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April 3, 2018

Mr. Chris Petykowski, P.E.
City of Madison
City-County Building, Room 115
210 Martin Luther King Jr. Boulevard
Madison, WI 53703

Re: Blair Street Corridor Study Report

Dear Chris,

Following is a PDF of the final revised Blair Street Corridor Study Report. Please distribute as necessary.

Please call with questions.

Sincerely,

STRAND ASSOCIATES, INC.®

Jeff Held, P.E., PTOE

Enclosure: Report

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Report for

City of Madison, Wisconsin

Blair Street Corridor Study Report

Prepared by:

STRAND ASSOCIATES, INC.®
910 West Wingra Drive
Madison, WI 53715
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April 2018

STRAND ASSOCIATES®

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EXECUTIVE SUMMARY

ES.01 INTRODUCTION

A. Background

The John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection is a cross roads for all transportation modes. It is one of the most highly used intersections for pedestrians, bicyclists, motor vehicles, and transit. It serves as both an entrance to the near east isthmus/Capitol area as well as the Williamson Street corridor. Key modal features associated with the intersection are listed following.

The importance of the intersection is augmented by the historic structures, such as Machinery Row and Hotel Ruby Marie, and parks such as Law Park and the Gateway Center pocket park. Figure ES.01-1 illustrates the modal importance of the intersection.

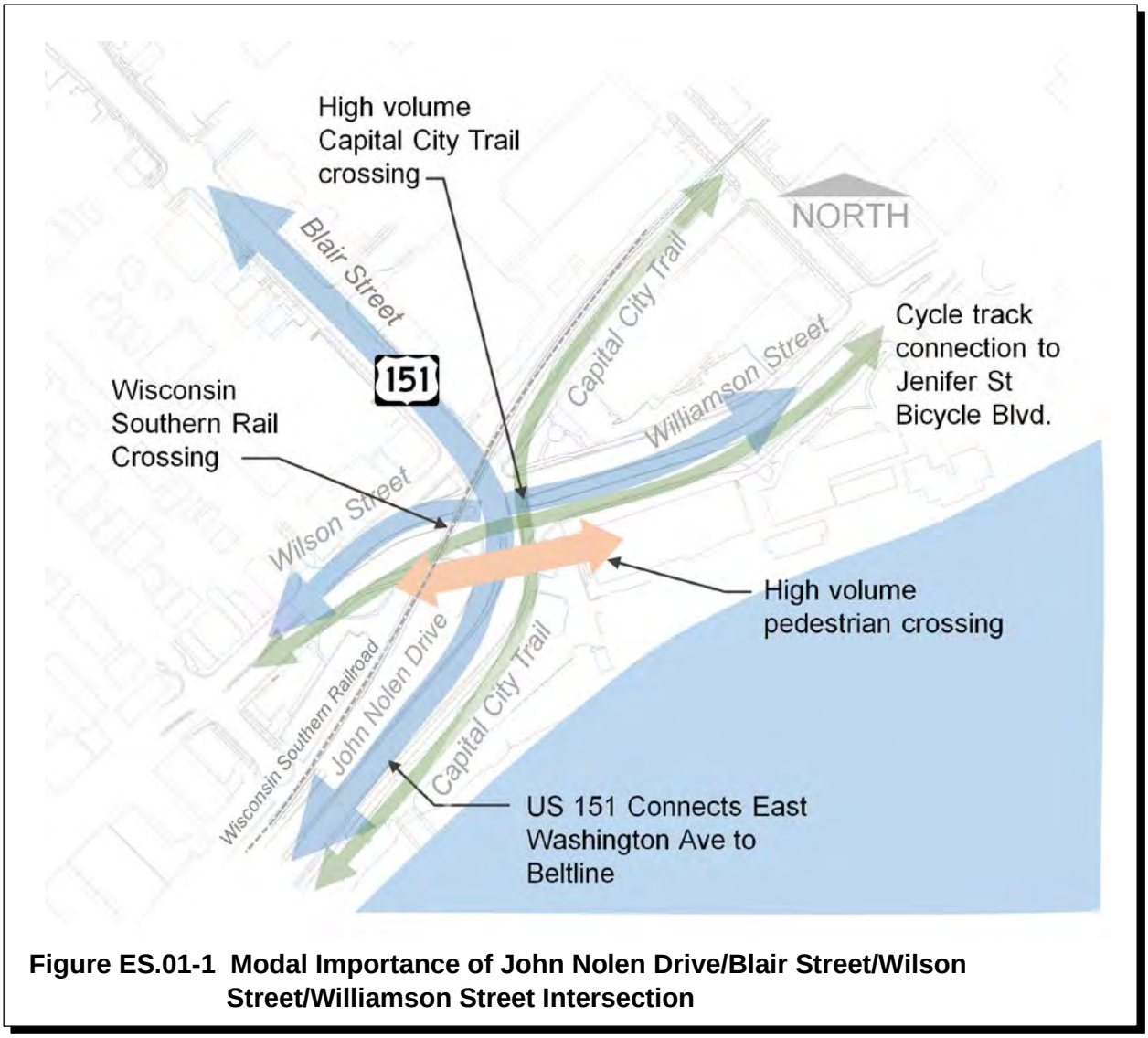


Figure ES.01-1 Modal Importance of John Nolen Drive/Blair Street/Wilson Street/Williamson Street Intersection

Because of the current pavement conditions, along with inadequate operations for all modes, the City of Madison (City) enlisted Strand Associates, Inc.® (Strand) to study the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection. The study was to evaluate existing conditions for pedestrians, bicyclists, motorists, transit, and emergency services. The study was then to develop alternatives that improved mobility for all of these services. Eventually the study was to be used to help program improvements for the intersection to address the deteriorating pavement conditions.

Public and stakeholder interaction soon expanded the scope of the study to include John Nolen Drive at the North Shore Drive and Broom Street intersections. The study was also expanded to include a blocking exercise to determine viewshed effects of constructing a parking garage/elevated park structure over John Nolen Drive east of Monona Terrace. Figure ES.01-2 illustrates the limits of the study.

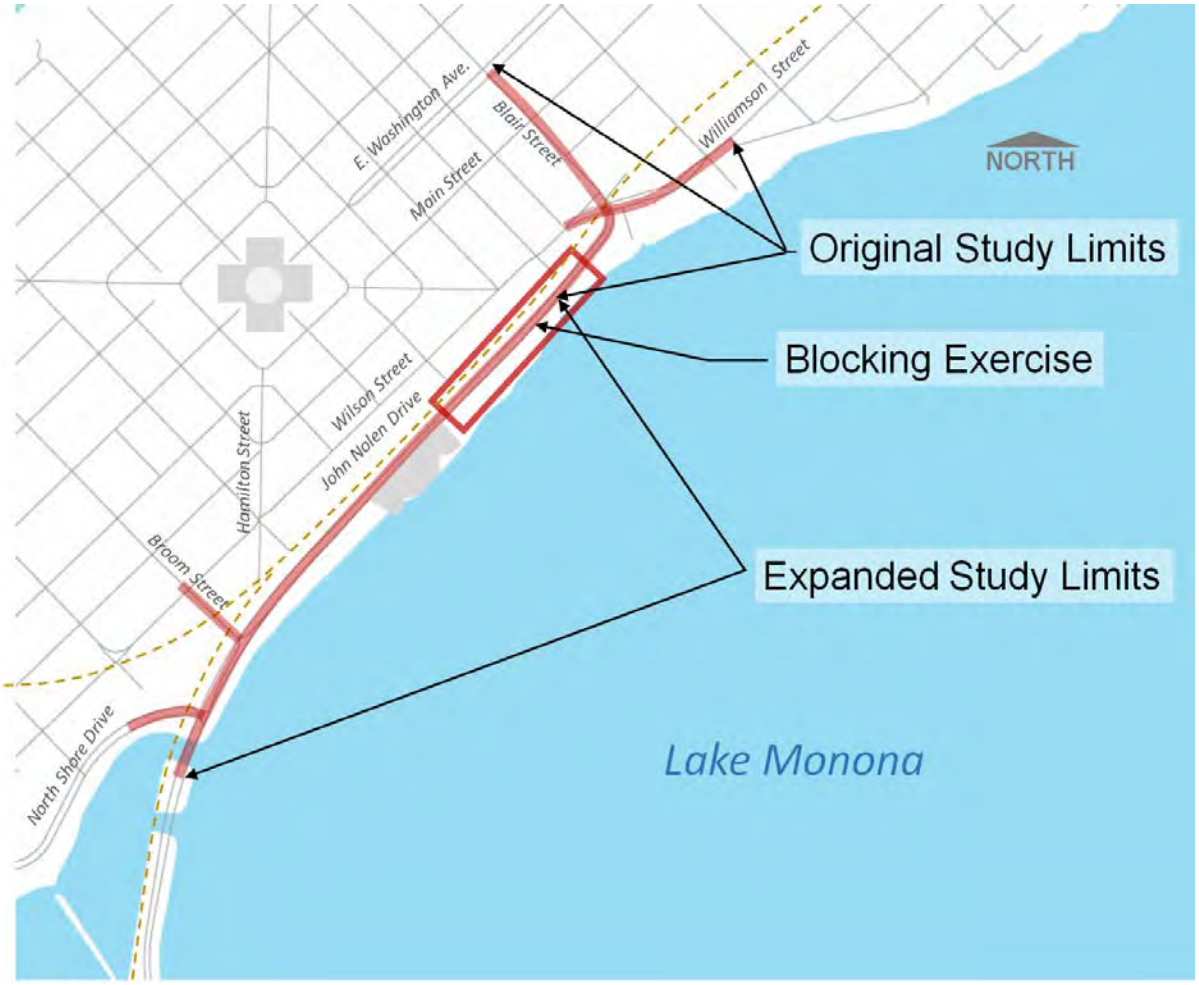


Figure ES.01-2 Study Limits

B. Study Purpose

The study's purpose is to develop a near-term solution for the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection area that:

1. Can be reasonably funded with federal transportation monies within the next 5 to 10 years.

2. Improves operations, safety, and comfort for:

    a. Pedestrians
    b. Cyclists
    c. Motorists
    d. Transit

3. Addresses the poor pavement conditions.

4. Evaluates short and long-term options that improve pedestrian and bicycle access to the lakeshore from North Shore Drive to Blair Street.

5. Evaluates the viewshed effects of proposals that include a structure over John Nolen Drive east of Monona Terrace.

The Blair Street and John Nolen Drive corridor is designated as US 151, a connecting highway. Therefore, these legs of the intersection are under the jurisdiction of the Wisconsin Department of Transportation (WisDOT). WisDOT and Federal funding likely would be used (and required) for improvements to these legs of the intersection.

C. Study Schedule

The yearlong study was segmented into three phases. Phase 1 focused on identifying needs and developing alternatives. Phase 2 presented a range of alternatives and then used stakeholder feedback to refine the alternatives. Phase 3 presented both draft and final recommendations. Figure ES.01-3 graphically illustrates both the study phases and the study schedule.

Figure ES.01-3 Study Phases and Schedule

ES.02 RECOMMENDATIONS

A. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection

1. Interim Recommendations

Depending on the availability of funding, reconstruction/reconfiguration of this intersection is likely several years away. Yet, one of the key concerns of stakeholders is the conflicts between motor vehicles and pedestrians and bicyclists at the Machinery Row driveways in the southeast quadrant. The study team recommends that the City investigate the feasibility of installing vehicle detection combined with a warning beacon to alert bicyclists and pedestrians when a vehicle is present. The beacon could be mounted over a sign indicating "Blind Driveway", "Watch for Exiting Vehicles", or similar.

2. Near-Term Recommendations

Figure ES.02-1 illustrates the recommended configuration for the John Nolen Drive/Blair Street and Wilson Street//Williamson Street intersection. It is also included in Appendix F. The configuration is the product of considerable public comment and seeks to balance priorities of residents, businesses, and travelers of all modes. The reconstruction of this intersection is listed as a near-term recommendation pending its approval of Highway Safety Improvement Program grant funding. Key features of the intersection include:

a. Shifting intersection west.

b. Removing Wilson Street stub in front of Hotel Ruby Marie and the expand the greenspace.

c. Providing parallel parking and a buffered bike lane in front of Hotel Ruby Marie.

d. Installing a left turn lane on the Blair Street north approach.

e. Removing parking on the east Wilson Street stub serving the Gateway Shopping Center. In that space designate an at-grade cycle path. Maintaining existing sidewalk for pedestrians.

f. Providing green bike box and green route markings through the intersection for eastbound and westbound Williamson Street and Wilson Street cyclists. Providing ramp to cycle track in front of Machinery Row.

g. Providing green pavement marking for Capital City Trail on east Williamson Street approach. Providing separate ladder marking crossing for pedestrians adjacent to Capital City Trail marking.

h. Reconfiguring the John Nolen Drive to Williamson Street right-turn island to:

   (1) Provide more staging area for pedestrians and cyclists.

   (2) Reduce the speed of right turning vehicles with a tighter curb radius and raised pedestrian and bicycle crossing.

   (3) Add a narrow, raised lane separator between the northbound through land and the channelized right-turn lane in the gore area to reduce late lane changes.

i. Enlarging the staging area for pedestrians and cyclists crossing the John Nolen Drive to Williamson Street right turn movement.

j. Reducing Williamson Street median and reallocate space from median and narrower travel lanes to enlarge the space in front of Machinery Row. Separating pedestrians and cyclists through:

   (1) Widening the sidewalk in front of Machinery Row and realigning the existing cycle track

   (2) Adding on-street parking on eastbound Williamson Street.

k. Relocating the two Machinery Row driveways to the southwest and reduce into one driveway.

   (1) Providing a protected left turn into the parking lot. Access and egress options increase from the relocation.

   (2) Making provisions for future signalization if it becomes necessary.

l. Relocate Capital City Trail to travel through the city-owned parking lot to reduce the number of decision points from vehicles entering and exiting the parking lots. (Note: Parking lot configuration and Law Park design to be developed by Madison Parks).

m. Providing left turn lane for John Nolen Drive to Wilson and Blair Street to Williamson Street movements.

n. Maintaining bike box on west Wilson Street approach.

o. Adding a buffered bike lane approaching the intersection eastbound on Wilson Street.

p. Design elements provided to aid in the creation of a railroad Quiet Zone on the east Isthmus including Supplemental Safety Measures (SSM) and/or Alternative Safety Measures (ASM). These primarily consist of active warning devices including flashers and crossbucks and raised curb/separators that would prevent a conflicting motor vehicle from driving around the lowered crossbuck when a train is present. These treatments also led to a change in the westbound Williamson Street lane configuration that eliminates the shared through/left-turn lane and provides two left-turn lanes and one shared through/right-turn lane. There is a negligible change to motor vehicle operations. Appendix G contains a report authored by Mark Morrison, P.E. regarding his review of the preliminary intersection design.

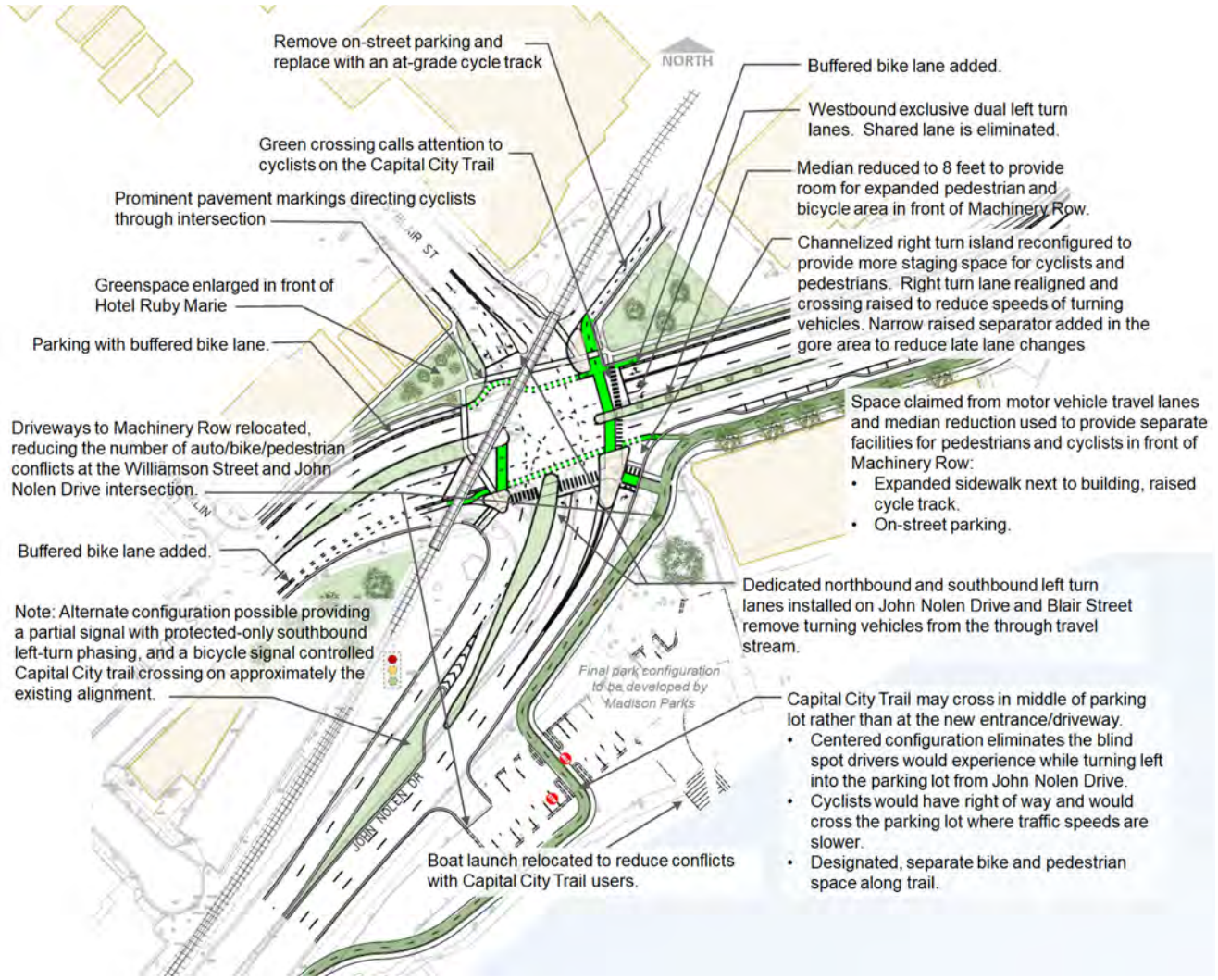


Figure ES.02-1 John Nolen Drive/Wilson/Blair/Williamson Street Intersection

Figure ES.02-2 shows the recommended cross section in front of Machinery Row.

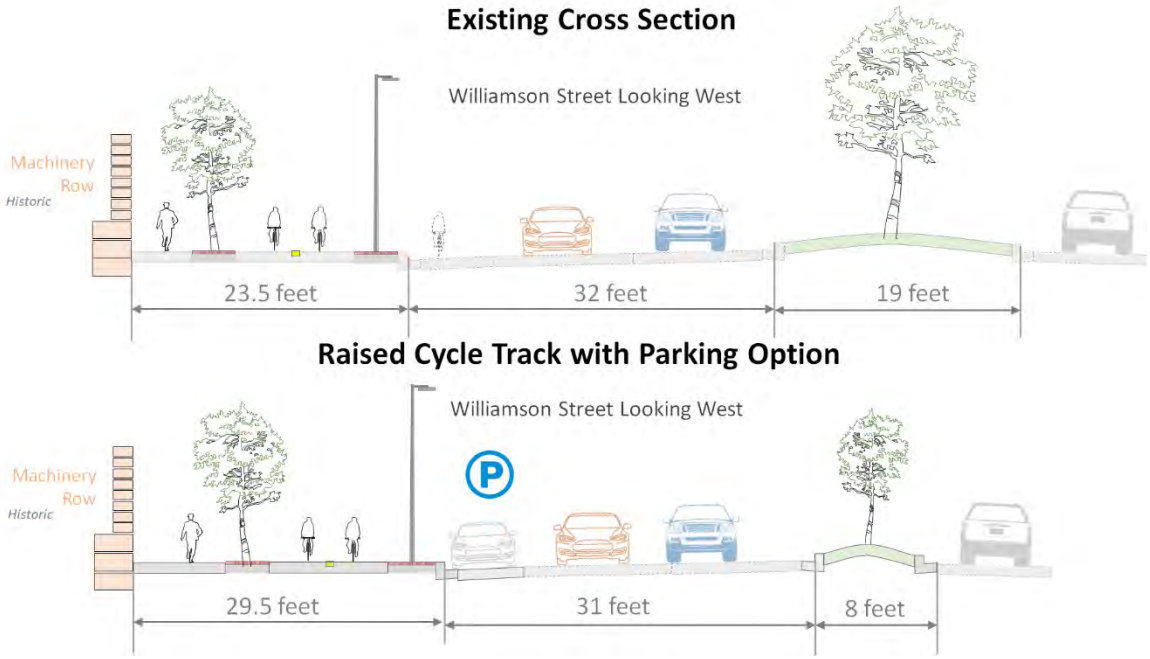


Figure ES.02-2 Recommended Cross Section in Front of Machinery Row

3. Long-Term Recommendations

If the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection is to accommodate more motor vehicle traffic volumes, there are relatively few options. They include:

a. Providing a triple left-turn on the Williamson Street east approach. This would require expanding John Nolen Drive to three lanes in the southbound direction, and possible acquisition of right-of-way from the railroad. If this is a potential option for the future, the City may want to maintain the current width of the Williamson Street median.

b. Grade separate movements within the intersection. Section 4 describes some of the significant challenges associated with this in the tunnel option.

This study does not currently recommend either of these options. This intersection is "at capacity" for all travel modes and the dynamic mix enriches the corridors that connect to the intersection.

B. Williamson Street and Blount Street Intersection

The near and long-term recommendation at the Blount Street intersection is to provide a diagonal, signalized bicycle crossing connecting to the recommended cycletrack in front of Machinery Row

and a recommended cycletrack along Blount Street connecting to the Capital City Trail. Figure ES.02-3 shows the recommended configuration.

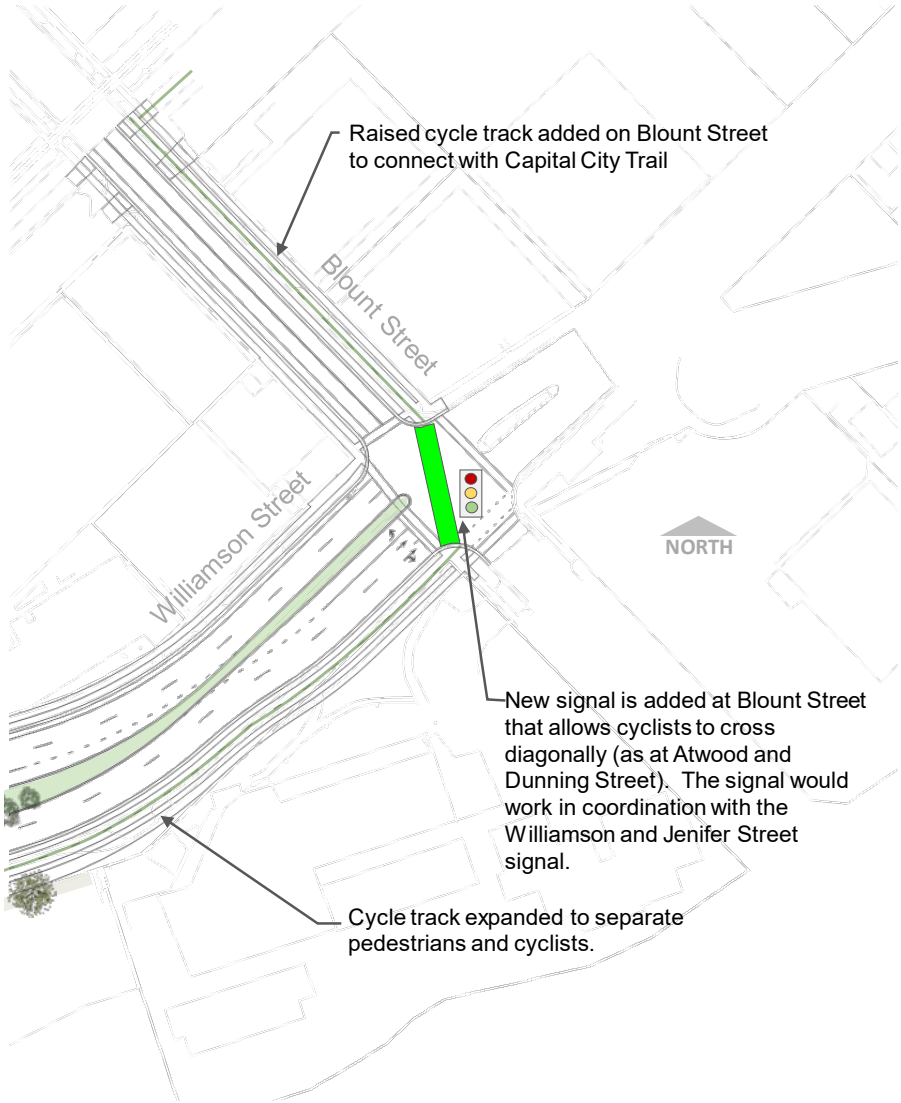


Figure ES.02-3 Williamson Street and Blount Street Intersection

C. Blair Street and Main Street Intersection

The study team recommends a traffic signal at Blair Street and Main Street as a means of providing a controlled bicycle and pedestrian crossing. From a motor vehicles operation standpoint, left turns from Blair Street to Main Street would likely need to be prohibited during peak periods, at a minimum. This is needed to avoid creating a condition similar to what currently exists at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection where left-turning vehicles on John Nolen Drive and Blair Street block one of the through lanes and lead to increased delays, queuing, and crashes.

D. East of Monona Terrace

There are several options being discussed for both Law Park and the air rights over John Nolen Drive. Some proposals include covering John Nolen Drive with a parking garage that has a roof-top park. Many also include constructing Frank Lloyd Wright's Boat House on Lake Monona.

1. Near-Term Recommendations

   a. Obtain an easement to allow a pedestrian and bike connection from Wilson Street to the edge of the railroad property to accommodate a future overpass of John Nolen Drive (completed).

   b. Work with the project team for the McGrath Redevelopment to construct footings that would accommodate a future overpass bridge that spans the rail line and John Nolen Drive to connect with the lake shore.

   c. Begin looking at funding options that could fund a pedestrian-bicycle overpass over the rail line and John Nolen Drive. Transportation Alternatives Program (or Set-Aside) might be one option.

2. Long-Term Options

The study recommends installing a pedestrian-bicycle overpass over the rail line and John Nolen Drive. Many have advocated for the bridge to be wide enough to accommodate landscaping, food carts, and/or activities. Madison Parks may soon be initiating a planning effort for Law Park. We recommend that this planning effort further refine the bridge's role and relationship to Law Park, and what amenities should be included.

As mentioned, there are proposals that include covering John Nolen Drive that could conflict with this bridge, depending on how far east the deck extends. The City can re-evaluate construction of the pedestrian-bicycle overpass in light of future priorities and proposals if and when bridge funding becomes available.

Figure 1.02-4 illustrates one option of a type of landscaped bridge that could be constructed. The actual bridge amenities should be determined in conjunction with Law Park planning.

Figure ES.02-4 Pedestrian Bridge to Law Park–One Possible Configuration

E. Broom Street Intersection

This intersection is particularly challenging. Full bike accommodations cannot be installed on Broom Street until it is reconstructed. And when it is reconstructed, building faces and topography constrain the amount of room for accommodations. The following paragraphs list the study's near and long-term recommendations.

1. Near-Term Solutions (2 to 5 years)

Near-term solutions (shown in Figure 1.02-5) for this intersection include:

a. Using a sharrow pavement marking to direct eastbound Broom Street cyclists to the left turn island. At the island, create a green colored box that directs cyclists where they should wait and cross, and alert drivers where cyclists will be crossing.

b. Creating a green bike box on the eastern left turn lane for northbound John Nolen Drive traffic to westbound Broom Street. This allows cyclists crossing John Nolen Drive from the Capital City Trail to westbound Broom Street the option

of positioning themselves in front of left-turning motor vehicle traffic and traveling through the intersection ahead of them during the protected left-turn signal phase.

c. Install a multi-use trail to connect Broom Street to Hamilton Street. This would provide a more direct route to the Capitol Square for cyclists, and allow them to travel on a roadway with less motor vehicle volume. Note that because this trail would travel on railroad right-of-way, coordination would be needed, which could delay implementation of the path.

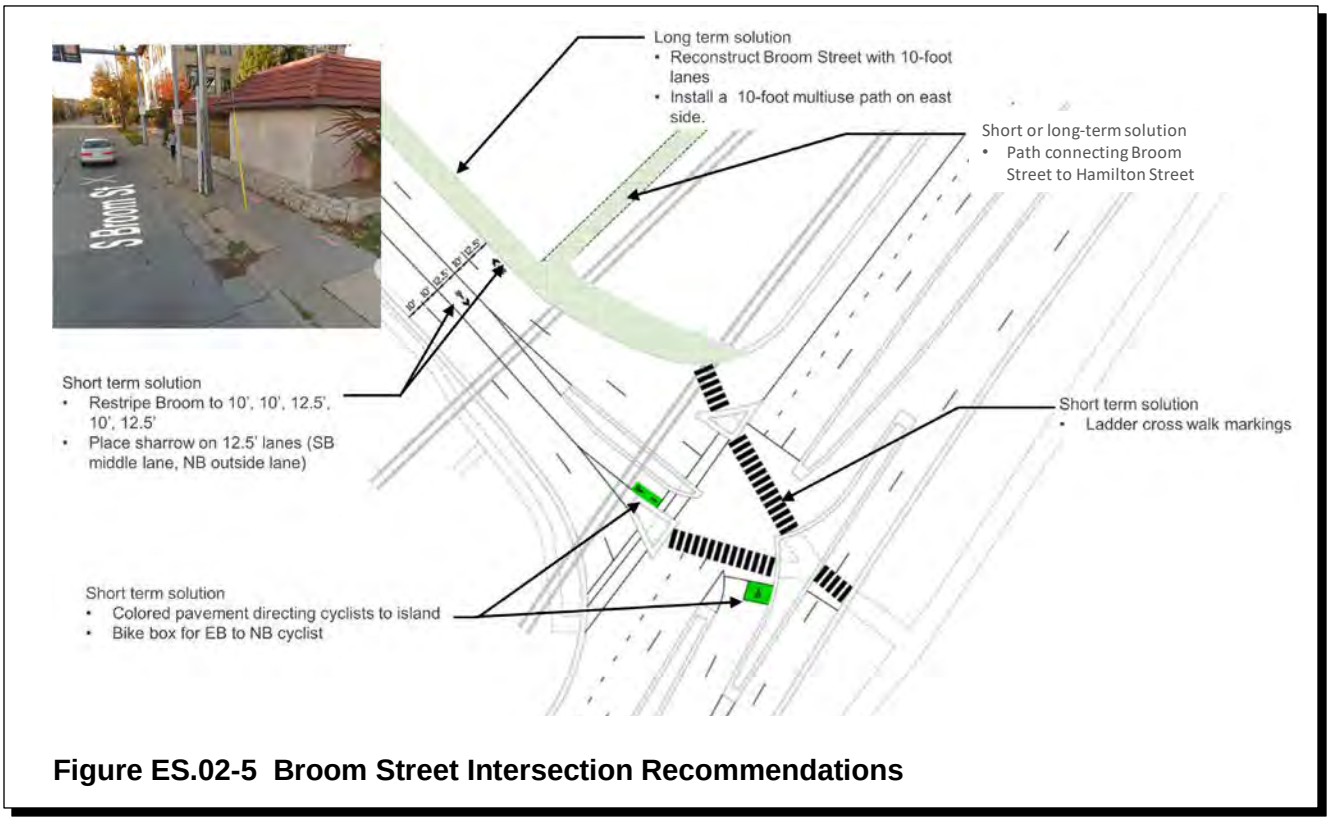


Figure ES.02-5 Broom Street Intersection Recommendations

2. Long Term Solutions (5 to 15 years)

Long term solutions for this intersection include:

a. Reconstructing Broom Street with narrower lanes (see Figure 1.02-5). With the additional space, install a raised cycle track (separated bicycle facility) on the east side of the street.

b. Connecting Broom Street with the pedestrian and bicycle underpass discussed under the North Shore Road improvements.

F. North Shore Drive Intersection

In recent years, the City has already made significant improvements to this intersection by enlarging the island on the north approach and providing green epoxy markings across John Nolen Drive. The following paragraphs describe additional measures that could be performed.

1. Near-Term Solutions (2 to 5 years)

The study recommends adding a no-right-turn blank out sign to the southbound channelized right turn lane. This will reinforce/alert drivers to the pedestrian and bicycle right-of-way during their walk signal phase.

The study team also recommends adding an off-path, paved staging area on the Capital City trail for pedestrians and cyclists. This will allow them to wait for a green signal to cross John Nolen Drive off the main path area.

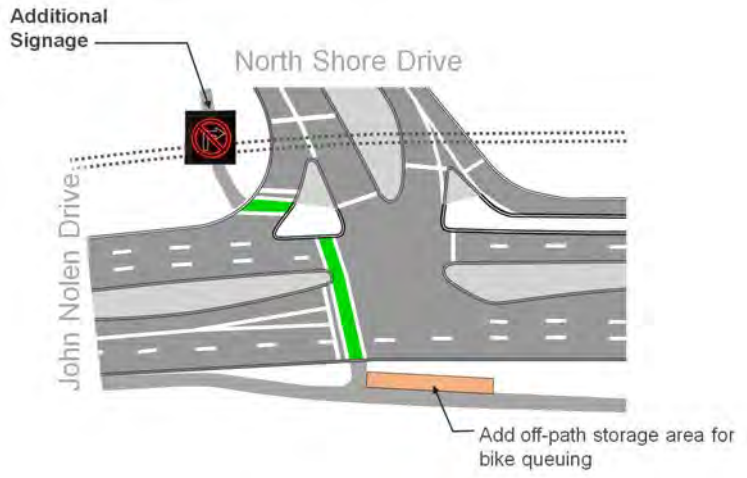


Figure ES.02-6 North Shore Drive–Near-Term Solutions

2. Long-Term Solutions (5 to 15 years)

Figure 1.02-7 illustrates one of the long-term recommendations. When the north approach of the intersection is reconstructed, the island channelizing the right turn could be enlarged to provide more room for cyclists and pedestrians waiting to cross either the right turn movement or John Nolen Drive. This modification would also reduce motor vehicle speeds.

Figure ES.02-7 North Shore Drive–Long-Term Solutions

A second long-term solution includes constructing a pedestrian and bike underpass between North Shore Drive and Broom Street. Features to consider in implementing this underpass include:

a. Raising the profile of John Nolen Drive between North Shore Drive and Broom Street. This will require reconstructing this portion of John Nolen Drive.

b. Even with this profile change on John Nolen Drive, a storm water lift station will be needed to drain the underpass of storm water that enters the underpass through the ramps.

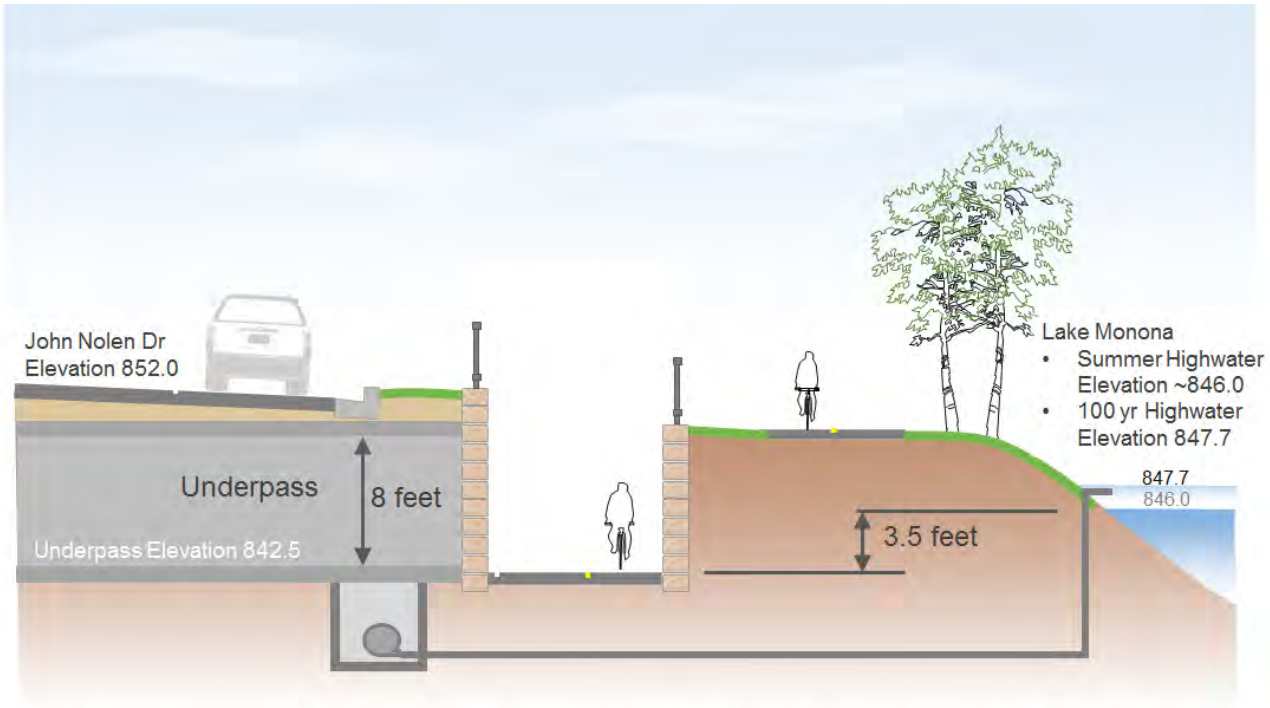
c. Reconstructing the westbound right turn lane onto North Shore Drive to reduce its functional width. This space will be needed for a ramp down to the pedestrian and bike underpass.

d. Constructing a multi-use path on the north side of North Shore Drive that connects to the pedestrian and bike underpass. This same path could continue to connect directly with Broom Street.

e. Relocating the Capital City Trail to the south to allow the trail room to travel around the ramps down to the pedestrian and bike underpass.

Figures ES.02-8 and ES.02-9 illustrates the connection network being proposed, and a cross section of the pedestrian bicycle underpass.

Figure ES.02-8 North Shore Drive–Long-Term Solutions



The underpass option places a pedestrian-bicycle tunnel underneath John Nolen Drive. This underpass would involve:

- Raising John Nolen Drive about 2 feet between North Shore Drive and Broom Street.
- Having the Capital City Trail run parallel to the ramp to the underpass.
- Constructing the underpass with a floor elevation of about 842.5.
- Because the underpass is beneath the normal lake level, the underpass would need to be watertight and would require a stormwater pump station.

Figure ES.02-9 North Shore Drive–Long-Term Solutions–Underpass Cross Section

SECTION 1
INTRODUCTION

1.01 BACKGROUND

The John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection is a cross roads for all transportation modes. It is one of the most highly used intersections for pedestrians, bicyclists, motor vehicles, and transit. It serves as both an entrance to the near east isthmus/Capitol area as well as the Williamson Street corridor. Key modal features associated with the intersection include:

1. **It is a high-volume pedestrian corridor that connects the Marquette neighborhood with the Capitol area**. This pedestrian routing serves home to work trips centered on the Capitol Square, and also trips oriented toward special events on the Capitol, such as the farmer's market, concerts on the Square, King Street concerts, Dane Dances, and others.

2. **It connects two of Madison's highest volume bike paths.** The Capitol City Trail crosses Williamson Street on the east leg, and it connects with the Machinery Row Cycle Track leading to the Jennifer Street bicycle boulevard. The intersection also connects the Capitol area with the Capital City Trail.

3. **It is a significant motor vehicle corridor,** essentially bridging the west with the east sides of the Capitol and carrying up to 37,000 vehicles per day. It is also a gateway to both Williamson Street and the Capitol area through Wilson Street.

4. **It is an important transit corridor.** Madison metro routes 3, 4,10, and 38 travel through several of the intersection approaches.

5. **It carries the Wisconsin Southern Railroad,** which when it travels through the intersection can cause considerable delay for all travel modes.

The importance of the intersection is augmented by the historic structures, such as Machinery Row and Hotel Ruby Marie, and parks such as Law Park and the Gateway Center pocket park. Figure 1.01-1 illustrates the modal importance of the intersection.

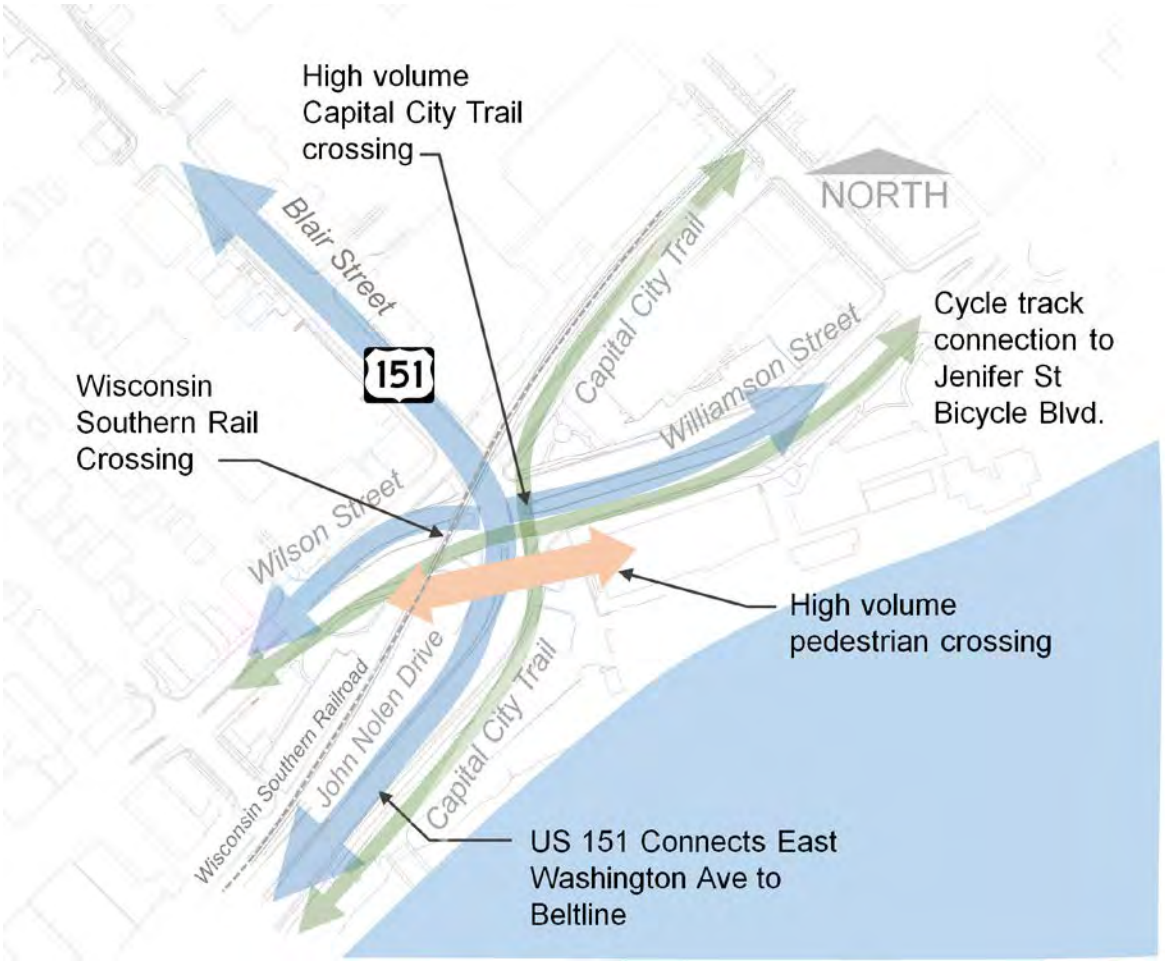


Figure 1.01-1 Modal Importance of John Nolen Drive/Blair Street/Wilson Street/Williamson Street Intersection

Because of the current pavement conditions, along with inadequate operations for all modes, the City of Madison (City) enlisted Strand Associates, Inc.® (Strand) to study the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection. The study was to evaluate existing conditions for pedestrians, bicyclists, motorists, transit, and emergency services. The study was then to develop alternatives that improved mobility for all of these services. Eventually the study was to be used to help program improvements for the intersection to address the deteriorating pavement conditions.

Public and stakeholder interaction soon expanded the scope of the study to include John Nolen Drive at the North Shore Drive and Broom Street intersections. The study was also expanded to include a blocking exercise to determine viewshed effects of constructing a parking garage/elevated park structure over John Nolen Drive east of Monona Terrace. Figure 1.01-2 illustrates the limits of the study.

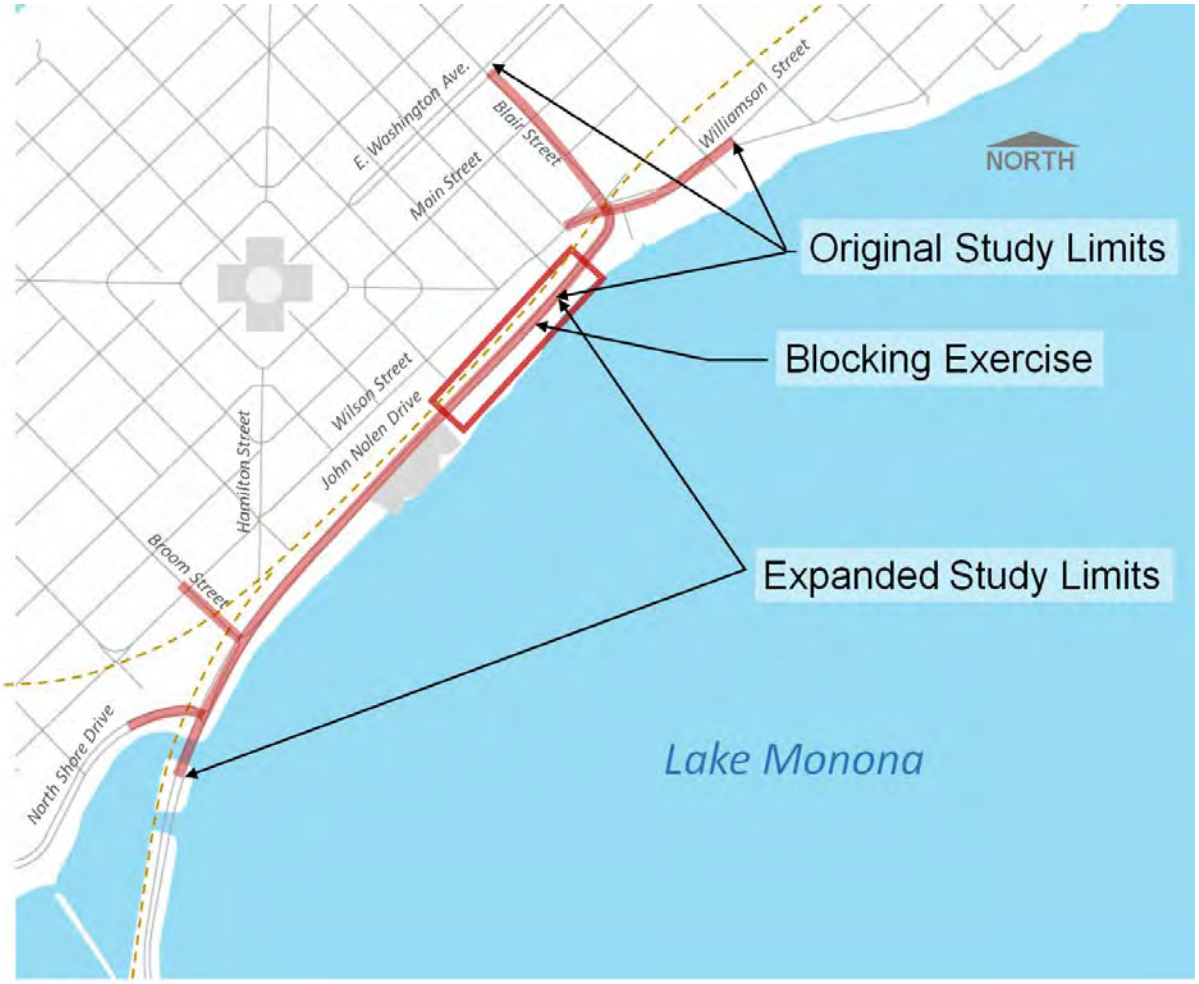


Figure 1.01-2 Study Limits

1.02 STUDY PURPOSE

The study's purpose is to develop a near-term solution for the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection area that:

1. Can be reasonably funded with federal transportation monies within the next 5 to 10 years.

2. Improves operations, safety, and comfort for:
   a. Pedestrians
   b. Cyclists
   c. Motorists
   d. Transit

3. Addresses the poor pavement conditions.

4. Evaluates near- and long-term options that improve pedestrian and bicycle access to the lakeshore from North Shore Drive to Blair Street.

5. Evaluates the viewshed effects of proposals that include a structure over John Nolen Drive east of Monona Terrace.

The Blair Street and John Nolen Drive corridor is designated as US 151, a connecting highway. Therefore, these legs of the intersection are under the jurisdiction of the Wisconsin Department of Transportation (WisDOT). WisDOT and Federal funding likely would be used (and required) for improvements to these legs of the intersection.

1.03 STUDY SCHEDULE

The yearlong study was segmented into three phases. Phase 1 focused on identifying needs and developing alternatives. Phase 2 presented a range of alternatives and then used stakeholder feedback to refine the alternatives. Phase 3 presented both draft and final recommendations. Figure 1.03-1 graphically illustrates both the study phases and the study schedule.

