastbound on State St. The east crosswalk had the lightest bicycle and pedestrian use with only eight crossings during the two hours (four bicyclists and four pedestrians). The most heavily used crosswalks were the south crosswalk with 46 crossings (23 bicycle and 23 pedestrian), the north crosswalk with 43 crossings (17 bicycle and 26 pedestrian), and the west crosswalk with 38 crossings (9 bicycle and 29 pedestrian).

The crossings of State St would automatically turn to “walk” when the traffic signal turned green for that direction. The crossings for West Ave require pedestrian activation to get the “walk.” Bicyclists and pedestrians were pretty good at pushing the pedestrian button if they got to the intersection when the signal was red. When the signal was green and there was a “don’t walk,” bicyclists and pedestrians proceeded through instead of hitting the button.

West Ave and Main St

A count of bicycle and pedestrian crossing movements was conducted from 7:00 am to 9:00 am on Tuesday, October 11, 2016. Table E summarizes the crossing movements by hour and by user type.

TABLE E: BICYCLE AND PEDESTRIAN CROSSINGS THROUGH THE MAIN ST/WEST AVE INTERSECTION[1]

	Movement				
	Northbound	Southbound	Eastbound	Westbound	Total
7:00 am – 8:00 am					
Bicyclists	10	1	11	5	27
Pedestrians	5	4	5	6	20
Subtotal	*15*	*5*	*16*	*11*	*47*
8:00 am – 9:00 am					
Bicyclists	3	5	8	4	20
Pedestrians	5	4	4	6	19
Subtotal	*8*	*9*	*12*	*10*	*39*
Total	**23**	**14**	**28**	**21**	**86**

[1]The count was taken on Tuesday, October 11, 2016 from 7:00 am to 9:00 am.

Because 3 bicyclists and 5 pedestrians each crossed two legs of the intersection, the total number of bicyclists and pedestrians crossing through the intersection was 78 (44 bicyclists and 34 pedestrians).

Fifteen bicyclists (34.1%) operated in the street, but only on Main St. No bicyclists operated on West Ave. The east crosswalk had the lightest bicycle and pedestrian use with only eight crossings (three bicycle and five pedestrian) during the two hours. The most heavily used crosswalks were the west crosswalk, the north crosswalk, and the south crosswalk, with 29 (16 bicycle and 13 pedestrian), 17 (7 bicycle and 10 pedestrian), and 17 (6 bicycle and 11 pedestrian) crossings, respectively.

This intersection is busy with joggers. They do not activate the pedestrian signal, however. If the light is green, they proceed without checking traffic. Bicyclists do not activate the pedestrian signal when operating as a pedestrian on the sidewalk. When stopped at a red light and the light turned green, some female bicyclists would just wait until turning traffic was through. Males on bicycles seemed to proceed through the intersection faster than females and seemed less cautious.

West Ave and Jackson St

A count of bicycle and pedestrian crossing movements was conducted from 7:00 am to 9:00 am on Monday, October 10, 2016. Table F summarizes the crossing movements by hour and by user type.

TABLE F: BICYCLE AND PEDESTRIAN CROSSINGS THROUGH THE JACKSON ST/WEST AVE INTERSECTION[1]

	Movement				
	Northbound	Southbound	Eastbound	Westbound	Total
7:00 am – 8:00 am					
Bicyclists	5	5	2	10	22
Pedestrians	4	1	2	7	14
Subtotal	*9*	*6*	*4*	*17*	*36*
8:00 am – 9:00 am					
Bicyclists	4	4	5	6	19
Pedestrians	4	0	2	8	14
Subtotal	*8*	*4*	*7*	*14*	*33*
Total	**17**	**10**	**11**	**31**	**69**

[1]The count was taken on Monday, October 10, 2016 from 7:00 am to 9:00 am.

Because 9 bicyclists and 3 pedestrians each crossed two legs of the intersection, the total number of bicyclists and pedestrians crossing through the intersection was 57 (32 bicyclists and 25 pedestrians).