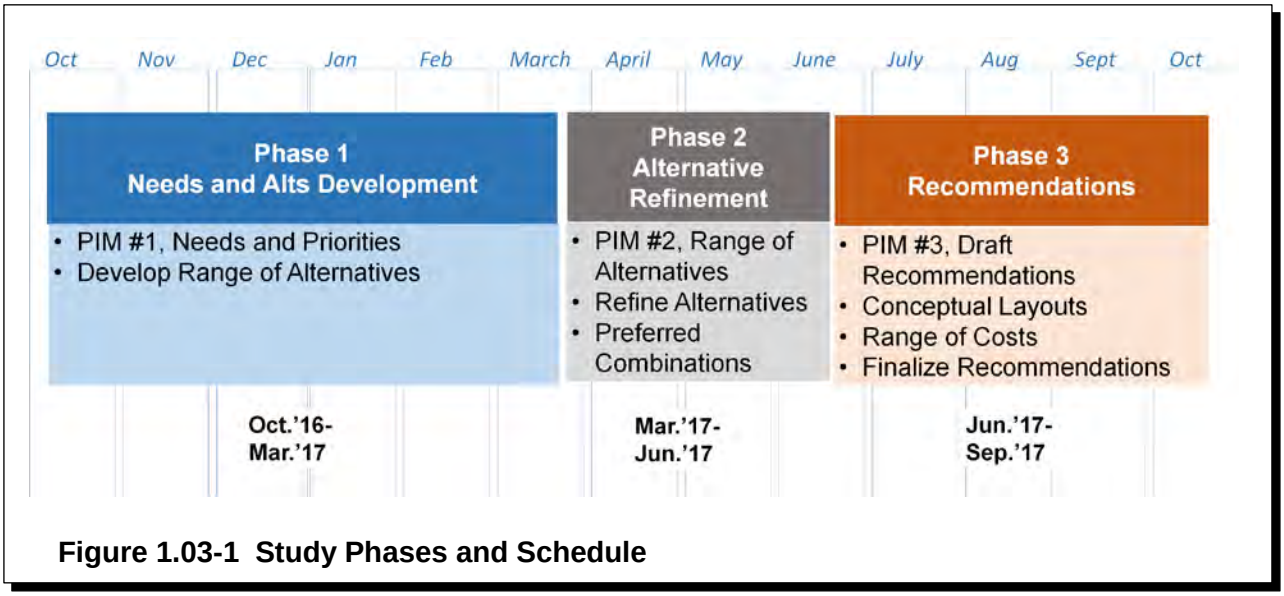


Figure 1.03-1 Study Phases and Schedule

1.04 OVERVIEW OF PREVIOUS STUDIES

There have been and are several studies of portions of the corridor that this study addresses. These include the South Capital Transit Oriented Development Study, as well as proposals/visions by Kenton Peters, Ken Saiki Design, and the Madison Design Professionals workgroup. The following paragraphs outline key features of their proposals.

A. South Capitol Transit Oriented Development Study

The City Planning Department enlisted the consultant team of Kimley Horne, Urban Assets, Potter Lawson, and Ken Saiki Design to develop a district planning study that provided design alternatives and recommendations for several components of the John Nolen Drive corridor. Some of the recommendations were endorsed by the South Capitol District Planning committee, while others were dismissed. The following briefly summarize the team's recommendations for areas that overlap with this study.

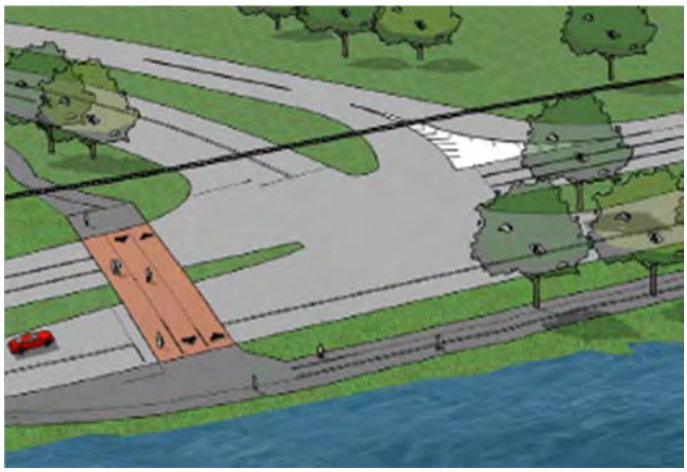


Figure 1.04-1 Example of a Super Crossing at North Shore Drive

1. North Shore and John Nolen Drive–Provide a "super crossing" that provides dedicated directional bike lanes and a shared pedestrian lane for crossing John Nolen Drive. They also recommend expanding bike and pedestrian queuing areas on both sides.

2. Broom Street and John Nolen Drive–Again, the study recommends providing a "super crossing" that provides dedicated directional bike lanes and a shared pedestrian lane for crossing John Nolen Drive. They also recommend providing a cycle track on the east side of Broom Street connecting to Wilson Street.

Figure 1.04-2 Example of a Super Crossing at Broom Street

3. John Nolen Drive/Blair Street and Wilson Street/Williamson Street–the study did not provide a unanimous recommendation for the intersection, but there were elements that the study advocated further evaluation of. These included:

    a. Provide a "super crossing" between Wilson Street and Williamson Street across the north Blair Street leg.

    b. Eliminate the small Wilson Street segment in front of Hotel Ruby Marie.

c. Remove and modify the back access to the Gateway Shopping Center.

d. Relocate the Machinery Row driveways.

e. Create left turn lanes to turn onto Wilson and Williamson Streets

4. Pedestrian connections–provide a grade separated plaza bridge pedestrian connection to Law Park on the east side of the Monona Terrace.

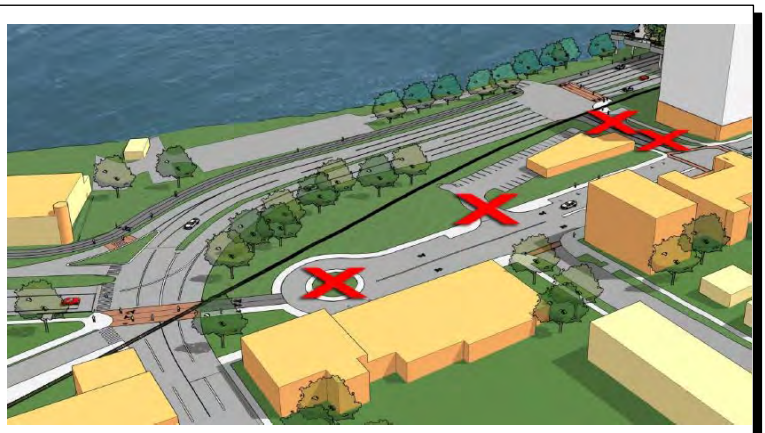


Figure 1.04-3 Partial Recommendations at Wilson/Williamson Intersection (x's convey concept portions not recommended)

B. Kenton Peters

Kenton Peters is a locally known architect, active for almost 50 years, who has designed several buildings in the Metropolitan area and downtown. He has been proposing covering John Nolen Drive with a park that steps down to the lake. The area above John Nolen Drive and under the park could be a parking garage and/or provide other uses. He suggested that leased parking and office space could pay the loan needed for building the raised park. The stepped park could lead to an enhanced waterfront that includes features such as the Frank Lloyd Wright Boathouse. Figure 1.04-5 illustrates the main concept advocated by Kenton Peters.

Figure 1.04-4 Plaza Style Pedestrian Connection to Law Park

C. Madison Design Professionals Workgroup

The Madison Design Professionals Workgroup have been studying the John Nolen Drive/Wilson Street/Williamson Street/Blair Street intersection for the past three years. They were awarded a grant from the Madison Community Foundation to envision various alternatives for the Monona waterfront. Some of their long-term visions also include covering John Nolen Drive with a park. Some of their near-term recommendations include reducing the size of the John Nolen Drive/Wilson Street/Williamson Street/Blair Street intersection. Figures 1.04-6 and 1.04-7 illustrate some of their concepts.

Figure 1.04-5 Kenton Peters Waterfront Proposal

WSJ Madison Design Professionals Workgroup and ZebraDog

Figure 1.04-6 Madison Design Professionals Long-Term Vision

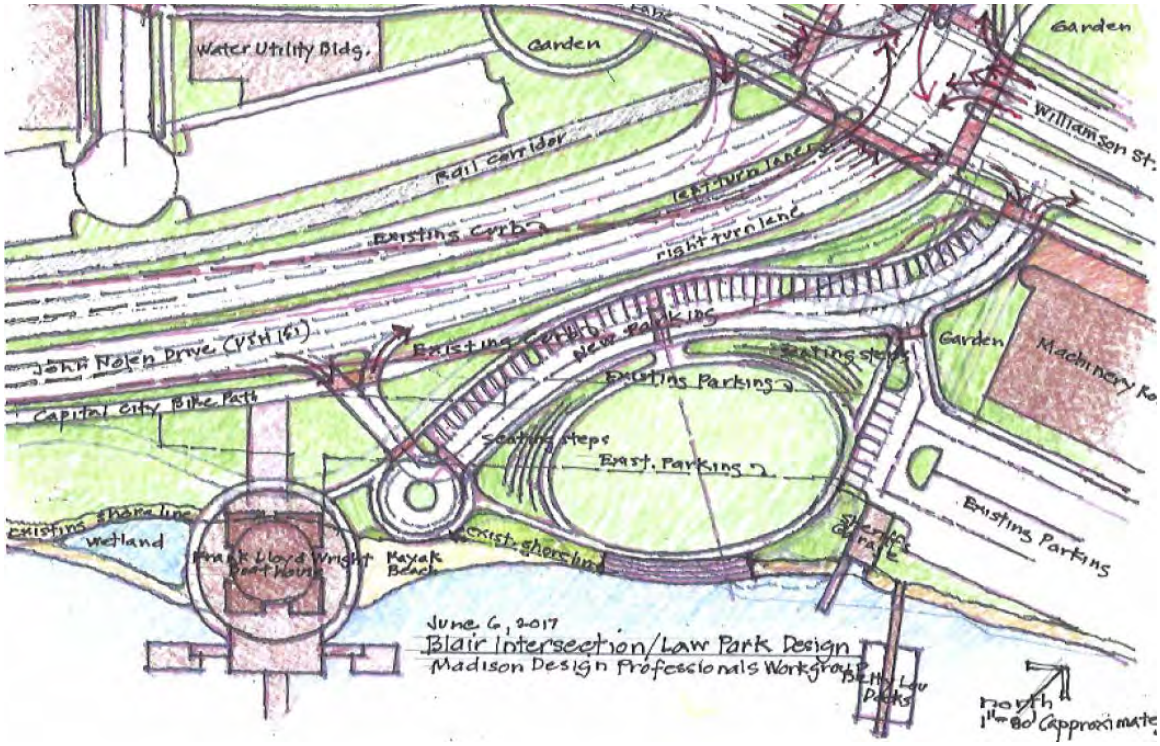


Figure 1.04-7 Madison Design Professionals Near-Term Vision

SECTION 2
BASE CONDITIONS AND PUBLIC INVOLVEMENT MEETING NO. 1

2.01 BASE CONDITIONS

Following is a summary of the current conditions along the study corridor.

A. General Transportation Context

The John Nolen Drive and Blair Street study corridor serves many functions. There is substantial pedestrian and bicycle activity along the corridor. The Capital City Trail lies along the south/east side of the corridor from its crossing at Williamson Street through the study boundary of North Shore Drive. Wilson Street is also a major pedestrian corridor connecting the Marquette neighborhood with the larger Capitol Square area.

Motor vehicles, including Metro Transit, use and cross the study corridor. The corridor is designated as US Highway 151, a corridor that is part of the National Highway System (NHS). NHS routes are those that are vital to the United States economy, national defense, and mobility. As such, according to the national Code of Federal Regulations (23 C.F.R. 625) NHS routes must "Adequately serve the existing and planned future traffic of the highway in a manner that is conducive to safety, durability, and economy of maintenance".

Daily motor vehicle traffic volumes have generally increased on the streets in the study area. The exception is along Williamson Street where traffic volumes have remained steady between 19,500 and 21,450 vehicles per day (vpd) from 1956 through 2013. Larger increases have occurred on North Shore Drive, Broom Street, John Nolen Drive, Blair Street, and East Washington Avenue. Figure 2.01-1 shows the daily traffic volumes in the study area.

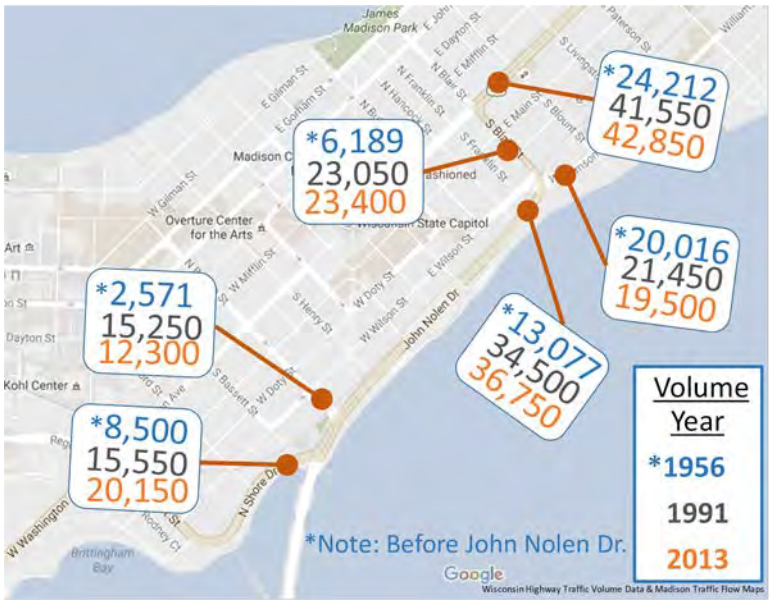


Figure 2.01-1 Daily Traffic Volumes in the Study Area

The Wisconsin and Southern Railroad (WSOR) maintains an active railroad corridor along the study corridor. The corridor crosses Monona Bay on the west side of and parallel to John Nolen Drive. It is joined by a second railroad corridor east of Broom Street. The WSOR railroad tracks continue along the west side of John Nolen Drive under Monona Terrace and cross the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection from the southwest to the northeast. There is an average of six trains per day on this railroad corridor.

B. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection

1. Pedestrian Conditions

Pedestrian activity is abundant at this intersection. Marked crosswalks exist on all four legs of the intersection. The Capital City Trail crosses the eastern Williamson Street leg. Traffic counts taken in spring 2015 indicate pedestrian crossing volumes from 30 to 84 crossing occurrences (multiple pedestrians can cross in a single occurrence) in the AM and PM peak hours combined. Effectively, most or all of the crosswalks are used on each traffic signal cycle during the AM and PM peak hours. Pedestrian refuge islands are provided in the medians on the southern John Nolen Drive leg, the eastern Williamson Street leg, and the western Wilson Street leg. Refuge islands are also provided between the channelized right-turn lanes and the through lanes on the southern John Nolen Drive leg. Figure 2.01-2 shows the pedestrian accommodations at the intersection. There were zero reported pedestrian crashes at the intersection from 2011 through 2015.

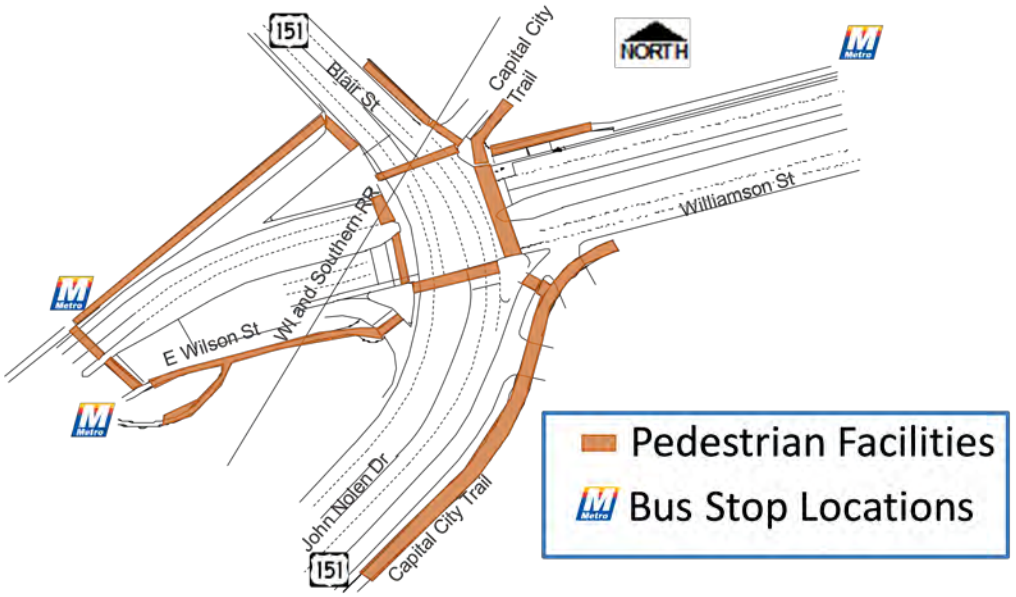


Figure 2.01-2 Pedestrian Accommodations at the John Nolen Drive/ Blair Street and Wilson Street/Williamson Street Intersection

2. Bicycle Conditions

This intersection sees high volumes of bicycle traffic, particularly on the eastern Williamson Street crossing of the Capital City Trail. Traffic counts taken in spring 2105 indicate bicycle crossing volumes exceeding 180 crossings in the AM and PM peak hours combined. The highest observed crossings were on the northern Blair Street leg and the eastern Williamson Street leg. The Capital City Trail joins a cycletrack in the southeast quadrant of the intersection that runs along the south side of Williamson Street in front of the Machinery Row building and Fauerbach Condominiums. There were nine reported bicycle crashes at the intersection from 2011 through 2015. Three

crashes occurred at one of the two driveways to the Machinery Row building located on the southeast corner of the intersection. Two crashes involved eastbound bicyclists traveling on Wilson Street. Two crashes occurred on the Capital City Trail crossing of the eastern Williamson Street leg. Two crashes involved westbound bicyclists traveling on Williamson Street.

3. Transit Conditions

Weekday Metro Transit Routes 10 and 38 travel on John Nolen Drive from Broom Street to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection where they continue service along Williamson Street and Jenifer Street. Weekday Routes 11 and 12 use Broom Street and travel south from there along John Nolen Drive. At the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection Routes 3, 4, 10, and 38 cross John Nolen Drive/Blair Street while using Wilson Street and Williamson Street.

4. Motor Vehicle Conditions

Motor vehicle operations are typically evaluated based on the Level of Service (LOS) criteria as defined in the Highway Capacity Manual (HCM) from the Federal Highway Administration (FHWA). LOS values range from A through F with LOS A representing very low delay to drivers and LOS F representing conditions where the vehicular demand (arrivals at an intersection) exceeds the capacity of the intersection. LOS F conditions result in long delays and queuing at intersections.

Congestion and queuing occur during the current AM and PM peak hours at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection. The John Nolen Drive northbound through (NBT) and Blair Street southbound through (SBT) movements currently operate at LOS F. One of the key contributing factors to poor operations is the lack of left-turn lanes for the John Nolen Drive northbound left-turn (NBL) and Blair Street southbound left-turn (SBL) movements. Left-turning traffic on these legs often block the inside through travel lane, significantly impacting the motor vehicle capacity.

There were 92 reported motor vehicle crashes at the intersection from 2011 through 2015; 46 of the 92 (50 percent) were rear-end crashes. Of these, 59 percent occurred on northbound John Nolen Drive. Appendix A includes additional details regarding crashes at this intersection.

C. Monona Terrace to Law Park Area

1. Pedestrian and Bicycle Conditions

The Capital City Trail runs along the east side of John Nolen Drive. A pedestrian and bicycle elevator is available for public use at the Monona Terrace. Anecdotal comments from area stakeholders suggest the elevator is not well known. In general, local stakeholders often commented on the lack of pedestrian and bicycle connectivity between the Capital Square area and the Monona lakeshore. There were zero reported pedestrian and bicycle crashes in this area from 2011 through 2015.

2. Transit Conditions

Weekday Metro Transit Routes 10 and 38 travel on John Nolen Drive from Broom Street to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection where they continue service along Williamson Street and Jenifer Street.

3. Motor Vehicle Conditions

Motor vehicle operations along John Nolen Drive in this area are considered acceptable, including at the signalized intersection serving Monona Terrace. Northbound John Nolen Drive queuing from the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection sometimes backs into this portion of the study corridor.

D. John Nolen Drive and North Shore Drive and Broom Street Area

1. Pedestrian Conditions

Pedestrian activity is abundant at both intersections in this area. At Broom Street, marked crosswalks exist crossing northbound John Nolen Drive with a median refuge provided between the NBT and NBL lanes. From there, crosswalks are provided to the northeast and northwest quadrants of the intersection. The Capital City Trail runs parallel to and east of John Nolen Drive at Broom Street. Traffic counts taken in spring 2015 indicate pedestrian crossing volumes from 40 to 62 crossing occurrences (multiple pedestrians can cross in a single occurrence) in the AM and PM peak hours combined. Effectively, the crosswalks are used on most traffic signal cycles during the AM and PM peak hours. Figure 2.01-3 shows the pedestrian accommodations at the Broom Street intersection. There were zero reported pedestrian crashes at the intersection from 2011 through 2015.

At North Shore Drive, marked crosswalks exist crossing northbound John Nolen Drive with a median refuge provided between the eastbound left-turn lanes (EBL) and the channelized eastbound right-turn lane (EBR). The Capital City Trail runs parallel to and east of John Nolen Drive at Broom Street. Traffic counts taken in Spring 2015 indicate pedestrian crossing volumes of up to 43 crossing occurrences (multiple pedestrians can cross in a single occurrence) in the AM and PM peak hours combined. Effectively, the crosswalks are used on most traffic signal cycles during the AM and PM peak hours. Figure 2.01-4 shows the pedestrian accommodations at the North Shore Drive intersection. There were zero reported pedestrian crashes at the intersection from 2011 through 2015.

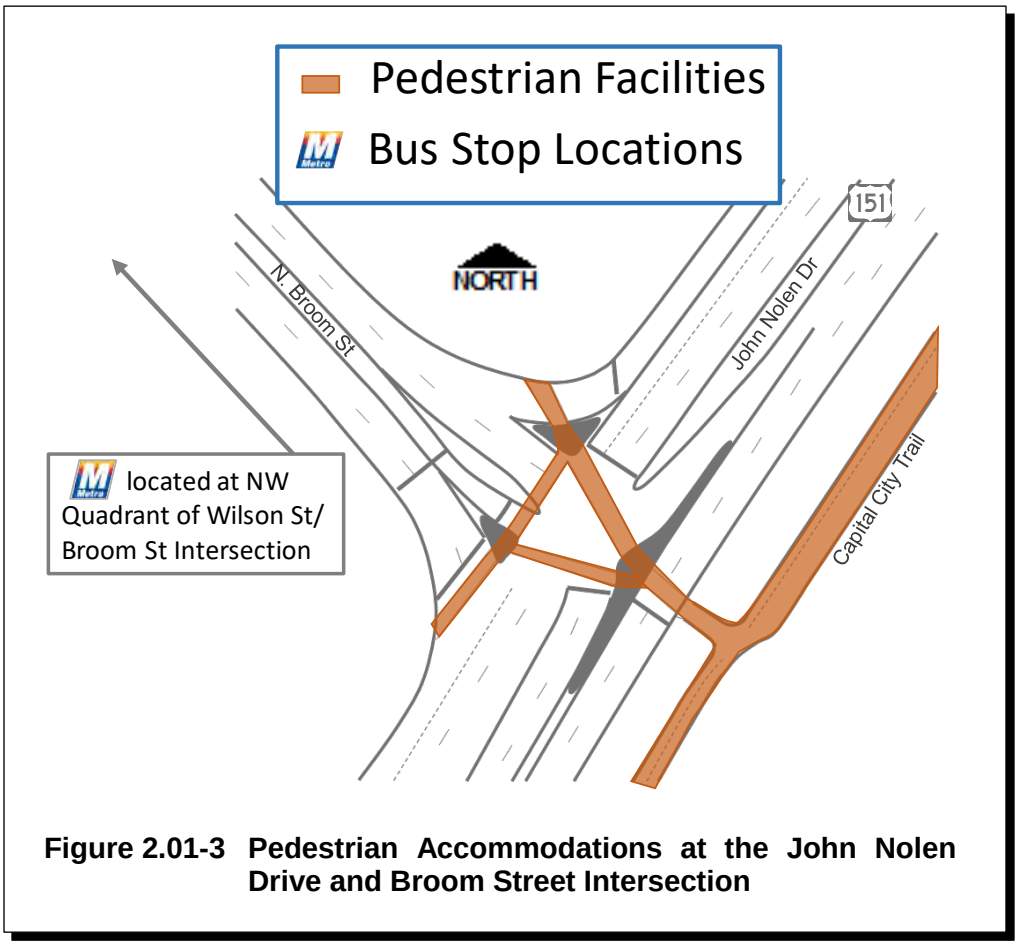


Figure 2.01-3 Pedestrian Accommodations at the John Nolen Drive and Broom Street Intersection

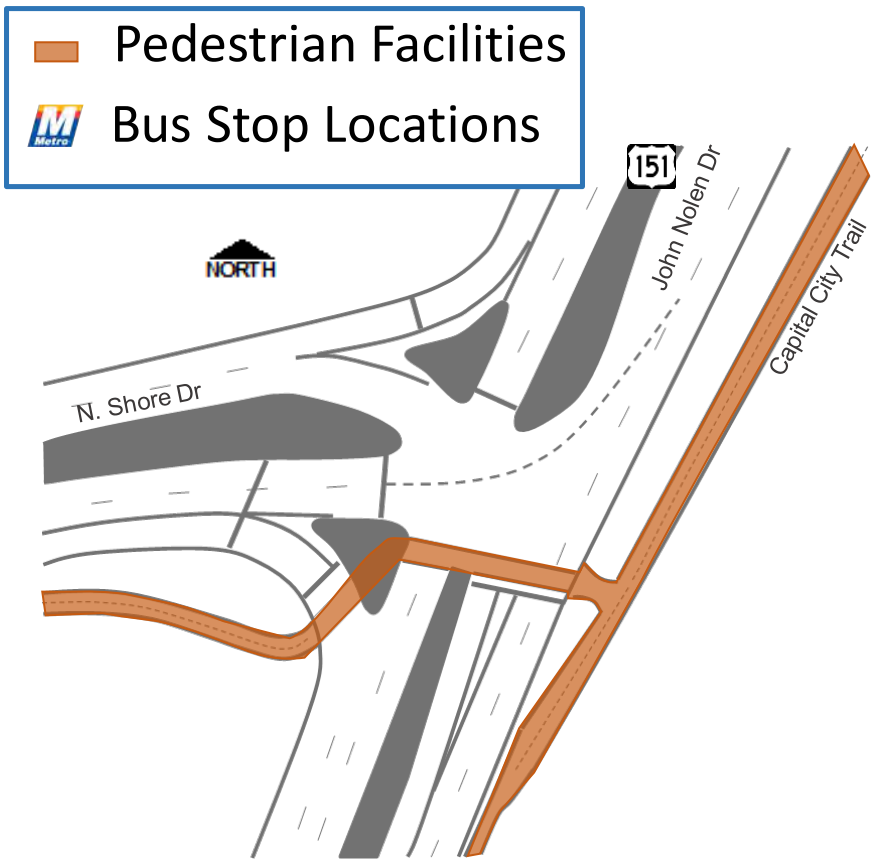


Figure 2.01-4 Pedestrian Accommodations at the John Nolen Drive and North Shore Drive Intersection

2. Bicycle Conditions

The Broom Street intersection sees moderate volumes of bicycle traffic crossing John Nolen Drive, with high volumes using the Capital City Trail on the east side of John Nolen Drive. Traffic counts taken in Spring 2015 indicate bicycle crossing volumes of up to 20 in the AM and PM peak hours combined. There were three reported bicycle crashes at the intersection from 2011 through 2015; one occurred at the crossing of the John Nolen Drive NBT lanes, one at the crossing of the John Nolen Drive SBT lanes, and one at the crossing of the Broom Street eastbound right-turn lanes (EBR).

The North Shore Drive intersection sees high volumes of bicycle traffic crossing John Nolen Drive, with high volumes also using the Capital City Trail on the east side of John Nolen Drive. Traffic counts taken in Spring 2015 indicate bicycle crossing volumes of nearly 100 in the AM and PM peak hours combined. There were six reported bicycle crashes at the intersection from 2011

through 2015; one occurred at the crossing of the John Nolen Drive NBL turn lane, while five occurred crossing the North Shore Drive channelized eastbound right-turn lane to southbound John Nolen Drive. Of the five, four occurred prior to the improvements made to the intersection in 2013 that eliminated one southbound John Nolen Drive travel lane to allow for a larger refuge island.

3. Transit Conditions

Weekday Metro Transit Routes 10 and 38 travel on John Nolen Drive from Broom Street to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection where they continue service along Williamson Street and Jenifer Street. Weekday Routes 11 and 12 use Broom Street and travel south from there along John Nolen Drive. At the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection routes 3, 4, 10, and 38 cross John Nolen Drive/Blair Street while using Wilson Street and Williamson Street. There are no Metro routes that use North Shore Drive.

4. Motor Vehicle Conditions

Congestion and queuing occur during the current AM and PM peak hours at the John Nolen Drive and Broom Street intersection. The John Nolen Drive NBT movement currently operates at LOS F during the AM peak hour. Queues exceed 700 feet northbound during the AM peak hour (reaching North Shore Drive upstream) and southbound during the PM peak hour.

There were 52 reported motor vehicle crashes at the intersection from 2011 through 2015; 32 of the 52 (62 percent) were rear-end crashes. This typically indicates the congestion and queuing is contributing to the crashes. Appendix A includes additional details regarding crashes at this intersection.

Congestion and queuing also occur during the current AM and PM peak hours at the John Nolen Drive and North Shore Drive intersection. During the AM peak hour, the John Nolen Drive northbound left turn operates at LOS F with queues approaching 700 feet that spill out of the turn bay storage. During the PM peak hour, the eastbound North Shore Drive left turn operates at LOS F while southbound John Nolen Drive queuing approaches 900 feet (reaching Broom Street upstream).

There were 119 reported motor vehicle crashes at the intersection from 2011 through 2015. The intersection crash rate was 1.41 crashes per 100 million entering vehicles (MEV). In Wisconsin, intersections with crash rates exceeding 1.00 per MEV are typically considered worthy of investigation for safety improvements. Rear-end crashes contributed to 58 of the 119 (49 percent) crashes. This typically indicates the congestion and queuing is contributing to the crashes. Appendix A includes additional details regarding crashes at this intersection.

2.02 PUBLIC INVOLVEMENT MEETING NO. 1

The first Public Involvement Meeting (PIM No. 1) was held at the Monona Terrace Convention Center on November 30, 2016, from 7 to 9 PM; 43 people attended. The primary goals of the meeting were to share information about the existing transportation conditions and gather feedback regarding needs from local stakeholders.

A. Presentation and Display Materials

The slideshow presentation from PIM No. 1 are included in Appendix B. The presentation outline follows:

1. Study corridor and reasons for study.
    a. Upcoming projects
    b. Previous studies and longer-term opportunities
2. Background and current conditions
3. Study process and schedule
4. Questions and answers
5. Goals exercise

B. Summary of Goals Exercise

Large paper roll plots showing aerial photos of the study corridor were provided at the meeting along with sharpie markers and sticky notes. The study team asked participants to provide feedback on corridor features and concerns. A full summary of the notes is included in Appendix B. Following are the most common comments.

1. At the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection the driveways serving the Machinery Row businesses in the southeast quadrant of the intersection causes problems with limited sight distances and conflicts between pedestrians, bicycles, and motor vehicles.
2. John Nolen Drive and Blair Street are barriers for pedestrians and bicycles. Additional and/or improved crossings are needed.
3. The Capital City Trail approach from the east to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection is confusing. Separate space for pedestrians and bicycles would be desirable.
4. The refuge islands at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection are not large enough for bicycles.

5. A better connection for pedestrians and bicycles between the Capitol Square and the Law Park/Lake Monona shoreline is needed.

6. The six-leg intersection at Wilson Street and Hamilton Street is confusing.

7. Long-term, “big picture” study is needed for the area.

C. Summary of Verbal and Written Comments

A full summary of the verbal and written comments is included in Appendix B. Following are the most common comments.

1. Needs:

   a. Pedestrians and bicyclists need better defined separate spaces on the south side of Williamson Street between John Nolen Drive/Blair Street and Jenifer Street.

   b. A better connection for pedestrians and bicycles between the Capitol Square and the Law Park/Lake Monona Shoreline is needed.

   c. Law Park is under used. Consider barriers and/or fences between the park and John Nolen Drive.

   d. The John Nolen Drive/Blair Street corridor works well for cars, but it needs to work well for residents too.

   e. Turns into the Essen Haus parking lot are as bad as at the main intersection, and redevelopment there is expected. Eliminate access to Blair Street and provide it via Wilson Street or Franklin Street.

2. Goals, ideas, and solutions:

   a. Better aesthetics along John Nolen Drive and traffic calming are needed to reduce speeding and red light running.

   b. Deemphasize Williamson Street as a through corridor by eliminating the channelized right-turn from John Nolen Drive to Williamson Street and implementing aesthetics and traffic calming to communicate that the first block of Williamson Street is a neighborhood.

   c. Maybe delays (LOS F), queuing, and congestion for cars is not a bad thing.

   d. Relocate the Capital City Trail crossing from the Williamson Street side of the intersection to Blount Street.

e. Cross the Capital City Trail under John Nolen Drive in the Broom Street and North Shore Drive area.

f. Implement a railroad quiet zone in this area.

g. Advance the Monona lake shore concepts that cover John Nolen Drive and place a park and open space on top.

h. Extend Hancock Street to John Nolen Drive and reroute Wilson Street traffic to the Hancock Street extension.

i. Close the Wilson Street approach to the main intersection and reuse the space for pedestrians and bicycles.

j. Make Wilson Street one-way or two-way for its entire length instead of switching back and forth.

SECTION 3
RANGE OF ALTERNATIVES AND PUBLIC MEETING NO. 2

3.01 RANGE OF ALTERNATIVES

The study team reviewed alternatives initially developed as part of the WisDOT's Madison Beltline Planning and Environment Linkages study (PEL) as a starting point. The team used Synchro and SimTraffic software to evaluate motor vehicle operations with forecasted 2050 AM and PM traffic volumes with the goal of reducing delays and queuing compared to a No Build condition. Based on the initial alternatives developed during the PEL the team created additional alternatives. Detailed motor vehicle operations results are included in Appendix C.

A. Blair Street/John Nolen Drive and Wilson Street/Williamson Street Intersection

1. Alternative 0: No Build

Congestion and queuing are estimated to be significant in 2050 under a No Build condition. Overall, the intersection operates at LOS F (342 seconds of delay) during the AM peak hour and LOS F (168 seconds of delay) during the PM peak hour. The John Nolen Drive NBT and Blair Street SBT movements operate at LOS F in the AM and PM peak hours with queues of 800 to nearly 1,300 feet. The WBL operates at LOS E during both peaks.

2. Alternative 1: Add NBL and SBL

Adding a NBL turn bay and SBL turn bay on John Nolen Drive/Blair Street results in overall intersection operations at LOS D (55 seconds of delay) during the AM peak hour and LOS D (37 seconds of delay) during the PM peak hour. During the AM peak hour, the WBL, NBL, and SBT/R movements operate at LOS E and southbound queuing is nearly 950 feet. During the PM peak hour, The WBL operates at LOS F. Figure 3.01-1 shows the No Build condition and Alternative 1.

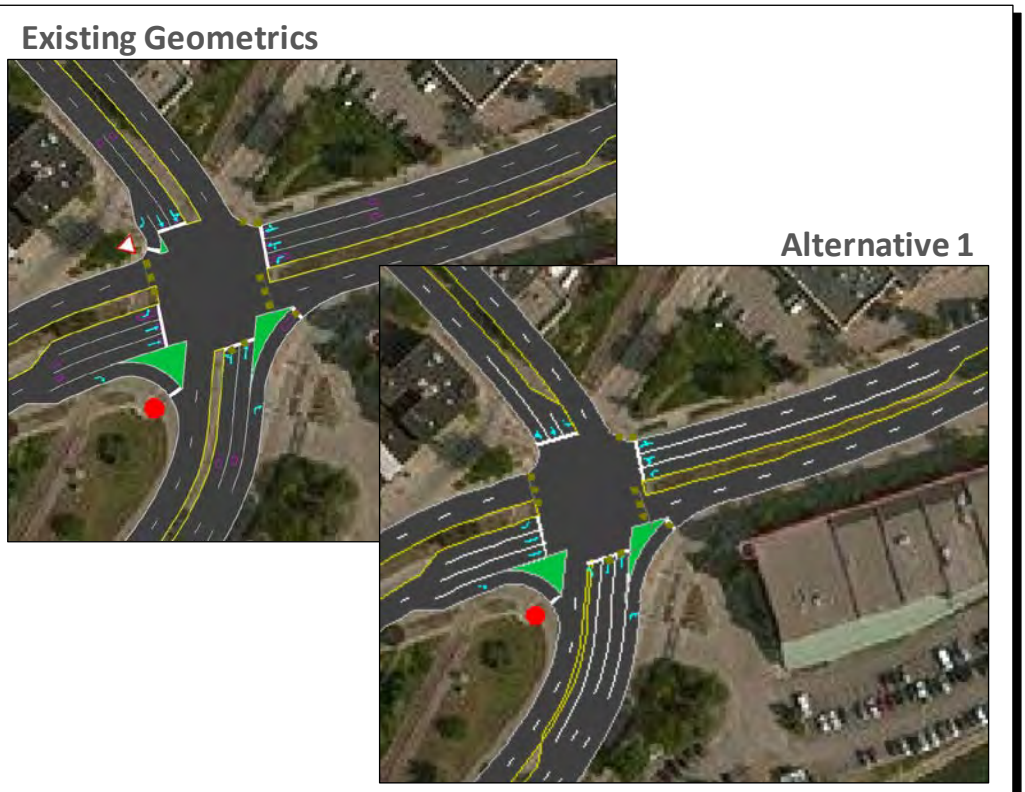


Figure 3.01-1 Alternative 1

3. Alternative 2: Add NBL, SBL, Single EBT, WBT

Reducing the eastbound and westbound through lanes allows the westbound shared through/left-turn lane on Williamson Street to be converted to an exclusive left-turn lane, which allows for modified signal phasing. It also reduces the intersection footprint overall. With this configuration the intersection operates overall at LOS E (75 seconds of delay) during the AM peak hour and LOS E (64 seconds of delay) during the PM peak-hour. There are six movements that operate at LOS E and one at LOS F in the AM peak hour. There are three movements that operate at LOS E and one at LOS F in the PM peak hour. Figure 3.01-2 shows the No Build condition and Alternative 2.

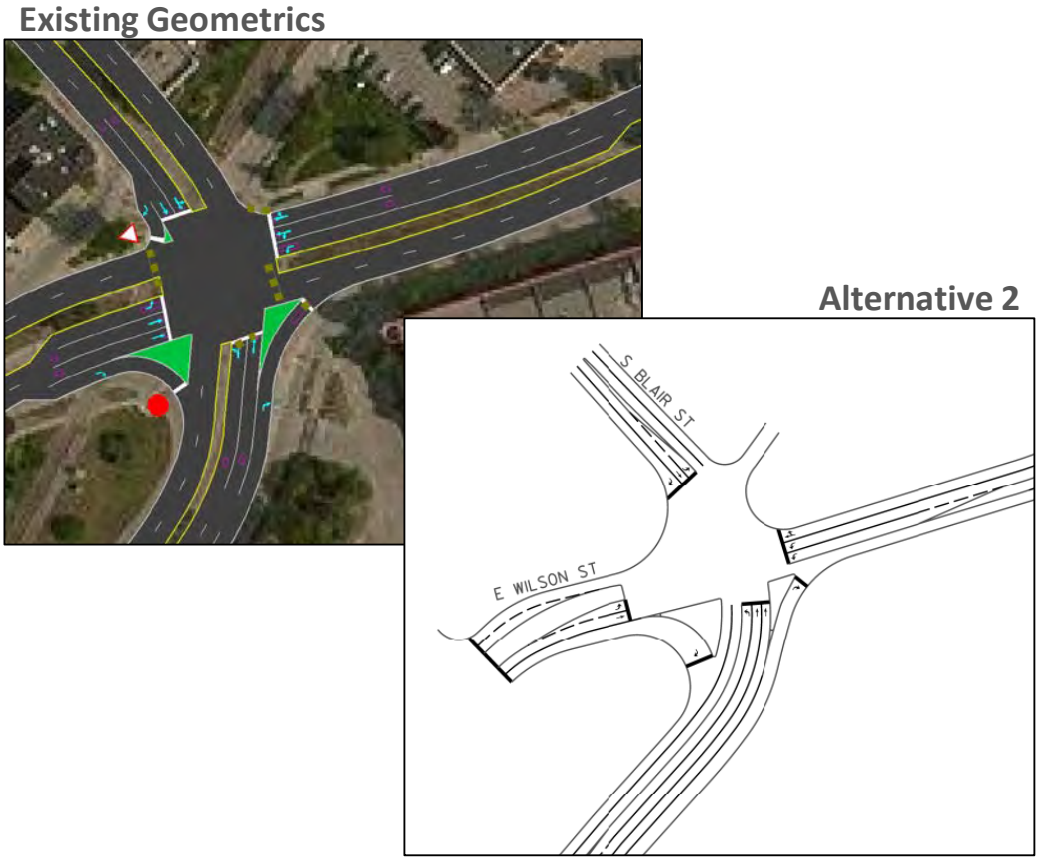


Figure 3.01-2 Alternative 2

4. Alternative 3: Add NBL, SBL, Single EBT, Eliminate Shared WBL/T

Reducing the eastbound through lanes reduces the intersection footprint. Eliminating the shared WBT/L allows for modified signal phasing options. With this configuration the intersection operates overall at LOS D (54 seconds of delay) during the AM peak hour and LOS E (60 seconds of delay) during the PM peak-hour. There are four movements that operate at LOS E and two at LOS F in the AM peak hour. There are three movements that operate at LOS E and one at LOS F in the PM peak-hour. Figure 3.01-3 shows the No Build condition and Alternative 3.

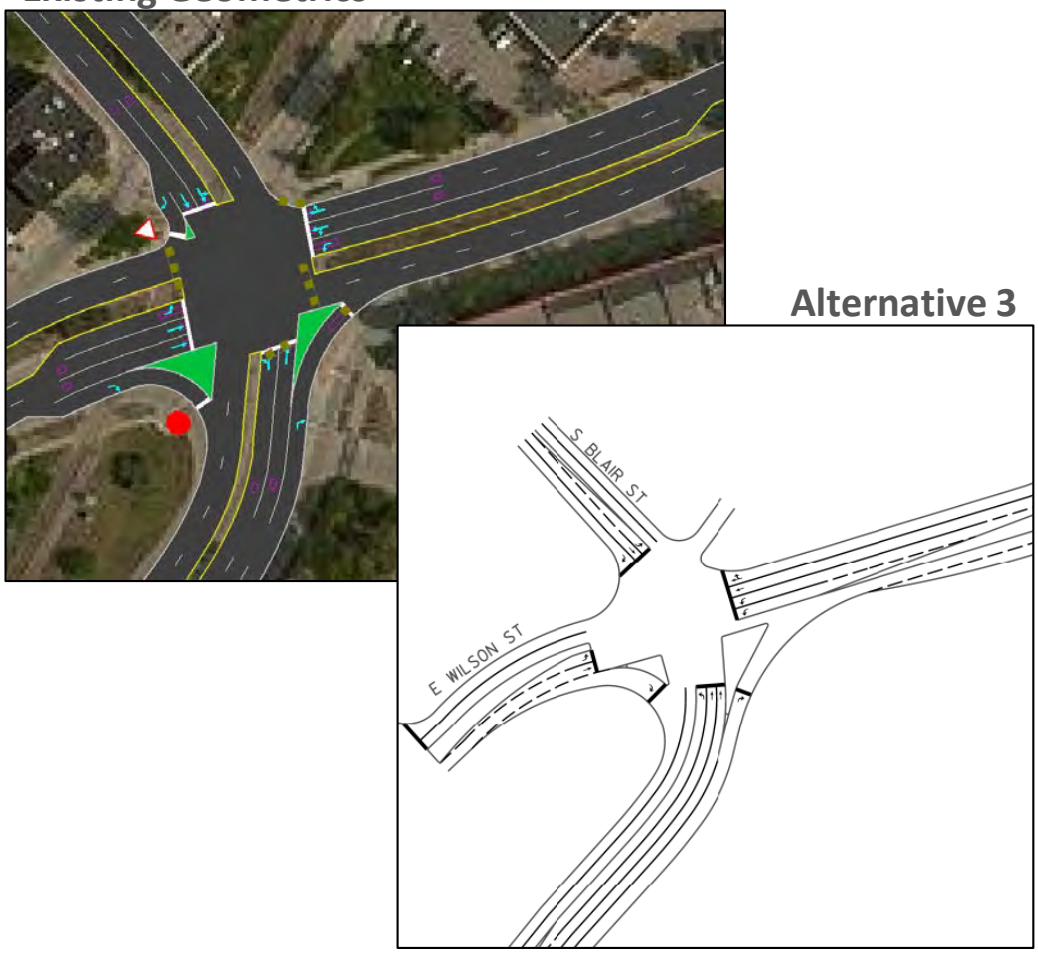


Figure 3.01-3 Alternative 3

5. Alternative 4: One-Way Circulator using Hancock Street

Alternative 4 uses one-way streets to provide motor vehicle access and mobility. Westbound Williamson Street traffic destined for southbound John Nolen Drive continues west on Wilson Street before turning south on the new Hancock Street connection to John Nolen Drive. Southbound Blair Street traffic turns right on to westbound Wilson Street and turns south on the new Hancock Street connection. Eastbound Wilson Street traffic destined for eastbound Williamson Street turns right on to the new Hancock Street connection followed by left on to John Nolen Drive. Figure 3.01-4 shows the No Build condition and Alternative 4.

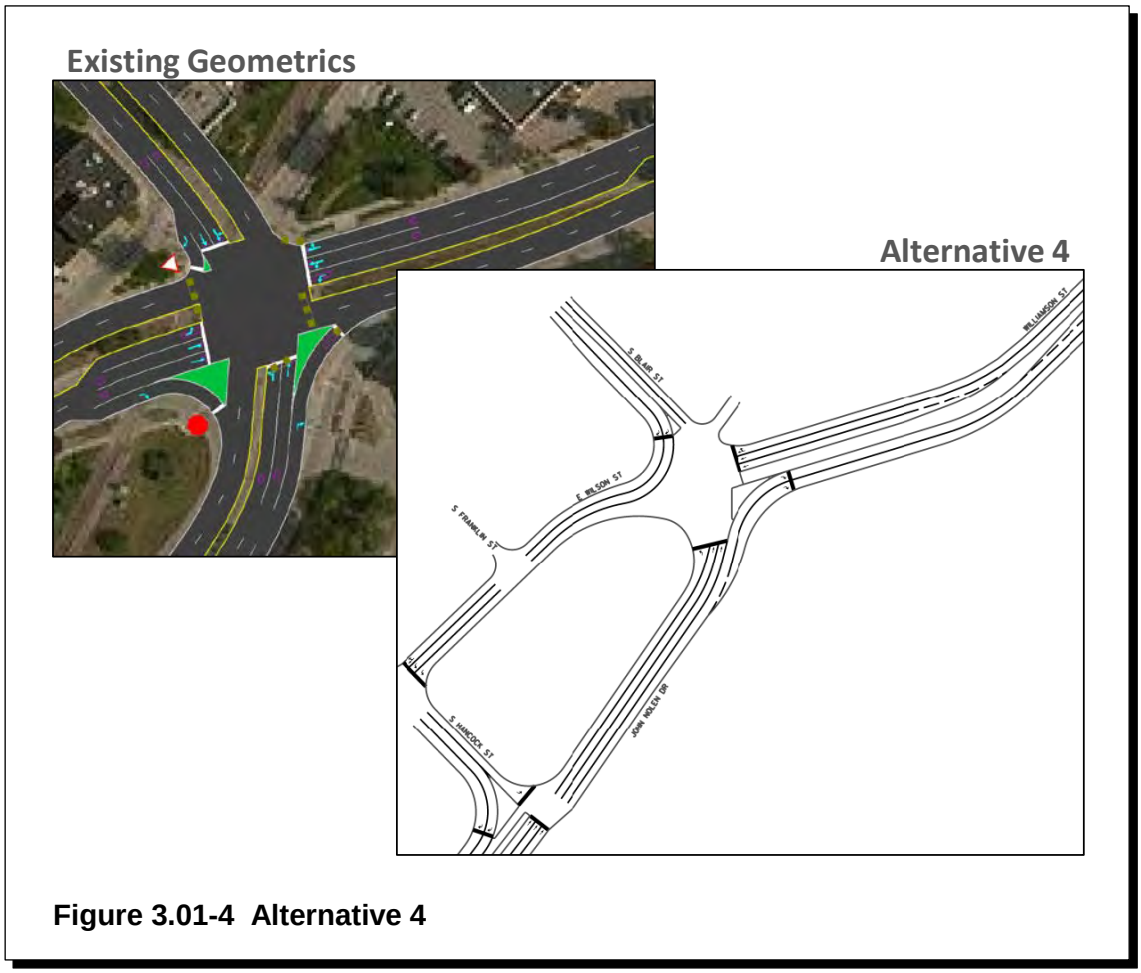


Figure 3.01-4 Alternative 4

With this configuration the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection operates overall at LOS E (59 seconds of delay) during the AM peak hour and LOS B (15 seconds of delay) during the PM peak hour. During the AM peak hour, the WBT/R, NBL, and SBR movements operate at LOS F.

The other two signals operate overall at LOS C or better. There are two movements that operate at LOS E during the AM peak hour.

6. Alternative 4a: One-Way Circulator with Two-Way Hancock Street

Alternative 4a operates similarly to Alternative 4, with the exception being that the Hancock Street connection between Wilson Street and John Nolen Drive operates as a two-way street. Northbound John Nolen Drive traffic destined for westbound Wilson Street turns left on to northbound Hancock Street followed by a left-turn on to Wilson Street. Figure 3.01-5 shows the No Build condition and Alternative 4a.

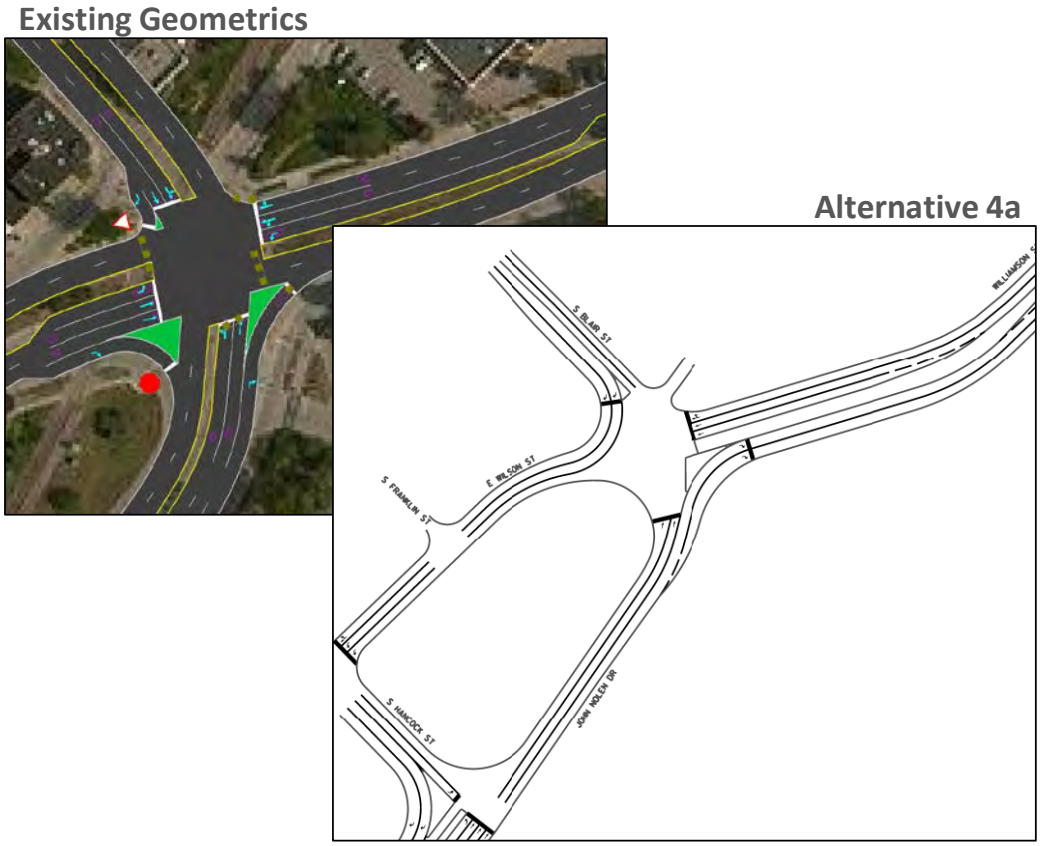


Figure 3.01-5 Alternative 4a

With this configuration the John Nolen Drive/Blair Street and Wilson Street/ Williamson Street intersection operates overall at LOS C (30 seconds of delay) during the AM peak hour and LOS B (12 seconds of delay) during the PM peak hour. All movements operate at LOS D or better during both peaks.

The other two signals operate overall at LOS C or better. The left-turn from southbound/eastbound Hancock Street to northbound John Nolen Drive operates at LOS F during the PM peak hour.

7. Alternative 5: Two-way Operation with Two-Way Hancock Street

Alternative 5 also includes a two-way Hancock Street connection. Wilson Street between Hancock Street and John Nolen Drive/Blair Street allows two-way operation, so southbound Hancock Street only serves eastbound Wilson Street traffic destined for southbound John Nolen Drive. Northbound John Nolen Drive traffic destined for westbound Wilson Street uses the Hancock Street connection as well. Figure 3.01-6 shows the No Build condition and Alternative 5.

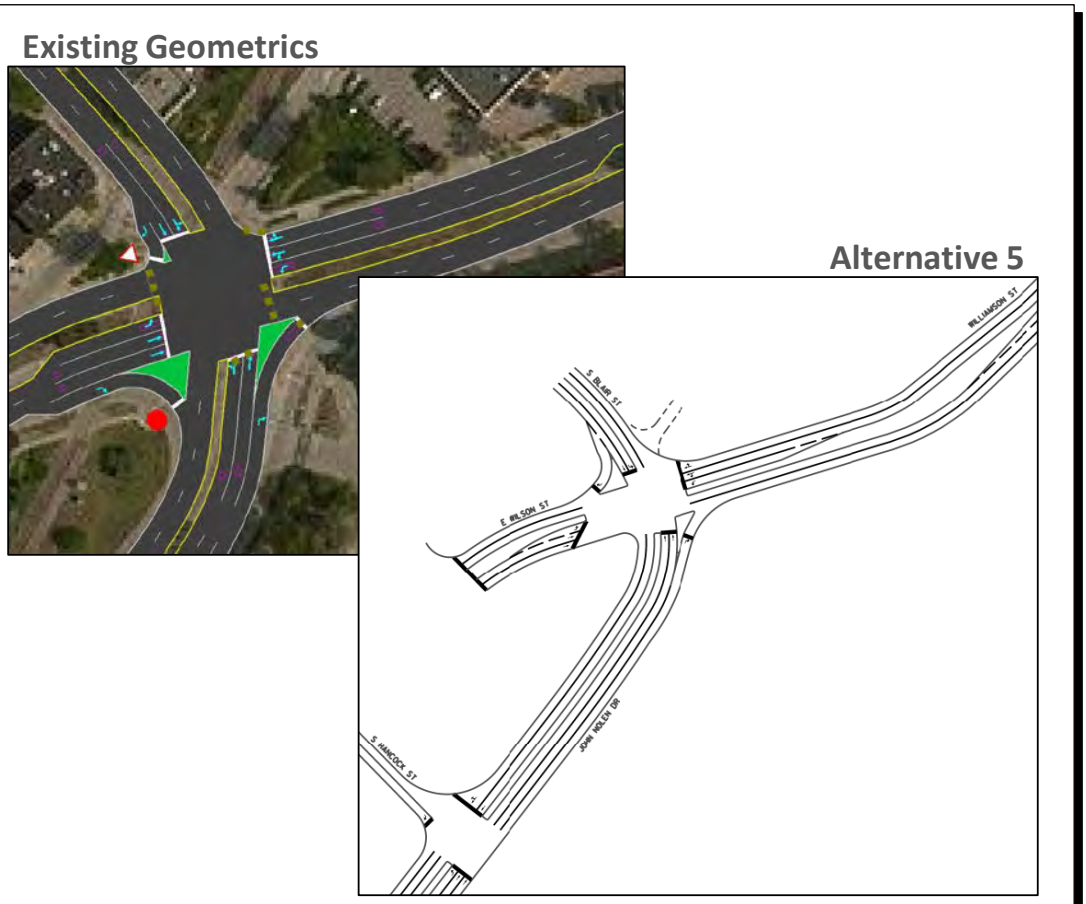


Figure 3.01-6 Alternative 5

With this configuration the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection operates overall at LOS F (132 seconds of delay) during the AM peak hour and LOS D (51 seconds of delay) during the PM peak hour. There are several movements that operate at LOS E or LOS F during the AM and/or PM peak hours.

The other two signals operate overall at LOS C or better. All movements operate at LOS D or better during both peaks.

8. Alternative 6: Two-Way Operation with Two-Way Hancock Street and Relocated Williamson Street WBL

Alternative 6 is similar to Alternative 5 except that it prohibits the WBL from Williamson Street directly on to southbound John Nolen Drive. Southbound Hancock Street serves eastbound Wilson Street traffic and westbound Williamson Street traffic destined for southbound John Nolen Drive. Northbound John Nolen Drive traffic destined for westbound Wilson Street uses the Hancock Street connection, as well. Figure 3.01-7 shows the No Build condition and Alternative 6.

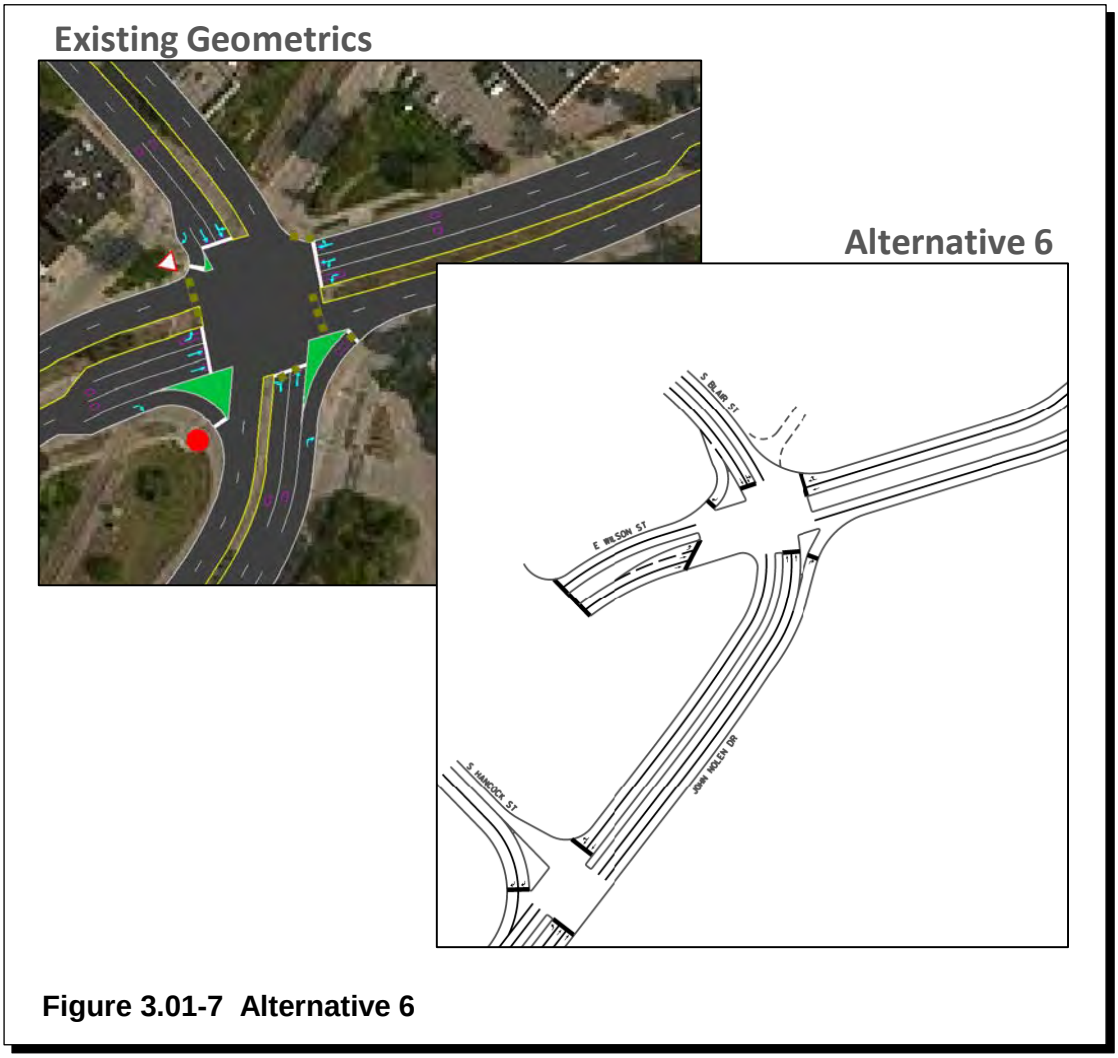


Figure 3.01-7 Alternative 6

With this configuration the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection operates overall at LOS F (180 seconds of delay) during the AM peak hour and LOS D (48 seconds of delay) during the PM peak hour. There are several movements that operate at LOS E or LOS F during the AM and/or PM peak hours.

The other two signals operate overall at LOS C or better. The right turn from the Hancock Street extension to southbound John Nolen Drive operates at LOS F during the AM peak hour.

9. Alternative 6a: Two-Way Operation with Two-Way Hancock Street, Relocated Williamson Street WBL, and Three NBT Lanes on John Nolen Drive

Alternative 6a is similar to Alternative 6 except that it provides three through lanes on northbound John Nolen Drive at the Hancock Street connection. The team did not model 2050 operations in detail because operations are similar to Alternative 6. Figure 3.01-8 shows Alternative 6 compared to Alternative 6a.

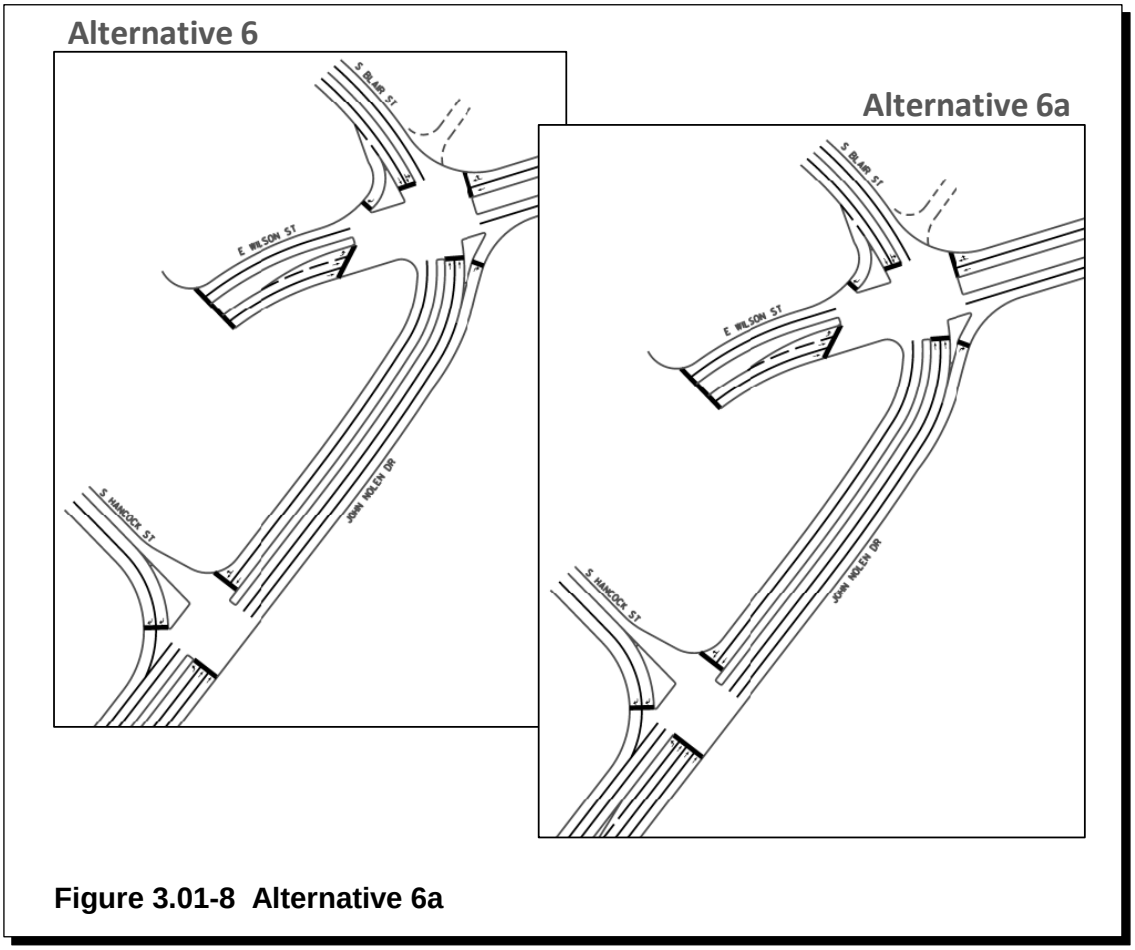


Figure 3.01-8 Alternative 6a

10. Alternative 7: Compact Circulator

Alternative 7 is similar to Alternative 4 by providing one-way counterclockwise circulation, but using a new extension of Franklin Street rather than the Hancock Street location. This provides a more compact system that functions similarly to a signalized roundabout. The team did not model 2050 operations in detail because operations are similar to Alternative 4. Figure 3.01-9 shows Alternative 4 and Alternative 7.

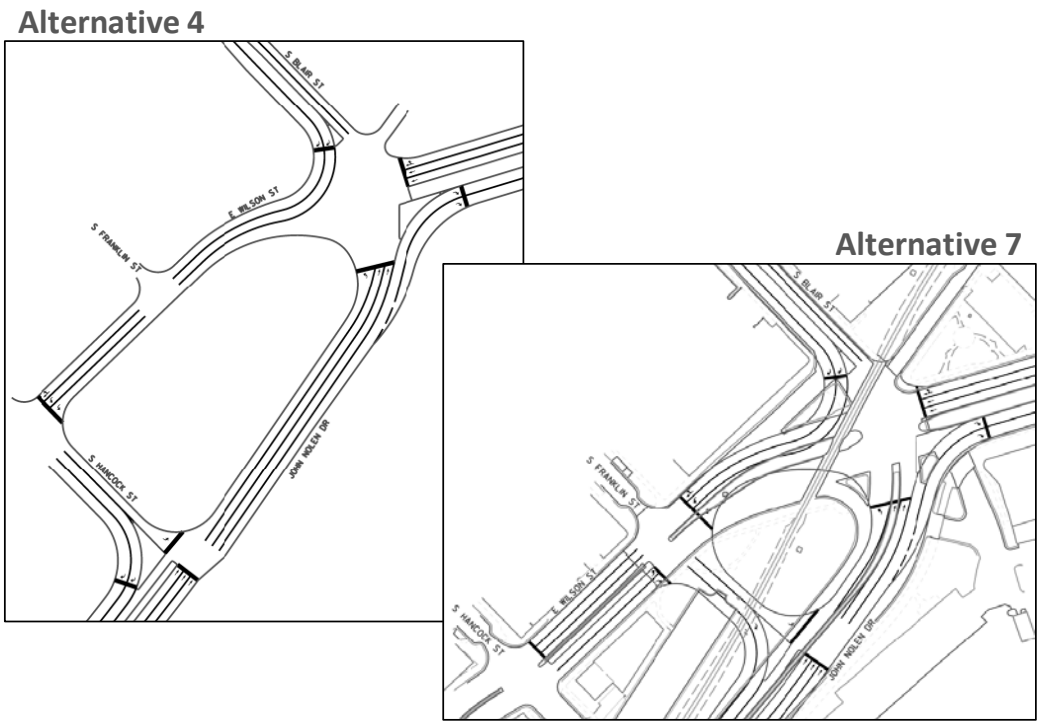


Figure 3.01-9 Alternative 7

11. Alternative 8: Add NBL, SBL, and Triple WBL

Alternative 8 is similar to Alternative 1 while adding a third westbound left-turn lane from Williamson Street to southbound John Nolen Drive. Adding a NBL turn bay on John Nolen Drive, a SBL turn bay on Blair Street, and a third WBL on Williamson Street results in overall intersection operations at LOS E (60 seconds of delay) during the AM peak hour and LOS C (28 seconds of delay) during the PM peak hour. All movements operate at LOS D or better during the PM peak hour. During the AM peak hour, the WBL, WBT/R, NBL, and EBT movements operate at LOS E and southbound queuing is nearly 950 feet. Figure 3.01-10 shows the No Build condition and Alternative 8.

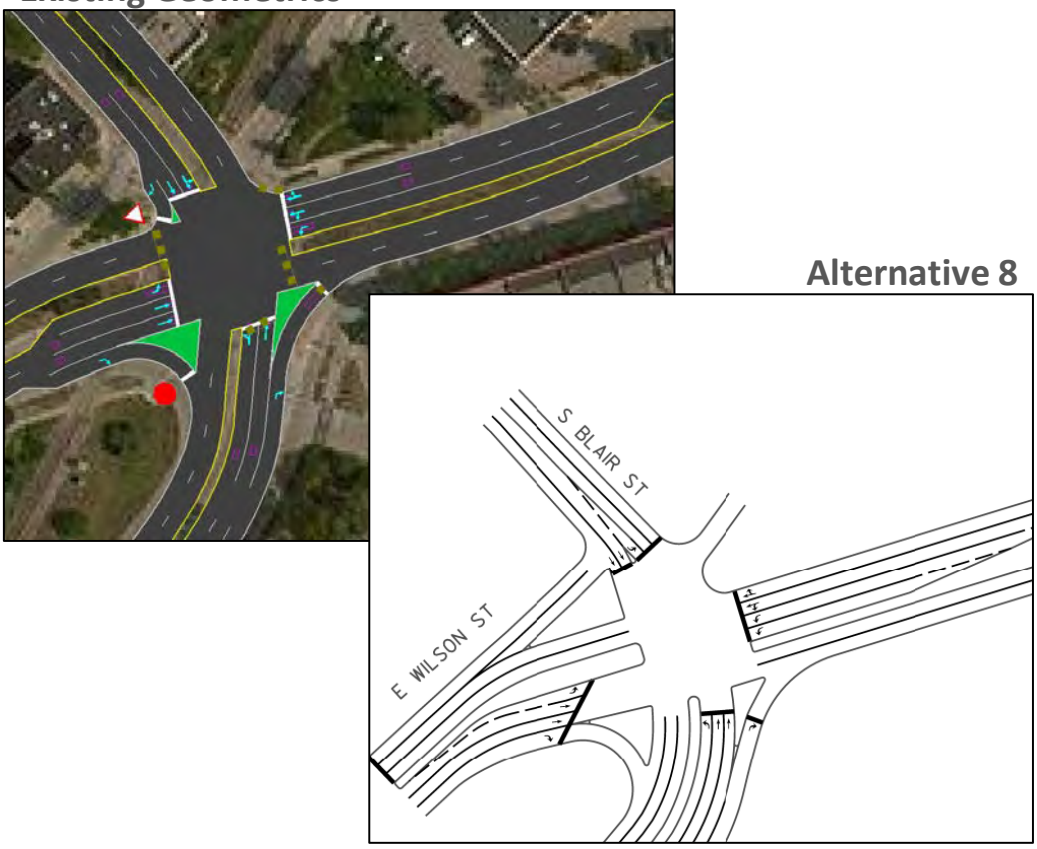


Figure 3.01-10 Alternative 8

12. Alternative 9: One-Way Blair Street and Blount Street Couplet

This alternative routes all northbound John Nolen Drive traffic destined for northbound Blair Street and/or East Washington Avenue on to eastbound Williamson Street and northbound Blount Street which operates one-way northbound. Blair Street operates one-way southbound so that Blair Street and Blount Street operate as a one-way pair (or couplet). This alternative was developed shortly before PIM No. 2 and 2050 operations were not modeled in detail. Instead, the team chose to bring it to the public for input before deciding if additional investigation was warranted. Figure 3.01-11 shows Alternative 9.

Figure 3.01-11 Alternative 9

13. Williamson Street and Blount Street Cycle Track

This alternative aims to improve conditions for pedestrians and bicyclists in the Law Park and Machinery Row area. Several features are included. The existing driveways to Machinery Row and Law Park are eliminated. The access is relocated to the south on John Nolen Drive providing a right-in, right-out, left-in motor vehicle configuration. The Capital City Trail is routed through a reconfigured parking area adjacent to the new access. This is done to move the trail away from John Nolen Drive to eliminate the conflict that would occur between motor vehicles turning into

and out of the relocated access point and the existing trail location running directly adjacent to John Nolen Drive.

Separate space for pedestrians and bicycles are proposed throughout the area. The space along the south side of Williamson Street between John Nolen Drive and Blount Street is reorganized to provide wider, separated space for pedestrians and bicycles. A new signal is provided at Blount Street that will work in conjunction with the existing bus signal at Jenifer Street. A diagonal crossing for pedestrians and bicycles is proposed at the new Blount Street signal. A cycle track is provided along Blount Street up to the existing Capital City Trail crossing. This alternative provides an alternate option for Capital City Trail users, allowing them to avoid crossing Williamson Street at the John Nolen Drive/Blount Street and Wilson Street/Williamson Street intersection. Figure 3.01-12 shows this alternative.

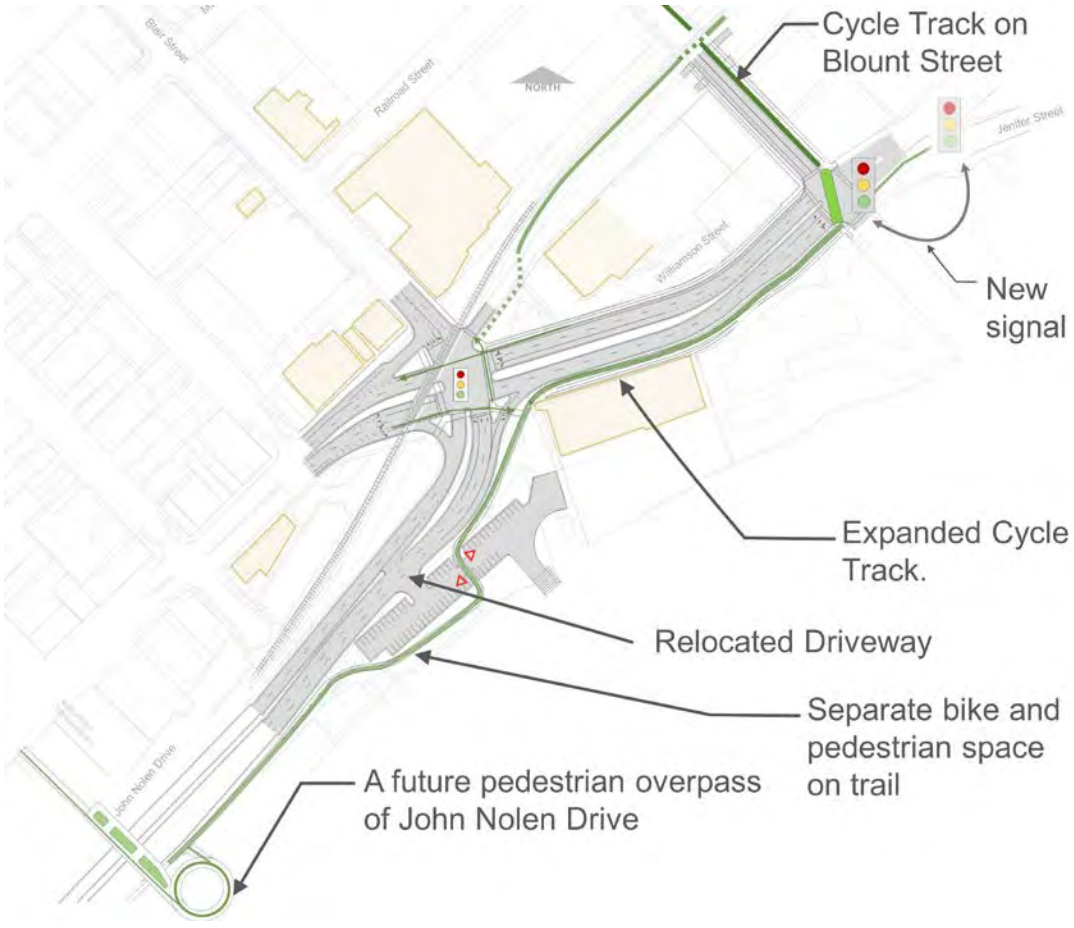


Figure 3.01-12 Williamson Street and Blount Street Cycletrack

14. Traffic Signal at Blair Street and Main Street

At PIM No. 1 the team received comments regarding the difficulty for pedestrians and bicycles crossing Blair Street at Main Street. The team investigated a traffic signal at Blair Street and Main Street as a means of providing a controlled bicycle and pedestrian crossing. From a motor vehicles operation standpoint, left-turns from Blair Street to Main Street would likely need to be prohibited, during peak periods at a minimum. This is needed to avoid creating a condition similar to what currently exists at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection where left-turning vehicles on John Nolen Drive and Blair Street block one of the through lanes and lead to increased delays, queuing, and crashes.

15. John Nolen Drive/Blair Street tunnel

Some have advocated for a tunnel to accommodate motor vehicle traffic through the intersection. A tunnel would reduce motor vehicle volumes, making the intersection more pedestrian and motor vehicle friendly. Figure 3.01-13 illustrates the concept of the tunnel.

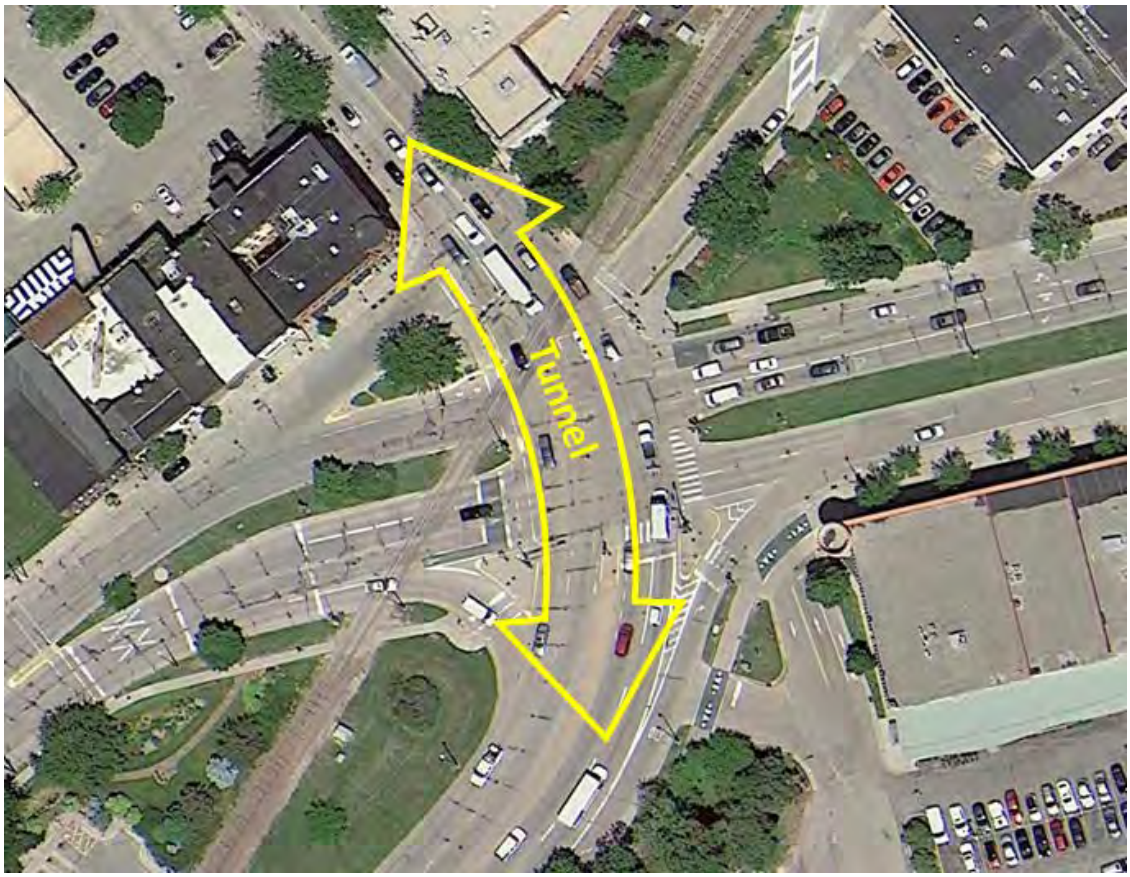


Figure 3.01-13 John Nolen Drive/Blair Street Tunnel Concept

The study team evaluated two concepts of a tunnel. There are several constraints associated with the construction of a tunnel, some of which include:

1. The distance between the Hotel Ruby Marie and the Madison Gas & Electric building, when including required offsets from walls and median barriers, do not allow for four travel lanes (two in each direction) in the tunnel.

2. Ramp grades are generally limited to 6 percent in states with snow cover. This limits how quickly John Nolen Drive/Blair Street can get below existing grade, and consequently limits the ability to provide cross street connections to Blair Street.

3. The railroad crosses the west approach of the intersection. Railroad grade changes are generally limited to 2 percent or less. As a railroad grade changes, it eliminates the ability of cross streets to travel across the rail line. Changing the railroad grade in the isthmus area likely would eliminate the ability of streets that currently cross the rail line to continue crossing the rail line.

4. The John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection is only 6 to 8 feet above the mean water level of Lake Monona. Any tunnel option will require pumps to drain pavement water that drains into the tunnel. Because of the size of the intersection, and the importance of keeping it open even during power outages, these options will require a substantial pump station and associated infrastructure.

5. There are numerous utilities that travel through this intersection that service the Capital area. Some utilities, such as fiber optic lines, are not dependent on grades. Other utilities, such as water, sewer, and storm sewer need to either maintain a specific grade for flow, or keep a minimum cover to keep from freezing.

Figure 3.01-14 illustrates the geometric constraints of the tunnel. Figure 3.01-15 illustrates the operational constraints associated with a tunnel. Figure 3.01-16 shows utilities that cross the intersection that would require relocation with a tunnel option. Figure 3.01-17 shows elevation constraints associated with the tunnel.

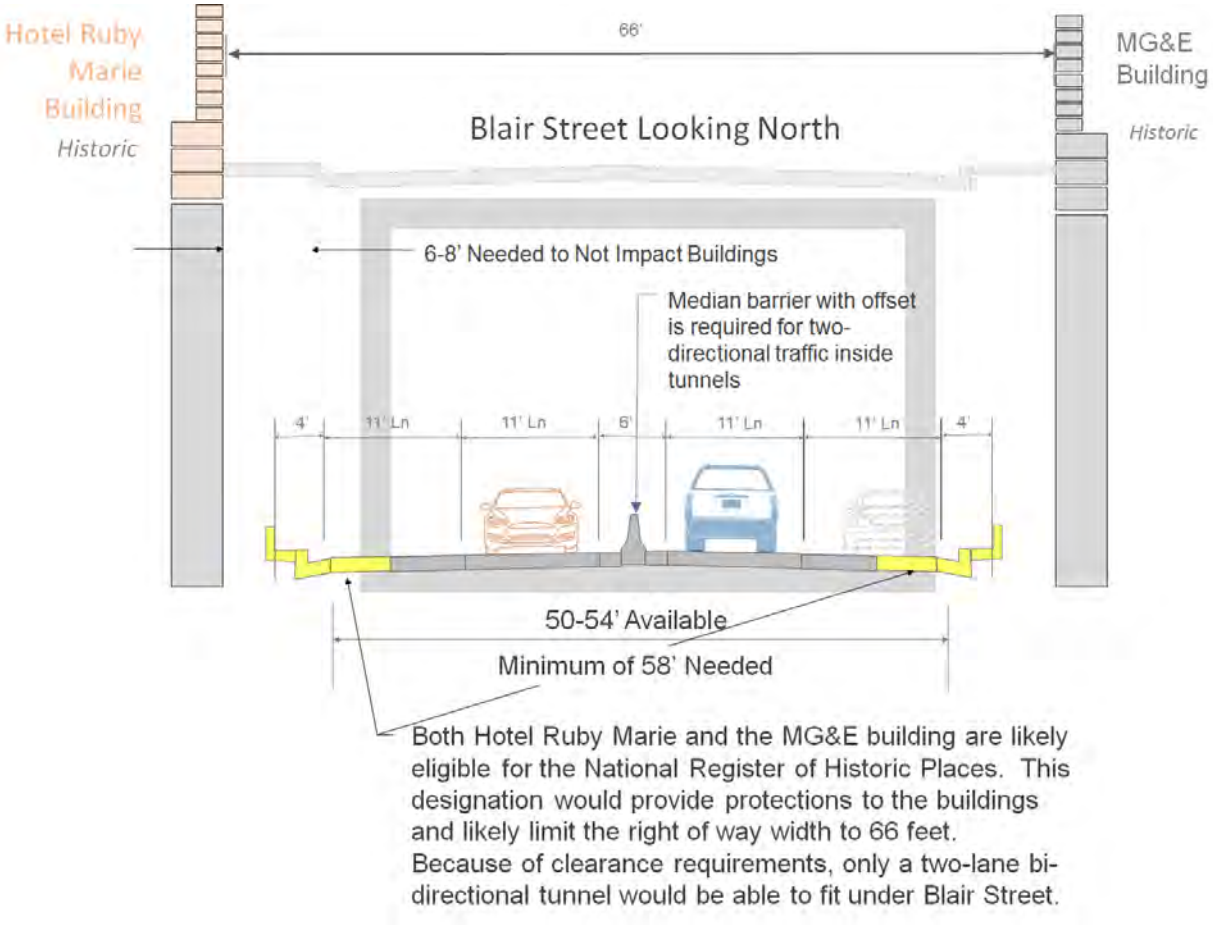
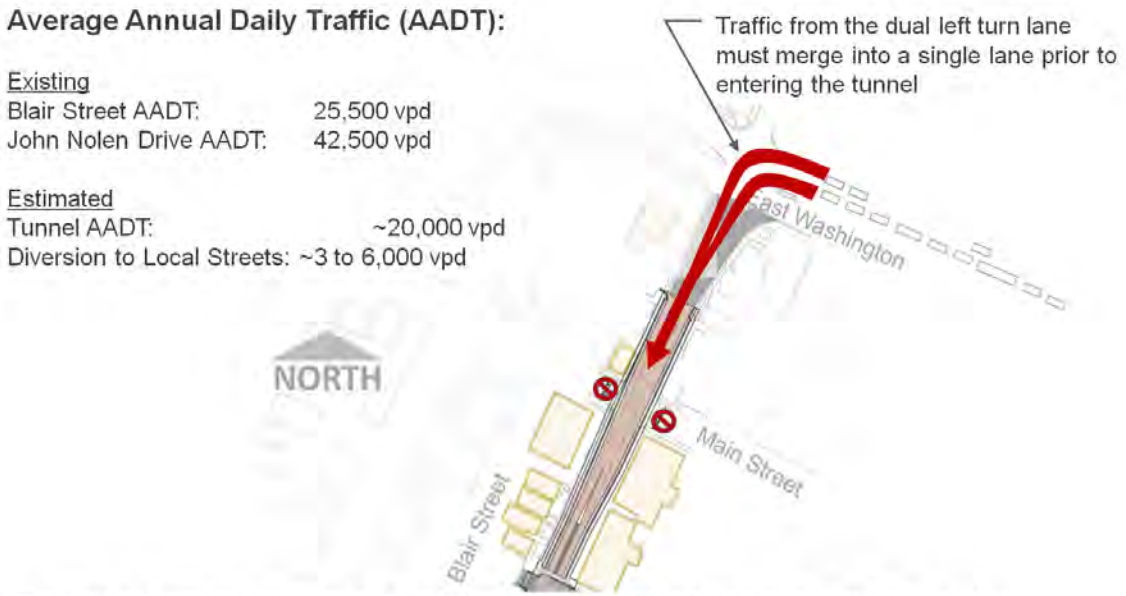
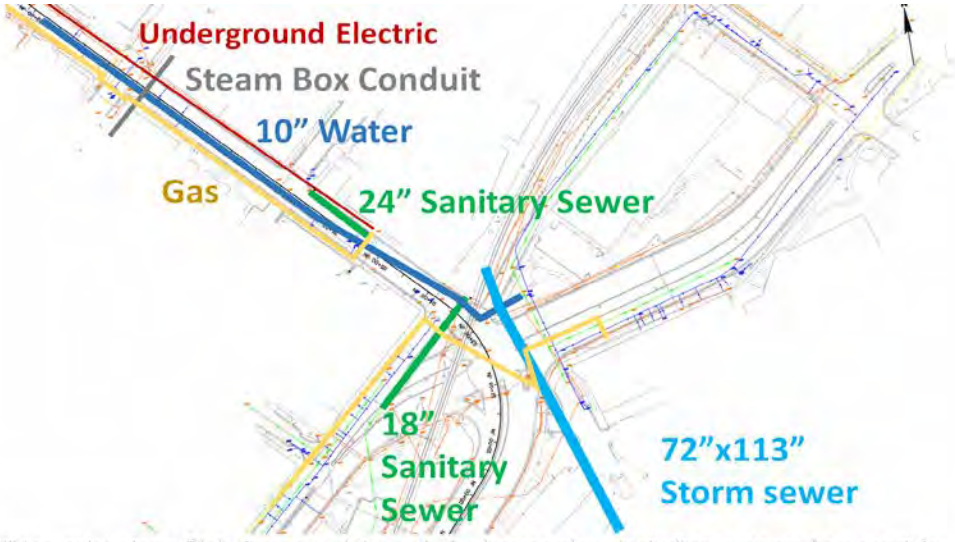


Figure 3.01-14 Tunnel Concept Constraints



The dual left-turn movement from East Washington Ave. must merge to a single lane prior to entering the tunnel. Based on the estimated turning volume, this substandard merge length will result in unbalanced lane usage on East Washington Avenue. Modeling indicates that this left turn queue would will backup through the Blount Street and Livingston Street intersections, and possibly farther.

Figure 4.01-15 Tunnel Concept Operational Constraints



Utilities exist along Blair Street and through the intersection, including a steam box conduit associated with the Capitol power plant. Some utilities, such as underground electrical lines and water lines are difficult yet possible to relocate. Other utilities, such as storm sewer and sanitary sewers, rely on a constant grade to allow them to drain by gravity. These utilities are not easily relocated or lowered without installing pump stations. Of particular concern at this location is the 72 inch by 113 inch storm sewer draining to Lake Monona.

Figure 3.01-16 Tunnel Concept Utility Relocations

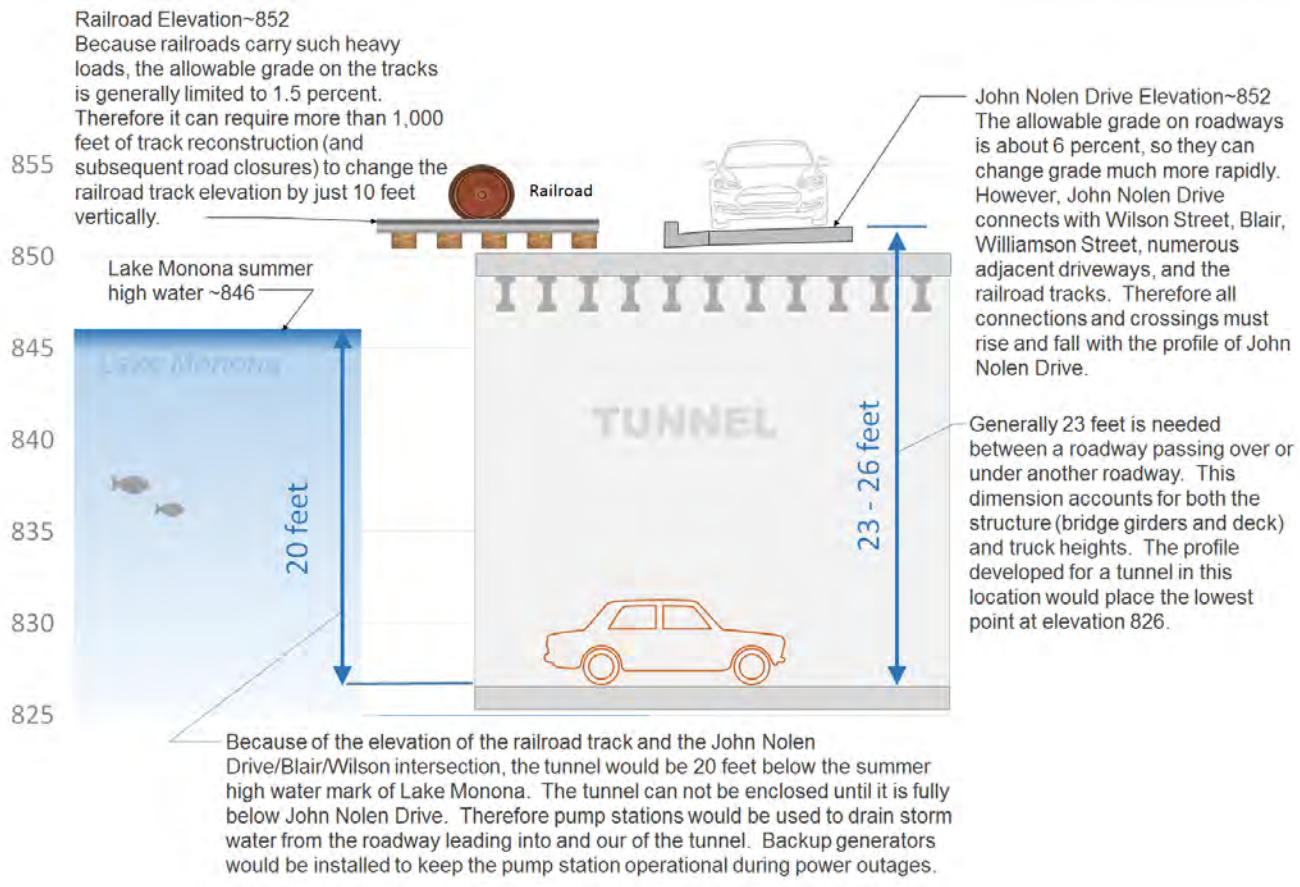


Figure 3.01-17 Tunnel Concept Elevation Constraints

Tunnel Option 1 maintains local surface access to Railroad Street, Main Street, and East Washington Avenue by providing frontage roads adjacent to the tunnel. It is shown as a schematic illustration Figure 3.01-18.

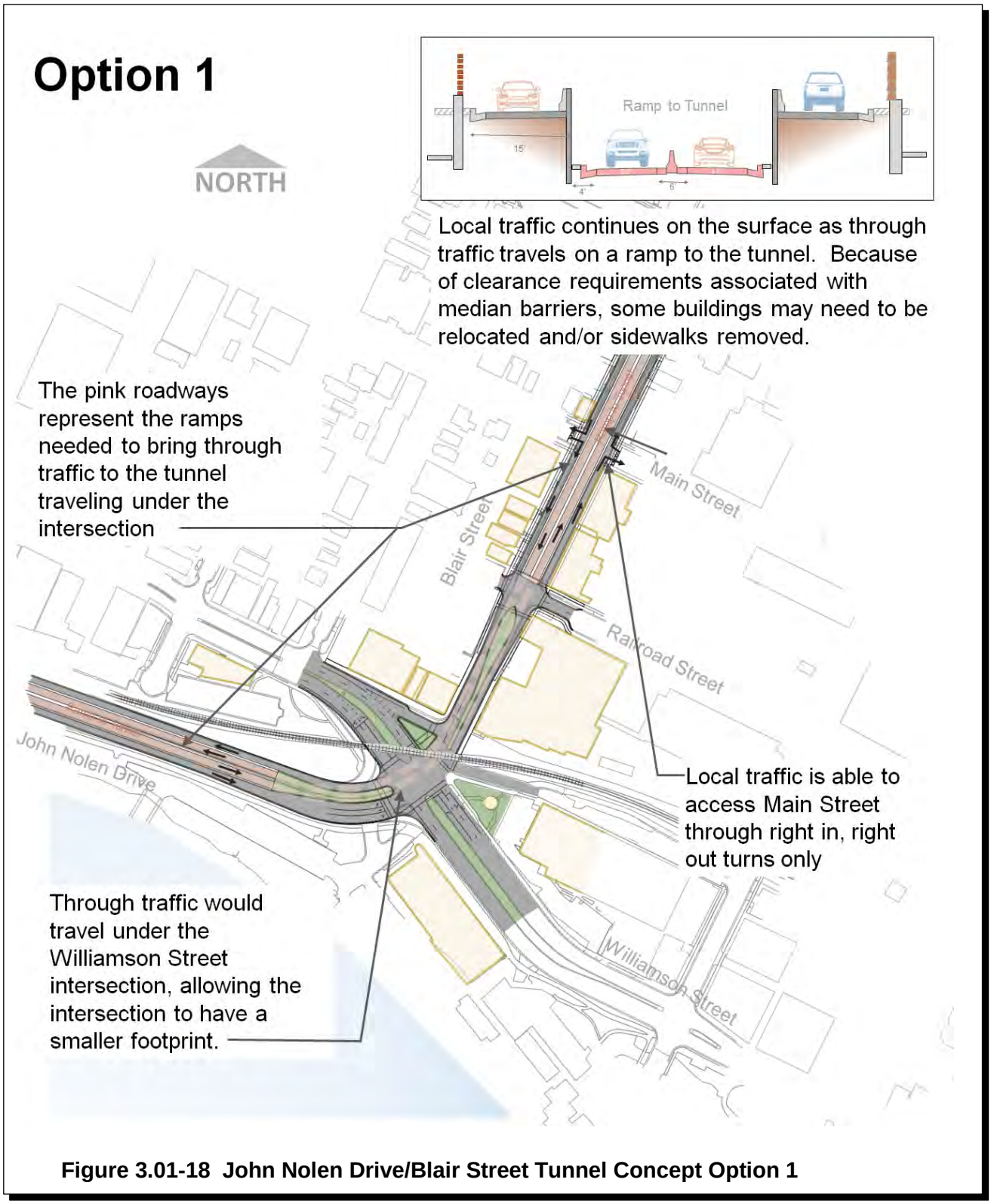


Figure 3.01-18 John Nolen Drive/Blair Street Tunnel Concept Option 1

Tunnel Option 2 maintains local surface access to Railroad Street. Access to Main Street is closed. The connection to and from East Washington Avenue flows directly into the tunnel. Figure 3.01-19 illustrates this concept.

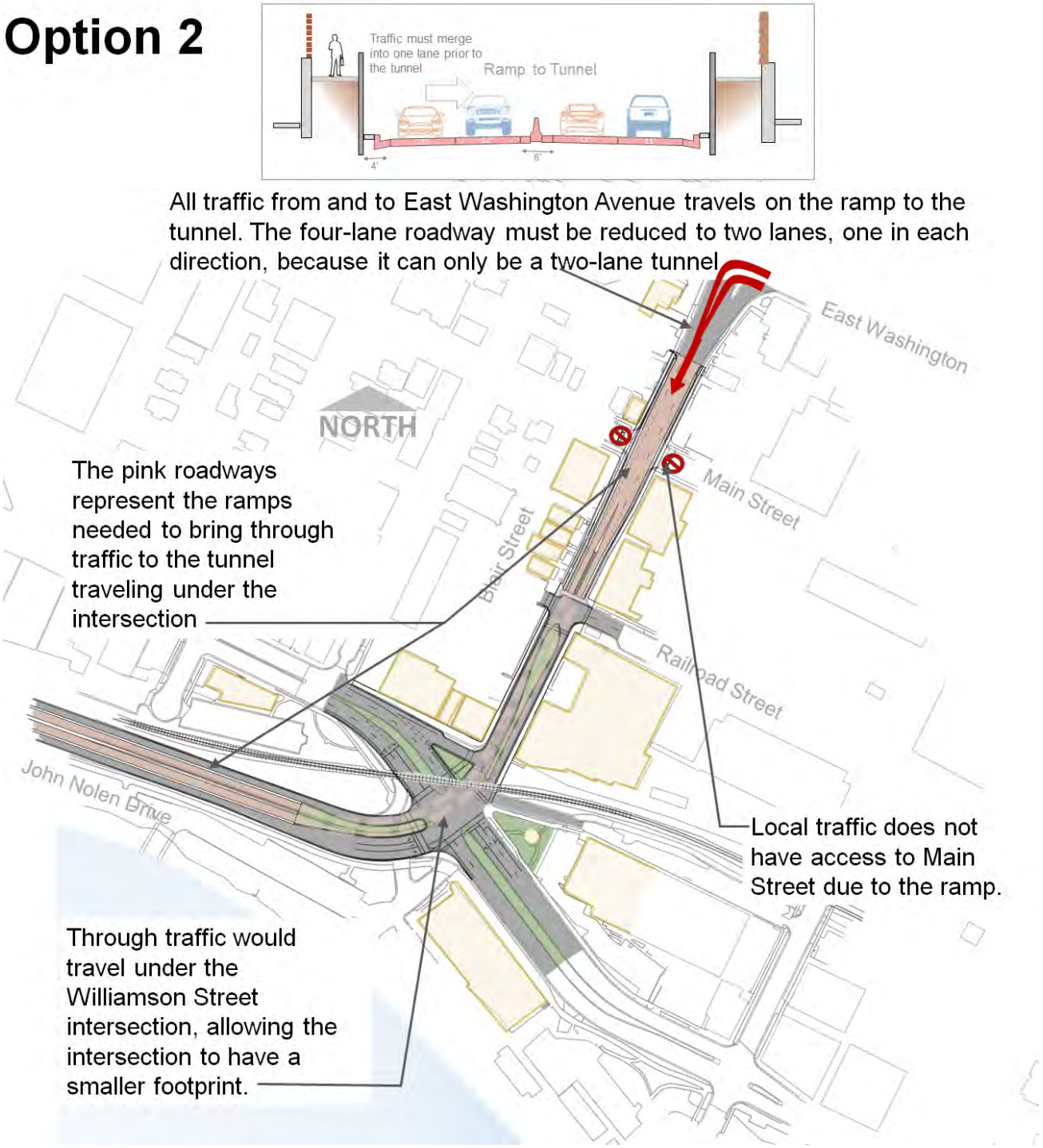


Figure 3.01-19 John Nolen Drive/Blair Street Tunnel Concept Option 2

While constructing both tunnel options is possible, and they could provide some benefits to the area, the costs and impacts associated with either are substantial.