One bicyclist operated entirely as a vehicle by positioning himself in the left-turn lane of northbound West Ave to continue westbound on-street on Jackson St (considered one movement). One eastbound woman on Jackson St operated as a vehicle in the street on the west side of West Ave, but transitioned to the crosswalk through the intersection and onto the sidewalk on the east side of West Ave.

The most heavily used crosswalk was the north crosswalk with 28 crossings (13 bicycle and 15 pedestrian), followed by the west crosswalk with 17 crossings (10 bicycle and 7 pedestrian), the south crosswalk with 13 crossings (9 bicycle and 4 pedestrian), and finally the east crosswalk with 10 crossings (8 bicycle and 2 pedestrian).

The northwest signal pole was missing for westbound traffic. This caused confusion for some pedestrians wanting to use the north crossing of West Ave. One group of three and a single pedestrian got stranded in the middle of the street after having pushed the pedestrian button and then proceeded on a red light. The signal pole on the southwest corner is too far out of sight alignment for pedestrians using this crossing. (The northwest signal pole was replaced shortly after this count.)

Other observations: 1) Vehicles turn too fast (large radii); 2) drivers always looking left to make the right on red; 3) bicyclists don't push the pedestrian button when using the crosswalk (it's too far away from the curb ramp).

Appendix C

The following chart from the Wisconsin Department of Transportation illustrates the annual hourly day of week percentages for 2014 for the segment of West Ave north of Mississippi St. The hours of the day where the hourly percentages averaged for the road equal or exceed 7.0% are considered part of the travel peak. Weekday mornings for West Ave seem to have a short travel peak between 7:00 am and 8:00 am and a longer afternoon peak between 2:00 pm and 5:00 pm. Sundays experience a long mid-day travel peak between 11:00 am and 5:00 pm, while Saturdays experience a shorter mid-day peak between 11:00 am and 3:00 pm.

The Monday, Tuesday, and Thursday percentages for the hours of 7:00 am and 8:00 am were used to calculate the hourly motor vehicle traffic used in the formula to determine a crash index for each of the problem intersections.