16. Summary of Motor Vehicle Operations for Initial Alternatives

Table 3.01-1 summarizes the motor vehicle operations for the initial range of alternatives at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection.

B. Monona Terrace to Law Park Area

1. Pedestrian Overpass at the McGrath Building

The study team investigated a pedestrian overpass of John Nolen Drive with the goal of improving the connectivity of the Capital Square and King Street area with the Monona lakeshore. This was a key need expressed by local stakeholders. In fall 2016 the property at 149 East Wilson Street was being redeveloped (McGrath Redevelopment). The team examined a connection between the McGrath Redevelopment site and 137 East Wilson Street (Marina Building) to the south/west. Figure 3.01-20 shows some of the renderings developed for the pedestrian/bicycle overpass of John Nolen Drive.

2. Monona Terrace Deck Extension

Multiple proposals for a long-term vision east of Monona Terrace for the Monona lakeshore and Law Park area include an elevated park over John Nolen Drive. Some of these proposals include a parking garage located above John Nolen Drive, and below the elevated park. The study team investigated how these decks over John Nolen Drive east of Monona Terrace would impact the existing and planned buildings on the north/west side of John Nolen Drive, such as the Marina Building and the McGrath Redevelopment. Figure 3.01-21 shows some of the renderings prepared by the study team. Additional views were presented at PIM No. 2 and are included in Appendix D.

Table 3.01-1 2050 AM and PM Peak Hour Motor Vehicle Operations Summary for the John Nolen Drive/Blair Street and Wilson Street/Williamson Street

Alternative	Overall LOS	LOS E Movements	LOS F Movements
Alt 0: No Build	F *F*	WBL *WBL*	NBL, NBT, SBL, SBT *NBL, NBT, SBL, SBT*
Alt 1: Add NBL, SBL	D *D*	WBL, NBL, SBT, SBR --	-- *WBL*
Alt 2: Add NBL, SBL, single EBT, WBT	E *E*	EBL, EBT, EBR, WBL, NBL, NBT *WBL, NBT, SBT, SBR*	WBT, WBR, SBT, SBR *EBT*
Alt 3: Add NBL, SBL, single EBT, eliminate WBL/T	D *E*	EBL, EBR, WBL, WBT, WBR *EBL, WBL, NBT*	EBT, NBL *EBT*
Alt 4: One-way Circulator, One-way Hancock	E *B*	-- --	WBT, WBR, NBL, SBR --
Alt 4a: One-way Circulator, Two-way Hancock	C *B*	-- --	-- --
Alt 5: Two-way Operation, Two-way Hancock	F *D*	EBL, EBT *EBT*	WBL, WBT, WBR, SBL, SBT *WBL, SBL, SBT*
Alt 6: Two-way Operation, Two-way Hancock, Relocate WBL	F *D*	EBL, EBT --	EBL, EBT, EBR, SBL, SBT *EBT, WBL, WBT, WBR*
[1]Alt 6a: Two-way Operation, Two-way Hancock, Relocate WBL, 3 NBT	F *D*	EBL, EBT --	EBL, EBT, EBR, SBL, SBT *EBT, WBL, WBT, WBR*
[2]Alt 7: One-way Circulator, One-way Franklin	E *B*	-- --	WBT, WBR, NBL, SBR --
Alt 8: Add NBL, SBL, WBL	E *C*	WBL, WBT, WBR, SBT, SBR --	-- --
[3]Alt 9: One-way Blair and Blount Couplet			

Notes:
AM Peak Hour
PM Peak Hour
NBL, NBT, NBR = Northbound John Nolen Drive Left, Through, Right
SBL, SBT, SBR = Southbound Blair Street Left, Through, Right
EBL, EBT, EBR = Eastbound Wilson Street Left, Through, Right
WBL, WBT, WBR = Westbound Williamson Street Left, Through, Right
[1]Alt 6a 2050 operations not modeled, Alt 6 operations shown in the table.
[2]Alt 7 2050 operations not modeled, Alt 4 operations shown in the table.
[3]Alt 9 2050 operations not modeled. The team chose to ask for stakeholder input at PIM No. 2 prior to additional analysis.

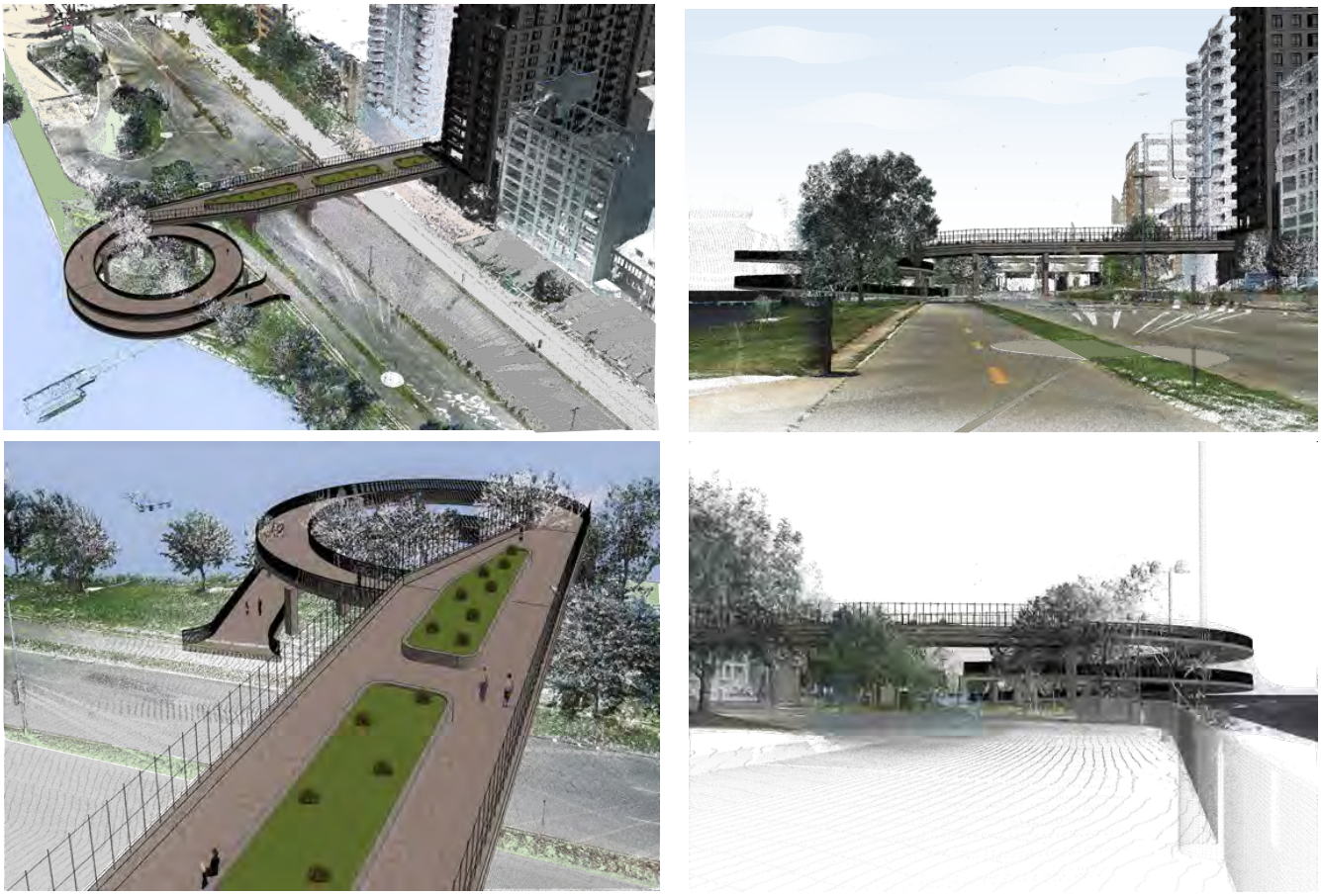


Figure 3.01-20 Pedestrian/Bicycle Overpass of John Nolen Drive

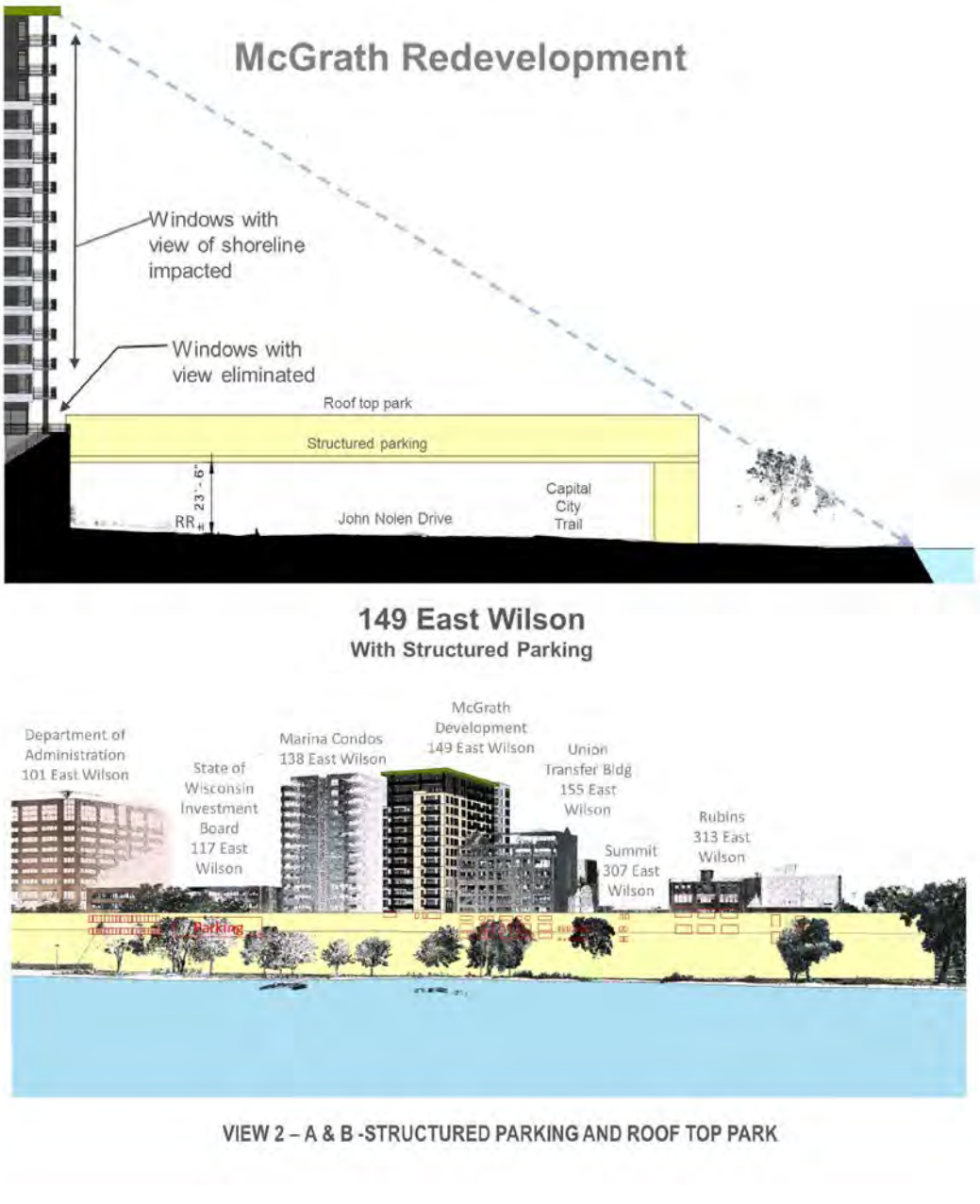


Figure 3.01-21 Renderings of a Raised Deck Over John Nolen Drive East of Monona Terrace

C. John Nolen Drive at North Shore Drive and Broom Street

1. Blankout Signage for No Right Turn on Red at North Shore Drive

The study team developed near-term improvements for the bicycle and pedestrian crossing of John Nolen Drive at North Shore Drive. These include additional blankout signage reinforcing the right-turn-on-red prohibition that currently exists for the eastbound North Shore Drive right-turn to southbound John Nolen Drive. Also proposed is the addition of a staging area adjacent to the Capital City Trail on the east side of John Nolen Drive for pedestrians and bicycles waiting to cross John Nolen Drive.

2. Single Stage Path Crossing at North Shore Drive

The South Capital Transit Oriented Development Study as well as stakeholder feedback suggested investigation of a single traffic signal phase pedestrian and bicycle crossing of John Nolen Drive at North Shore Drive. The study team modeled this condition using the existing crosswalk configuration and 2015 traffic volumes. This requires a much longer signal phase that stops northbound and southbound John Nolen Drive traffic than under the current, two-stage crossing configuration. During the AM peak hour, the northbound John Nolen Drive left turning motor vehicle traffic would experience severe average delays exceeding 150 seconds accompanied by northbound queues reaching 800 to 1,200 feet in length or more. During the PM peak-hour the southbound John Nolen Drive through motor vehicle traffic would experience severe average delays of 180 seconds accompanied by southbound queues reaching 1,300 feet in length or more.

Another alternative would be to reduce the crossing length, so a shorter signal phase would be required. Because of the existing roadway geometry, this would require a costly reconfiguration of the beam guard that exits in the median of John Nolen Drive and the connection to the Capital City Trail on the east side of John Nolen Drive would not have any throat length/staging space for crossing pedestrians and bicyclists. This would create frequent conflicts between path users traveling through along John Nolen Drive and those wishing to cross.

Based on these results the study team chose not to bring this alternative forward as an option at PIM No. 2.

3. Single Stage Crossing at Broom Street

The South Capital Transit Oriented Development Study, as well as stakeholder feedback, suggested investigation of a single traffic signal phase pedestrian and bicycle crossing of John Nolen Drive at Broom Street. The study team modeled this condition using the existing crosswalk configuration and 2015 traffic volumes. This requires a much longer signal phase that stops northbound and southbound John Nolen Drive traffic than under the current, two-stage crossing configuration. During the AM peak hour, the northbound John Nolen Drive left turning motor vehicle traffic would experience significant average delays exceeding 100 seconds accompanied by northbound queues reaching 600 to 900 feet in length or more, blocking the North Shore Drive intersection upstream. During the PM peak hour, the eastbound left-turning

Broom Street traffic would experience severe average delays of more than 130 seconds accompanied by queues reaching 490 feet or longer, blocking the Wilson Street intersection upstream. The northbound John Nolen Drive through motor vehicle traffic would experience significant average delays of more than 80 seconds accompanied by northbound queues reaching 1,200 feet in length or more, blocking the North Shore Drive intersection upstream.

Based on these results the study team chose not to bring this alternative forward as an option at PIM No. 2.

4. Path from Broom Street to Hamilton Street along the WSOR Railroad Tracks

One of the pedestrian and particularly bicycle connectivity issues in this area is between the Capital City Trail west of the Monona Terrace and the Capital Square area. The study team investigated a connection along the railroad tracks on the west side of Jon Nolen Drive between Broom Street and Hamilton Street to improve this connectivity. An existing worn trail in the grass along the railroad tracks indicates this connection is desired by pedestrians.

While coordination with the railroad to allow such a connection will be a challenge, it does appear there is sufficient room to provide a shared use path parallel to the tracks.

5. Bicycle and Pedestrian Underpass of John Nolen Drive

Local advocates have proposed a system of John Nolen Drive pedestrian and bicycle underpasses as an alternative for crossing John Nolen Drive at-grade. The study team reviewed the feasibility of an underpass between North Shore Drive and Broom Street.

4.02 PUBLIC INVOLVEMENT MEETING NO. 2

A. Study Team Pre-Screening

Considering that nine alternatives were developed for the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection, prior to PIM No. 2 the study team reviewed the alternatives to narrow the pool to a smaller amount that warranted a higher level of development. Each of the refined alternatives includes the Williamson Street and Blount Street cycle track and signalized diagonal bicycle and pedestrian crossing at the intersection of Blount Street and Williamson Street.

1. Alternative 1: Add NBL and SBL

Alternative 1 represents a “do minimum” option with relatively modest physical impacts while addressing the key motor vehicle safety issue of a lack of northbound and southbound left-turn bays. For this reason, the study team elected to develop Alternative 1 further prior to PIM No. 2. Figure 3.02-1 shows the more highly developed Alternative 1.

Figure 3.02-1 Alternative 1

2. Alternative 7: Compact Circulator

Alternative 7 showed promise as an innovative solution that reconfigures the motor vehicle operations, potentially allowing for a smaller footprint at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection. Figure 3.02-2 shows the more highly developed Alternative 7.

Figure 3.02-2 Alternative 7

3. Alternative 8: Add NBL, SBL, and Triple WBL

Alternative 8 provides a modestly larger footprint than Alternative 1 because the triple westbound left turn from Williamson Street requires three receiving lanes on southbound John Nolen Drive. Alternative 8 also addresses the key motor vehicle safety issue of a lack of northbound and southbound left-turn bays. For this reason, the study team elected to develop Alternative 8 further prior to PIM No. 2. Figure 3.02-3 shows the more highly developed Alternative 8.

Figure 3.02-3 Alternative 8

4. Alternative 9: One-Way Blair Street and Blount Street Couplet

Initial testing of motor vehicle operations suggested that Alternative 9 showed promise for improving conditions at the John Nolen Drive/Blount Street and Wilson Street/Williamson Street intersection. While this alternative routes additional traffic to Williamson Street between Blair Street and Blount Street and to Blount Street between Williamson Street and East Washington Avenue, it also reduces traffic on Blair Street from East Washington Avenue to Wilson Street/Williamson Street. For these reasons, the study team elected to develop Alternative 9 further prior to PIM No. 2. Figure 3.02-4 shows the more highly developed Alternative 9.

Figure 3.02-4 Alternative 9

B. Presentation and Display Materials

The second public meeting was held at the Monona Terrace Convention Center on April 17, 2017, from 7 to 9 P.M.; 52 people signed in. The primary goals of the meeting were to discuss the range of alternatives and gather feedback about the alternatives from local stakeholders.

The slideshow presentation and exhibit materials from PIM No. 2 are included in Appendix D. The presentation outline follows:

1. Study corridor and reasons for study.
    a. Upcoming projects
    b. Previous studies and longer-term opportunities
2. John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection area
3. East of Monona Terrace area
4. John Nolen Drive and North Shore Drive and Broom Street area
5. Next steps
6. Questions and answers

The exhibits displayed included the following:

1. Overview of Ideas (summary of multiple longer-term visions for the Monona Lakeshore).
2. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection area
    a. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection Expressed Needs
    b. John Nolen/Blair/Williamson/Wilson Tunnel Alternative (3 boards). Not recommended for further study.
    c. Bike Routing showing the cycle track along Williamson Street and Blount Street. Recommended for further study.
    d. Alternatives considered
    e. Alternative 1 NB and SB Left Turn Lanes. Recommended for further study.
    f. Alternative 7 Circulator. Not recommended for further study.
    g. Alternative 8 Westbound Triple Left. Not recommended for further study.
    h. Alternative 9 One-way Couplet (2 boards). Recommended for further study.
    i. Traffic Signal at Main Street and Blair Street. Recommended for further study.

3. East of Monona Terrace area

    a. Pedestrian Bicycle Connection to Law Park. Recommended for further study.

    b. Discussion of Concepts East of Monona Terrace (4 boards).

4. North Shore Drive and Broom Street area

    a. North Shore Drive/North Broom Street Expressed Needs

    b. North Shore and Broom Street Characteristics

    c. North Shore and Broom Street–Bicycle Underpass. Recommended for further study.

C. Summary of PIM No. 2 Verbal and Written Comments

A full summary of the verbal and written comments is included in Appendix D. Following are the most common comments.

1. Reduce the speeds of or eliminate the John Nolen Drive northbound channelized right-turn lane.

2. Move the intersection west and reduce the median width on Williamson Street to gain space for pedestrians and bicycles and create a more “Main Street” feel.

3. Support for Alternative 1, including relocating the Machinery Row driveways and reorganizing/expanding the bicycle and pedestrian space along the south side of Williamson Street. Request to add further enhancements for east-west bike travel on Williamson Street and Wilson Street.

4. Support for the bicycle and pedestrian overpass of John Nolen Drive east of Monona Terrace.

5. The team should develop a near-term improvement for the John Nolen Drive pedestrian and bicycle crossing at Broom Street.

6. Support and Opposition for Alternative 9.

4.01 JOHN NOLEN DRIVE/BLAIR STREET AND WILSON STREET/WILLIAMSON STREET ALTERNATIVES SCREENING

The study team reviewed the four alternatives that were highlighted as showing the most promise at PIM No. 2. These included Alternatives 1, 7, 8, and 9. First, the team developed refined Synchro traffic models. 2015 traffic volumes were used to provide an understanding of operational conditions shortly after construction for each alternative. Detailed modeling results are included in Appendix C. Table 4.01-1 summarizes the 2015 operations modeling.

Alternative	Peak Hour	Overall LOS (sec)	LOS E Movements	LOS F Movements	Queues >500 feet
Alt 1: Add NBL, SBL	AM	D (44)	WBL, WBT	--	WBL, NBT, SBT
	PM	C (31)	WBL	--	NBR
Alt 7: Circulator	AM	C (24)	--	--	--
	PM	C (20)	--	--	NBT, NBR
Alt 8: Add NBL, SBL, WBL	AM	D (36)	--	--	NBT, SBT
	PM	C (28)	--	--	NBT, NBR
Alt 9: One-way Couplet	AM	D (36)	WBT, NBL, SBT	--	SBT
	PM	E (61)	EBT, WBL, NBR, SBL	--	NBR

Table 4.01-1 2015 Operations Modeling Summary

Based on the operations modeling results, the team agreed to study Alternative 1 and Alternative 9 further. Alternative 7 was dismissed because of challenges in accommodating bicycles, and its complexity and cost versus the other alternatives. Alternative 8 was eliminated due to offering only modestly better traffic operations while requiring a higher level of impacts and costs compared to Alternative 1.

Carrying Alternatives 1 and 9 forward, the team evaluated them against the needs identified in the area, as well as in terms of how each mode of travel was impacted and the anticipated construction costs.

4.02 JOHN NOLEN DRIVE/BLAIR STREET AND WILSON STREET/WILLIAMSON STREET ALTERNATIVES EVALUATION

Figure 4.02-1 shows the team's evaluation of Alternative 1 and Alternative 9 against the most frequently expressed needs. Green text indicates a relative improvement over existing conditions. Yellow text indicates mixed or unknown results. Red text indicates poorer conditions compared to existing conditions.

Figure 4.02-2 shows the team's evaluation of Alternative 1 and Alternative 9 in terms of each travel mode, stakeholder comments, cost, and additional considerations.

Figure 4.02-1 Alternatives 1 and 9 Versus the Expressed Needs

Expressed Concern/Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet
John Nolen Drive is a barrier for pedestrian/bicycle access to the lake.	• Ped/bike access to lake is enhanced when combined with proposed ped/bike overpass	• Reduced when combined with proposed overpass
Reduce Speeds of Northbound Right-Turns	• Smaller radii on northbound right-turn channelization should reduce right turn travel speeds.	• Providing a dual right turn lane for the northbound to eastbound movement requires larger radii and consequently may increase speeds.
Discourage Use of Williamson Street for Longer Trips	• Use of Williamson Street for longer trips is likely to remain unchanged from current conditions	• Directing all northbound traffic down Williamson Street until Blount Street may conflict with these goals.
Reduce Conflicts at Machinery Row Driveways	• Relocated parking lot access and realigned bike path reduces the number of conflicts at the intersection.	• Relocated parking lot access and realigned bike path reduces the number of conflicts at the intersection.
Provide Off-Path Staging Area for North-South bikes/peds crossing Williamson Street	• Additional staging area provided with the modified northbound right-turn channelization	• Modest staging area may be possible with dual channelized northbound through/right-turn.
Better Delineate Bicycle versus Pedestrian Space along south side of Williamson Street between Blair Street and Jennifer Street	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.
Relocate Capital City Trail Crossing of Williamson Street from Blair Street to Blount Street	• Achieved with signalized diagonal crossing and cycle track connection along Blount Street. Existing Capital City Trail crossing at Blair Street intersection remains.	• Achieved with signalized diagonal crossing and cycletrack connection along Blount Street. • Existing Capital City Trail crossing at Blair Street is eliminated.
Improve Pedestrian and Bicycle Access Across Blair Street	• Blair Street is easier to cross for pedestrians and bikes if Main Street signal is implemented.	• Blair Street is easier to cross for pedestrians and bikes because Blair Street carries about 50 percent less traffic. One-way operation on Blair Street also provides larger gaps in traffic.

Figure 4.02-2 Alternatives 1 and 9 Versus the Expressed Needs

Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet

Accommodations for Pedestrians and Bicycles	• Enhanced accommodations for pedestrians and bicycles through:
	  • Reallocation of space along Machinery Road cycle track
	  • Relocating parking lot driveway to minimize ped/bike/auto conflicts at intersection.
	  • Better delineation of connection of Wilson Street to Capital City Trail for bicycles and pedestrians.
		• One-way Blair Street may allow for more space to be dedicated to terrace, pedestrian, and/or bicycle accommodations.
		• Enhanced accommodations along John Nolen Drive and Williamson Street
		• Increased traffic volumes along Williamson Street between Blair Street and Blount Street.

Transit	• No significant impacts.	• Lower traffic volumes eastbound along East Washington Avenue between Blair Street and Blount Street which carries 9 weekday routes and has a bus stop at the southeast corner at Blount Street. • Higher traffic volumes along eastbound Williamson Street between Blair Street and Blount Street which carries 4 weekday routes. • No significant impacts to current routing.
Motor Vehicles	• Modest improvement to delays and queuing compared to a Do Nothing scenario.	• Lower delay and queuing during the AM peak hour than Alt 1 • Higher delay and queuing during the PM peak hour than Alt 1
Stakeholder and Alder Comments	• Generally positive	• Generally negative
Cost	• $3.7 Million	• $6.0 Million
Additional Considerations	• Reduced crashes with the addition of left-turn bays.	• Reduced crashes with the addition of left-turn bays. • Spreads traffic burden among two streets instead of one. • Perception of encouraging John Nolen Drive northbound/ eastbound traffic to use Williamson Street instead of East Washington Avenue.
Result	**Recommended**	Dismissed

4.03 ALTERNATIVE 1 ADDITIONAL REFINEMENTS

Based on study team and stakeholder input, Alternative 1 was refined further prior to PIM No. 3. The team received several iterations of intersection concepts from the Madison Design Professionals workgroup. Some of the concepts were able to be implemented while others could not be supported by the study team. The key features proposed included:

1. Moving the intersection west. The study team revised the design to move the intersection as far west as possible while accommodating truck turning paths and the addition of northbound and southbound left-turn lanes.

2. Expanding the space in front of Machinery Row. The revised design includes a staging area in front of Machinery Row for pedestrians and bicycles waiting to cross Williamson Street or John Nolen Drive.

3. Providing expanded stormwater treatment features. The revised design maintains the 18-foot-wide median along Williamson Street to provide options for stormwater treatment during final design.

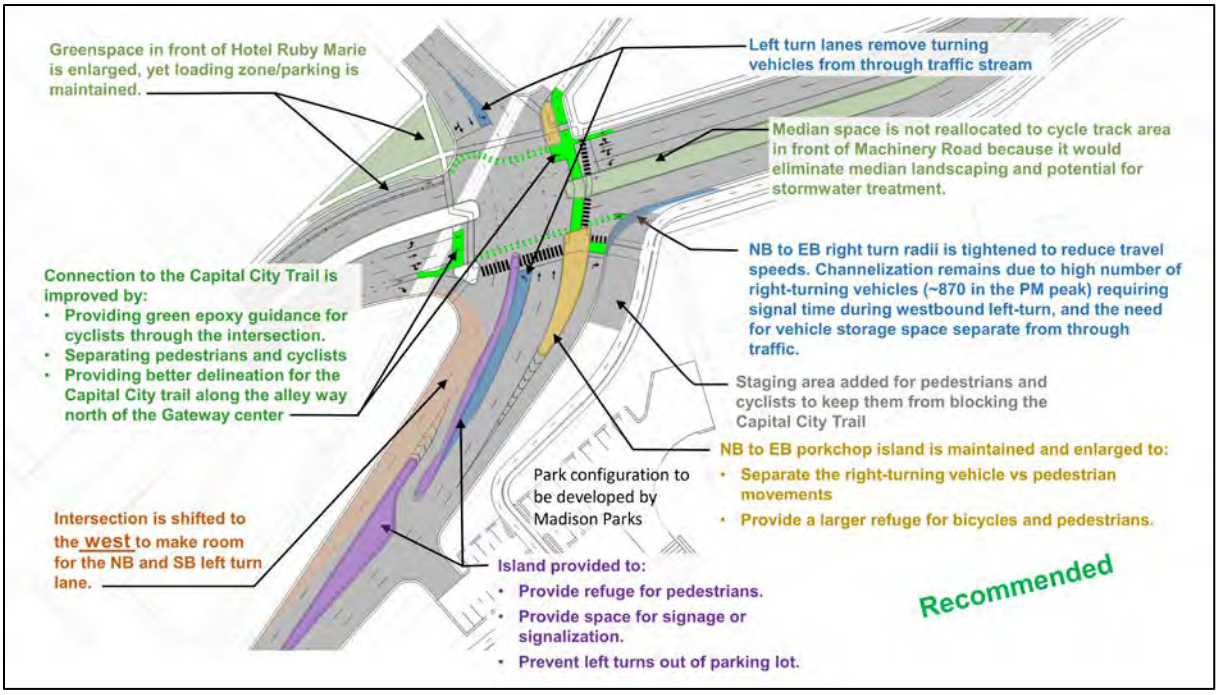
4. Providing right-in, right-out motor vehicle access to Machinery Row/Law Park. The revised design provides a relocated right-in, right-out, left-in access farther south on John Nolen Drive, improving conditions compared to the exiting configuration.

5. Removing the Wilson Street entrance to the Gateway Mall in the northeast quadrant. The study team does not support this removal because of potential impacts to internal circulation and truck deliveries to the Gateway Mall parcel.

6. Removing the Wilson Street stub in front of Hotel Ruby Marie. The revised design removes this portion of Wilson Street.

7. Removing the John Nolen Drive channelized northbound right turn to eastbound Williamson Street. The study team does not support eliminating the channelized right turn. It allows for positive control of the conflict between the high volume of bicycles and pedestrians crossing Williamson Street and John Nolen Drive and the right turning motor vehicle traffic. The total number of potential conflicts during peak periods between these movements is likely one of the highest in the City.

Figure 4.03-1 shows an exhibit that was displayed at PIM #3 that summarizes the revised Alternative 1 design.



Note: This exhibit was presented at PIM No. 3, additional refinements have been made, See Section 5 Recommendations.

Figure 4.03-1 Alternative 1 Refinements Based on Stakeholder Input

4.04 BROOM STREET NEAR-TERM IMPROVEMENTS

One of the comments the study team received at PIM No. 2 was a disappointment in the lack of improvements at the John Nolen Drive and Broom Street intersection, other than the pedestrian and bicycle underpass and possible path connection between Broom Street and Hamilton Street parallel to the railroad tracks west of John Nolen Drive. The study team refined the alternatives at Broom Street to respond to these comments.

Figure 4.04-1 shows the refinements presented at PIM No. 3. New near-term options included reconfigured lane widths along Broom Street and bike boxes for the northbound John Nolen Drive to westbound Broom Street and eastbound Broom Street to the Capital City Trail crossings. A new long-term option was also introduced consisting of the reconstruction of Broom Street to provide narrower motor vehicle lanes to allow for a 10-foot path along the north side of Broom Street between John Nolen Drive and Wilson Street.

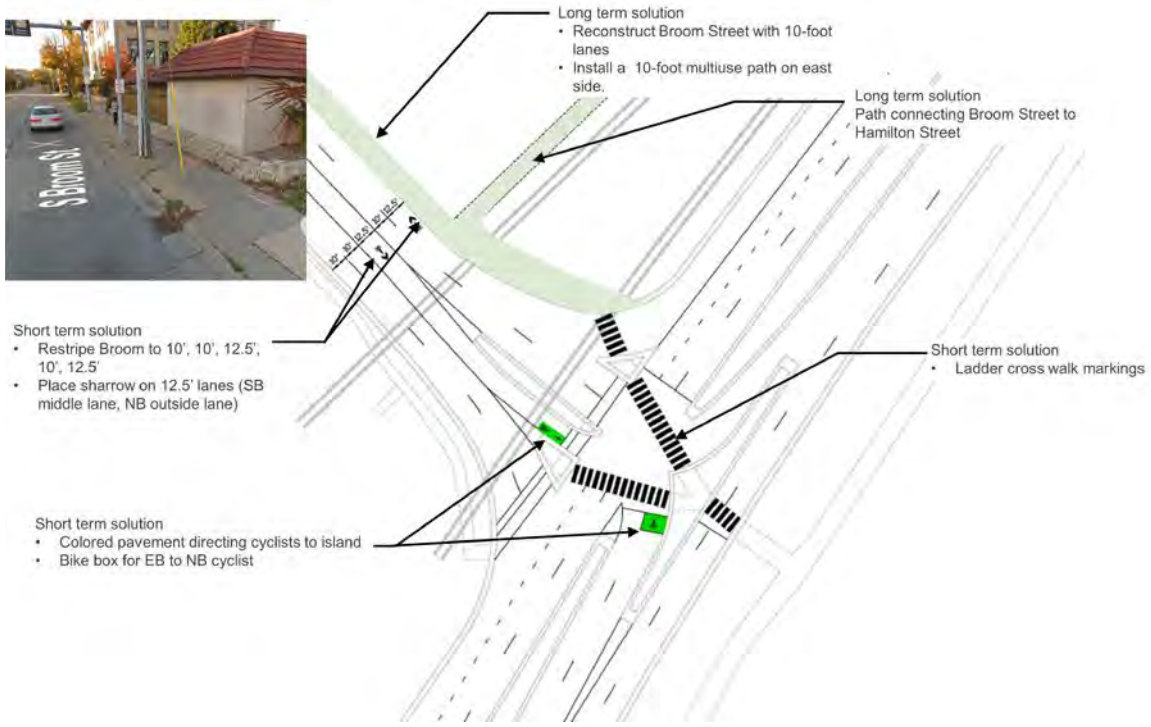


Figure 4.04-1 Broom Street Refined Improvements

4.05 PUBLIC INVOLVEMENT MEETING NO. 3

The third public meeting was held at the Monona Terrace Convention Center on August 9, 2017, from 7 to 9 P.M.; 45 people signed in. The primary goals of the meeting were to discuss the refined alternatives and draft recommendations and gather feedback from local stakeholders.

A. Presentation and display materials

The slideshow presentation and exhibit materials from PIM No. 3 are included in Appendix E. The presentation outline follows:

1. Study corridor and reasons for study
   a. Upcoming projects
   b. Previous studies and longer-term opportunities
2. John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection area
3. John Nolen Drive and North Shore Drive and Broom Street area
4. Overview of PIM No. 3 exhibits
5. Study schedule
6. Questions and answers

The exhibits displayed included the following:

1. Study Purpose

2. Overview of Ideas (summary of multiple longer-term visions for the Monona lakeshore)

3. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection area

    a. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection Expressed Needs

    b. John Nolen/Blair/Williamson/Wilson Tunnel Alternative (3 boards). Dismissed.

    c. Bike Routing showing the cycle track along Williamson Street and Blount Street. Recommended.

    d. Alt 1 NB and SB Left Turn Lanes. Recommended.

    e. Why is the Channelized Right Turn Remaining? Why is the Driveway Entrance Being Relocated?

    f. Alt 1 Revisions Responding to Public Comments

    g. Alt 7 One-way Couplet. Dismissed.

    h. Alt 9 One-way Couplet. Dismissed.

    i. Alt 1 and Alt 9 Comparison–Expressed Needs

    j. Alt 1 and Alt 9 Comparison–Additional Measures

    k. Traffic Signal at Main Street and Blair Street. Recommended.

4. East of Monona Terrace area

    a. Pedestrian Bicycle Connection to Law Park. Recommended.

    b. Discussion of Concepts East of Monona Terrace (four boards). Further Study by Others.

5. North Shore Drive and Broom Street area

    a. North Shore Drive/North Broom Street Expressed Needs

    b. Broom Street Near and Long-Term Recommendations

c. North Shore Drive Near and Long-Term Recommendations

d. Right Turn Channelization

e. North Shore and Broom Street–Bicycle Underpass. Recommended (long term).

B. Summary of PIM No. 3 Verbal and Written Comments

A full summary of the verbal and written comments is included in Appendix E. Following are the most common comments.

1. Eliminate the John Nolen Drive channelized right-turn lane. (five comments)

   The study team does not recommend eliminating the channelized right turn because it allows for controlled interaction between the high volume of right-turning traffic and the high volume of bicycles and pedestrians crossing the east and south legs of the intersection.

2. Can pedestrians be detected instead of requiring them to push a button? (four comments)

   Optical detection is still relatively expensive and not perfectly reliable. It's likely push buttons would still be provided. The design will seek to locate the buttons or add buttons in a way that reduces or eliminates conflicts between pedestrians and bicyclists.

3. Could a raised pedestrian/bicycle crossing (table) be installed at the John Nolen Drive channelized northbound right turn on to Williamson Street? (four comments)

   Perhaps, the team will consider it.

4. Williamson Street from John Nolen Drive/Blair Street to Jenifer Street should look more like a "Main Street" and less like a continuation of US 151. (three comments)

5. Support for the proposed improvements to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection. (three comments)

6. Can the John Nolen Drive right turn on to Williamson Street be shortened to a turn bay instead of a full lane? This may reduce occurrences of traffic choosing to bypass the through movement queue and diverting to Williamson Street. This diverted traffic then takes a left on a side street to access East Washington Avenue instead of staying on Blair Street. (two comments)

   The team reviewed forecasted motor vehicle queue lengths to evaluate this idea and does not recommend removing the third John Nolen Drive travel lane. It should be noted that the addition of left-turn bays will improve operations and reduce through movement queuing, which should reduce traffic diversion onto Williamson Street.

7. Is there any way the project could be advanced (sooner than 2020 or 2021)? The driveways for Machinery Row are dangerous. Could there be interim measures, such as stop signs on the path at the driveways?

   It is possible the City could make some improvements sooner to the portions outside the core of the intersection. The team discussed interim treatments for the Machinery Row driveways and developed a recommendation for one.

4.06 ALTERNATIVE 1 REFINEMENTS

Following PIM No. 3, the study team made refinements to Alternative 1. The median on Williamson Street was reduced from the existing 18 feet to 8 feet to provide additional space in front of Machinery Row. The final configuration of the pedestrian and bicycle space along Williamson Street between John Nolen Drive and Jenifer Street will be decided during final design. Additional refinements include reducing the size of the refuge island created by the John Nolen Drive channelized northbound right turn lane to eastbound Williamson Street to provide additional open space, and routing the relocated Capital City Trail closer to John Nolen Drive to provide additional space for Law Park. The final configuration of the Capital City Trail, Law Park and Machinery Row parking, and boat launch will be determined during final design. Figure 4.06-1 shows the final Alternative 1 developed as part of this study. This layout was taken before City boards, commissions, and committees for review with their comments considered when developing the recommendations.

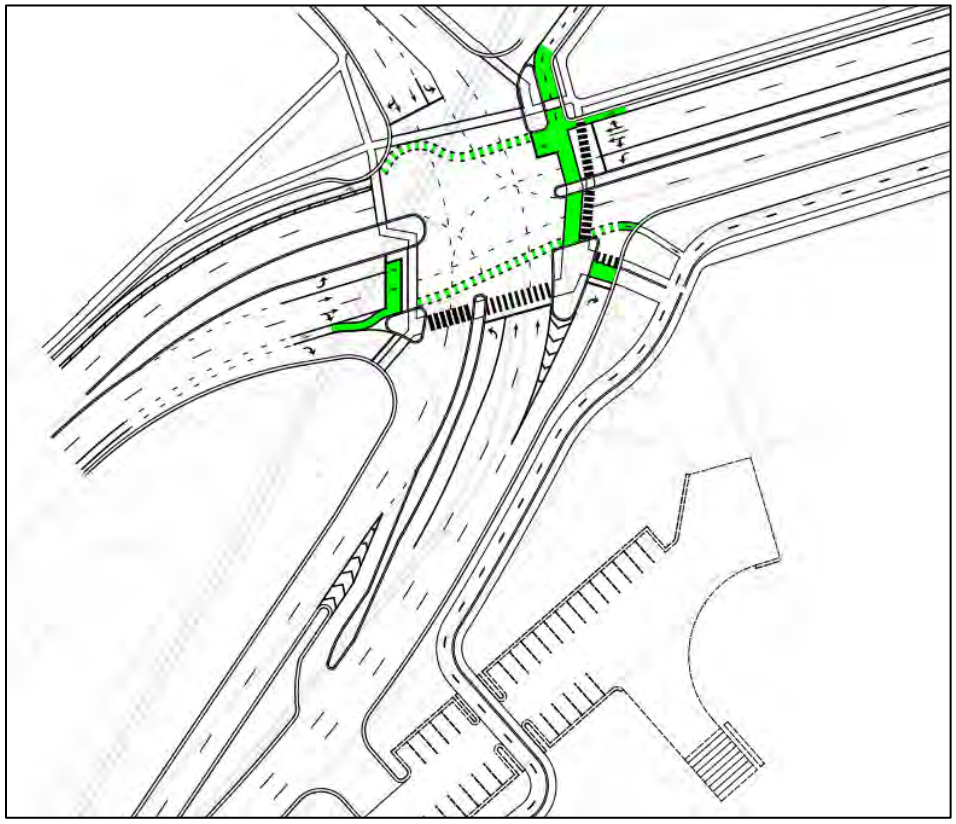


Figure 4.06-1 Alternative 1 Refinements

SECTION 5
RECOMMENDATIONS AND NEXT STEPS

5.01 JOHN NOLEN DRIVE/BLAIR STREET AND WILSON STREET/WILLIAMSON STREET INTERSECTION AREA

A. John Nolen Drive/Blair Street and Wilson Street/Williamson Street Intersection

1. Interim Recommendations

Depending on the availability of funding, reconstruction/reconfiguration of this intersection is likely several years away. Yet, one of the key concerns of stakeholders is the conflicts between motor vehicles and pedestrians and bicyclists at the Machinery Row driveways in the southeast quadrant. The study team recommends that the City investigate the feasibility of installing vehicle detection combined with a warning beacon to alert bicyclists and pedestrians when a vehicle is present. The beacon could be mounted over a sign indicating “Blind Driveway”, or “Watch for Exiting Vehicles”, or similar.

2. Near-Term Recommendations

Figure 5.01-1 illustrates the recommended configuration for the John Nolen Drive/Blair Street and Wilson Street//Williamson Street intersection. It is also included in Appendix F. The configuration is the product of considerable public comment and seeks to balance priorities of residents, businesses, and travelers of all modes. The reconstruction of this intersection is listed as a near-term recommendation pending its approval of Highway Safety Improvement Program grant funding. Key features of the intersection include:

a. Shifting intersection west.

b. Removing Wilson Street stub in front of Hotel Ruby Marie and the expand the greenspace.

c. Providing parallel parking and a buffered bike lane in front of Hotel Ruby Marie.

d. Installing a left turn lane on the Blair Street north approach.

e. Removing parking on the east Wilson Street stub serving the Gateway Shopping Center. In that space designate an at-grade cycle path. Maintaining existing sidewalk for pedestrians.

f. Providing green bike box and green route markings through the intersection for eastbound and westbound Williamson Street and Wilson Street cyclists. Providing ramp to cycle track in front of Machinery Row.

g. Providing green pavement marking for Capital City Trail on east Williamson Street approach. Providing separate ladder marking crossing for pedestrians adjacent to Capital City Trail marking.

h. Reconfiguring the John Nolen Drive to Williamson Street right-turn island to:

(1) Provide more staging area for pedestrians and cyclists.

(2) Reduce the speed of right turning vehicles with a tighter curb radius and raised pedestrian and bicycle crossing.

(3) Add a narrow, raised lane separator between the northbound through land and the channelized right-turn lane in the gore area to reduce late lane changes.

i. Enlarging the staging area for pedestrians and cyclists crossing the John Nolen Drive to Williamson Street right turn movement.

j. Reducing Williamson Street median and reallocate space from median and narrower travel lanes to enlarge the space in front of Machinery Row. Separating pedestrians and cyclists through:

(1) Widening the sidewalk in front of Machinery Row and realigning the existing cycle track

(2) Adding on-street parking on eastbound Williamson Street.

k. Relocating the two Machinery Row driveways to the southwest and reduce into one driveway.

(1) Providing a protected left turn into the parking lot. Access and egress options increase from the relocation.

(2) Making provisions for future signalization if it becomes necessary.

l. Relocate Capital City Trail to travel through the city-owned parking lot to reduce the number of decision points from vehicles entering and exiting the parking lots. (Note: Parking lot configuration and Law Park design to be developed by Madison Parks).

m. Providing left turn lane for John Nolen Drive to Wilson and Blair Street to Williamson Street movements.

n. Maintaining bike box on west Wilson Street approach.

o. Adding a buffered bike lane approaching the intersection eastbound on Wilson Street.

p. Design elements provided to aid in the creation of a railroad Quiet Zone on the east Isthmus including Supplemental Safety Measures (SSM) and/or

Alternative Safety Measures (ASM). These primarily consist of active warning devices including flashers and crossbucks and raised curb/separators that would prevent a conflicting motor vehicle from driving around the lowered crossbuck when a train is present. These treatments also led to a change in the westbound Williamson Street lane configuration that eliminates the shared through/left-turn lane and provides two left-turn lanes and one shared through/right-turn lane. There is a negligible change to motor vehicle operations. Appendix G contains a report authored by Mark Morrison, P.E. regarding his review of the preliminary intersection design.

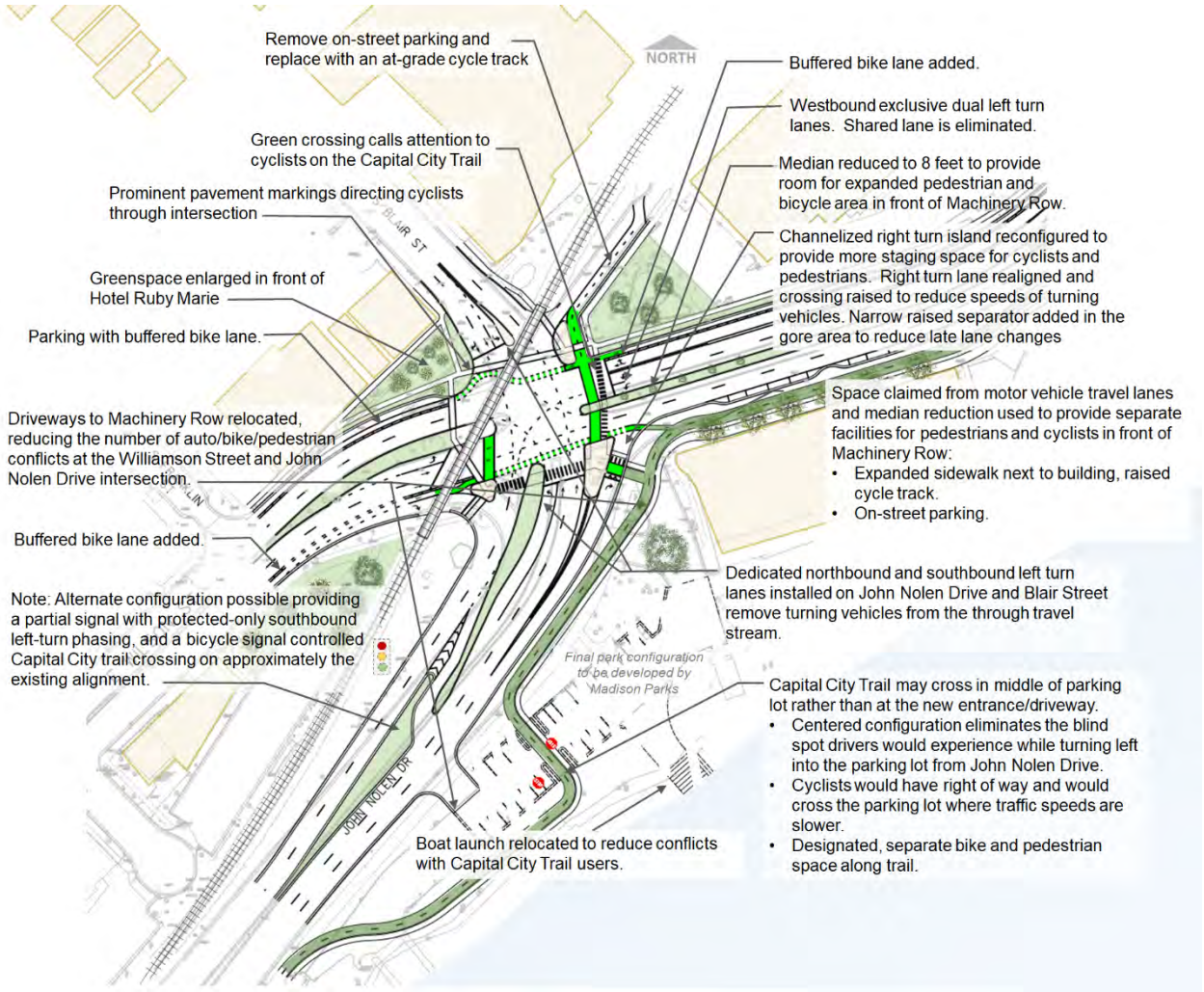


Figure 5.01-1 John Nolen Drive/Wilson/Blair/Williamson Street Intersection

Figure 5.01-2 shows the recommended cross section in front of Machinery Row.

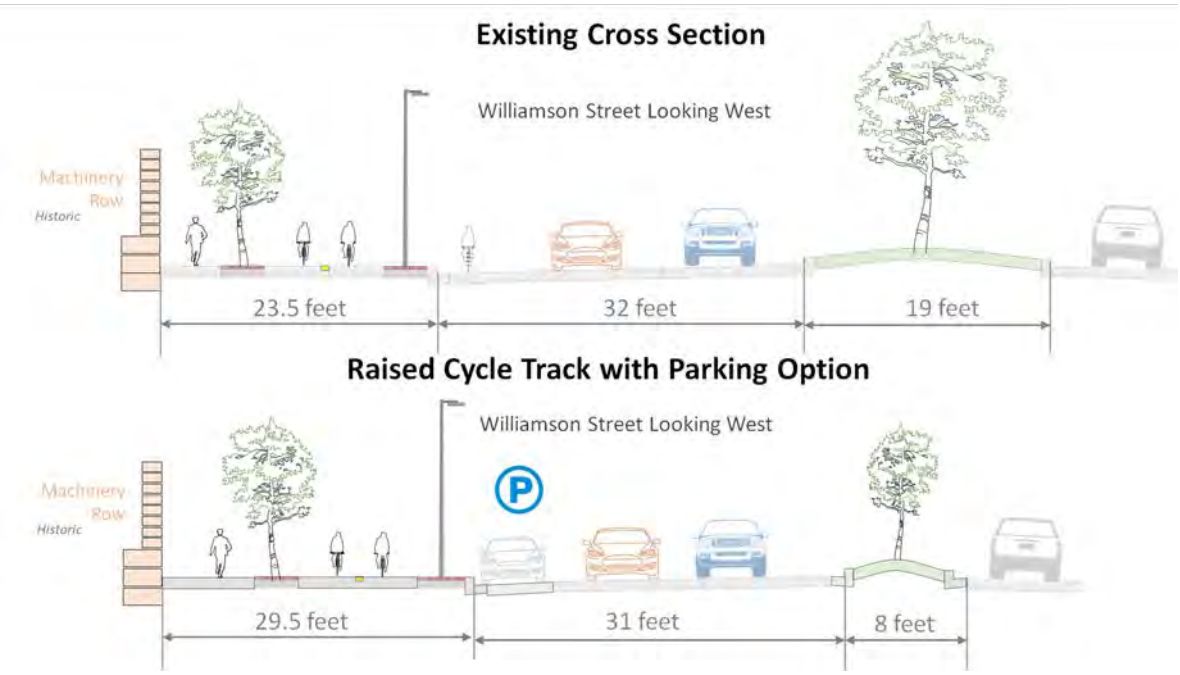


Figure 5.01-2 Recommended Cross Section in Front of Machinery Row

2. Long-Term Recommendations

If the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection is to accommodate more motor vehicle traffic volumes, there are relatively few options. They include:

a. Providing a triple left-turn on the Williamson Street east approach. This would require expanding John Nolen Drive to three lanes in the southbound direction, and possible acquisition of right-of-way from the railroad. If this is a potential option for the future, the City may want to maintain the current width of the Williamson Street median.

b. Grade separate movements within the intersection. Section 3 describes some of the significant challenges associated with this in the tunnel option.

This study does not currently recommend either of these options. This intersection is "at capacity" for all travel modes and the dynamic mix enriches the corridors that connect to the intersection.

B. Williamson Street and Blount Street Intersection

The near and long-term recommendation at the Blount Street intersection is to provide a diagonal, signalized bicycle crossing connecting to the recommended cycletrack in front of Machinery Row and a recommended cycletrack along Blount Street connecting to the Capital City Trail. Figure 5.01-3 shows the recommended configuration.

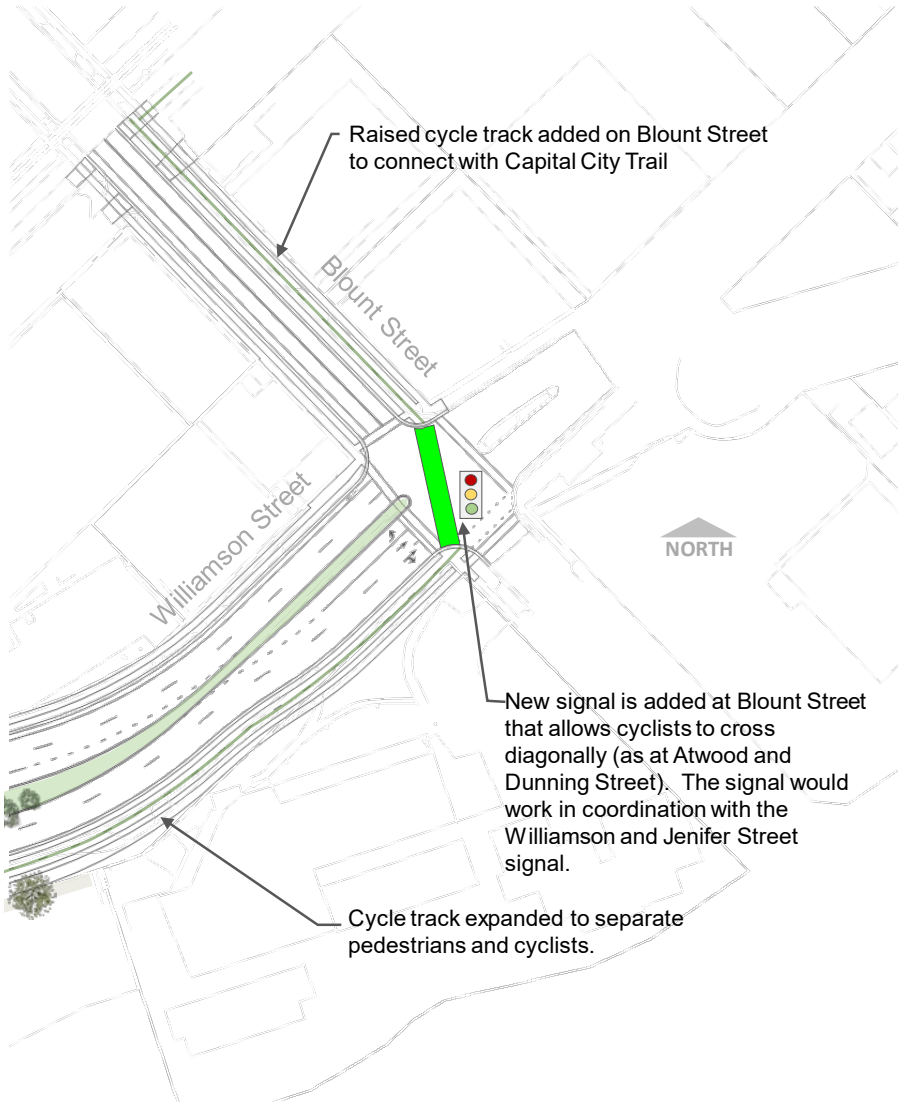


Figure 5.01-3 Williamson Street and Blount Street Intersection

C. Blair Street and Main Street Intersection

The study team recommends a traffic signal at Blair Street and Main Street as a means of providing a controlled bicycle and pedestrian crossing. From a motor vehicles operation standpoint, left turns from Blair Street to Main Street would likely need to be prohibited during peak periods at a minimum. This is needed to avoid creating a condition similar to what currently exists at the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection where left-turning vehicles on John Nolen Drive and Blair Street block one of the through lanes and lead to increased delays, queuing, and crashes.

5.02 EAST OF MONONA TERRACE

There are several options being discussed for both Law Park and the air rights over John Nolen Drive. Some proposals include covering John Nolen Drive with a parking garage that has a roof-top park. Many also include constructing Frank Lloyd Wright's Boat House on Lake Monona.

A. Near-Term Recommendations

1. Obtain an easement to allow a pedestrian and bike connection from Wilson Street to the edge of the railroad property to accommodate a future overpass of John Nolen Drive (completed).

2. Work with the project team for the McGrath Redevelopment to construct footings that would accommodate a future overpass bridge that spans the rail line and John Nolen Drive to connect with the lakeshore.

3. Begin looking a funding options that could fund a pedestrian bicycle overpass over the rail line and John Nolen Drive. Transportation Alternatives Program (or Set-Aside) might be one option.

B. Long-Term Options

The study recommends installing a pedestrian bicycle overpass over the rail line and John Nolen Drive. Many have advocated for the bridge to be wide enough to accommodate landscaping, food carts, and/or activities. Madison Parks may soon be initiating a planning effort for Law Park. We recommend that this planning effort further refine the bridge's role and relationship to Law Park, and what amenities should be included.

As mentioned, there are proposals that include covering John Nolen Drive could conflict with this bridge, depending on how far east the deck extends. The City can re-evaluate construction of the pedestrian-bicycle overpass in light of future priorities and proposals if and when bridge funding becomes available.

Figure 5.02-1 illustrates one option of a type of landscaped bridge that could be constructed. The actual bridge amenities should be determined in conjunction with Law Park Planning.

Figure 5.02-1 Pedestrian Bridge to Law Park–One Possible Configuration

5.03 BROOM STREET INTERSECTION

This intersection is particularly challenging. Full bike accommodations cannot be installed on Broom Street until it is reconstructed. And when it is reconstructed, building faces and topography constrain the amount of room for accommodations. The following paragraphs list the study's near and long-term recommendations.

A. Near-Term Solutions (2 to 5 years)

Near-term solutions (shown in Figure 5.03-1) for this intersection include:

1. Using a sharrow pavement marking to direct eastbound Broom Street cyclists to the left turn island. At the island create a green colored box that directs cyclists where they should wait and cross, and alerts drivers where cyclists will be crossing.

2. Creating a green bike box on the eastern left turn lane for northbound John Nolen Drive traffic to westbound Broom Street. This allows cyclists crossing John Nolen Drive from the Capital City Trail to westbound Broom Street the option of positioning themselves in front

of left-turning motor vehicle traffic, and allows cyclists to travel through the intersection ahead of the left-turning motor vehicles during the protected left-turn signal phase.

3. Installing a multi-use trail to connect Broom Street to Hamilton Street. This would provide a more direct route to the Capitol Square for cyclists, and allow them to travel on a roadway with less motor vehicle volume. Note that because this trail would travel on railroad right-of-way, coordination would be needed, which could delay implementation of the path.

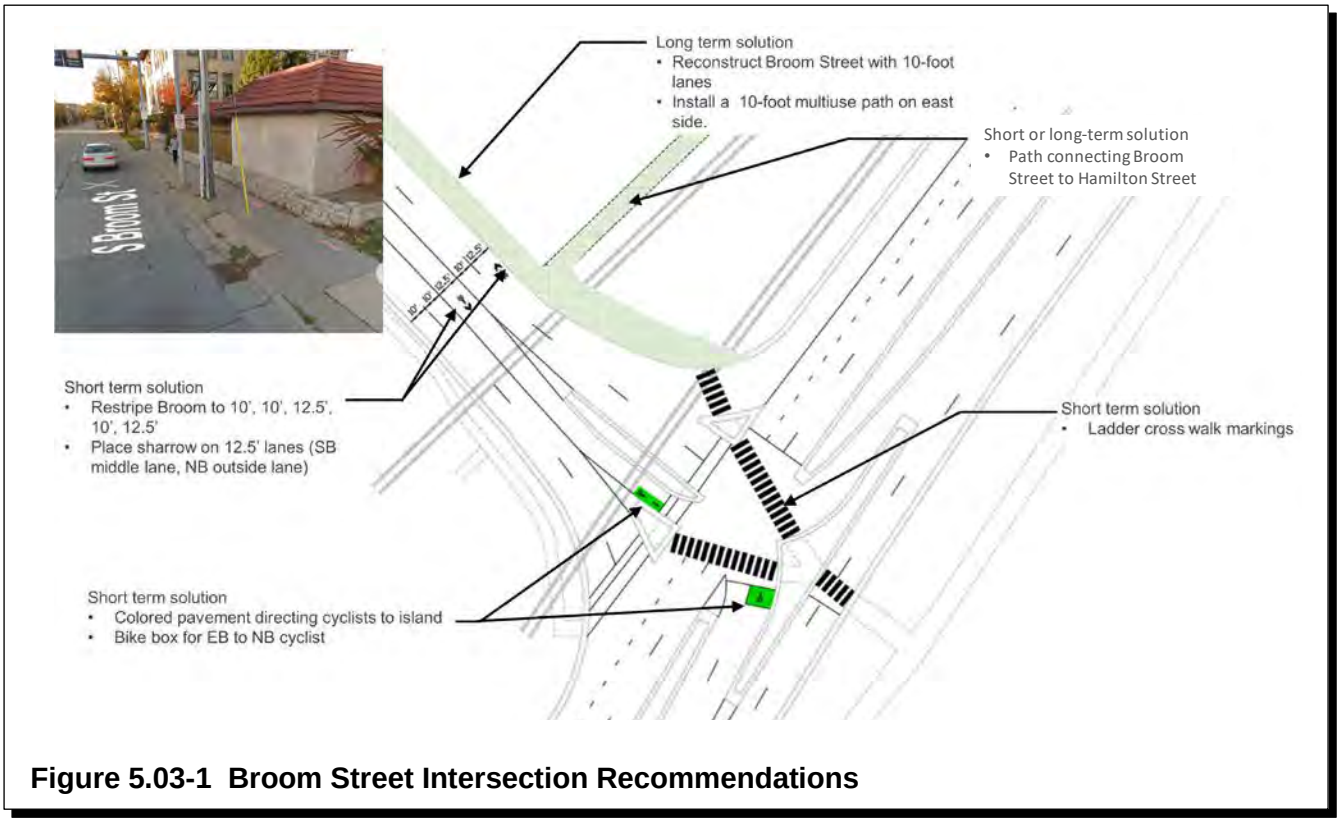


Figure 5.03-1 Broom Street Intersection Recommendations

B Long Term Solutions (5 to 15 years)

Long term solutions for this intersection include:

1. Reconstruct Broom Street with narrower lanes (see Figure 5.03-1). With the additional space, install a raised cycle track (separated bicycle facility) on the east side of the street.

2. Connecting Broom Street with the pedestrian and bicycle underpass discussed under the North Shore Road improvements.

5.04 NORTH SHORE DRIVE INTERSECTION

In recent years, the City has already made significant improvements to this intersection by enlarging the island on the north approach and providing green epoxy markings across John Nolen Drive. The following paragraphs describe additional measures that could be performed.

A. Near-Term Solutions (2 to 5 years)

The study recommends adding a no-right-turn blank out sign to the southbound channelized right turn lane. This will reinforce/alert drivers to the pedestrian and bicycle right-of-way during their walk signal phase.

The study team also recommends adding an off-path, paved, staging area on the Capital City trail for pedestrians and cyclists. This will allow them to wait for a green signal to cross John Nolen Drive off the main path area.

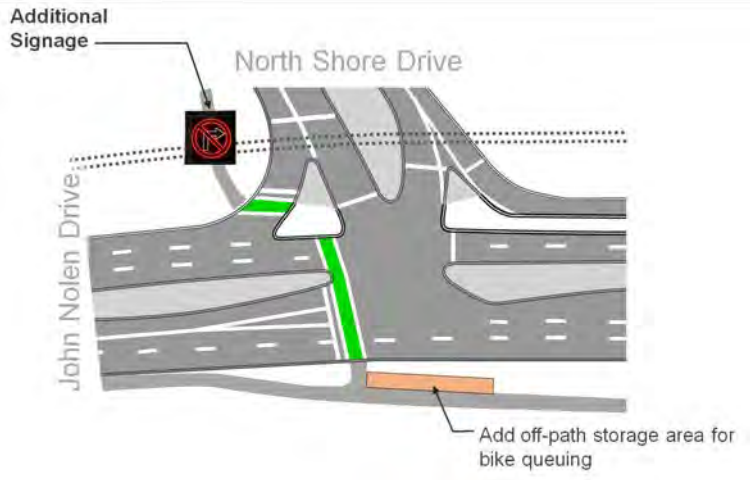


Figure 5.04-1 North Shore Drive–Near-Term Solutions

B. Long-Term Solutions (5 to 15 Years)

Figure 5.04-2 illustrates one of the long-term recommendations. When the north approach of the intersection is reconstructed, the island channelizing the right turn could be enlarged to provide more room for cyclists and pedestrians waiting to cross either the right turn movement or John Nolen Drive. This modification would also reduce motor vehicle speeds.

A second-long term solution includes constructing a pedestrian and bike underpass between North Shore Drive and Broom Street. Features to consider in implementing this underpass include:

Figure 5.04-2 North Shore Drive–Long-Term Solutions

1. Raising the profile of John Nolen Drive between North Shore Drive and Broom Street. This will require reconstructing this portion of John Nolen Drive.

2. Even with this profile change on John Nolen Drive, a storm water lift station will be needed to drain the underpass of storm water that enters the underpass through the ramps.

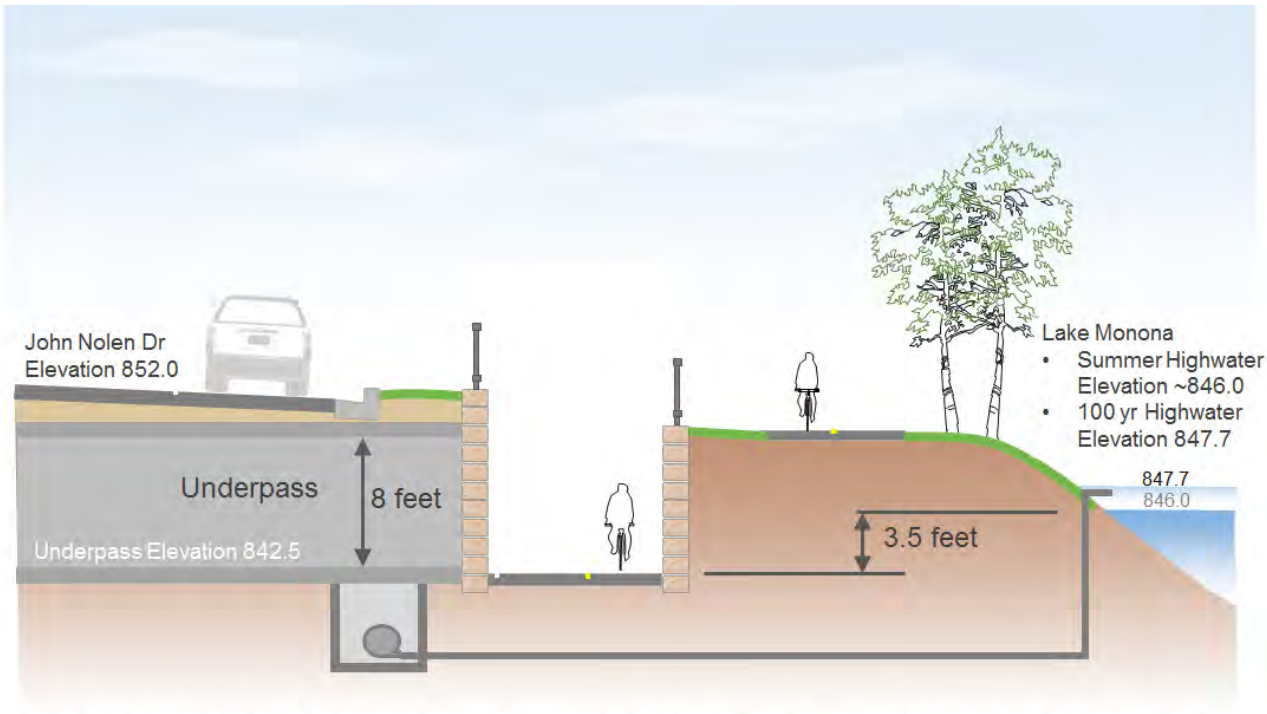
3. Reconstructing the westbound right turn lane onto North Shore Drive to reduce its functional width. This space will be needed for a ramp down to the pedestrian and bike underpass.

4. Constructing a multi-use path on the north side of North Shore Drive that connects to the pedestrian and bike underpass. This same path could continue to connect directly with Broom Street.

5. Relocating the Capital City Trail to the south to allow the trail room to travel around the ramps down to the pedestrian and bike underpass.

Figures 5.04-3 and 5.04-4 illustrates the connection network being proposed, and a cross section of the pedestrian bicycle underpass.

Figure 5.04-3 North Shore Drive–Long-Term Solutions



The underpass option places a pedestrian-bicycle tunnel underneath John Nolen Drive. This underpass would involve:

- Raising John Nolen Drive about 2 feet between North Shore Drive and Broom Street.
- Having the Capital City Trail run parallel to the ramp to the underpass.
- Constructing the underpass with a floor elevation of about 842.5.
- Because the underpass is beneath the normal lake level, the underpass would need to be watertight and would require a stormwater pump station.

Figure 5.04-4 North Shore Drive–Long-Term Solutions–Underpass Cross Section

5.05 COMMENTS FROM REVIEWING BODIES

A. Pedestrian, Bicycle, and Motor Vehicle Committee, August 22, 2017

City staff presented the draft study recommendations to the City of Madison Pedestrian, Bicycle, and Motor Vehicle Committee on August 22, 2017. The following summarizes the comments received applicable to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection.

1. Consider a single eastbound motor vehicle lane on Wilson Street.

   The study team evaluated two alternatives that reduced eastbound Wilson Street to a single through lane (Alternative 2 and Alternative 3). Both were dismissed due to multiple LOS F movements in the initial 2050 operations modeling.

2. Soften the cycletrack corner radii.

The study team agrees with this comment and recommends it be implemented during final design.

3. On westbound Wilson Street in front of Hotel Ruby Marie consider swapping the position of the on-street parking and the buffered bicycle lane.

This area is expected to be serve as a part-time loading zone, which would create conflicts between deliveries and the on-street bicycle accommodation. The study team does not recommend this be implemented during final design.

4. Consider swapping the position of the crosswalk on the west Wilson Street leg and the bicycle box (place the bike box in front of the crosswalk).

The study team implemented this change in subsequent revisions to the intersection layout.

5. Provide an enhanced connection between the Hotel Ruby Marie and Essen House area and the Capital City Trail considering the expected redevelopment of those properties.

This comment refers to making it easier for eastbound bicyclists leaving the northwest quadrant of the intersection wishing to travel eastbound on the Capital City Trail. The study team recommends this be investigated during final design.

6. Reduce the Williamson Street median to provide additional space in front of Machinery Row.

The study team recommends this be implemented during final design.

7. Straighten the Capital City Trail crossing on the east Williamson Street leg.

The configuration of this crossing is a result of accommodating truck turns through the intersection while providing separate space for bicycles and pedestrians making the Capital City Trail crossing and moving the intersection west to provide more space in front of Machinery Row. The study team does not recommend this be implemented during final design.

8. Soften the proposed Capital City Trail crossing of the relocated Law Park/Machinery Row parking area.

The study team prefers the 90-degree reverse curves to slow bicycle travel through the crossing, provide the shortest crossing possible, and provide optimal sight lines for both motorists and bicyclists. The ultimate layout will be developed during the City of Madison Parks Department's Law Park planning process.

9. Maintain the motor vehicle eastbound u-turn movement at Blount Street and Williamson Street.

The geometry of the eastbound approach is not proposed to be modified. Vehicles that can currently make a u-turn at this intersection will continue to be able to do so after the project is completed.

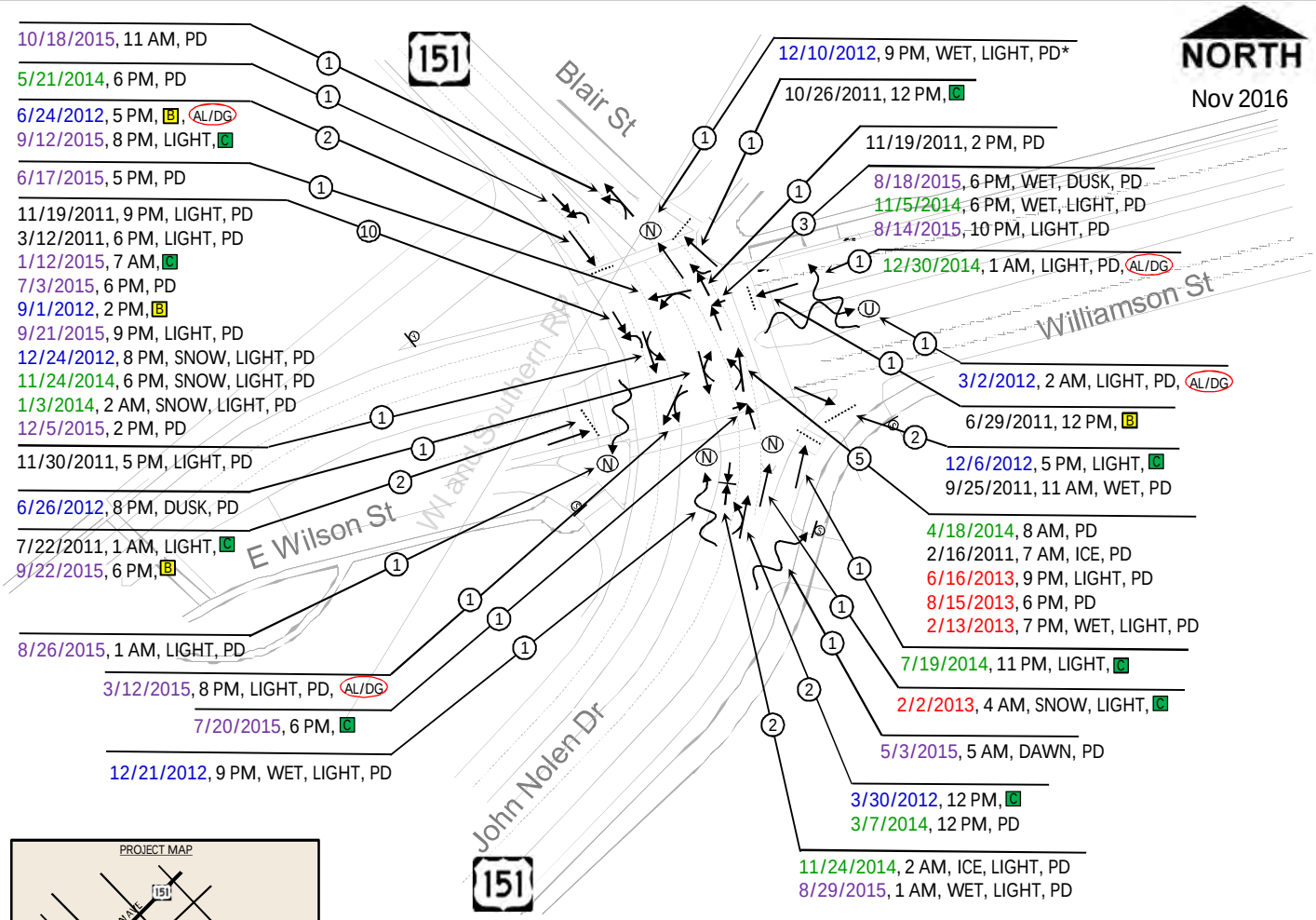
10. Modify the North Shore Drive path crossing to be create a single stage crossing for pedestrians and bicyclists.

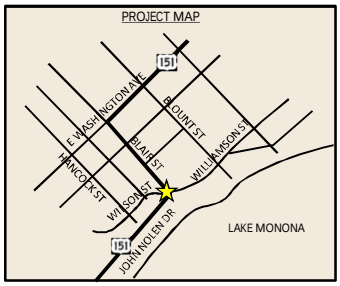
The study team investigated this change and recommends maintaining the current geometry and signal timings that provide for a two-stage crossing. Reasons for this include:

a. The study team modeled this condition using the existing crosswalk configuration and 2015 traffic volumes. This requires a much longer signal phase that stops northbound and southbound John Nolen Drive traffic than under the current, two-stage crossing configuration. During the AM peak hour, the northbound John Nolen Drive left turning motor vehicle traffic would experience severe average delays exceeding 150 seconds accompanied by northbound queues reaching 800 to 1,200 feet in length or more. During the PM peak-hour the southbound John Nolen Drive through motor vehicle traffic would experience severe average delays of 180 seconds accompanied by southbound queues reaching 1,300 feet in length or more.

b. An alternative to the existing configuration would be to reduce the crossing length, so a shorter signal phase would be required. Because of the existing roadway geometry, this would require a costly reconfiguration of the beam guard that exits in the median of John Nolen Drive and the connection to the Capital City Trail on the east side of John Nolen Drive would not have any throat length/staging space for crossing pedestrians and bicyclists. This would create frequent conflicts between path users traveling through along John Nolen Drive and those wishing to cross.

APPENDIX A
CRASH ANALYSIS





Note: This diagram does not include rear-end accidents. See Exhibit A2 for rear-end accident types.

YEAR
2011 BLACK
2012 BLUE
2013 RED
2014 GREEN
2015 PURPLE

CRASH RATE
1.09 Crashes
Per Million Entering Vehicles
Entering Vehicles: 46,500/day

CRASH FREQUENCY/SEVERITY
92 Crashes

0	Fatal Crash (K)
0	Incapacitating (A-Level)
5	Non-Incapacitating (B-Level)
23	Possible (C-Level)
64	Property Damage Only

LEGEND
- Moving Vehicle
- Backing Vehicle
- Pedestrian
- Bicyclist
- Parked Vehicle
- Stop/Yield Sign
- Tree
- Utility Pole
- Fixed Object
- Non-Fixed Object
- Angle (Right Angle)
- Angle (Left-Turn)
- Angle (Right-Turn)
- Sideswipe-Same
- Sideswipe-Opposite
- Head-On
- Rear-End
- Out of Control
- Overtake
- Overturn

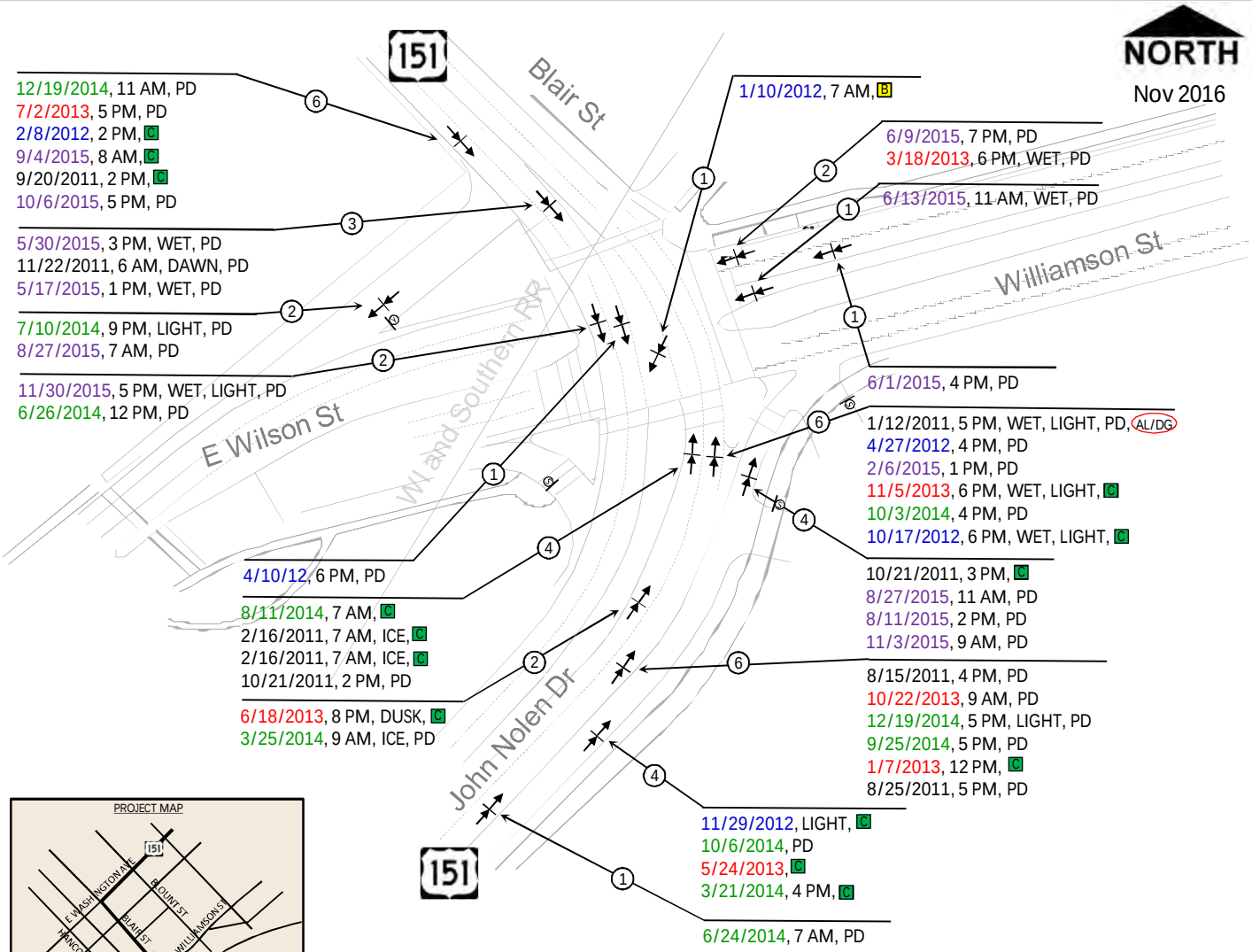
(#) = CRASH FREQUENCY

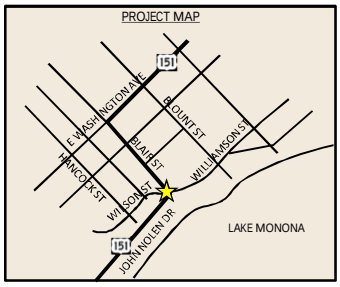
"LETTER" = USED FOR REFERENCING CRASHES IN REPORT AS NEEDED
DATE OF CRASH
HOUR
SEVERITY (SEE SEVERITY DEFINITIONS)
ROAD CONDITIONS (DRY IF BLANK)
LIGHT CONDITIONS (DAYTIME IF BLANK)
ALCOHOL/DRUG INVOLVEMENT AL/DG

CRASH SEVERITY DEFINITIONS
- K = Fatal Crash
- A = Incapacitating Injury Crash
- B = Non-Incapacitating Injury Crash
- C = Possible Injury Crash
- PD = Property Damage Only Crash

Note: All type A and type B crashes are shown on the diagram.
*Vehicle hit railroad flashing lights and arm.

EXHIBIT A1
INTERSECTION CRASH STATISTICS
BLAIR ST / JOHN NOLEN DR AND E WILSON ST / WILLIAMSON ST
DANE COUNTY, WISCONSIN





Note: This diagram only includes rear-end accidents. See Exhibit A1 for all other accident types.

YEAR

2011 BLACK
2012 BLUE
2013 RED
2014 GREEN
2015 PURPLE

CRASH RATE

1.09 Crashes
Per Million
Entering Vehicles

Entering Vehicles: 46,500/day

CRASH FREQUENCY/SEVERITY

92 Crashes

0	Fatal Crash (K)
0	Incapacitating (A-Level)
5	Non-Incapacitating (B-Level)
23	Possible (C-Level)
64	Property Damage Only

LEGEND

- Moving Vehicle
- Backing Vehicle
- Pedestrian
- Bicyclist
- Parked Vehicle
- Stop/Yield Sign
- (T) Tree
- (U) Utility Pole
- (F) Fixed Object
- (N) Non-Fixed Object
- Angle (Right Angle)
- Angle (Left-Turn)
- Angle (Right-Turn)
- Sideswipe-Same
- Sideswipe-Opposite
- Head-On
- Rear-End
- Out of Control
- Overtake
- Overturn

(#) = CRASH FREQUENCY

"LETTER" = USED FOR REFERENCING CRASHES IN REPORT AS NEEDED
DATE OF CRASH
HOUR
SEVERITY (SEE SEVERITY DEFINITIONS)
ROAD CONDITIONS (DRY IF BLANK)
LIGHT CONDITIONS (DAYTIME IF BLANK)
ALCOHOL/DRUG INVOLVEMENT (AL/DG)

CRASH SEVERITY DEFINITIONS

- K = Fatal Crash
- A = Incapacitating Injury Crash
- B = Non-Incapacitating Injury Crash
- C = Possible Injury Crash
- PD = Property Damage Only Crash

EXHIBIT A2
INTERSECTION CRASH STATISTICS
BLAIR ST / JOHN NOLEN DR AND E WILSON ST / WILLIAMSON ST
DANE COUNTY, WISCONSIN

GENERAL INFORMATION

INTERSECTION: BLAIR ST / JOHN NOLEN DR AND E WILSON ST / WILLIAMSON ST
MUNICIPALITY: CITY OF MADISON
COUNTY: DANE
STATE: WI
STRAND PROJECT ID: 1020.098
CRASHES FROM: 1/1/2011
TO: 12/31/2015
DURATION 5 YEARS 0 MONTHS
PREPARED BY: AGG
DATE: 8/8/2016

INTERSECTION CHARACTERISTICS

TRAFFIC CONTROL: SIGNAL CONTROLLED
INTERSECTION AADT: Year (2010-2014): 46,500
NUMBER OF LEGS: 4
POSTED SPEED (BLAIR ST): 25 mph
DEER CRASHES INCLUDED: NO
AREA TYPE: URBAN

CRASH STATISTICS

CRASH FREQUENCY & SEVERITY

YEAR	PD	C-LEVEL	B-LEVEL	A-LEVEL	FATAL	TOTAL
2010	11	6	1	0	0	18
2011	7	5	3	0	0	15
2012	6	5	0	0	0	11
2013	17	3	0	0	0	20
2014	23	4	1	0	0	29
TOTAL	*64*	*23*	*5*	*0*	*0*	*92*
PERCENT	*69.6%*	*25.0%*	*5.4%*	*0.0%*	*0.0%*	*100.0%*
YEAR AVG.	*12.8*	*4.6*	*1.0*	*0.0*	*0.0*	*18.4*

CRASH RATES	per MEV
CRASH RATE	1.10
INJURY CRASH RATE	0.33
FATAL CRASH RATE	0.00

LIGHT CONDITIONS		PERCENT
DAY	56	60.9%
DARK	36	39.1%
TOTAL	*92*	*100.0%*

Note: Dawn, dusk or street lighted conditions included in dark total.

VEHICLE TYPES		PERCENT
CAR	148	83.6%
TRUCK	17	9.6%
OTHER/UNKN	12	6.8%
TOTAL	*177*	*100.0%*

Note: Statistics based on first and second vehicles in crashes.

ROAD CONDITIONS		PERCENT
DRY	73	79.3%
WET	15	16.3%
SNOW	4	4.3%
ICE	0	0.0%
MUD	0	0.0%
OTHER/UNKN	0	0.0%
TOTAL	*92*	*100.0%*

CRASH TYPE		PERCENT
ANGLE	23	25.0%
REAR-END	46	50.0%
HEAD-ON	2	2.2%
SS-SAME	12	13.0%
SS-OPPOSITE	2	2.2%
FIXED	6	6.5%
NOT FIXED	0	0.0%
OVERTURN	0	0.0%
OTHER/UNKN	1	1.1%
TOTAL	*92*	*100.0%*
PEDESTRIAN	0	
BICYCLE	9	

DAY AND TIME

DAY OF WEEK	*EARLY MORNING* 2:00 AM TO 5:59 AM	*AM PEAK* 6:00 AM TO 9:59 AM	*MIDDAY* 10:00 AM TO 1:59 PM	*PM PEAK* 2:00 PM TO 5:59 PM	*EVENING* 6:00 PM TO 9:59 PM	*LATE EVENING* 10:00 PM TO 1:59 AM	*UNKNOWN*	*TOTAL*	
MONDAY	0	2	1	4	6	0	0	13	
TUESDAY	0	6	0	4	7	1	0	18	
WEDNESDAY	0	3	2	4	4	1	0	14	Weekday
THURSDAY	0	1	2	4	3	0	0	10	
FRIDAY	2	2	5	6	2	2	0	19	
SATURDAY	2	0	1	4	3	2	0	12	Weekend
SUNDAY	1	0	3	1	1	0	0	6	
TOTAL	*5*	*14*	*14*	*27*	*26*	*6*	*0*	*92*	

DRIVER AGES		PERCENT
<25	36	20.3%
25-34	44	24.9%
35-44	38	21.5%
45-54	29	16.4%
55-64	21	11.9%
65-74	4	2.3%
75-84	0	0.0%
85+	0	0.0%
UNKNOWN	5	2.8%
TOTAL	177	100.0%

Note: Statistics based on first and second vehicles in crashes.

VEHICLE DAMAGE		PERCENT
OTHER/UNKN	6	3.4%
NONE	7	4.0%
VERY MINOR	40	22.6%
MINOR	39	22.0%
MODERATE	69	39.0%
SEVERE	12	6.8%
VERY SEVERE	4	2.3%
TOTAL	*177*	*100.0%*

Note: Statistics based on first and second vehicles in crashes.

AVERAGE NUMBER OF VEHICLES PER CRASH	2.0

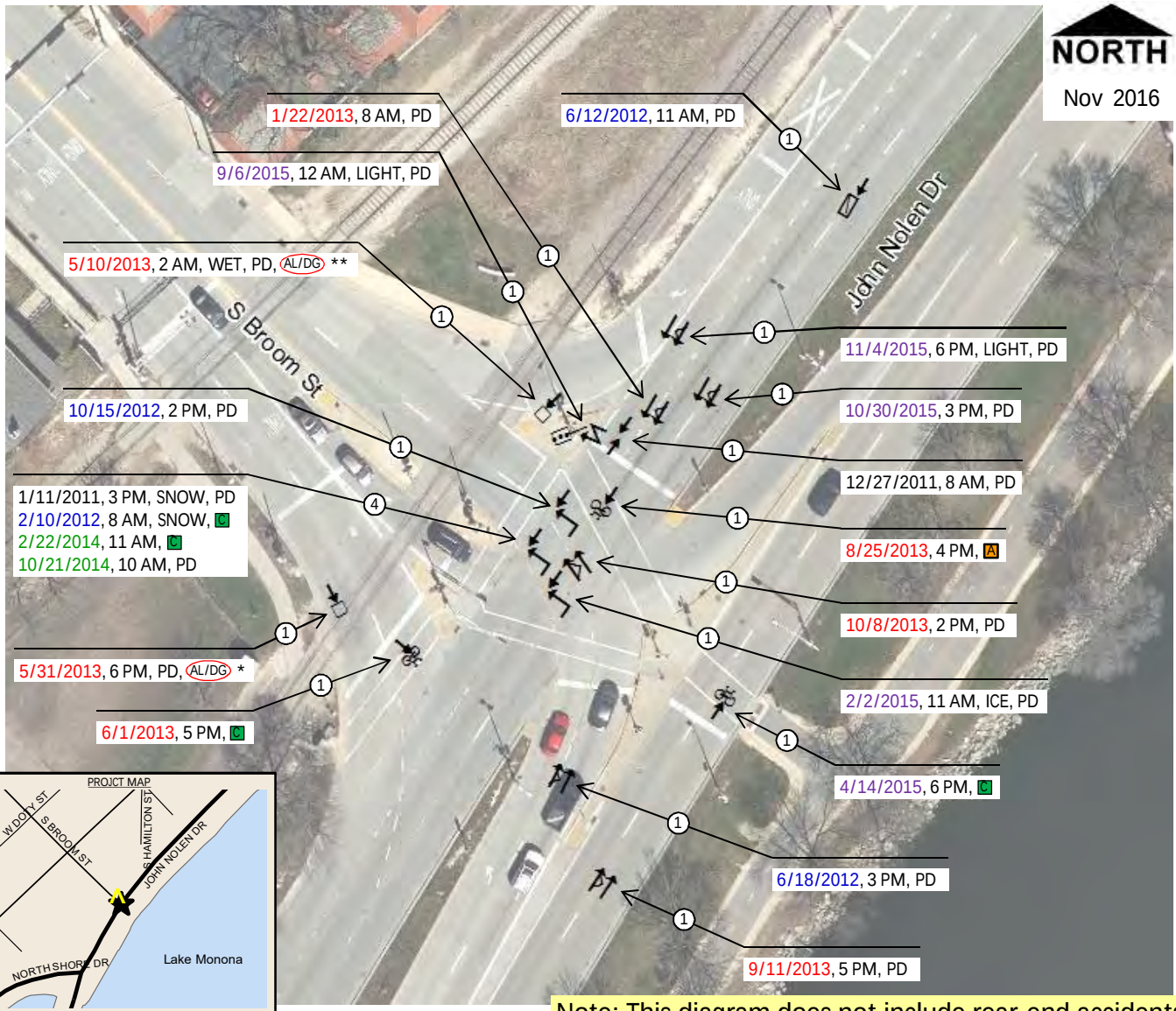
Note: Statistics based on all vehicles in crashes.

BY SEASON		PERCENT
SPRING	19	20.7%
SUMMER	25	27.2%
FALL	28	30.4%
WINTER	20	21.7%
TOTAL	*92*	*100.0%*

Note: Wint=Jan-Mar, Spr=Apr-June, Sum=July-Sept, Fall=Oct-Dec

PERCENT OF CRASHES	
ALCOHOL RELATED	5.4%

EXHIBIT A3
INTERSECTION CRASH STATISTICS
BLAIR ST / JOHN NOLEN DR AND E WILSON ST / WILLIAMSON ST
DANE COUNTY, WISCONSIN



Note: This diagram does not include rear-end accidents. See Exhibit B2 for rear-end accident types.

YEAR

2011 BLACK
2012 BLUE
2013 RED
2014 GREEN
2015 PURPLE

CRASH RATE

0.58 Crashes
Per Million
Entering Vehicles

Entering Vehicles: 48,900/day

CRASH FREQUENCY/SEVERITY

52 Crashes

0	Fatal Crash (K)
1	Incapacitating (A-Level)
0	Non-Incapacitating (B-Level)
7	Possible (C-Level)
44	Property Damage Only

LEGEND

- Moving Vehicle
- Backing Vehicle
- Pedestrian
- Bicyclist
- Parked Vehicle
- Stop/Yield Sign
- Tree
- Signal Pole
- Light Object
- Fixed Object
- Angle
- Left Turn-Traffic from Right
- Left Turn-Traffic from Left
- Left Turn Merging
- Swerved
- Head-On
- Rear-End
- Sideswipe-Opp.
- Sideswipe-Same

(#) = CRASH FREQUENCY

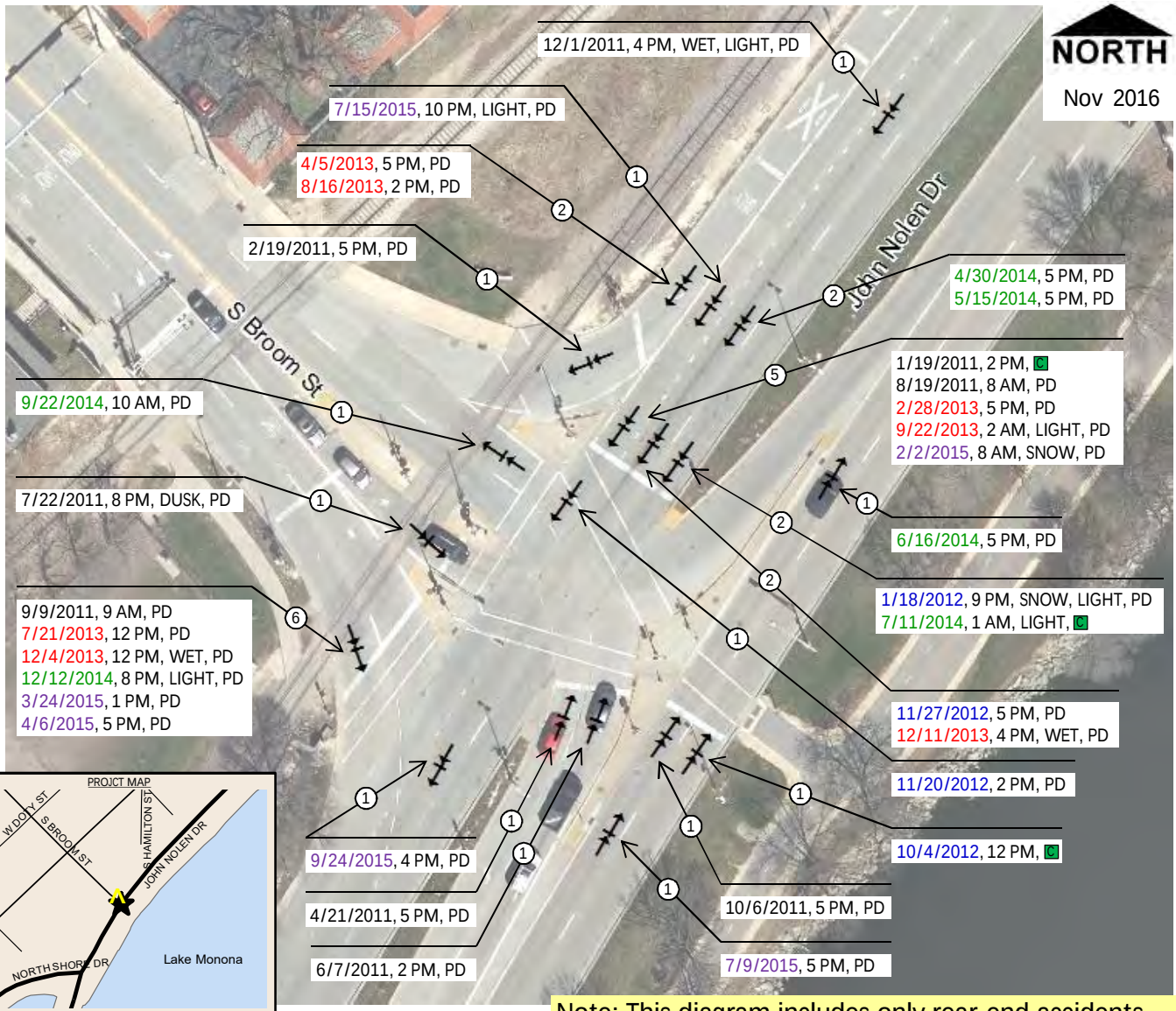
"LETTER" = USED FOR REFERENCING CRASHES IN REPORT AS NEEDED
DATE OF CRASH
HOUR
SEVERITY (SEE SEVERITY DEFINITIONS)
ROAD CONDITIONS (DRY IF BLANK)
LIGHT CONDITIONS (DAYTIME IF BLANK)
ALCOHOL/DRUG INVOLVEMENT (AL/DG)

CRASH SEVERITY DEFINITIONS

- K = Fatal Crash
- A = Incapacitating Injury Crash
- B = Non-Incapacitating Injury Crash
- C = Possible Injury Crash
- PD = Property Damage Only Crash

*Vehicle hit railroad crossing arm.
**Vehicle struck unknown fixed object.

EXHIBIT B1
INTERSECTION CRASH STATISTICS
S BROOM ST / JOHN NOLEN DR
DANE COUNTY, WISCONSIN



Note: This diagram includes only rear-end accidents.
See Exhibit B1 for all other accident types.