Wisconsin Department of Transportation

Annual Hourly Day of Week Percentages for 2014

Site Names:	326116, 2753, SW	Seasonal Factor Group:	2
County:	La Crosse	Daily Factor Group:	2
Funct. Class:	U Minor Arterial	Axle Factor Group:	6
Location:	STH 35 - NORTH OF MISSISSIPPI ST	Growth Factor Group:	1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg Dir	Pos Dir	Road	Neg Dir	Pos Dir	Road	Neg Dir	Pos Dir	Road	Neg Dir	Pos Dir	Road	Neg Dir	Pos Dir	Road	Neg Dir	Pos Dir	Road	Neg Dir	Pos Dir
0:00	1.5	1.5	1.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	1.4	1.4	1.3
1:00	1.1	1.2	1.0	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.9	1.0	0.8
2:00	1.1	1.2	1.0	0.3	0.2	0.3	0.4	0.3	0.5	0.5	0.3	0.6	0.5	0.3	0.6	0.5	0.4	0.6	0.9	0.9	0.9
3:00	0.6	0.6	0.6	0.3	0.2	0.4	0.3	0.2	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.5	0.5
4:00	0.5	0.5	0.5	0.8	0.6	1.0	0.8	0.6	1.0	0.8	0.6	1.0	0.8	0.6	0.9	0.7	0.6	0.9	0.6	0.5	0.7
5:00	1.0	0.9	1.0	1.9	1.4	2.4	1.9	1.4	2.4	1.9	1.5	2.4	1.8	1.4	2.3	1.8	1.3	2.2	1.2	1.0	1.3
6:00	1.7	1.4	1.9	4.3	3.5	5.0	4.3	3.5	5.1	4.4	3.5	5.2	4.2	3.4	4.9	3.9	3.3	4.5	2.0	1.6	2.4
7:00	2.8	2.3	3.2	7.2	6.4	8.1	7.2	6.5	8.0	7.2	6.4	8.0	7.1	6.4	7.9	6.7	6.1	7.3	3.2	2.8	3.6
8:00	3.9	3.3	4.6	5.1	4.5	5.7	5.0	4.4	5.7	5.0	4.5	5.5	5.0	4.4	5.6	4.9	4.5	5.4	4.7	4.1	5.3
9:00	5.9	5.0	6.9	5.0	4.8	5.3	5.0	4.8	5.2	5.0	4.8	5.2	4.9	4.8	5.1	5.2	4.9	5.5	6.1	5.5	6.6
10:00	6.7	6.6	6.8	5.4	5.3	5.5	5.3	5.3	5.4	5.3	5.3	5.4	5.3	5.2	5.4	5.6	5.5	5.7	6.8	6.5	7.0
11:00	8.1	8.6	7.5	6.4	6.3	6.4	6.2	6.2	6.3	6.4	6.3	6.4	6.1	6.0	6.3	6.6	6.5	6.7	7.8	7.6	7.4
12:00	7.6	7.9	7.3	6.6	6.7	6.5	6.5	6.6	6.3	6.5	6.6	6.4	6.5	6.6	6.3	6.8	7.0	6.6	7.4	7.6	7.1
13:00	7.3	7.7	7.2	6.5	6.7	6.4	6.5	6.5	6.4	6.3	6.5	6.2	6.4	6.6	6.3	6.7	6.9	6.4	7.3	7.5	7.1
14:00	7.4	7.6	7.2	7.5	7.9	7.1	7.3	7.6	7.0	7.3	7.6	7.0	7.3	7.7	7.0	7.5	7.9	7.1	7.1	7.4	6.8
15:00	7.4	7.6	7.3	8.4	8.9	8.0	8.3	8.9	8.1	8.2	8.6	7.9	8.4	8.7	8.0	8.1	8.5	7.7	6.9	7.2	6.5
16:00	7.2	7.3	7.1	9.1	9.5	8.8	9.0	9.3	8.8	8.9	9.1	8.6	8.8	8.9	8.6	8.3	8.6	8.0	6.7	6.6	6.7
17:00	6.5	6.7	6.2	6.9	7.4	6.5	6.9	7.3	6.5	6.9	7.3	6.5	6.8	7.1	6.5	6.4	6.6	6.2	6.1	6.2	6.0
18:00	6.0	6.3	5.6	5.1	5.6	4.7	5.2	5.7	4.8	5.3	5.7	4.9	5.2	5.5	5.0	4.9	5.1	4.7	5.7	6.0	5.4
19:00	4.9	5.1	4.7	4.1	4.6	3.5	4.0	4.7	3.4	4.1	4.7	3.6	4.1	4.7	3.5	3.8	4.1	3.5	4.6	4.9	4.4
20:00	4.0	4.0	3.9	3.1	3.4	2.8	3.2	3.7	2.8	3.3	3.8	2.9	3.4	3.9	3.0	3.3	3.6	3.0	4.0	4.2	3.8
21:00	3.1	3.0	3.2	2.4	2.5	2.2	2.6	2.8	2.3	2.5	2.8	2.3	2.7	2.9	2.4	2.9	3.1	2.7	3.6	3.7	3.5
22:00	2.2	2.2	2.3	1.7	1.8	1.7	1.8	1.8	1.8	1.8	1.8	1.7	1.9	2.0	1.9	2.3	2.3	2.2	2.9	3.0	2.9
23:00	1.3	1.3	1.4	1.0	1.1	0.9	1.1	1.1	1.1	1.0	1.1	1.0	1.2	1.2	1.2	1.5	1.6	1.4	2.1	2.2	2.0
AADW	13,877	6,972	6,905	21,258	10,788	10,469	22,430	11,389	11,040	22,144	11,240	10,905	22,097	11,193	10,904	22,676	11,456	11,220	16,011	8,067	7,945
NDAYS	53	53	53	52	52	52	52	52	52	52	52	52	51	51	51	52	52	52	52	52	52

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