YEAR

2011 BLACK
2012 BLUE
2013 RED
2014 GREEN
2015 PURPLE

CRASH RATE

0.58 Crashes
Per Million
Entering Vehicles

Entering Vehicles: 48,900/day

CRASH FREQUENCY/SEVERITY

52 Crashes

0	Fatal Crash (K)
1	Incapacitating (A-Level)
0	Non-Incapacitating (B-Level)
7	Possible (C-Level)
44	Property Damage Only

LEGEND

- Moving Vehicle
- Backing Vehicle
- Pedestrian
- Bicyclist
- Parked Vehicle
- Stop/Yield Sign
- Tree
- Signal Pole
- Light Object
- Fixed Object
- Angle
- Left Turn-Traffic from Right
- Left Turn-Traffic from Left
- Left Turn Merging
- Swerved
- Head-On
- Rear-End
- Sideswipe-Opp.
- Sideswipe-Same

(#) = CRASH FREQUENCY

"LETTER" = USED FOR REFERENCING CRASHES IN REPORT AS NEEDED
DATE OF CRASH
HOUR
SEVERITY (SEE SEVERITY DEFINITIONS)
ROAD CONDITIONS (DRY IF BLANK)
LIGHT CONDITIONS (DAYTIME IF BLANK)
ALCOHOL/DRUG INVOLVEMENT (AL/DG)

CRASH SEVERITY DEFINITIONS

- K = Fatal Crash
- A = Incapacitating Injury Crash
- B = Non-Incapacitating Injury Crash
- C = Possible Injury Crash
- PD = Property Damage Only Crash

EXHIBIT B2
INTERSECTION CRASH STATISTICS
S BROOM ST / JOHN NOLEN DR
DANE COUNTY, WISCONSIN

GENERAL INFORMATION

INTERSECTION: S BROOM ST / JOHN NOLEN DR
MUNICIPALITY: CITY OF MADISON
COUNTY: DANE
STATE: WI
STRAND PROJECT ID: 1020.098

CRASHES FROM: 1/1/2011
TO: 12/31/2015

DURATION
5 YEARS
0 MONTHS

PREPARED BY: CJS

DATE: 10/12/2016

INTERSECTION CHARACTERISTICS

TRAFFIC CONTROL: SIGNAL CONTROLLED
INTERSECTION AADT: Year (2010-2014): 48,900
NUMBER OF LEGS: 3

POSTED SPEED (JOHN NOLEN): 35 mph
DEER CRASHES INCLUDED: NO
AREA TYPE: URBAN

CRASH STATISTICS

CRASH FREQUENCY & SEVERITY

YEAR	PD	C-LEVEL	B-LEVEL	A-LEVEL	FATAL	TOTAL
2011	10	1	0	0	0	11
2012	6	2	0	0	0	8
2013	12	1	0	1	0	14
2014	6	2	0	0	0	8
2015	10	1	0	0	0	11
TOTAL	*44*	*7*	*0*	*1*	*0*	*52*
PERCENT	*84.6%*	*13.5%*	*0.0%*	*1.9%*	*0.0%*	*100.0%*
YEAR AVG.	*8.8*	*1.4*	*0.0*	*0.2*	*0.0*	*10.4*

CRASH RATES	per MEV
CRASH RATE	0.58
INJURY CRASH RATE	0.01
FATAL CRASH RATE	0.00

VEHICLE TYPES		PERCENT
CAR	89	90.8%
TRUCK	8	8.2%
OTHER/UNKN	1	1.0%
TOTAL	*98*	*100.0%*

Note: Statistics based on first and second vehicles in crashes.

LIGHT CONDITIONS		PERCENT
DAY	44	84.6%
DARK	8	15.4%
UNKNOWN	0	0.0%
TOTAL	*52*	*100.0%*

Note: Dawn, dusk or street lighted conditions included in dark total.

ROAD CONDITIONS		PERCENT
DRY	43	82.7%
WET	4	7.7%
SNOW	4	7.7%
ICE	1	1.9%
MUD	0	0.0%
OTHER/UNKN	0	0.0%
TOTAL	*52*	*100.0%*

CRASH TYPE		PERCENT
LEFT TURN-TRAFFIC FROM RIGHT	6	11.5%
LEFT TURN-TRAFFIC FROM LEFT	0	0.0%
LEFT TURN MERGING	0	0.0%
REAR-END	32	61.5%
HEAD-ON	1	1.9%
SS-SAME	6	11.5%
SS-OPPOSITE	0	0.0%
FIXED	3	5.8%
NOT FIXED	1	0.8%
PEDESTRIAN RELATED	0	0.0%
BICYCLE RELATED	3	5.8%
TOTAL	*52*	*100.0%*

DAY AND TIME

DAY OF WEEK	*EARLY MORNING* 2:00 AM TO 5:59 AM	*AM PEAK* 6:00 AM TO 9:59 AM	*MIDDAY* 10:00 AM TO 1:59 PM	*PM PEAK* 2:00 PM TO 5:59 PM	*EVENING* 6:00 PM TO 9:59 PM	*LATE EVENING* 10:00 PM TO 1:59 AM	*UNKNOWN*	*TOTAL*	
MONDAY	0	1	2	4	0	0	0	7	
TUESDAY	0	2	3	5	1	0	0	11	
WEDNESDAY	0	0	1	4	2	1	0	8	Weekday
THURSDAY	0	0	1	7	0	0	0	8	
FRIDAY	1	3	0	3	3	1	0	11	
SATURDAY	0	0	1	2	0	0	0	3	Weekend
SUNDAY	1	0	1	1	0	1	0	4	
TOTAL	*2*	*6*	*9*	*26*	*6*	*3*	*0*	*52*	

DRIVER AGES		PERCENT
<25	18	18.4%
25-34	22	22.4%
35-44	19	19.4%
45-54	16	16.3%
55-64	13	13.3%
65-74	5	5.1%
75-84	1	1.0%
85+	0	0.0%
UNKNOWN	4	4.1%
TOTAL	98	100.0%

Note: Statistics based on first and second vehicles in crashes.

VEHICLE DAMAGE		PERCENT
OTHER/UNKN	3	3.1%
NONE	3	3.1%
VERY MINOR	21	21.4%
MINOR	31	31.6%
MODERATE	29	29.6%
SEVERE	10	10.2%
VERY SEVERE	1	1.0%
TOTAL	*98*	*100.0%*

Note: Statistics based on first and second vehicles in crashes.

AVERAGE NUMBER OF VEHICLES PER CRASH	2.1

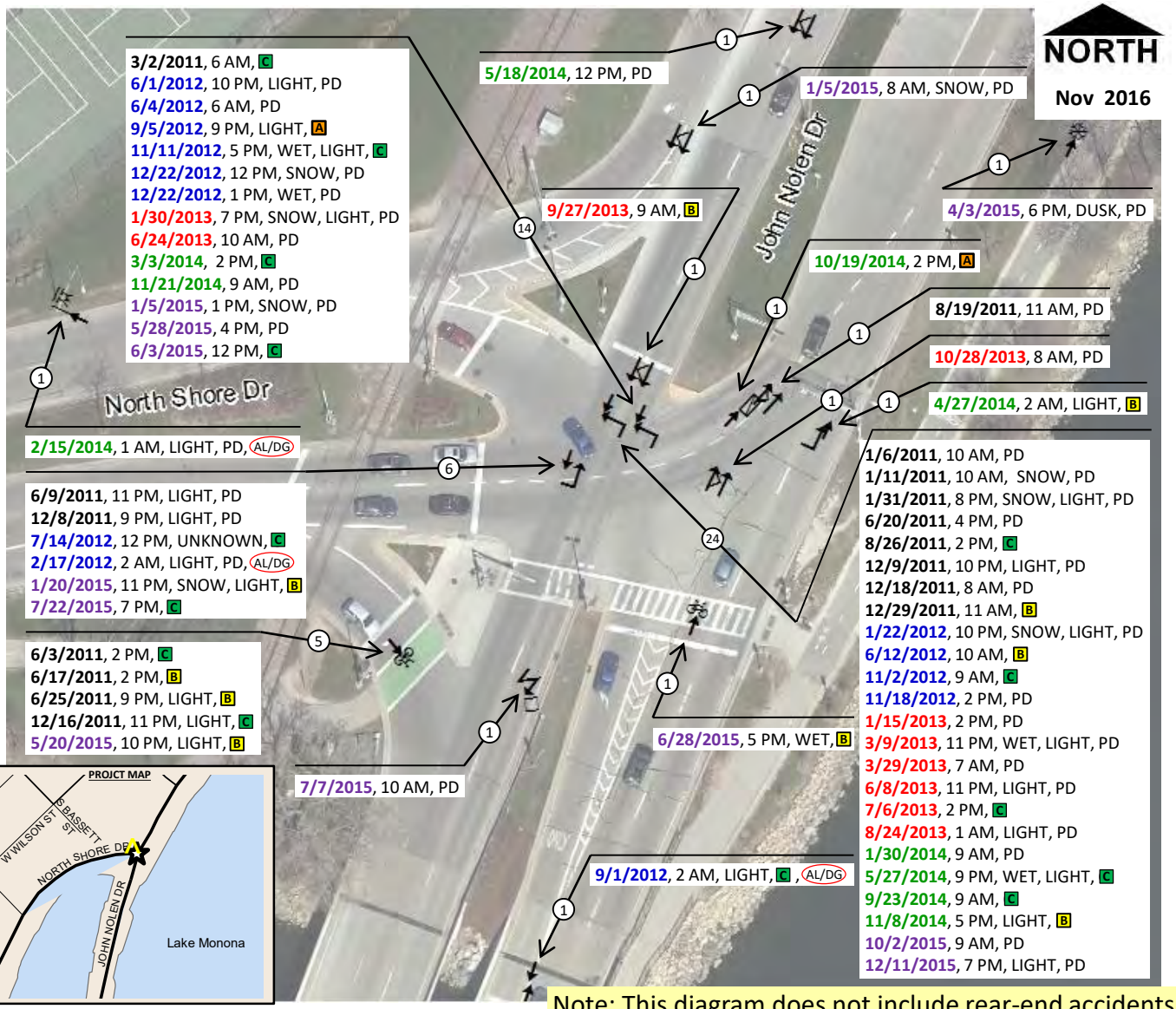
Note: Statistics based on all vehicles in crashes.

BY SEASON		PERCENT
SPRING	13	25.0%
SUMMER	14	26.9%
FALL	14	26.9%
WINTER	11	21.2%
TOTAL	*52*	*100.0%*

Note: Wint=Jan-Mar, Spr=Apr-June, Sum=July-Sept, Fall=Oct-Dec

PERCENT OF CRASHES	
ALCOHOL RELATED	3.8%

EXHIBIT A3
INTERSECTION CRASH STATISTICS
S BROOM ST / JOHN NOLEN DR
DANE COUNTY, WISCONSIN



Note: This diagram does not include rear-end accidents. See Exhibit C2 for rear-end accident types.

YEAR

2011 BLACK
2012 BLUE
2013 RED
2014 GREEN
2015 PURPLE

CRASH RATE

1.41 Crashes
Per Million
Entering Vehicles

Entering Vehicles: 46,400/day

CRASH FREQUENCY/SEVERITY

119 Crashes

0	Fatal Crash (K)
2	Incapacitating (A-Level)
14	Non-Incapacitating (B-Level)
30	Possible (C-Level)
73	Property Damage Only

LEGEND

- Moving Vehicle
- Backing Vehicle
- Pedestrian
- Bicyclist
- Parked Vehicle
- Stop/Yield Sign
- Tree
- Signal Pole
- Light Object
- Fixed Object
- Angle
- Left Turn-Traffic from Right
- Left Turn-Traffic from Left
- Left Turn Merging
- Swerved
- Head-On
- Rear-End
- Sideswipe-Opp.
- Sideswipe-Same

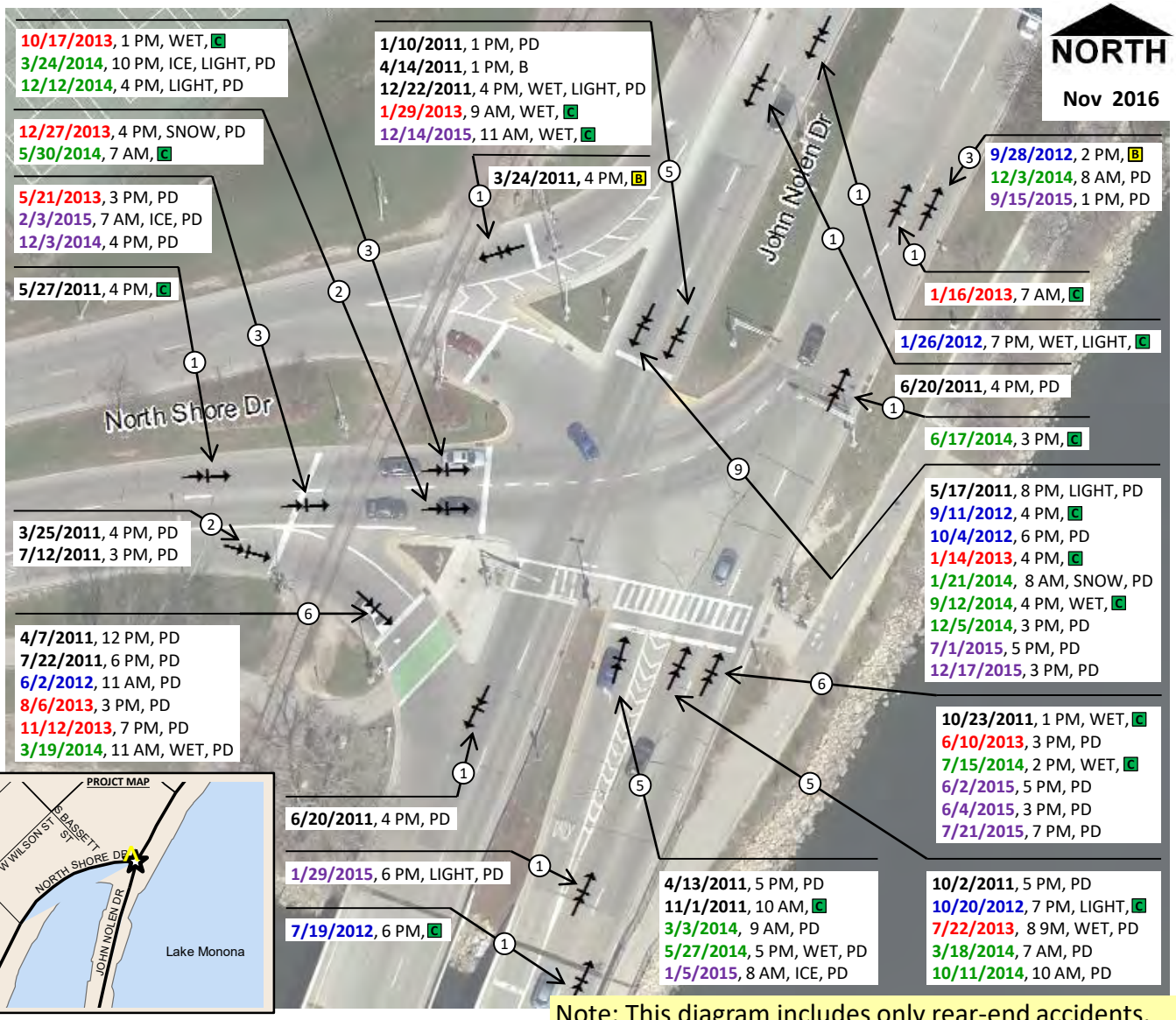
(#) = CRASH FREQUENCY

"LETTER" = USED FOR REFERENCING CRASHES IN REPORT AS NEEDED
DATE OF CRASH
HOUR
SEVERITY (SEE SEVERITY DEFINITIONS)
ROAD CONDITIONS (DRY IF BLANK)
LIGHT CONDITIONS (DAYTIME IF BLANK)
ALCOHOL/DRUG INVOLVEMENT (AL/DG)

CRASH SEVERITY DEFINITIONS

- K = Fatal Crash
- A = Incapacitating Injury Crash
- B = Non-Incapacitating Injury Crash
- C = Possible Injury Crash
- PD = Property Damage Only Crash

EXHIBIT C1
INTERSECTION CRASH STATISTICS
JOHN NOLEN DR / NORTH SHORE DR
DANE COUNTY, WISCONSIN



Note: This diagram includes only rear-end accidents. See Exhibit C1 for all other accident types.

YEAR

2011 BLACK
2012 BLUE
2013 RED
2014 GREEN
2015 PURPLE

CRASH RATE

1.41 Crashes
Per Million
Entering Vehicles

Entering Vehicles: 46,400/day

CRASH FREQUENCY/SEVERITY

119 Crashes

0	Fatal Crash (K)
2	Incapacitating (A-Level)
14	Non-Incapacitating (B-Level)
30	Possible (C-Level)
73	Property Damage Only

LEGEND

- Moving Vehicle
- Backing Vehicle
- Pedestrian
- Bicyclist
- Parked Vehicle
- Stop/Yield Sign
- Tree
- Signal Pole
- Light Object
- Fixed Object
- Angle
- Left Turn-Traffic from Right
- Left Turn-Traffic from Left
- Left Turn Merging
- Swerved
- Head-On
- Rear-End
- Sideswipe-Opp.
- Sideswipe-Same

(#) = CRASH FREQUENCY

"LETTER" = USED FOR REFERENCING CRASHES IN REPORT AS NEEDED
DATE OF CRASH
HOUR
SEVERITY (SEE SEVERITY DEFINITIONS)
ROAD CONDITIONS (DRY IF BLANK)
LIGHT CONDITIONS (DAYTIME IF BLANK)
ALCOHOL/DRUG INVOLVEMENT AL/DG

CRASH SEVERITY DEFINITIONS

- K = Fatal Crash
- A = Incapacitating Injury Crash
- B = Non-Incapacitating Injury Crash
- C = Possible Injury Crash
- PD = Property Damage Only Crash

EXHIBIT C2
INTERSECTION CRASH STATISTICS
JOHN NOLEN DR / NORTH SHORE DR
DANE COUNTY, WISCONSIN

GENERAL INFORMATION

INTERSECTION: JOHN NOLEN DR / NORTH SHORE DR
MUNICIPALITY: CITY OF MADISON
COUNTY: DANE
STATE: WI
STRAND PROJECT ID: 1020.098

CRASHES FROM: 1/1/2011
TO: 12/31/2015

DURATION
5 YEARS
0 MONTHS

PREPARED BY: CJS

DATE: 10/12/2016

INTERSECTION CHARACTERISTICS

TRAFFIC CONTROL: SIGNAL CONTROLLED
INTERSECTION AADT: Year (2010-2014): 46,400
NUMBER OF LEGS: 3

POSTED SPEED (JOHN NOLEN): 35 mph
DEER CRASHES INCLUDED: NO
AREA TYPE: URBAN

CRASH STATISTICS

CRASH FREQUENCY & SEVERITY

YEAR	PD	C-LEVEL	B-LEVEL	A-LEVEL	FATAL	TOTAL
2011	20	7	5	0	0	32
2012	9	8	2	1	0	20
2013	14	5	1	0	0	20
2014	14	7	2	1	0	24
2015	16	3	4	0	0	23
TOTAL	*73*	*30*	*14*	*2*	*0*	*119*
PERCENT	*61.3%*	*25.2%*	*11.8%*	*1.7%*	*0.0%*	*100.0%*
YEAR AVG.	*14.6*	*6.0*	*2.8*	*0.4*	*0.0*	*23.8*

CRASH RATES	per MEV
CRASH RATE	1.41
INJURY CRASH RATE	0.19
FATAL CRASH RATE	0.00

VEHICLE TYPES		PERCENT
CAR	211	91.3%
TRUCK	17	7.4%
OTHER/UNKN	3	1.3%
TOTAL	*231*	*100.0%*

Note: Statistics based on first and second vehicles in crashes.

LIGHT CONDITIONS		PERCENT
DAY	91	76.5%
DARK	27	22.7%
UNKNOWN	1	0.8%
TOTAL	*119*	*100.0%*

Note: Dawn, dusk or street lighted conditions included in dark total.

ROAD CONDITIONS		PERCENT
DRY	90	75.6%
WET	16	13.4%
SNOW	10	8.4%
ICE	3	2.5%
MUD	0	0.0%
OTHER/UNKN	0	0.0%
TOTAL	*119*	*100.0%*

CRASH TYPE		PERCENT
LEFT TURN-TRAFFIC FROM RIGHT	38	31.9%
LEFT TURN-TRAFFIC FROM LEFT	6	5.0%
LEFT TURN MERGING	1	0.8%
REAR-END	58	48.7%
HEAD-ON	1	0.8%
SS-SAME	5	4.2%
SS-OPPOSITE	0	0.0%
FIXED	3	2.5%
NOT FIXED	1	0.8%
PEDESTRIAN RELATED	0	0.0%
BICYCLE RELATED	6	5.0%
TOTAL	*119*	*100.0%*

DAY AND TIME

DAY OF WEEK	*EARLY MORNING* 2:00 AM TO 5:59 AM	*AM PEAK* 6:00 AM TO 9:59 AM	*MIDDAY* 10:00 AM TO 1:59 PM	*PM PEAK* 2:00 PM TO 5:59 PM	*EVENING* 6:00 PM TO 9:59 PM	*LATE EVENING* 10:00 PM TO 1:59 AM	*UNKNOWN*	*TOTAL*	
MONDAY	0	5	4	6	2	1	0	18	
TUESDAY	0	5	5	9	5	1	0	25	
WEDNESDAY	0	3	2	2	2	1	0	10	Weekday
THURSDAY	0	1	5	6	5	0	0	17	
FRIDAY	1	6	1	10	3	3	0	24	
SATURDAY	1	0	5	2	2	4	0	14	Weekend
SUNDAY	1	1	2	5	0	2	0	11	
TOTAL	*3*	*21*	*24*	*40*	*19*	*12*	*0*	*119*	

DRIVER AGES		PERCENT
<25	59	25.5%
25-34	59	25.5%
35-44	31	13.4%
45-54	25	10.8%
55-64	39	16.9%
65-74	7	3.0%
75-84	2	0.9%
85+	0	0.0%
UNKNOWN	9	3.9%
TOTAL	231	100.0%

Note: Statistics based on first and second vehicles in crashes.

VEHICLE DAMAGE		PERCENT
OTHER/UNKN	12	5.2%
NONE	8	3.5%
VERY MINOR	27	11.7%
MINOR	59	25.5%
MODERATE	77	33.3%
SEVERE	40	17.3%
VERY SEVERE	8	3.5%
TOTAL	*231*	*100.0%*

Note: Statistics based on first and second vehicles in crashes.

AVERAGE NUMBER OF VEHICLES PER CRASH	2.1

Note: Statistics based on all vehicles in crashes.

BY SEASON		PERCENT
SPRING	33	27.7%
SUMMER	23	19.3%
FALL	32	26.9%
WINTER	31	26.1%
TOTAL	*119*	*100.0%*

Note: Wint=Jan-Mar, Spr=Apr-June, Sum=July-Sept, Fall=Oct-Dec

PERCENT OF CRASHES	
ALCOHOL RELATED	2.5%

EXHIBIT A3
INTERSECTION CRASH STATISTICS
JOHN NOLEN DR / NORTH SHORE DR
DANE COUNTY, WISCONSIN

APPENDIX B
PUBLIC INVOLVEMENT MEETING NO. 1

City of Madison
Blair St and John Nolen Dr Corridor Study

Presentation Outline:

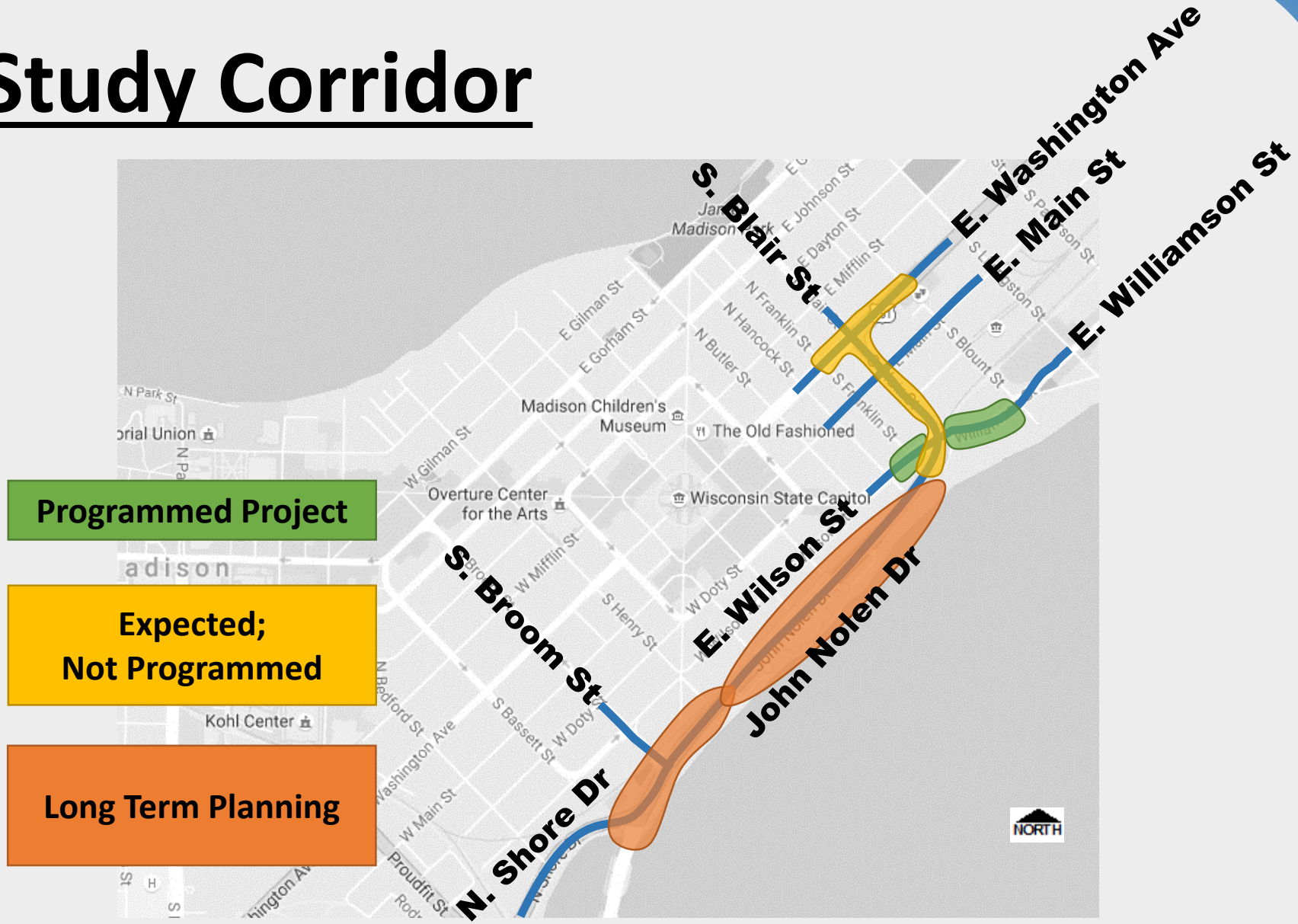
- Study Corridor and Reasons for Study
  - Upcoming Projects
  - Previous Studies and Longer Term Opportunities
- Background and Current Conditions
- Study Process and Schedule
- Questions and Answers
- Goals Exercise

Study Limits → Project Location

Study Corridor

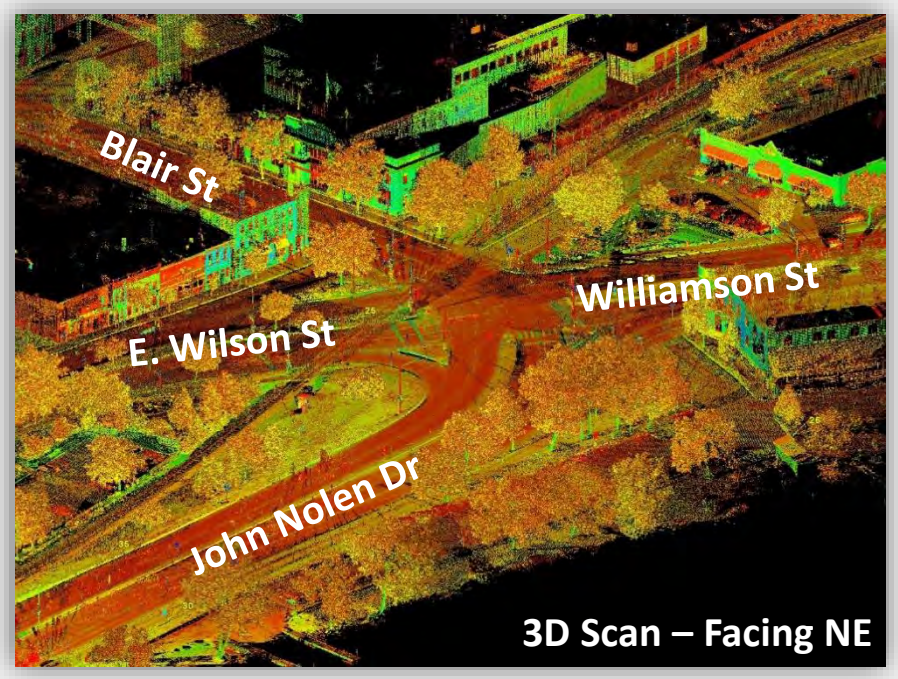
- Project Limits

Study Corridor



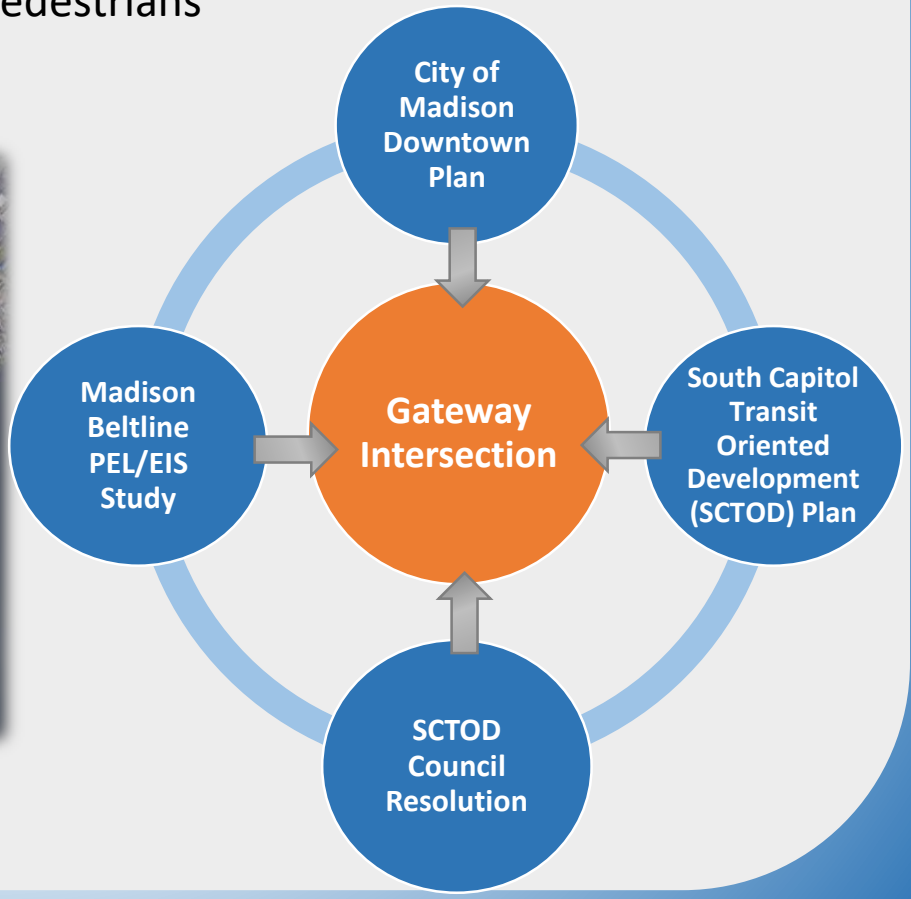
Reasons for Study

- Short Term
  - Scheduled 2018 Pavement Replacement
    - Wilson/Williamson (Franklin → Blount)
  - Blair Street (John Nolen → East Washington) *not* programmed



Reasons for Study

- Long Term
  - Several studies concluded → '*gateway intersection*'
    - For Vehicles/ Trains/ Bicyclists/ Pedestrians



Reasons for Study

STUDIES	FINDINGS			
City of Madison Downtown Plan	Key 'Gateway'	Improve: safety, aesthetics, ped/bike crossings, efficient traffic movements		
South Capitol Transit Oriented Development (SCTOD) Plan	East 'Gateway' Intersection	Lack of Wayfinding for ped/bikes	Further study of 'super crossing'	Eliminate Wilson Street Connection to East/ Prohibit Left Turns
SCTOD Council Resolution	Adopt SCTOD plan	Narrower lanes on John Nolen for added ped/bike space	Does not support filling of Lake Monona	Improve bike/ped crossings/make safer
WisDOT Beltline PEL Study	Strand/TADI evaluated 7 alternatives	Strand/TADI evaluated intersection expansion		

Reasons for Study

- Timeline of Vision Studies

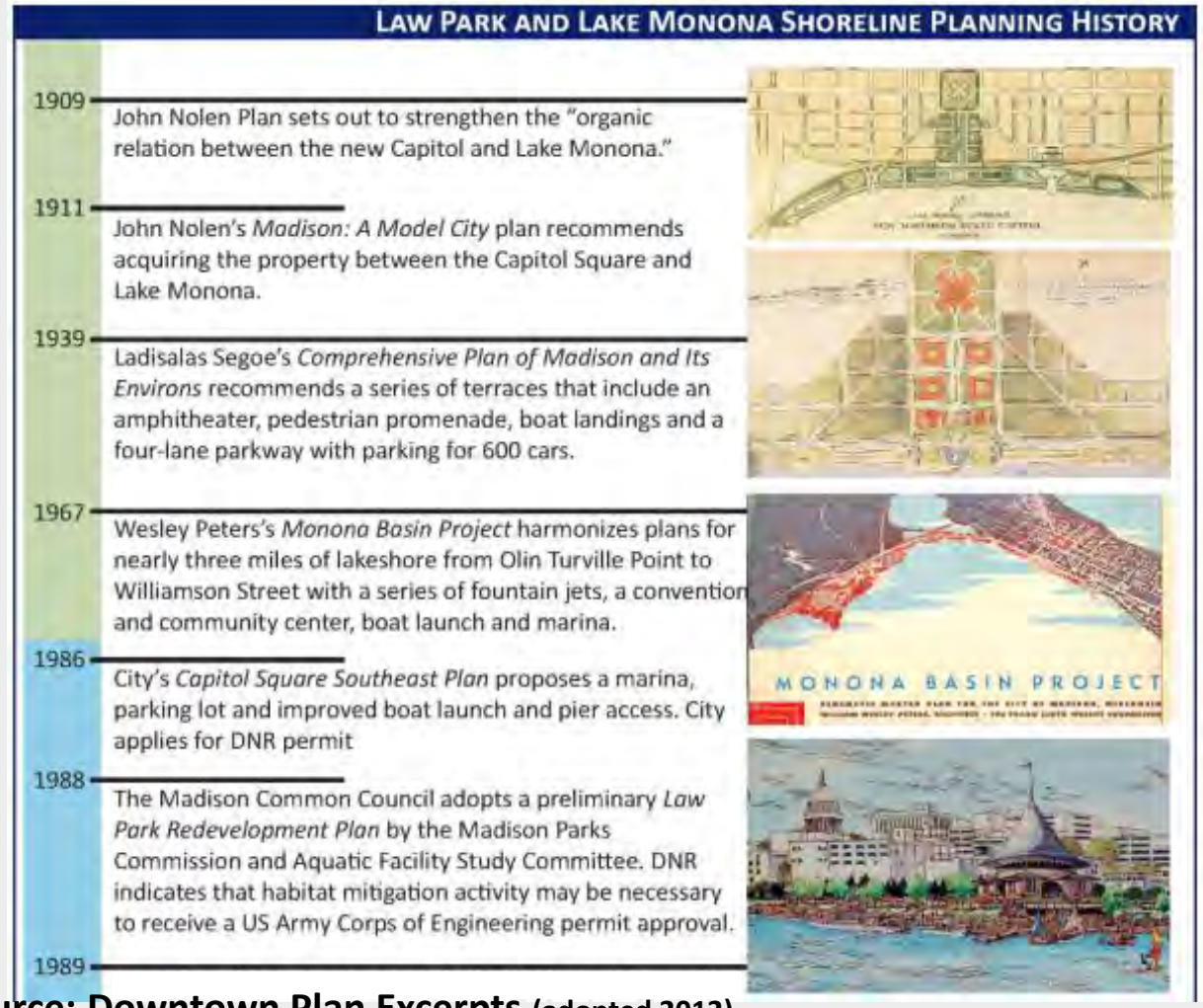


Image source: Downtown Plan Excerpts (adopted 2012)

Reasons for Study

- Timeline of Vision Studies

Image source: Downtown Plan Excerpts (adopted 2012)

Reasons for Study

- Previous Vision Studies
  - Law Park Concept

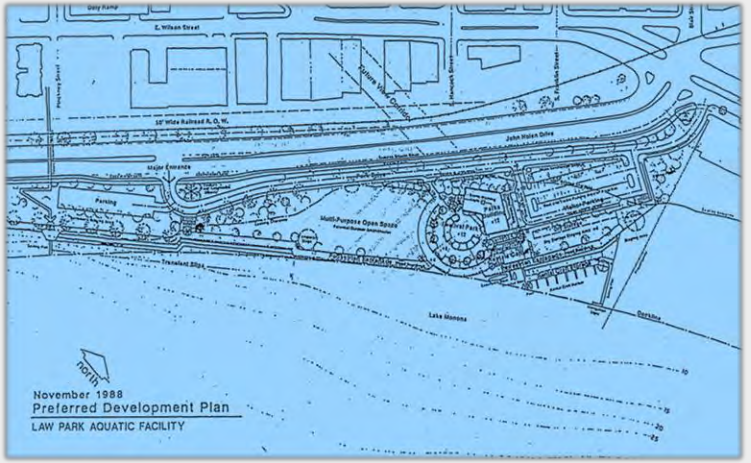


Image source: 1988 Law Park Proposal
U.S. Army Corps of Engineers Permit

Image source: 1990 Law Park Proposal

Reasons for Study

- Recent Plans
  - Parks and Open Space

Image source: Downtown Plan Excerpts (adopted 2012)

Reasons for Study

- Recent Plans – Downtown Plan

Downtown's Lake Monona shoreline

Image source: Downtown Plan Excerpts (adopted 2012)

Reasons for Study

- Recent Plans
  - South Capitol Transit Oriented Development Plan

Image source: SCTOD Plan Executive Summary

Reasons for Study

- Ongoing Private Studies (Non-City)

Image source: Kenton Peters

Image source: Isthmus

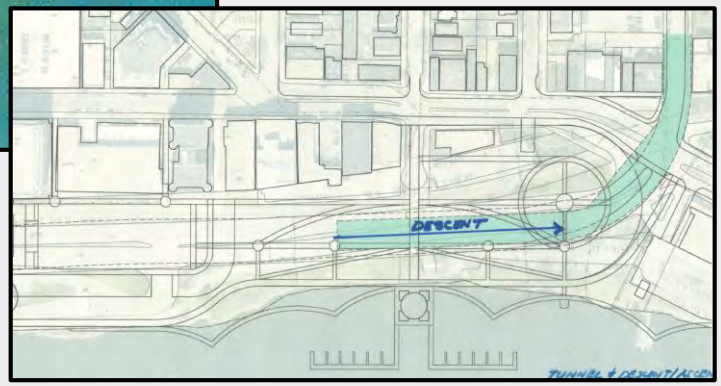


Image source: Madison Design Professionals Workgroup

Presentation Outline:

- Study Corridor and Reasons for Study
  - Upcoming Projects
  - Previous Studies and Longer Term Opportunities
- **Background and Current Conditions**
- Study Process and Schedule
- Questions and Answers
- Goals Exercise

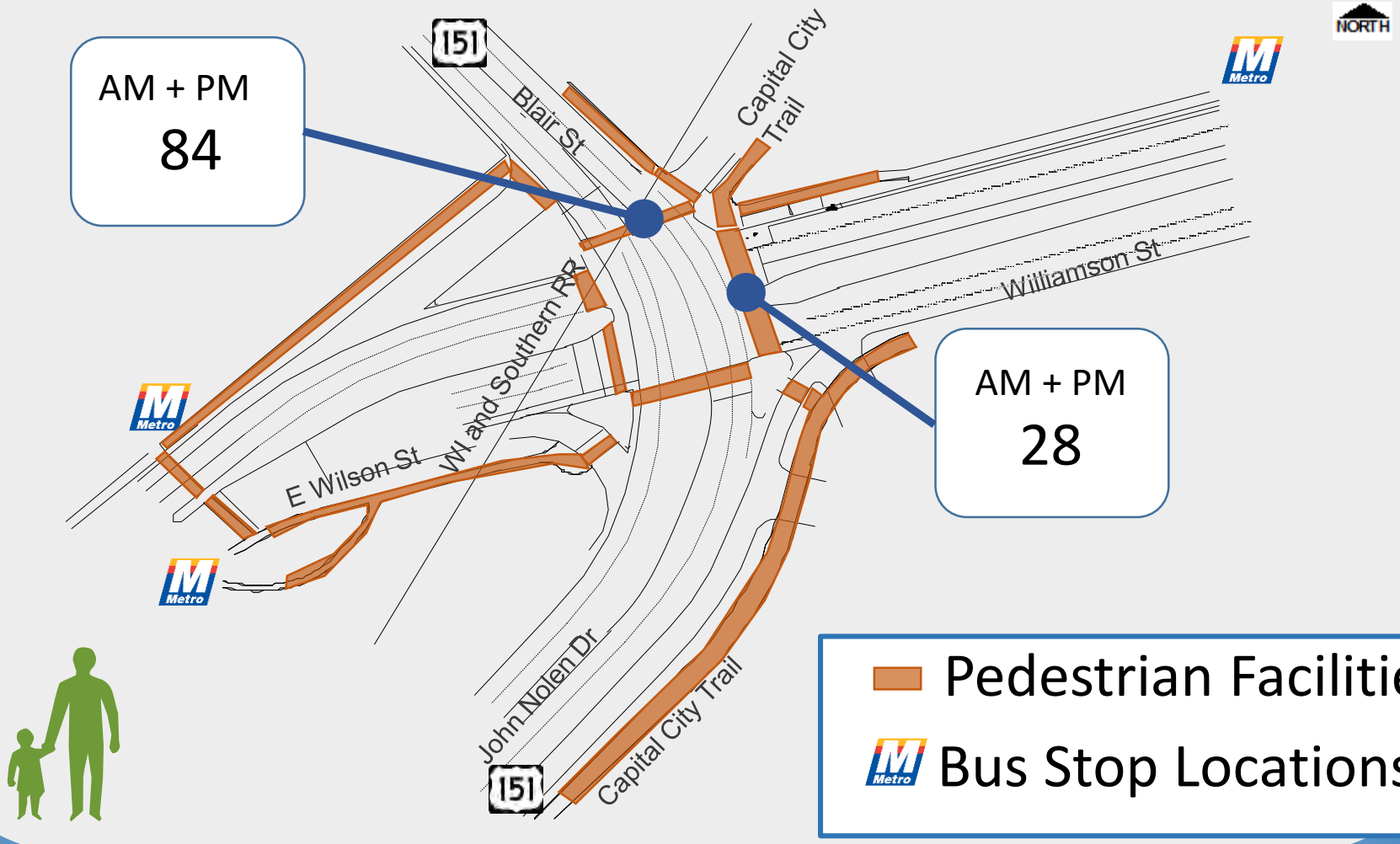
Background and Current Conditions

- Transit Conditions

https://www.cityofmadison.com/metro/schedules/systemMaps.cfm

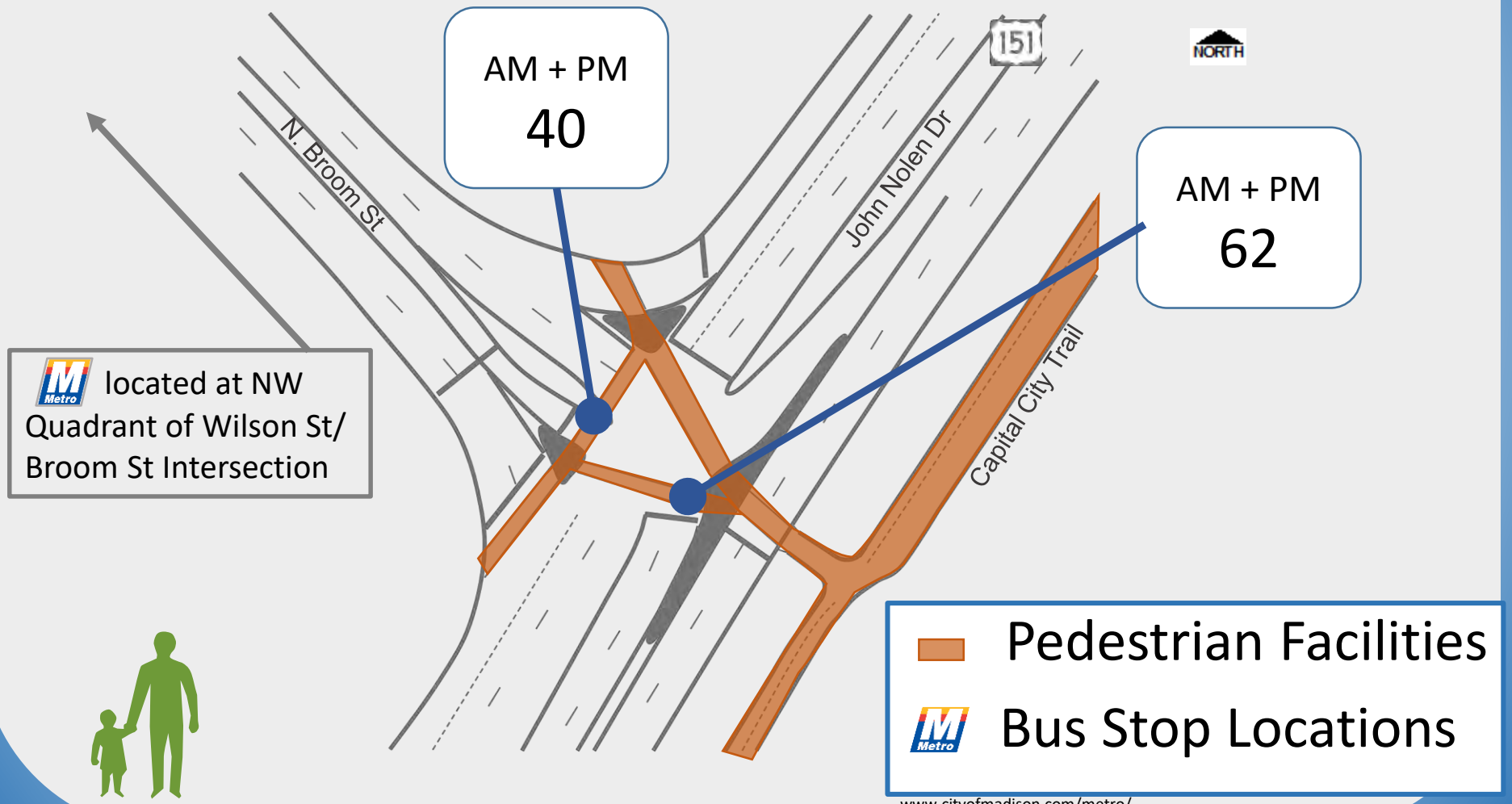
Background and Current Conditions

- Pedestrian and Transit Conditions



Background and Current Conditions

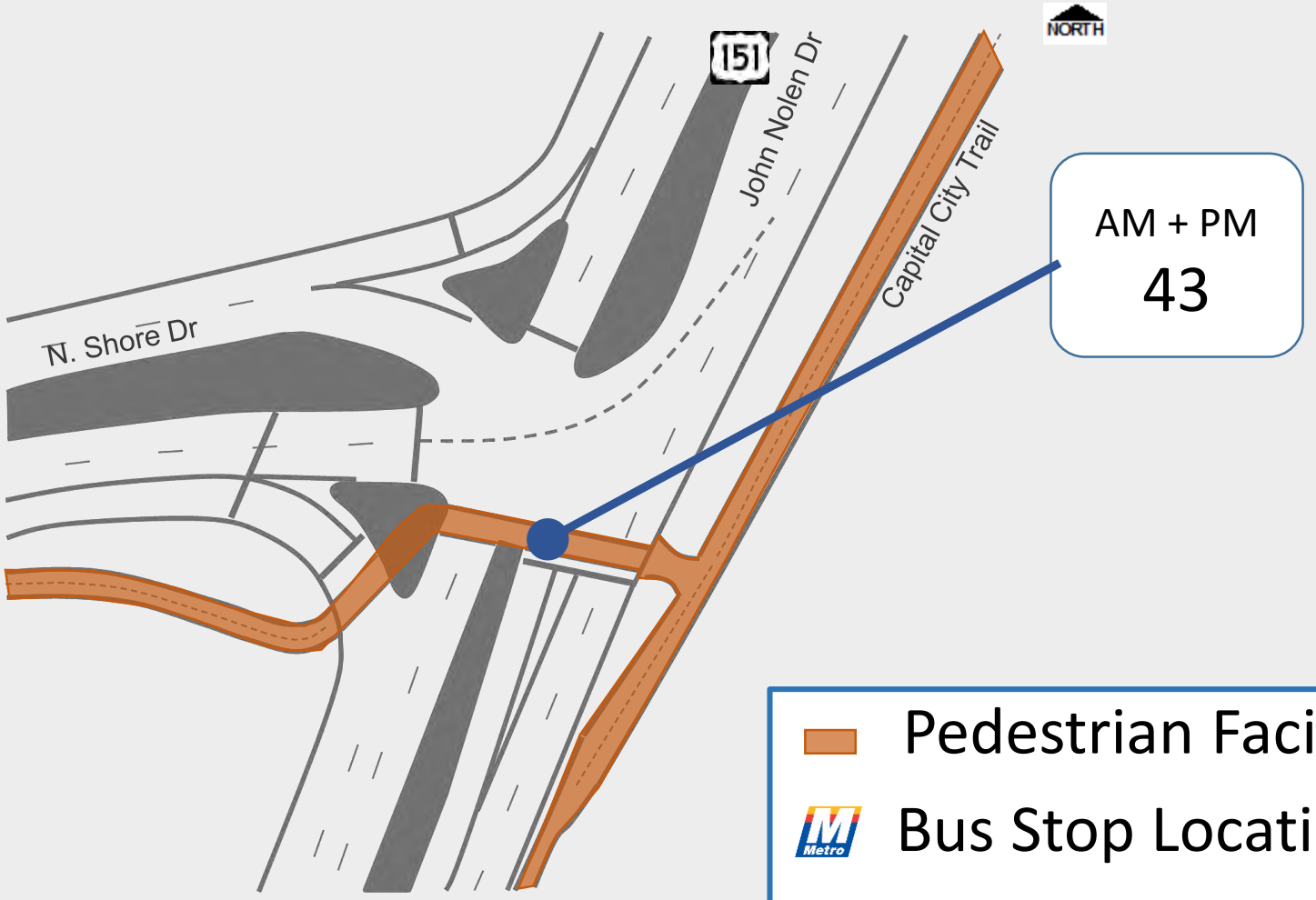
- Pedestrian and Transit Conditions



www.cityofmadison.com/metro/

Background and Current Conditions

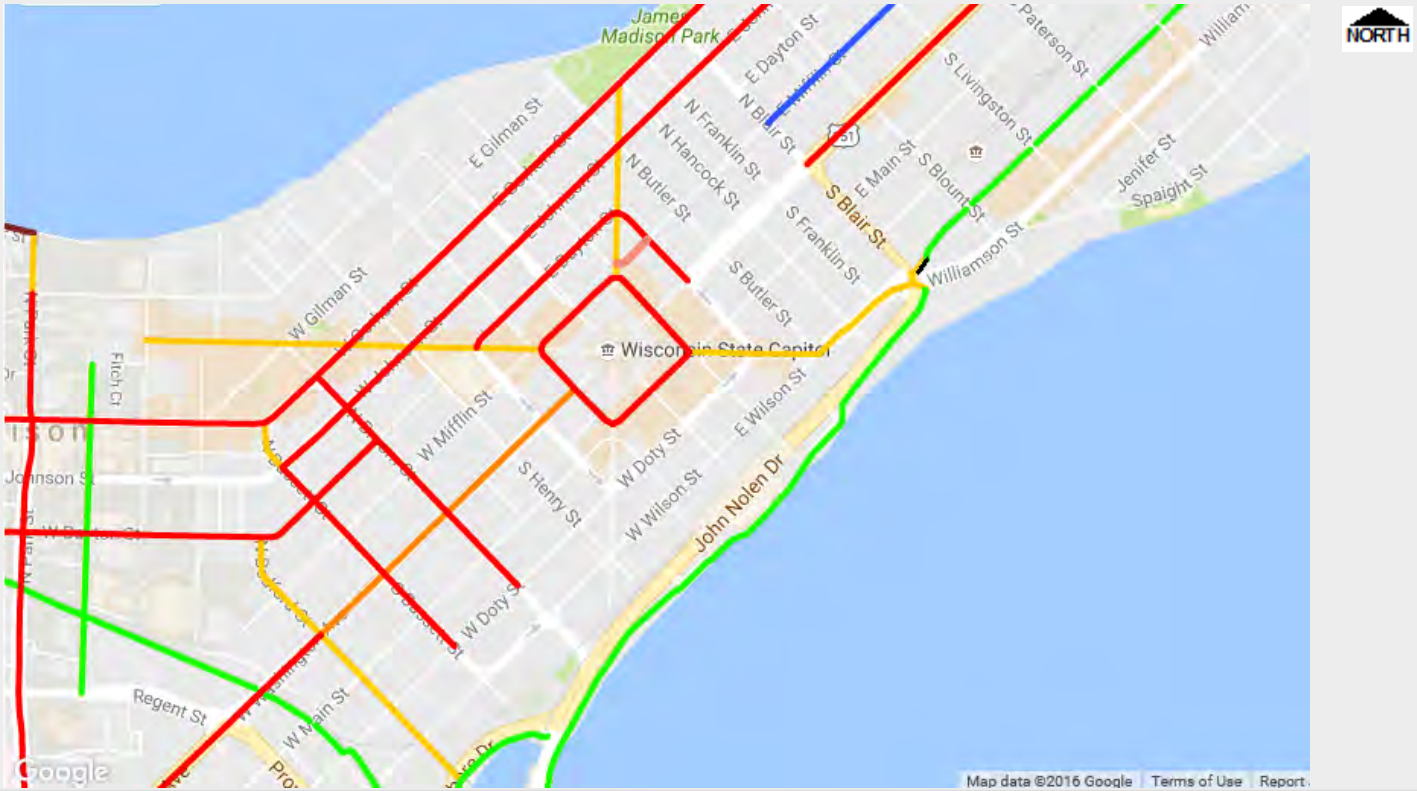
- Pedestrian and Transit Conditions



www.cityofmadison.com/metro/

Background and Current Conditions

- Bicycle Conditions



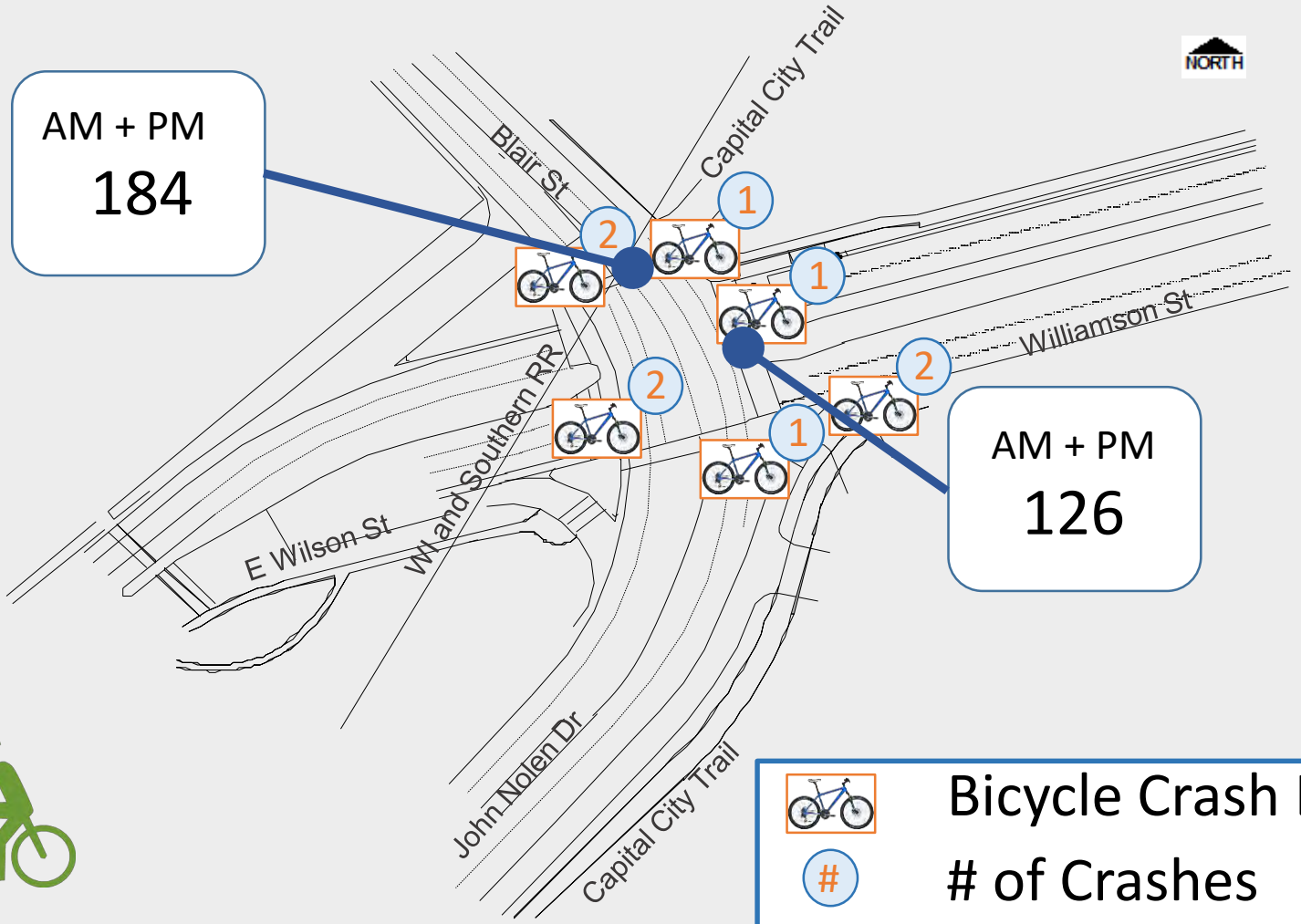
BICYCLING NETWORK LEGEND

Off street paved path	Off street paved path - Trail Pass required	Bicycle boulevard	Bike lane or paved shoulder	Contra-flow bike lane	Wide curb lane	On street route	Off street unpaved path	Bicycle route on sidewalk

https://www.cityofmadison.com/bikeMadison/planTrip/interactivemap.cfm

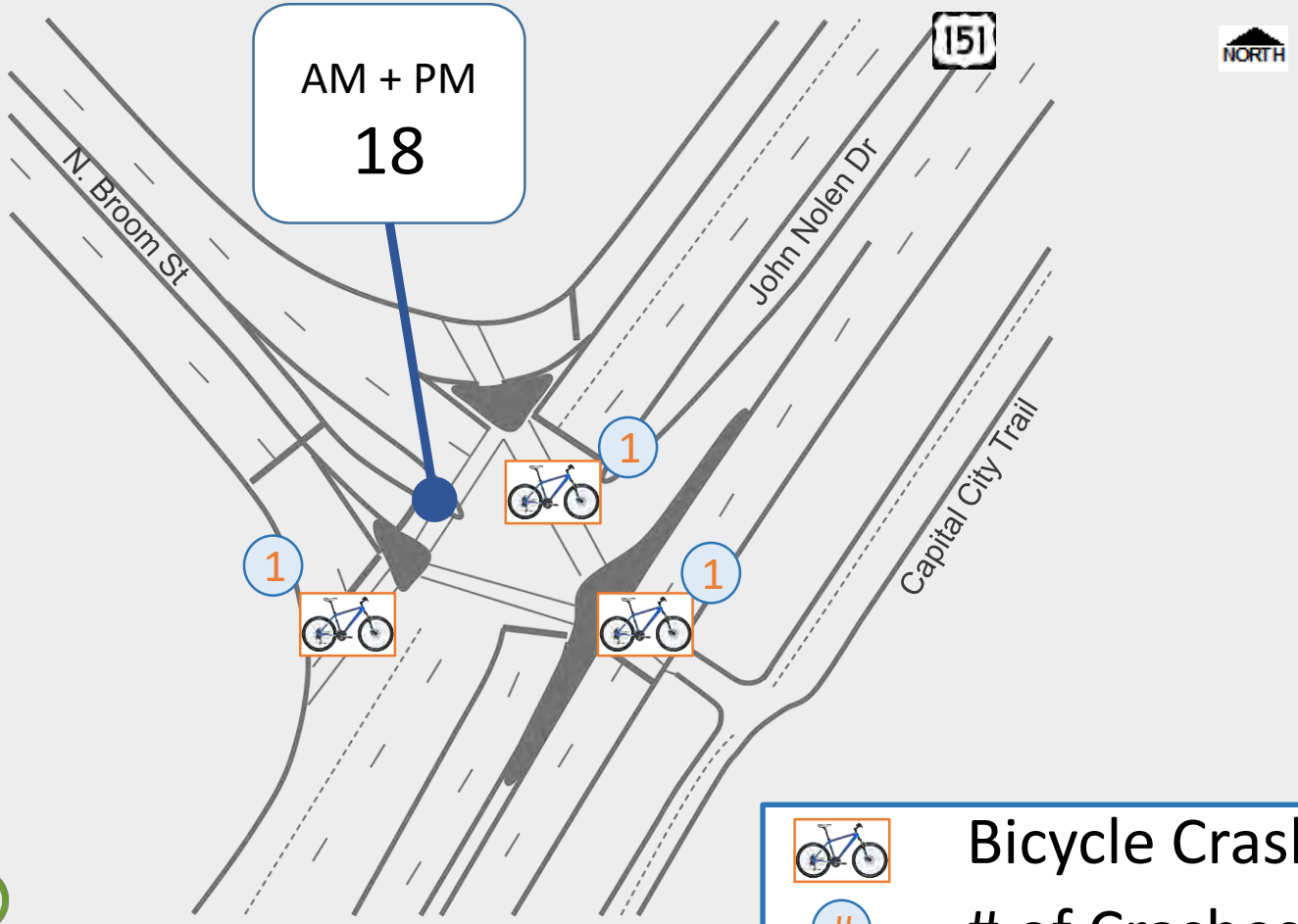
Background and Current Conditions

- 9 Reported Bike Crashes (2011-2015)



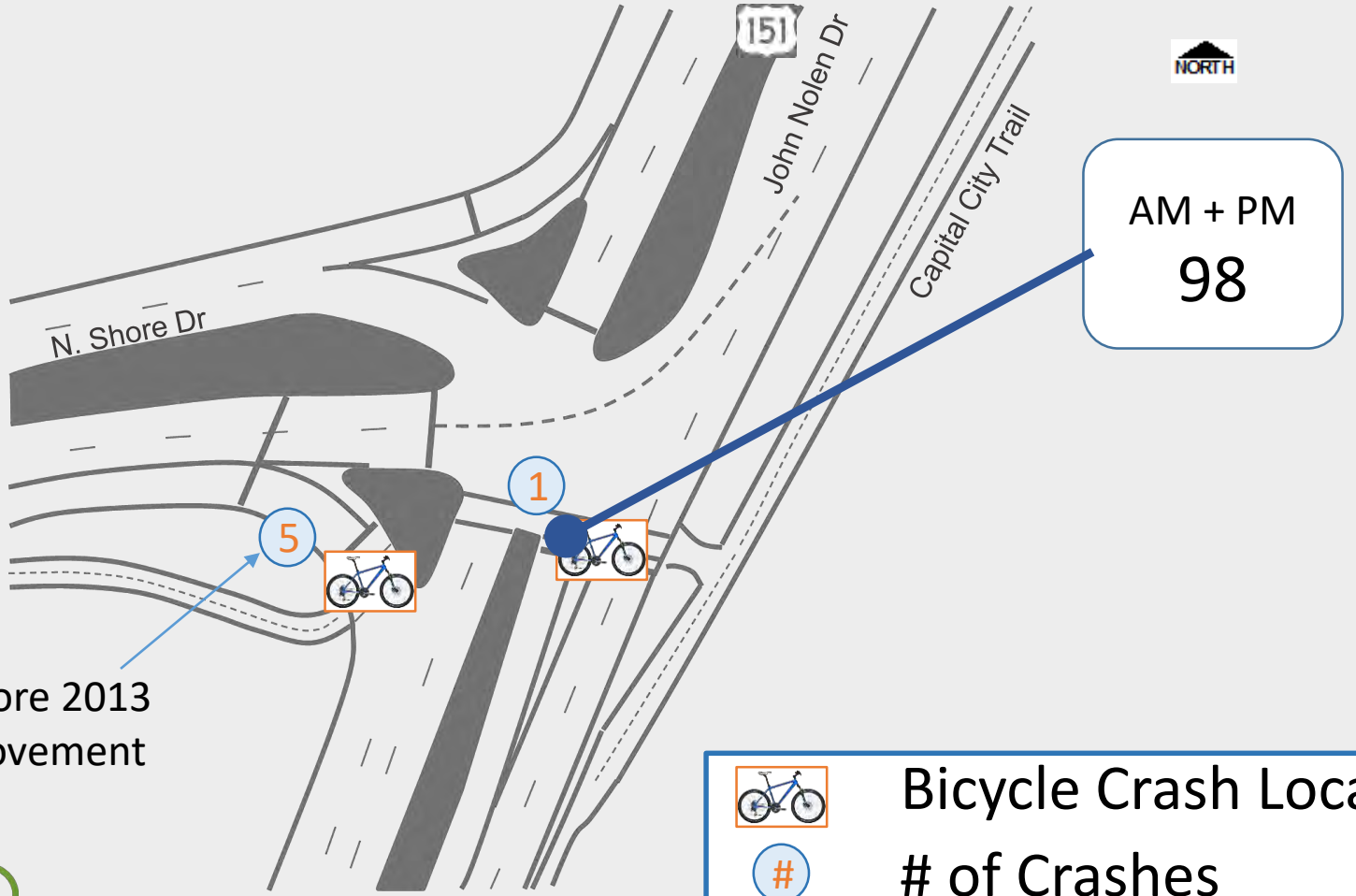
Background and Current Conditions

- 3 Reported Bike Crashes (2011-2015)



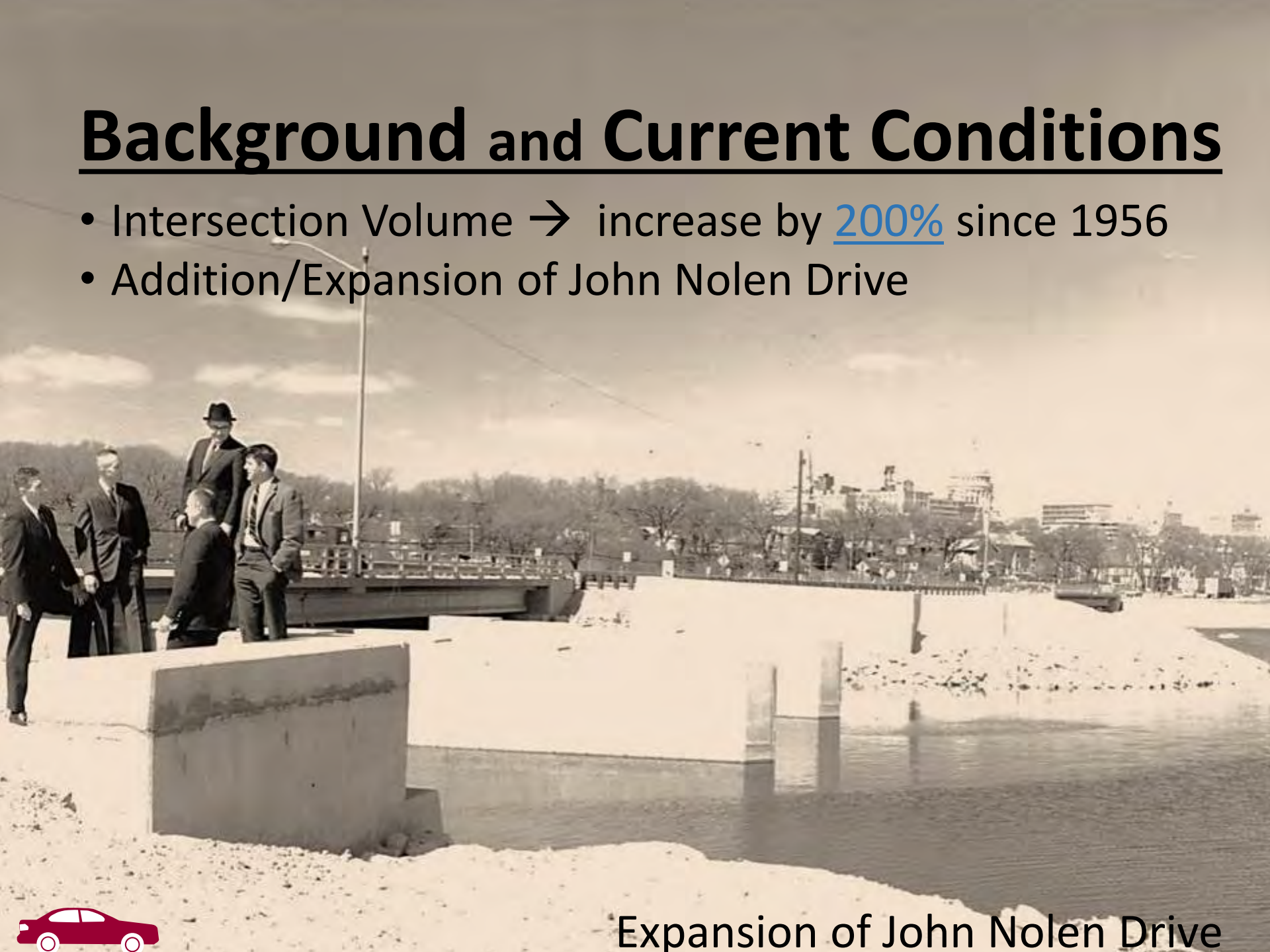
Background and Current Conditions

- 6 Reported Bike Crashes (2011-2015)



Background and Current Conditions

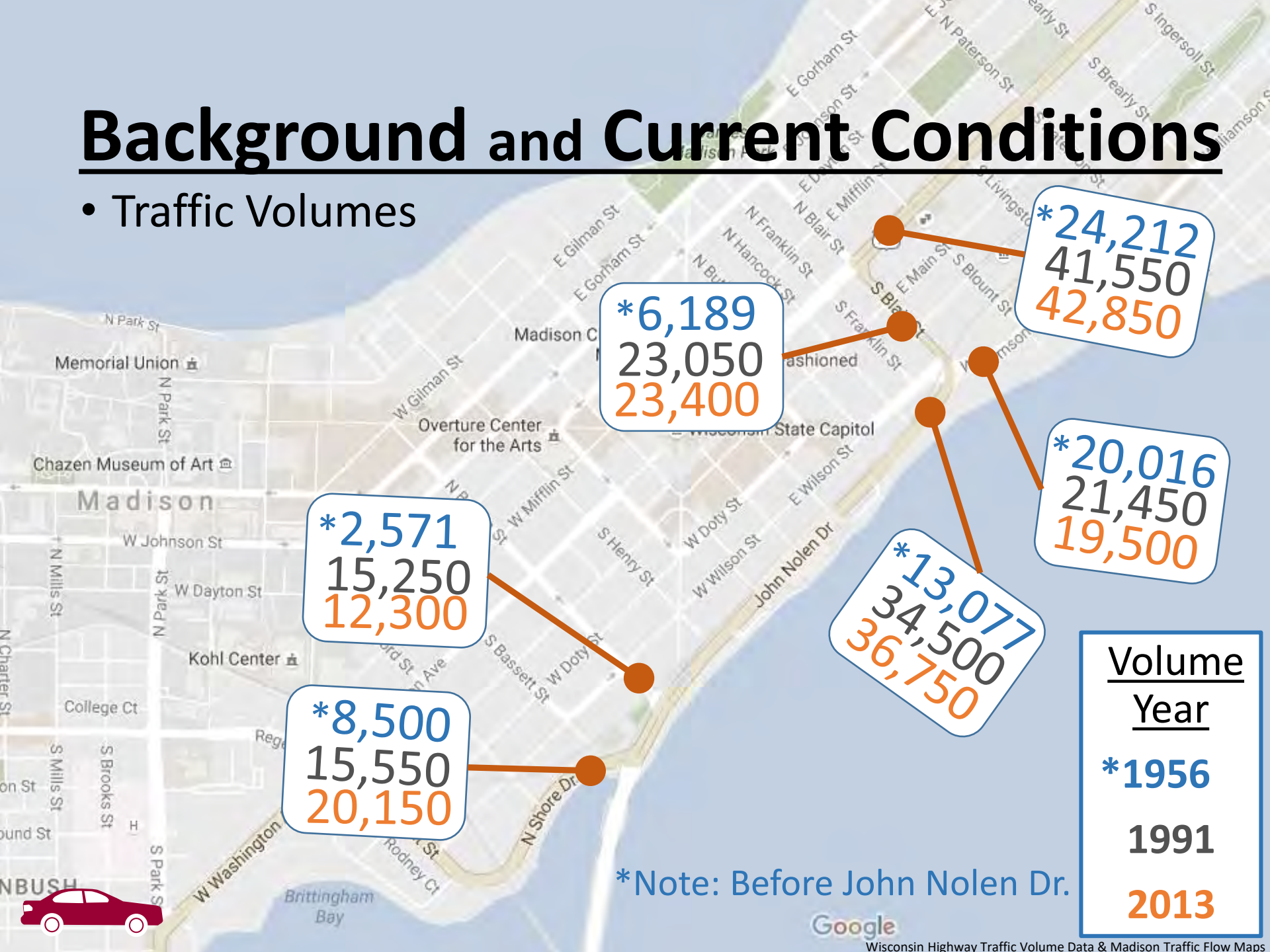
- Intersection Volume → increase by 200% since 1956
- Addition/Expansion of John Nolen Drive



Expansion of John Nolen Drive

Background and Current Conditions

- Traffic Volumes



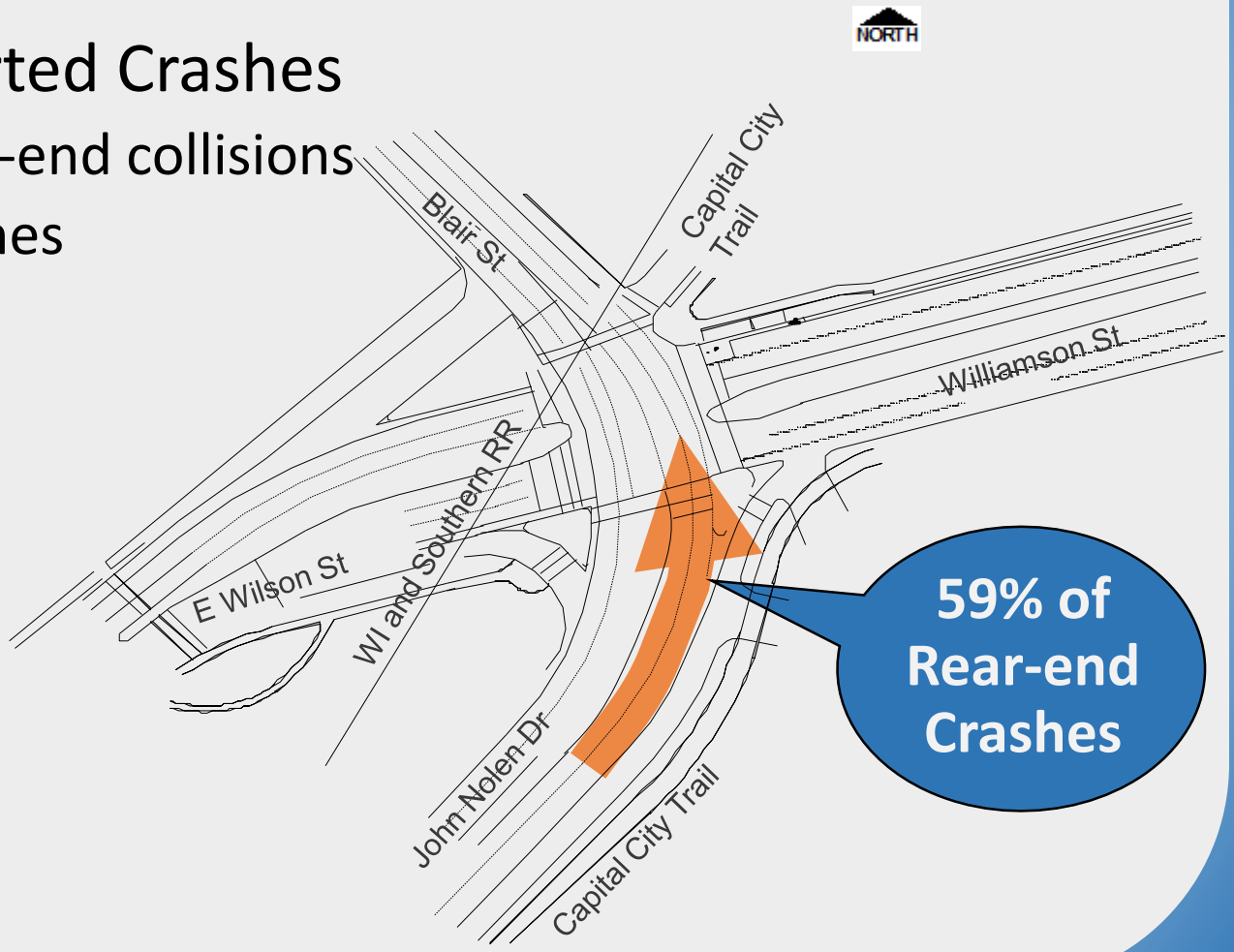
Wisconsin Highway Traffic Volume Data & Madison Traffic Flow Maps

Background and Current Conditions

- Crash History (2011-2015)

→ 92 Total Reported Crashes

- 46/92 → Rear-end collisions
- 9 →Bike Crashes



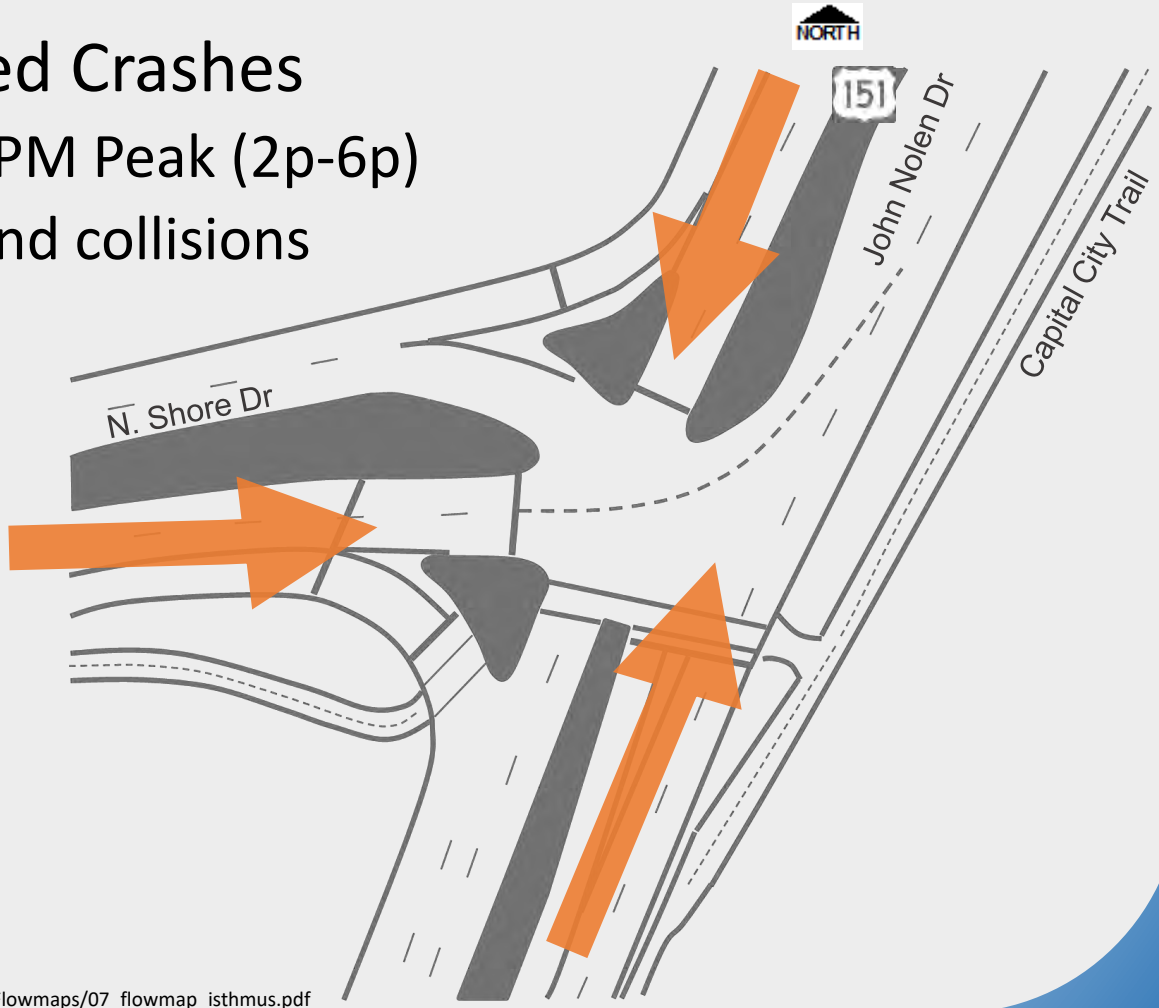
http://trust.dot.state.wi.us/roadrunner/
www.cityofmadison.com/trafficengineering/documents/Flowmaps/07_flowmap_isthmus.pdf

Background and Current Conditions

- Crash History (2011-2015)

→ 119 Total Reported Crashes

- 40/119 →during PM Peak (2p-6p)
- 58/119 → Rear-end collisions
- 6 →Bike Crashes



http://trust.dot.state.wi.us/roadrunner/
www.cityofmadison.com/trafficengineering/documents/Flowmaps/07_flowmap_isthmus.pdf

Background and Current Conditions

- Motor Vehicle Operations - ***Blair/John Nolen & Wilson/Williamson Street***
  - Northbound and Southbound Queueing and Congestion
    - Existing LOS F movements – NB/SB through
    - Left turners block through movement

Background and Current Conditions

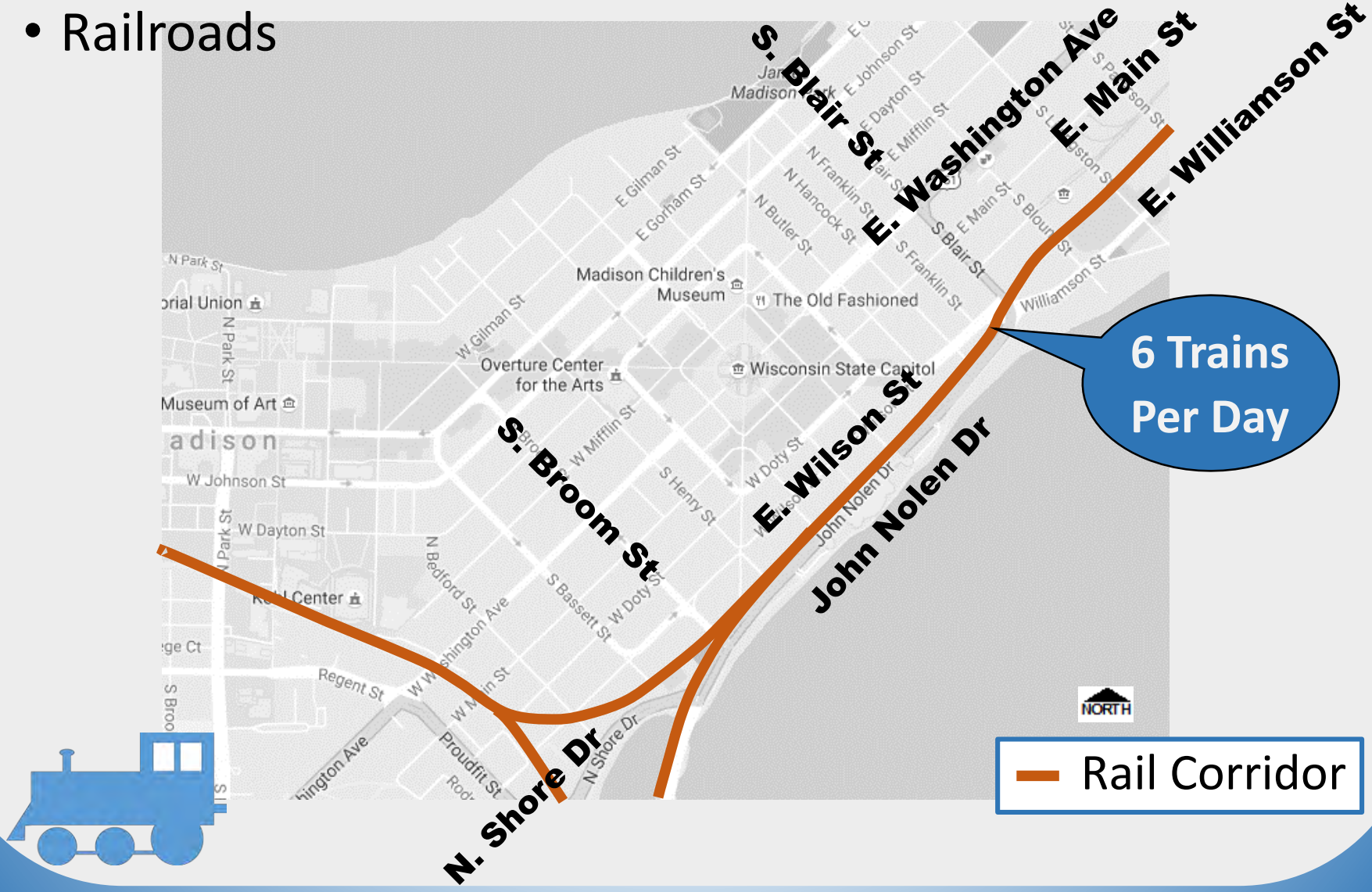
- Motor Vehicle Operations - ***John Nolen Drive & Broom Street***
  - Northbound and Southbound Queueing and Congestion
    - Existing LOS F movements –SB through

Background and Current Conditions

- Motor Vehicle Operations - ***John Nolen Drive & North Shore Drive***
  - Queueing and Congestion all approaches
    - Existing LOS F movements –NBL and EBL

Background and Current Conditions

- Railroads



Presentation Outline:

- Study Corridor and Reasons for Study
  - Upcoming Projects
  - Previous Studies and Longer Term Opportunities
- Background and Current Conditions
- **Study Process and Schedule**
- Questions and Answers
- Goals Exercise

Study Process and Schedule

Phase 1 – Needs & Alts Development

- PIM # 1, Needs and Priorities
- Range of Alternatives
- Alternatives Pros and Cons

Oct.'16-Mar.'17

Phase 2 – Alternatives Refinement

- PIM # 2, Range of Alternatives
- Refined Alternatives
- Preferred Combinations

Mar.'17-Jun.'17

Phase 3 - Recommendations

- PIM #3, Draft Recommendations
- Conceptual Layout, Range of Costs
- Layout Refinement
- Finalize Recommendations

Jun.'17-Jul.'17

Presentation Outline:

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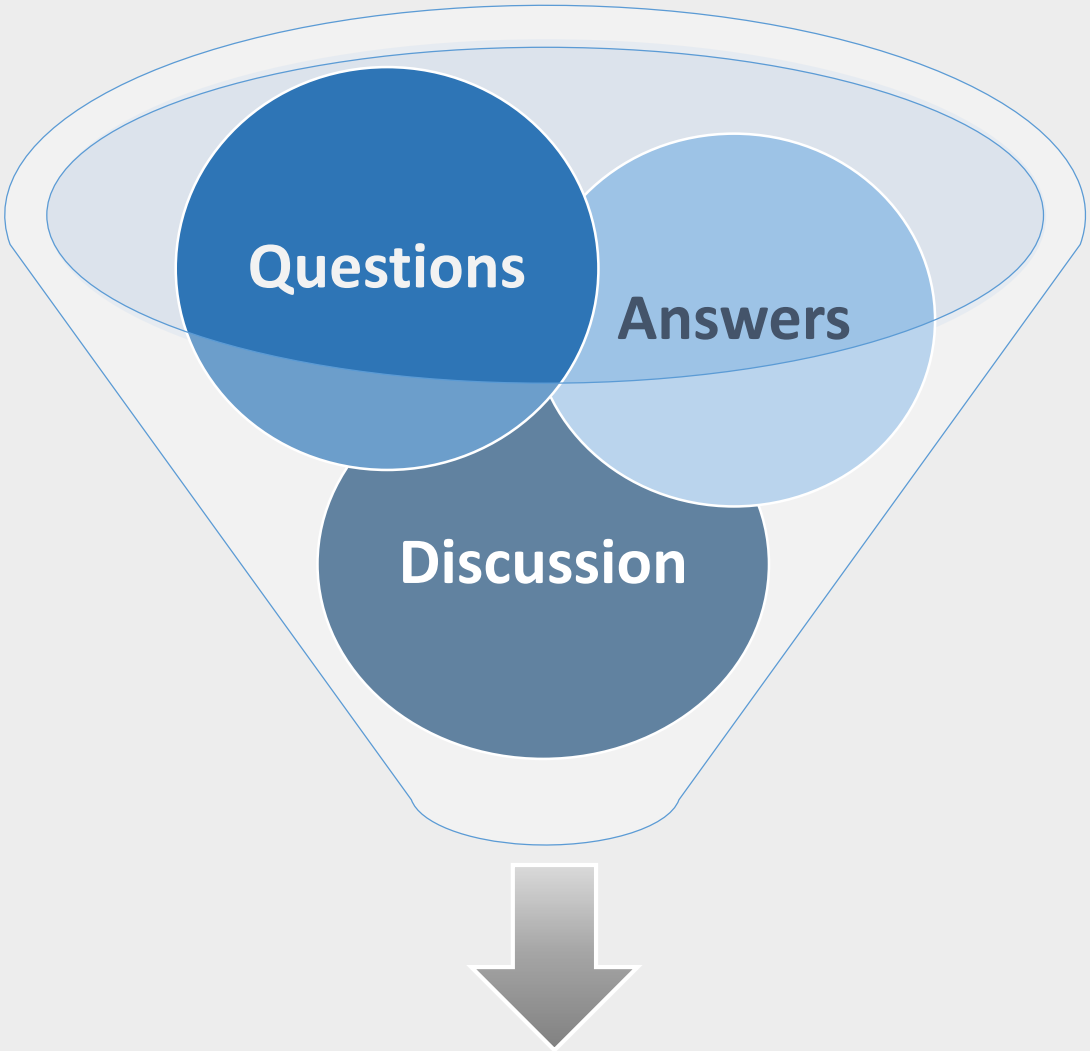
- Goals Exercise



Better Solutions

Presentation Outline:

- Study Corridor and Reasons for Study
  - Upcoming Projects
  - Previous Studies and Longer Term Opportunities
- Background and Current Conditions
- Study Process and Schedule
- Questions and Answers
- **Goals Exercise**

Goals Exercise

1. Discuss top goals (concerns/problems) at your tables.

2. Designate a reporter at your table to present your top 3 goals to the group after ~15-minutes.

3. Add notes to Sticky Notes and then place on the maps.

How to Get More Information?

City of Madison:

Chris Petykowski, P.E.

cpetykowski@cityofmadison.com

Strand Associates, Inc.:

Jeff Held, P.E.

608-251-4843

jeff.held@strand.com

City of Madison
Blair Street Corridor Study

Blair Street and John Nolen Drive Corridor Study
Public Involvement Meeting #1

	Comment	General	Blair/JND	JND/Broom	JND/N Shore
Needs and Challenges					
4	Bikes and peds need separate spaces, particularly along Willy east of Blair/JND	4			
3	Lack of connections from the loop/square to the Monona lakeshore	3			
2	Law Park is underused. Consider barriers/fences between park and JND	2			
2	JND/Blair works well for cars, it needs to work for residents too	2			
2	Need to consider Essen House redevelopment, turns into their parking lot are as bad as Blair/JND intersection, eliminate Blair access, provide via Wilson or Franklin	2			
1	Bike crossings of train tracks are very dangerous in the rain	1			
1	Crossing JND as a pedestrian is a problem, speeds are too high, there are too many trucks	1			
1	Too much going on at Blount and Willy, dangerous location	1			
1	Parking needs to be studied	1			
1	Complicated area with many users, State, City, and Railroad stakeholders, need for staged improvements	1			
1	JND Causeway is used by School Buses from Franklin Elementary	1			
1	Ped crossings are poor at Blair/JND		1		
1	Ped crossings are poor at JND/N Shore				1
1	Need to reduce MV congestion to improve safety	1			
Goals, Ideas, and Solutions					
5	Better aesthetics along JND and traffic calming - reduce speeding and red light running	5			
4	Deemphasize Willy be eliminating the channelized NBR from JND (flying right). Institute other calming measures to give cues that highway is ending and neighborhood street is beginning.		4		
3	Maybe LOS F for cars isn't a bad thing.	3			
3	Relocate Captiol City Trail Crossing from east leg of Blair/JND intersection to Blount & Williamson		3		
3	Cross Capitol City Trail under JND in the N Shore and Broom area			3	3
2	Implement a rail quiet zone	2			
2	Advance Monona Lakeshore visions that cover JND and add park on top.	2			
2	Extend Hancock to JND, reroute Wilson traffic via Hancock		2		
2	Close Wilson approach (at least WB toward Capitol) and reuse space for peds and bikes		2		
2	Make Wilson one-way or two-way throughout, don't switch back and fort	2			
1	Bury the power lines	1			
1	Need larger staging areas for bike and ped travelers	1			
1	Need short left-turn bays on JND and Blair and Wilaon/Willy		1		
1	Bike/Ped Bridge for Cap City Trail crossing at Blair/JND		1		
1	Bike/Ped Bridge over JND between Wilson and Law Park east of the Monona Terrace	1			
1	Add second bike/ped path along Railroad tracks	1			
1	Overpass(es) of JND near Broom and N Shore			1	1
1	Fill lake at Law Park and eliminate skew on the Blair/JND intersection	1			
1	Add parking	1			
1	Move Capitol City trail to Monona Lakeshore past Machinery Row and the Fauerbach building	1			
1	Grade sepearated roundabout above Blair/JND intersection for bikes and peds		1		
1	Add a bathroom to Law Park	1			
1	Advocate for better transit service	1			
1	Provide shared signal on Willy at Blount and Jennifer	1			
1	Add parking meters to EB Willy from Blair to Blount	1			
1	Eliminate the channelized EBR to SB JND at Blair/JND intersection (flying right)		1		
1	Prohibit NBL and SBL, provide via right-turn/u-turn or other legal alternate routes (Main Street)		1		
1	Connect Law Park/Machinery Row parking to Monona Terrace signal to the SW, eliminate the existing driveways near Blair/JND.	1			
Other Comments					
3	Pedestrian counts on the slides seem too low. Add path counts from City.		3	3	3
1	Update City bike map to show cycletrack along Williamson and Bike Boulevard along Jennifer Street	1			
1	Request to "be on this committee" by Gene Devitt - 608-341-3291	1			
1	Do no impact historic buildings with any alternatives	1			
1	Close Gateway Mall access at Blair		1		
1	Designers should observe and ride through Blair/JND intersection to understand nuances		1		
	Totals	49	22	7	8

Blair Street and John Nolen Drive Corridor Study
Public Involvement Meeting #1

	Comment	General	Blair/JND	JND/Broom	JND/N Shore
Needs and Challenges					
5	Driveway to Machinary ROW in NBR operates poorly for Bikes PEDs and Cars		5		
3	John Nolen and Blair are Barriers for PED's and BIkes, Connection needed	3			
3	Cap city approach from East to JN and Williamson Street is not safe. Designate Separate PED and Bik	3			
3	N and S crossing of JN and Williamson St Islands are not big enough for Bikes	3			
2	Connect Capital Area to Law Park for Peds and Bikes	2			
2	6 leg intersection of Hamilton and Wilson is Confusing	2			
2	Long Term "Big Picture" Study is needed for the area	2			
2	This intersection is also very scary for bike/peds		1		1
1	Bike elevator is a bad connection to Law park	1			
1	Two stage PED and Bike Crossing at Blair and John nolen is not acceptable		1		
1	Reduce footprint of John Nolen and Blair		1		
1	Cars Block Blount when Jenifer signal is Red	1			
1	NBL and SBL at JN and Williamson St cause backups		1		
1	Improve Bike and PED experience at JN and Williamson Street	1			
1	Improve astetics along JND	1			
1	Divert traffic from John Nolen and Williamson street	1			
1	Traffic is a barrier to living downtown	1			
1	Honor the Urban Nature of the Grid system	1			
1	What about bike access on Blair?	1			
1	Tough/Impossible for pedestrians/bicyclists to cross at Main St or E Wash with redevelopment of E. Wash, need connetion w/ square	1			
1	Turns in and out of Lot across from Railroad st are just as dangerous as the intersection	1			
1	RR tracks mean that bicyclists can't cross safely along (parallel to) tracks, so must get into car traffic to avoid getting wheel caught on tracks.		1		
1	Get rid of parking on the lake. Under path and dedicate ped/bike	1			
1	JND Causeway is used by School Buses from Franklin Elementary				1
1	Ped crossings are poor at JND/N Shore				1
1	PED walk phase does not activate quickly at Broom			1	
Goals, Ideas, and Solutions					
6	Separate Bike and Ped Facilities on CAP city trail, widen path	6			
4	Separate PEDs and Bikes From John Nolen to Jenifer Street	4			
3	Eliminate all right- turn slip lanes	3			
2	Better aesthetics along JND and traffic calming - reduce speeding and red light running	2			
2	Cross Capitol City Trail under JND in the N Shore and Broom area	2			
2	Move access to Law Park to be near Hancock st	2			
2	Remove NBR slip lane at Blair and JN		2		
2	Add Coordinated Signal at Williamson Street and Blount St. with Jenifer signal	2			
1	Improve ped/bike crossing/access all allong Blair (ie. Main/E. Wash)	1			
1	Acomadate Frank Lloyd Wright Boathouse	1			
1	Bike Speed Limts on Cap City Trail	1			
1	Ped Bike Ramp from MLK to Monona Shoreline along west side of Terrace Parking	1			
1	Make John Nolen Drive a Low Speed Parkway	1			
1	Make Wilson Street carry the bulk of the Traffic to improve shoreline.	1			
1	remove lane drop and add near west terrace entrance	1			
1	Better signing for bike elevator is needed at terrace	1			
1	The study should make law park a major city park	1			
1	Add parking along Williamson Street	1			
1	Diagnal Bike Crossing at Williamson and Blount	1			
1	Move Cap City Trail along lake Shore and then bring it across Willy street at Blount	1			
1	Remove Wilson Street to JN Right Turn lane		1		
1	Abandon North short leg of Wilson street to widen Plaza	1			
1	Make eastbound Williamson Street a single lane with Parking and Separate BIke PED		1		
1	Remove Metro from Jenifer St so it is a designated Bikeway	1			
1	Law Park overpass with ped/bike access to Square/Willy/bike path	1			
1	Use of bike/ped under passes for Blair/Willy/Wilson		1		
1	No-Push-Button-Only "Walk" signs - should automatically say "wait" at all times		1		
1	Crossing here from the north feels dangerious because of the blind corner of the deli		1		
1	Main/Blair needs to support high volume ped/bike crossing. Needs a signal. Mifflin Hawk type light?	1			
1	Disallow left-turns from Blair to either WB Wilson or EB Willy - No space!		1		

1	Elevated RAB for bike/peds. Five access points?			1		
1	Relocated Stop Bar EBR at North Shore Drive					1
1	SW Path Crossing at North Shore Drive feels unsafe Cars do not stop					1
		Totals	63	19	1	5

Blair Street and John Nolen Drive Corridor Study
Public Involvement Meeting #1
Top 5 Comments by Category

Map Comments
Comment Sheets and Verbal

	Comment	General	Blair/JND	JND/Broom	JND/N Shore
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3	Relocate Captiol City Trail Crossing from east leg of Blair/JND intersection to Blount & Williamson		3		
3	Cross Capitol City Trail under JND in the N Shore and Broom area			3	3
	Totals	49	12	3	3

Traffic Terror at Blount St and Willy St Intersection.
Comments in preparation for the John Nolen/Blair Corridor Study Public Meeting November 30, 2016.

As a resident of the Fauerbach at 404 Blount Street, office window overlooks the intersection of Blount and Williamson Streets. I want to highlight the extremely dangerous two block stretch of Willy Street from the John Nolan right turn lane into the 3 lane wide east bound Willy Street, which does not narrow down until after the Jenifer Street intersection. That stretch features, once past the Machinery Row Building, a shared bike lane and sidewalk, plus a marked bike lane along the curb in the street. There is no pedestrian-exclusive sidewalk. Pedestrians, patrons of the B-cycle rental rack, and passengers at the bus stop at Willy and Jennifer, are commingled with speeding bikes enjoying the downhill run from Jennifer Street. The shared sidewalk and bike lane makes walking or waiting for the bus a truly terrifying experience.

Similarly, trying to exit the Fauerbach Parking lot into S Blount involves dodging all of the activities mentioned above, plus the Elks Club's departing guests, while negotiating one's way across: sidewalk, bi-directional speeding bikes in both the sidewalk and street curb lanes, and 6 lanes of traffic on a median divided street. Adults walking their children across to the Red Caboose add to the mix of pedestrians at risk, and people a driver must avoid. The expansion of classes at the Yoga Studio in Machinery Row has created additional parking demand on S. Blount south of Willy Street from 6 am to 9 pm; those patrons' vehicles must also negotiate that intersection. At rush hours, east-bound traffic at the Jennifer Street light is often backed up across the Blount street intersection.

Fauerbach residents have requested help to make this intersection safer. For our efforts, the City posted signs admonishing US to be more careful, a result that fails to address most of these concerns, especially speeding cyclists that take no note of Blount street traffic. We are told that the primary reason for the signal at Jenifer is to allow the buses to exit Jennifer with a left turn into Willy Street. We do not understand why it is not possible to have a paired signal with the same timing at Blount and Willy street. Traffic Engineers just say no - but I have never heard a rationale that makes sense. There is precedent elsewhere in Madison for this approach on the West side at the intersections of Spring Harbor and Craig avenue with University. This solution needs to be revisited.

Slowing drivers down sooner after leaving John Nolan is essential to preserving the small-scale pedestrian character of Willy Street. Narrowing Willy Street from the intersection with Blair, and eliminating the right turn lane will send the necessary signal that the multi lane expressway has ended. Those two improvements will certainly make that section safer for pedestrians. Through and commuter traffic can move via Blair Street onto E. Washington Street, which has the capacity and speed limit to accommodate that usage. Extra space from fewer traffic lanes can be used to move bikes into dedicated lanes both east and west bound on Willy, returning the sidewalk to the exclusive use of pedestrians.

If keeping buses on Willy street would lead to closing to Jennifer to all but Bike traffic, and moving the signal to the Blount and Willy intersection, I believe that strengthens the case for making that temporary bus routing change permanent. [Since I wrote this, apparently parking concerns in the 1200 block of Willy Street have trumped safety concerns in the 800 block, and the buses will stay on Jenifer Street. That is a flaw in the piecemeal approach to planning in E. Willy Street corridor.]

The Willy & Blount intersection is in desperate need of a traffic signal, and indicators to drivers - such as lane elimination -that vehicles must slow down at Blair Street. The distance from Blair to Livingston must not be treated as a deceleration zone, which is now the case. As proposed multifamily buildings replace single family homes and commercial uses, the additional residential development from Blount to Livingston mandates a more integrated neighborhood approach.

I look forward to participating in the process of developing holistic, well integrated solutions to enhance mobility and traffic safety for all modes in our neighborhood. I trust that you will share my comments with appropriate city officials, and refer to them in planning for the November 30 John Nolen/Blair Corridor Study Public

Karen D. Kendrick-Hands
404 S. Blount St
[redacted]

Lawrence M. Hands, PE
404 S Blount St., Unit 101
[redacted]

November 30, 2016

Blair/John Nolen Dr Corridor Study

Let's first talk about the eastbound section of Williamson Street between John Nolen Drive and Jennifer. Proper evaluation of this section will streamline the Williamson, Blair, Wilson, and John Nolen Drive intersection.

Eastbound John Nolen drive is a fast road and it is designed to look like a fast road. I, as a driver, have to slow down at the light at Wilson, Blair, and Williamson Street, but wait, I have my own vehicle lane and I can move quickly on the separate turnoff lane to what looks like the open road, 3 lanes of mostly empty pavement on Williamson Street Eastbound. I zip around my separate turnoff lane, hopefully avoiding inattentive pedestrians, see the open road and I accelerate as fast as my car will go; squealing the tires and having lots of fun. But wait. At Jennifer Street, a short distance away, the three lanes turn into one, and I have to crawl along the next 8 blocks through one of the most vibrant sections of Madison. It is slow with lots of stops. Why did I ever get sucked into taking what I thought was the Willy Street speedway? What happened to the road signals that I got that this was my special short-cut. I did get to step on the gas in front of Machinery Row and the Fauerbach and that was fun and saved me some time, but then I needed to brake, and that fast section is for naught. Now I wish that I just took East Washington to my destination, as that is a reliable faster road, but Willy Street *looked* so fast.

Willy Street shouldn't give these clues of being a fast street. It is not a fast street, and I can't imagine that anyone in the community wants it to be a fast street. But at the John Nolen Drive/Willy Street intersection, it is designed as a very fast street.

This redo of the intersection is a great opportunity to give motorists the correct clues as to what Willy Street really is. The City needs to remove the separate turnoff lane, and have Willy Street traffic wait for the green light and make a regular right hand turn, just like most right turns in Madison. This eastbound section of Willy Street between John Nolen and Jennifer should look like Williamson Street to the east, with one lane of traffic plus parking (maybe 2 lanes during rush hour). Left hand turns at Blount do not need a separate lane, but just have no parking on the parking lane by the turn so that cars can move around a car wanting to make a left turn, just like all the other left hand turns on Willy St.

A simple solution is to add parking meters on the south side of the street in front of Machinery Row and the Fauerbach and a separated 2 lane bike path in front of the Elks and Fauerbach next to the parked cars, with a pedestrian sidewalk to the south. Move the eastbound bus stop to Jennifer past the light to avoid conflict with bikes

For a pedestrian or a bike rider, there is no clear signal as to where the walkers should go and where the bicyclists should go along the south side of Willy in front of the Fauerbach and the Elks. The section in front of the Fauerbach has two bike paths, one in the street, and one taking over the sidewalk, but no good safe place for pedestrians. This is especially true for the bicyclists going westbound on the south side of the street, as they are going downhill and tend to be moving fast. The section in front of the Elks has a wide path, but veering pedestrians and veering bicyclists.

Machinery Row has a separated pedestrian sidewalk away from the off-street bike path. There is also an on-street bike path. With the extra space removed from Williamson Street, the bike lane can be separated from the sidewalk in front of the Fauerbach and the Elks lodge. These changes would calm the traffic in this section of Williamson, and make it safer for both bicyclists and pedestrians.

In addition, Eastbound Wilson street carries so little traffic that the current light frequently doesn't give eastbound Wilson a green light as the signal can see that there are no cars waiting. The separate on-ramp from Eastbound Wilson to southbound John Nolen Drive should be removed, just like for most intersections. Eastbound Wilson can also be right-sized to make it skinnier.

Westbound Wilson could be made skinnier also, based on my understanding of traffic counts along this street. Westbound Williamson Street between Blount and John Nolen Drive may not require any changes as it provides effective storage for vehicles waiting for the light during the morning rush.

Left turns are very dangerous on southbound Blair to Willy street and Northbound John Nolen Drive to Wilson Street. These should be prohibited. To go from Blair to Willy, use a "Detroit left turn" where one turns right on Wilson and provide for a u-turn lane at Hancock. To turn left from John Nolan Drive to the Square, make the legal left turn at E Main St.

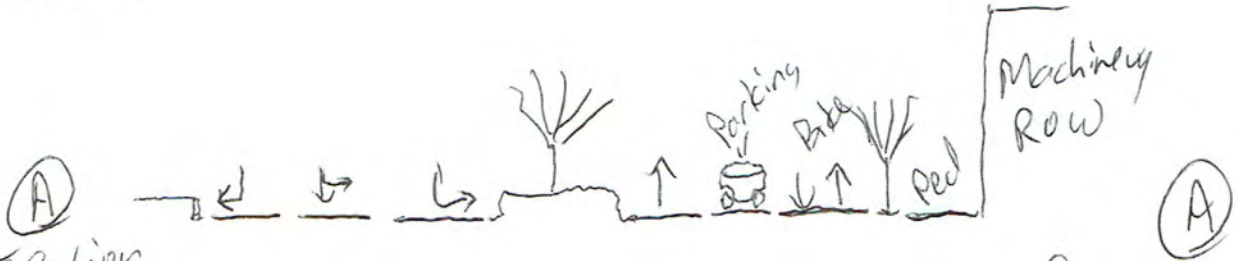
With this design, the pedestrian signal at the intersection can be simplified. I have attached a sketch of the proposed changes.

Thank you for your consideration,
Kind regards,

Lawrence M. Hands, PE, BCEE

Lawrence M. Hands, PE
Blair/John Nolen Drive Intersection
comments 11/30/2016

Section



Section

No Left turns - ① John Nolen to Wilson ② Blair to Willy

Held, Jeff

From: [redacted]
Sent: Wednesday, November 30, 2016 3:38 PM
To: Held, Jeff
Subject: Contact Information - John Noles/Blair Corridor Study

Hi Jeff -

Thanks for taking my call. I was planning on, but won't be able to attend this evening's meeting. I will be Madison Gas and Electric Company's representative for the John Nolen/Blair St. corridor study. I am hoping to receive the meeting minutes or notes from the kickoff meeting. Also, I thought I would provide you with a couple of issues MGE experiences along S. Blair St.

One issue MGE experiences along S. Blair St. is the ability for employees to safely cross S. Blair St. by foot. The street light timing makes it challenging to cross at E. Main St.

Another safety issue is the sight line for vehicles attempting to turn onto S. Blair St. at Railroad St./S. Blair St. is poor due to the existing buildings/structures.

Please reply with any questions. I look forward to being involved with this process.

Tim

Tim Bliefernicht, P.E.
Director - Facilities Management
[redacted]

Southwestern Law Park Ped-Bike Underpass Concept

This is a proposed radical redesign of the John Nolen Drive corridor on the southwestern end of Law Park.

Underpass Concept A
Reconstruct John Nolen Drive in the vicinity of North Shore Drive and Broom Street to allow for a ped/bike underpass to be constructed between the Capital City Trail and the parkland area just west of Broom Street. This would require raising the elevation of the roadway approximately 6 to 7 feet.

Reconstruct both railroad corridors in this area by reconfiguring the trackage so that the two rail corridors meet at a new switch location between North Shore Drive and Broom Street. The publicly owned east-west rail corridor would follow a new railroad right of way just north of North Shore Drive to reconnect with the existing corridor just east of Bedford Street. The Union Pacific track could be moved slightly to the west in this area to allow JND to be shifted slightly away from the existing lakeshore in this area. Both railroads would also be raised approximately 4 feet in elevation to allow for the various ped/bike paths to travel under the tracks as underpasses in this vicinity.

North Shore Drive would also be raised approximately 6 feet in elevation as it approaches to connect with JND. This would allow the North Shore ped/bike path to be relocated as it approaches JND to travel through a new underpass under North Shore Drive. It would continue under the relocated publicly owned railroad tracks and connect to a new ped/bike path along the former publicly owned rail corridor. This new ped/bike path would connect the Cannonball ped/bike path with the Wilson Street ped/bike corridor. Broom Street would be reconstructed approximately 5 feet higher to allow for an underpass where the new ped/bike corridor crosses Broom Street.

The new ped/bike underpass that would connect the Capitol City Trail with the new ped/bike path along the old Union Pacific rail corridor could be constructed as a bridge similar to the East Washington Avenue bridge over the Yahara River. During construction a portion of the fill that was placed in this area years ago to fill in Lake Monona and create JND would be removed to create a small lagoon between the existing Lake Monona shoreline and the original Lake Monona shoreline that existed along the old Chicago and Northwestern Railroad before that railroad corridor was originally constructed in 1864. This railroad corridor became publicly owned by the Wisconsin River Trail Transit Commission in 1980.

The new lagoon would reclaim this filled area of Lake Monona to be part of a state of the art storm water treatment facility for the storm water entering the lake from multiple storm water outflows that exist in the area. The debris and sediment collection areas for the storm water would be designed to be cloaked with landscaping features to make the storm water outflows look more like natural springs and streams. Four or more vertical axis windmills could be constructed along the lakeshore in this vicinity to generate electricity to power a lake water pumping facility that would circulate fresh lake water through the lagoon area. Depending on the amount of wind power available at any time, the fresh lake water

would appear as springs at the disguised storm water outflows and, when there is enough wind to power it, a spray fountain in the lagoon that varies in height depending on the power produced by the windmills.

The existing parkland, consisting of a dog park, a basketball court and 4 tennis courts, could be reconfigured to contain some of the same park elements or reconfigured for other uses. The tennis courts and basketball court often sit idle. The dog park is little used during the day Monday through Friday but can become heavily used on weekday evenings and on weekends. In fact, this dog park can become crowded with too many dogs at times and the grass there has a very hard time recovering from this periodic heavy use. In the spring and fall this dog park becomes very muddy whenever the ground is wet and it is above freezing. Perhaps the area could be reconfigured to create a larger dog park and eliminate or reduce the number of tennis courts.

Benefits of the proposed extensive reconstruction of this transportation corridor

- All ped/bike path crossings would be grade separated from the roads and rail corridors in this area. This would allow the ped/bike traffic to travel unimpeded through the area.
- The new ped/bike path along the old publicly owned rail corridor would connect multiple nearby ped/bike paths to the Wilson Street ped/bike corridor with mostly off road paths and a grade separated crossing of Broom Street.
- Because all the roads in this area would become grade separated from pedestrian and bike traffic the vehicular traffic flow through the area would be greatly improved. The reduced idling times for traffic stopped at the lights would translate into improved air quality in this area.
- The proposed state of the art storm water treatment system would greatly benefit Lake Monona and could become a self guided educational walkway tour area to educate the public on the city's efforts to improve storm water quality.
- The proposed vertical axis wind powered generators would be part of this "Sustainable Future" walkway by showing how the wind can be harnessed to work for us in helping to improve our lake water quality.
- The combining of the two rail corridors and moving the switch area to the west of Broom Street would clean up the present configuration with two sets of tracks crossing Broom Street at the intersection with John Nolen Drive. With only one set of tracks the intersection would be easier to navigate for traffic traveling on Broom Street.

Underpass Concept A
This is the full proposed concept described above.

Alternative Underpass Concept B

This is a scaled down version of the concept reducing the size of the main ped/bike underpass under John Nolen Drive. Both railroad corridors would remain where they are presently located however the Union Pacific rail corridor would be raised in grade to allow for the Ped/bike underpass under both John Nolen Drive and the railroad tracks. The publicly owned railroad corridor would have to be raised slightly but not as much as it would in Option A. The new ped/bike connection in the triangular parkland area would terminate at Broom Street. The storm water treatment system could still be constructed but it would have to run in a smaller channel with the ped/bike underpass. Although this concept would cost less than Option A, the rail corridors would continue to box in the parkland in the area and would make it impossible to create grade separation for a ped/bike path across Broom Street to South Hamilton Street.

Alternative Underpass Concept B

Alternatives to a ped/bike underpass concept

Build ped/bike overpasses for this entire area
This would require multiple bridges that would have to be constructed more than 23 feet over the railroad corridors to achieve the clearance required by Federal Law. At least two large bridges would have to be constructed with very long approaches at each end to gradually transition back to the existing path elevation. A third bridge would be required to achieve ped/bike path separation over Broom Street. However there is no room for a third bridge over Broom Street with the existing publicly owned rail corridor trackage location.

These bridges would block the scenic viewsheds of the Isthmus and Lake Monona for people traveling the corridor and living on properties adjacent to the area. While some may like the views from the perspective of the ped/bike path users, others will be terrified of using the

bridges due to their height and due to complications caused by adverse weather conditions including high winds, rain, snow and ice. In other words, bridges would be too scary for some people to use. Therefore, you would still have to provide the at grade crossings at the intersections for people who don't want to use the bridges for whatever reason.

Due to the need to keep these ped/bike paths operational all year long, a large amount of salt would be required during the winter to keep the ramps and bridges safe to use. This salt use would contribute to higher maintenance costs for the bridge structures.

Keep the present at grade situation into the foreseeable future
This would cause the present situation only to get worse. Monies would be spent to maintain a heavily utilized transportation interface in the heart of this city that is liked by no one. Additional development on properties adjacent to this area could keep us from choosing the underpass option in the future.

Other rational for or against the underpass concept

For
Foot powered transportation would for the first time since 1864 be able to access the north shoreline of Lake Monona without having to cross a hazardous railroad and highway corridor at grade.

Against
Ped/bake underpasses are dangerous and people will not use them for fear of being isolated and vulnerable to attack by another person.

For
Madison already has numerous ped/bike underpasses that are heavily used by Madison residents and visitors to the city. There have been no to very few incidences of crime at most of these underpasses. One of the first underpasses to be built was the underpass at Wingra Creek where it travels under John Nolen Drive. This popular ped/bike underpass has been used as part of the route for the bicycle portion of the Ironman Race here in Madison ever since the popular race was first held here. Then there are the underpasses along the new Yahara River Corridor traveling under East Washington Avenue and Johnson Street. Other popular underpasses cross the beltline and Verona Road and the rail corridor near the Kohl Center on the UW Campus. At the end of this document are some links to similar underpasses in Colorado that are well received by the people who live there and use them.

Against
This concept will cost too much.

For
Although a project of this magnitude would be expense, it would provide a much needed improvement to the quality of life in the heart of Madison. It would help to reconnect downtown Madison with Lake Monona and restore the reasoning behind placing the State

Capitol in the Madison area in the first place, the beauty of experiencing the lakes and landscapes that have drawn mankind to this area ever since the last glacier retreated.
By comparison, this project would be much less expensive than the proposed massive reconstruction of the Verona Road and Stoughton Road corridors. It would provide a much needed shift from spending most of our transportation tax dollars for the benefit of motorized vehicles to making real improvements to our non-motorized transportation grid.

Against
Attempting to raise the grade of the rail corridors and move the tracks to new alignments would be impossible to do politically and physically.

For
The trackage along these railroad corridors has been altered in the recent and distant past. There used to be four sets of tracks that traveled along the Law Park area. There were also multiple sets of tracks that were lain across Lake Monona rather than the one set of tracks that travel across the lake now. The multiple tracks were removed as they were no longer needed and the existing single track at Monona Terrace was re-aligned to travel through the area along the best possible route at the time. There is plenty of room along these rail corridors to raise the grade of the tracks up to 5 feet higher than the present tracks. A grade change of 1% or less can me maintained along the corridor.
In 1996, a two mile section of a railroad corridor adjacent to the Dane County Airport was relocated to provide adequate clearance to expand one of the main runways for the airport. This was a major undertaking as the relocated corridor crossed wetlands and required a full environmental impact review by the US Corps of Engineers.

Against
Even the higher elevations of 7 feet or less proposed for the road and rail corridors will block the viewsheds in this area.

For
Because most of the private properties facing the lake in the Broom Street area are on land that is at a elevation that is more than 7 feet above the existing corridor elevation the views of the lake from them would be maintained. For travelers in both directions along this corridor and those approaching the area from the southern end of the causeway over Lake Monona, an elevation difference of 7 feet would be barely noticeable and views of the entire city skyline would remain much as they are now. In contrast, a system of ramps and bridges for a ped/bike overpass alternative would completely alter all of the viewsheds in this area no matter which direction you are headed.

Images of some existing ped/bike underpasses in Madison

Wingra Creek ped/bike path at John Nolen Drive

Wingra Creek ped/bike path at John Nolen Drive - Looking South

Wingra Creek ped/bike path at Olin Avenue

Yahara River ped/bike path at East Washington Avenue

This document was created by Ron Shutvet to promote grade separation wherever possible on our ped/bike transportation grid. For questions or for more information you can contact me at [redacted]

For additional historical information about the John Nolen Corridor visit www.olin-turville.org This website has a timeline of historical events along the John Nolen Drive Corridor as well as links to other websites containing historical data and images of this area.

Below are additional links with information and images of similar ped/bike underpasses that have recently been constructed in Colorado. All of these webpages have multiple pictures of each underpass configuration.

http://lorisandassociates.com/services/ped-bridges/wonderland-creek-underpass

http://lorisandassociates.com/services/ped-bridges/elmers-two-mile-underpass

http://lorisandassociates.com/services/ped-bridges/skunk-creek-underpass

http://lorisandassociates.com/services/vehicular-bridges/old-wadsworth-bridge

http://lorisandassociates.com/services/ped-bridges/van-bibber-underpass

http://lorisandassociates.com/services/ped-bridges/u-s-highway-287-underpass

Elevation Data for Ped-Bike Underpasses in North Shore-Broom-JND Area

Lake Monona
Historical High = 847.86 feet
100 yr Flood = 847.70 feet
Summer Target Max = 845.20 feet

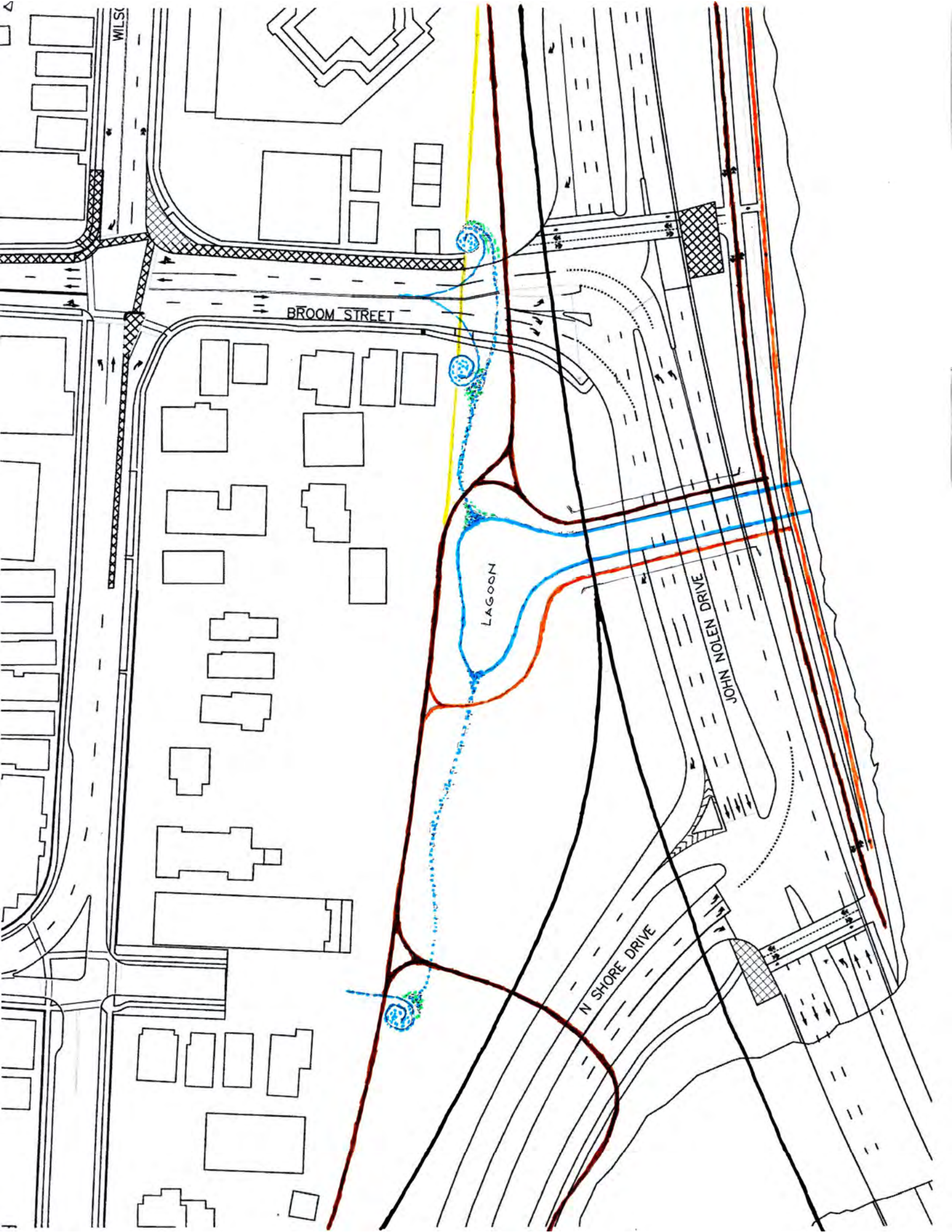
JND Causeway Northern Bridge
Existing Capital City Trail elevation @ north most bridge abutment = 853.20 feet
Bottom of existing bridge support beam = 848.70 feet
Thickness of roadway + support beam = 4.5 feet
Proposed underpass Ped/Bike Tail elevation = 848.00 to 849.70 feet
This type of bridge would need to be 7.3 feet to 9 feet higher depending on trail elevation (would be less with a different type of bridge beam and bridge design)
With bridge design similar to East Washington/Yahara bridge the bridge would only have to be 6 feet to 7.70 feet higher depending on the elevation chosen for the new Bed/bike trail

Monona Terrace
Ped/bike Trail = 849.70 feet
Top of breakwater = 853.46 feet

East Washington - Yahara River Bridge
Yahara River Historical High = 847.86 feet (approx.)
Ped/Bike Trail = 848.00
East Washington Road Elevation = 859.00 feet (at sidewalk level above Ped/Bike Trail)
Ped/Bike Trail Clearance = 9.0 feet

Railroad Bridge over Wingra Creek @ JND
Ped/Bike Trail = 847.75 feet
Top of Rail = 857.41 feet
Ped/Bike trail clearance = 8.0 feet

Railroad Bridge at North Shore/JND Intersection
Existing top of rail = 853.25 feet
If new Ped/Bike underpass @ 848.00 feet top of rail would have to be 4.16 feet higher (approx. depending on design of support beam)
Maximum railroad grade = 1% (approx.)
Minimum length of elevation adjustment for 4 foot elevation change = 400 feet
Minimum length of elevation adjustment for 6 foot elevation change = 600 feet


BROOM STREET
LAGOON
JOHN NOLEN DRIVE
N SHORE DRIVE

Held, Jeff

From: Petykowski, Christopher <CPetykowski@cityofmadison.com>
Sent: Thursday, August 3, 2017 3:13 PM
To: Held, Jeff; Lynch, Tom
Subject: FW: Blair/Williamson/John Nolen Corridor Concerns

Importance: High

Chris Petykowski, P.E.
Principal Engineer
City of Madison
210 Martin Luther King Jr. Blvd. Rm. 115
Madison, WI 53703
608-267-8678

From: Kelly Forman [redacted]
Sent: Thursday, August 3, 2017 2:25 PM
To: Petykowski, Christopher
Subject: Blair/Williamson/John Nolen Corridor Concerns
Importance: High

Dear Chris,

I am happy to hear that the city is reviewing this corridor because I am very concerned that it's just a matter of time before there is a car-bike/car-car/car-pedestrian fatality at this intersection.

This area of town is exceptionally busy which is wonderful for business but very challenging to safely navigate. It is nearly impossible to safely pull in or out of the driveway of the Machinery Row building in a car or on a bike. As you likely already know – this building houses popular, high traffic Madison businesses: Machinery Row Bikes, Sardine, and The Studio Yoga. Because of the bike path, multiple streams of traffic and the timing of the traffic lights, there are very few ways to enter or exit this building in a safe and reasonably convenient way.

As an example, a few current options for exiting the Machinery Row Building in a car to head SW on John Nolen:

1. Exit right to Williamson Street, make U-turn at Blount onto Williamson Street, turn right onto John Nolen
2. Exit right onto John Nolen across 3 lanes of traffic, immediately turn left onto E Wilson, make a U-turn at Hancock back onto E Wilson, turn right onto John Nolen
3. Exit right to Williamson Street, make U-turn at Blount onto Williamson Street, cross intersection of John Nolen/Williamson Street, make a U-turn at Hancock onto E Willson, turn right onto John Nolen

This list is obviously not comprehensive but written to illustrate the challenge. Nearly 5 directions of traffic need to be vetted before pulling onto Williamson Street – the hazard is obvious.

I am looking forward to hearing about what plans the city will develop to ameliorate this serious issue.

Thank you in advance.

Best,

Kelly Forman
Director of Operations

PCNA | Preventive Cardiovascular Nurses Association
[redacted]

APPENDIX C
OPERATIONS ANALYSIS 2050

John Nolen Drive, Blair Street, Wilson Street, and Williamson Street - 2015 Existing LOS

Year 2015 Existing Traffic Operations & Queues

Corridor With Existing Geometrics & Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	Level of Service/Queue per Movement by Approach												Intersection HCM LOS	Intersection Delay (s)
			Eastbound			Westbound			Northbound			Southbound				
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	D	D	D	D	D		F		A	F		B	F	153
			30	*44*	*1*	*400*	*324*		*798*		*140*	*755*		*76*		
		PM	D	D	D	D	D		D		B	C		B	D	36.7
			44	*190*	*80*	*459*	*254*		*757*		*900*	*417*		*26*		

Notes: (*) indicates HCM2000 output due to non-NEMA phasing; (---) indicates a movement that is prohibited or does not exist.

Grey highlighted cell indicates poor level of service and v/c < 1.0.

Blue highlighted cell indicates v/c >= 1.0.

Green highlighted cell indicates v/c >= 1.1.

Yellow highlighted cell indicates v/c >= 1.2.

Orange highlighted cell indicates v/c >= 1.3.

Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive, Blair Street, Wilson Street, and Williamson Street - 2050 Forecasted LOS

Year 2050 Existing Traffic Operations & Queues

Corridor With Existing Geometrics & Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	Level of Service/Queue per Movement by Approach												Intersection HCM LOS	Intersection Delay (s)
			Eastbound			Westbound			Northbound			Southbound				
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	D	D	D	E	D		F		A	F		B	F	342.2
			37	*51*	*9*	*516*	*450*		*1116*		*179*	*1060*		*106*		
		PM	D	D	D	E	D		F		C	F		B	F	167.9
			54	*226*	*131*	*610*	*315*		*1283*		*1232*	*800*		*31*		

Notes: (*) indicates HCM2000 output due to non-NEMA phasing; (---) indicates a movement that is prohibited or does not exist.

Grey highlighted cell indicates poor level of service and v/c < 1.0.

Blue highlighted cell indicates v/c >= 1.0.

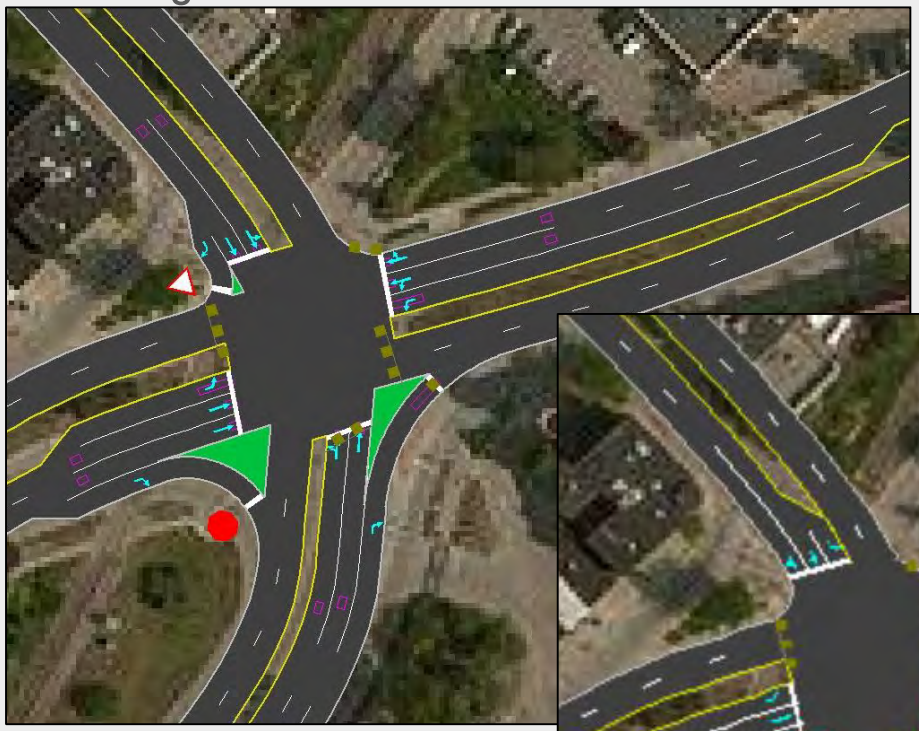
Green highlighted cell indicates v/c >= 1.1.

Yellow highlighted cell indicates v/c >= 1.2.

Orange highlighted cell indicates v/c >= 1.3.

Red highlighted cell indicates v/c >= 1.4.

Existing Geometrics



Alternative 1

Year 2050 Forecast Traffic Operations & Queues

Alternative 1 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach												Intersection LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH/RT		LT	TH	RT	LT	TH/RT			
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street	Traffic Signal	AM	LOS	D	D	D	E	D		E	D	A	C	E		D	54.8
			95th % Queue (ft)	43	60	0	484	306		159	821	120	90	949			
		PM	LOS	D	D	C	F	D		C	C	B	C	C		D	36.7
			95th % Queue (ft)	48	192	125	281	209		33	700	346	54	386			
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	C	--	C	--	B	A	B	A	--	A	8.1
			95th % Queue (ft)	--	--	--	10	--	8	--	282	4	1	279	--		
		PM	LOS	--	--	--	D	--	D	--	B	A	C	A	--	A	9.6
			95th % Queue (ft)	--	--	--	112	--	50	--	431	5	4	117	--		

Notes: (*) indicates HCM2000 output due to non-NEMA phasing; (---) indicates a movement that is prohibited or does not exist.

Grey highlighted cell indicates poor level of service and v/c < 1.0.

Blue highlighted cell indicates v/c >= 1.0.

Green highlighted cell indicates v/c >= 1.1.

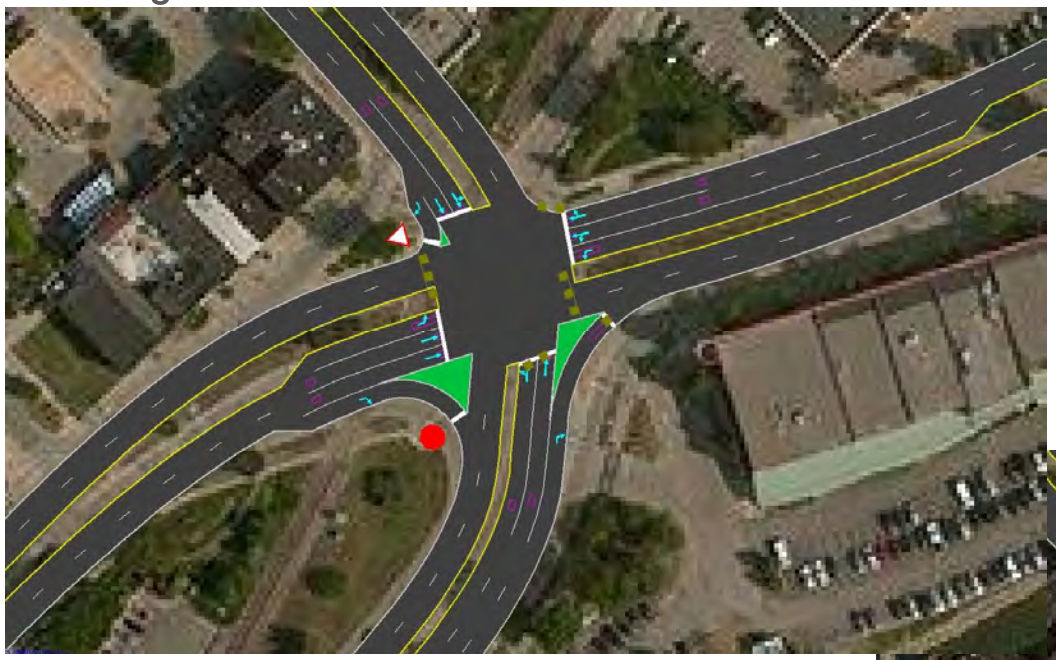
Yellow highlighted cell indicates v/c >= 1.2.

Orange highlighted cell indicates v/c >= 1.3.

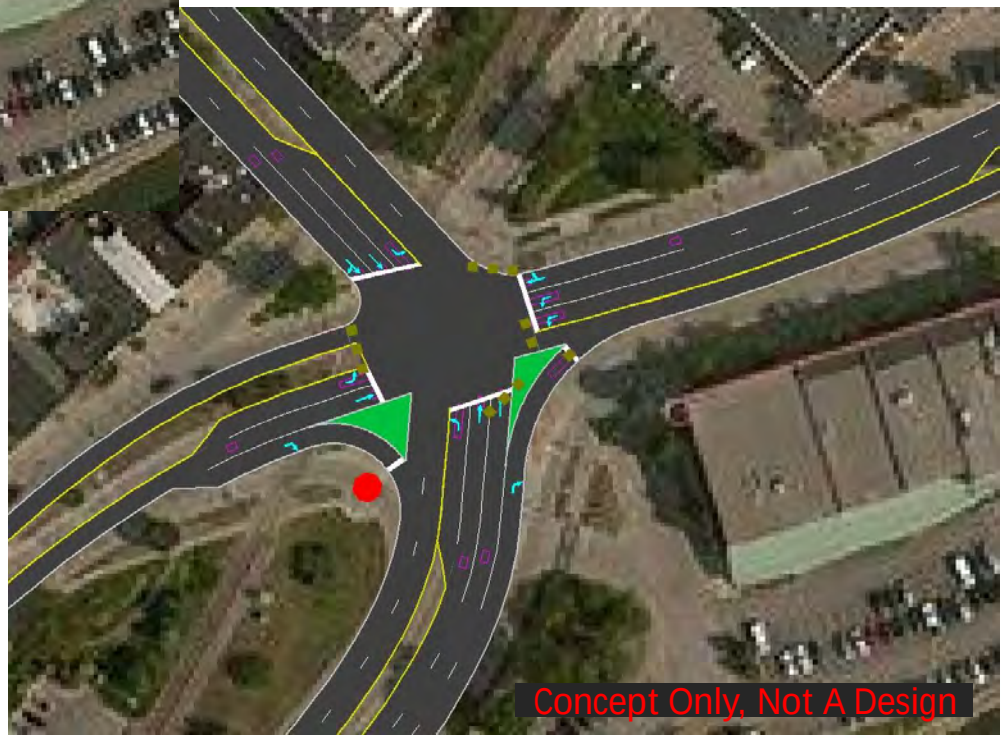
Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive & Blair Street/Wilson Street/Williamson Street

Existing Geometrics



Alternative 2



John Nolen Drive & Blair Street/Wilson Street/Williamson Street – Alternative 2 LOS and Queue Table

Year 2050 Forecast Traffic Operations & Queues

Alternative 2 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach												Intersection LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH/RT		LT	TH	RT	LT	TH/RT			
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	LOS	E	E	E	E	F		E	E	A	D	F		E	74.5
			95th % Queue (ft)	*52*	*143*	*0*	*488*	*906*		*205*	*1014*	*158*	*127*	*1203*			
		PM	LOS	D	F	D	E	C		D	E	D	D	E		E	63.9
			95th % Queue (ft)	*57*	*534*	*94*	*441*	*148*		*19*	*808*	*980*	*58*	*597*			
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	D	--	D	--	B	A	B	A	--	A	6.3
			95th % Queue (ft)	--	--	--	*12*	--	*10*	--	*269*	*3*	*1*	*152*	--		
		PM	LOS	--	--	--	D	--	D	--	B	A	C	A	--	A	9.5
			95th % Queue (ft)	--	--	--	*120*	--	*66*	--	*441*	*5*	*1*	*10*	--		

Notes: (*) indicates HCM2000 output due to non-NEMA phasing; (---) indicates a movement that is prohibited or does not exist.

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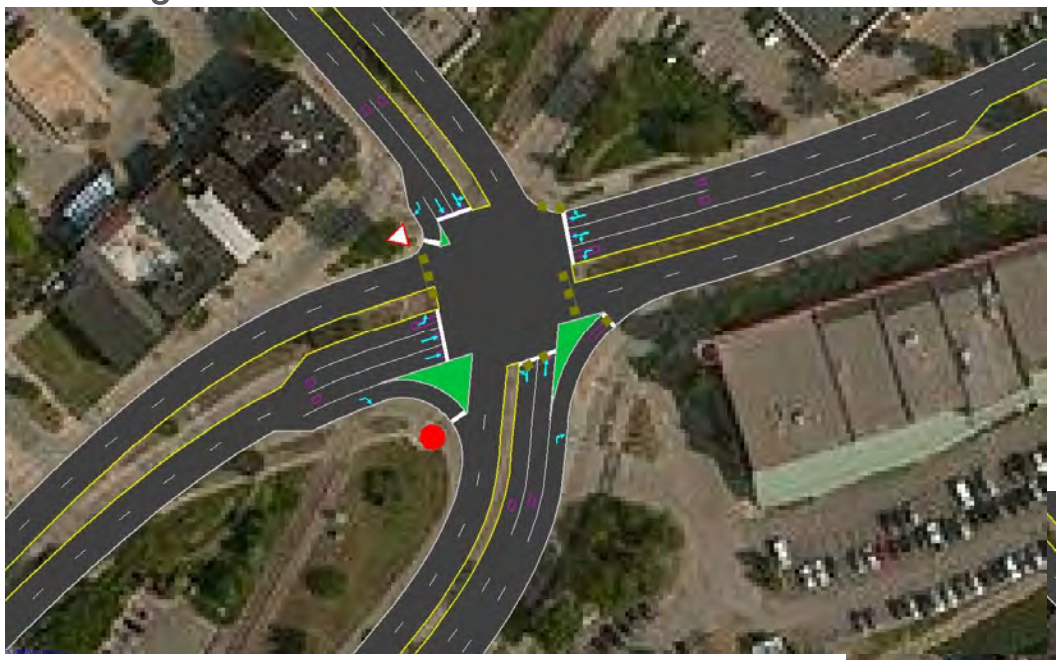
Yellow highlighted cell indicates v/c >= 1.2.

Orange highlighted cell indicates v/c >= 1.3.

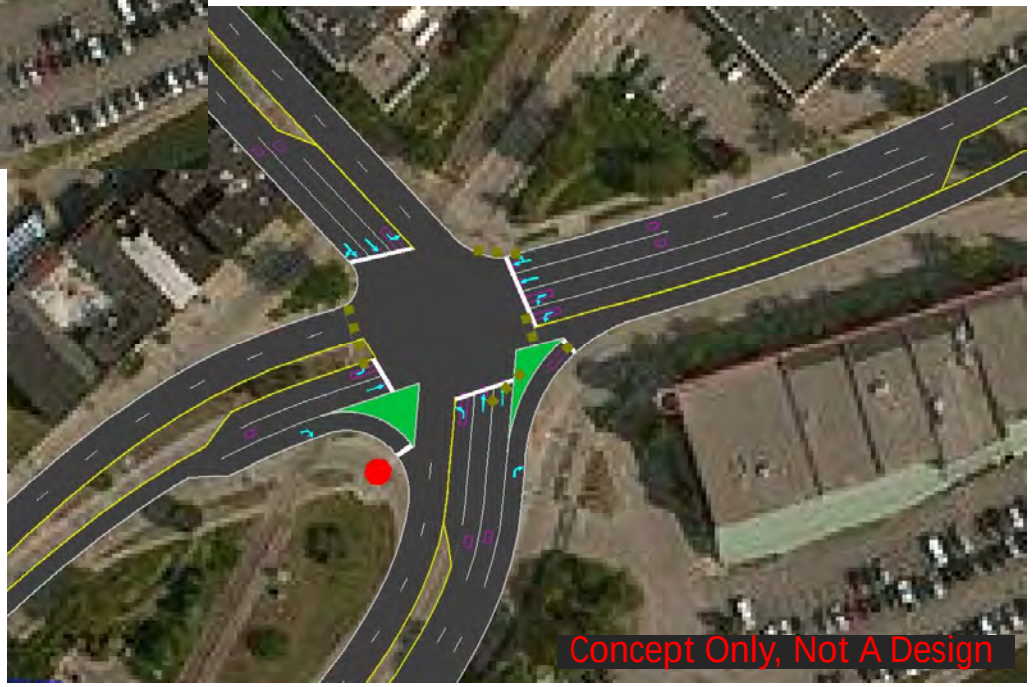
Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive & Blair Street/Wilson Street/Williamson Street

Existing Geometrics



Alternative 3



John Nolen Drive & Blair Street/Wilson Street/Williamson Street – Alternative 3 LOS and Queue Table

Year 2050 Forecast Traffic Operations & Queues

Alternative 3 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach													Intersection LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound					
				LT	TH	RT	LT	TH/RT		LT	TH	RT	LT	TH/RT				
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	LOS	E	F	E	E	D		F	D	A	D	E			D	54.1
			95th % Queue (ft)	*52*	*167*	*9*	*546*	*352*		*203*	*599*	*199*	*124*	*1102*				
		PM	LOS	E	F	D	E	C		D	E	D	D	D			E	59.7
			95th % Queue (ft)	*61*	*574*	*112*	*463*	*75*		*21*	*865*	*1040*	*65*	*611*				
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	D	--	D	--	B	A	B	A	--		A	6.3
			95th % Queue (ft)	--	--	--	*12*	--	*10*	--	*269*	*3*	*1*	*149*	--			
		PM	LOS	--	--	--	E	--	E	--	B	A	C	A	--		B	10.1
			95th % Queue (ft)	--	--	--	*129*	--	*48*	--	*484*	*5*	*1*	*14*	--			

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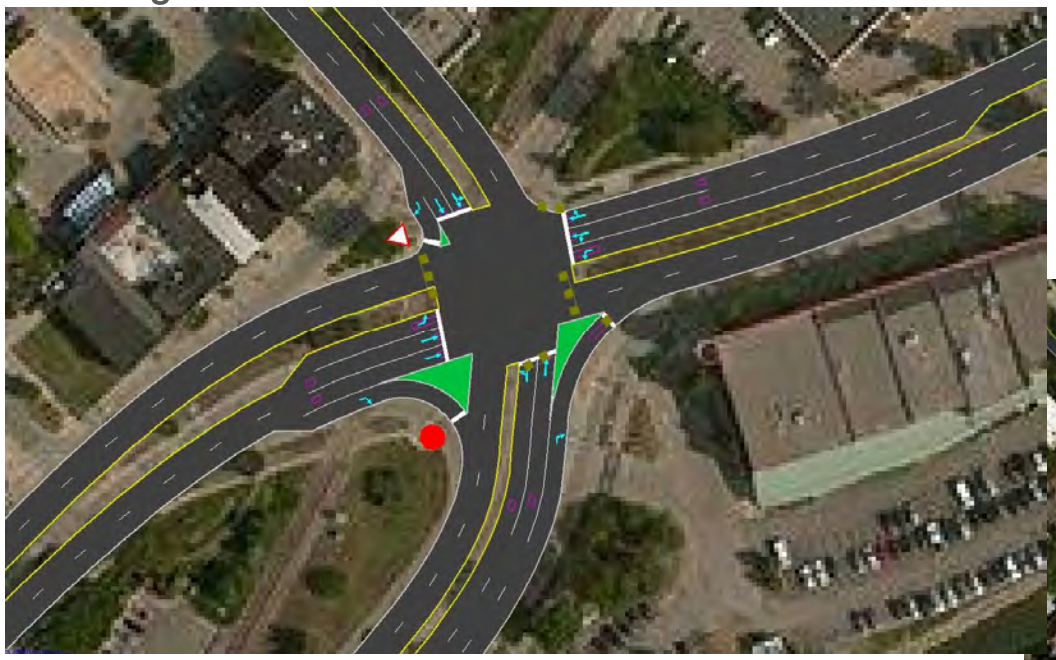
Yellow highlighted cell indicates v/c >= 1.2.

Orange highlighted cell indicates v/c >= 1.3.

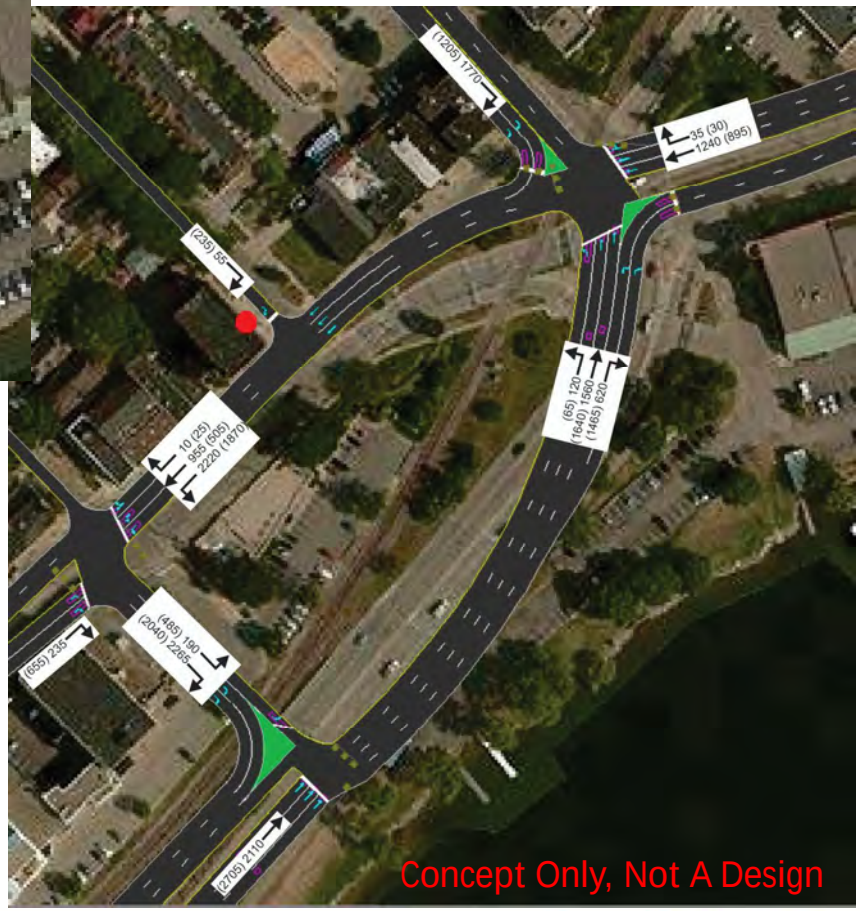
Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive, Blair Street, Wilson Street, and Williamson Street

Existing Geometrics



Alternative 4



XX = AM Peak Hour Volumes

(XX) = PM Peak Hour Volumes

John Nolen Drive & Blair Street/Wilson Street/Williamson Street – Alternative 4 LOS and Queue Table

Year 2050 Forecast Traffic Operations & Queues

Alternative 4 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach												Intersection HCM LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	LOS	--	--	--	--	F		F	A	B	--	--	F	E	58.9
			95th % Queue (ft)	--	--	--	--	539		221	11	159	--	--	970		
		PM	LOS	--	--	--	--	C		D	A	A	--	--	C	B	15.2
			95th % Queue (ft)	--	--	--	--	211		34	6	194	--	--	442		
John Nolen Drive & Hancock Street*	Traffic Signal	AM	LOS	E	--	A	--	--	--	A			--	--	--	A	6.8
			95th % Queue (ft)	250	--	450	--	--	--	72			--	--	--		
		PM	LOS	C	--	A	--	--	--	D			--	--	--	C	30.6
			95th % Queue (ft)	258	--	23	--	--	--	709			--	--	--		
Wilson Street & Hancock Street*	Traffic Signal	AM	LOS	--	--	E	A	A		--	--	--	--	--	--	A	7.1
			95th % Queue (ft)	--	--	155	86	54		--	--	--	--	--	--		
		PM	LOS	--	--	D	B	A		--	--	--	--	--	--	B	17.2
			95th % Queue (ft)	--	--	288	615	98		--	--	--	--	--	--		
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	E	--	E	--	A	A	A	A	--	A	2.6
			95th % Queue (ft)	--	--	--	17	--	13	--	286	3	1	181	--		
		PM	LOS	--	--	--	D	--	D	--	A	A	A	A	--	A	3.3
			95th % Queue (ft)	--	--	--	110	--	40	--	470	6	3	158	--		

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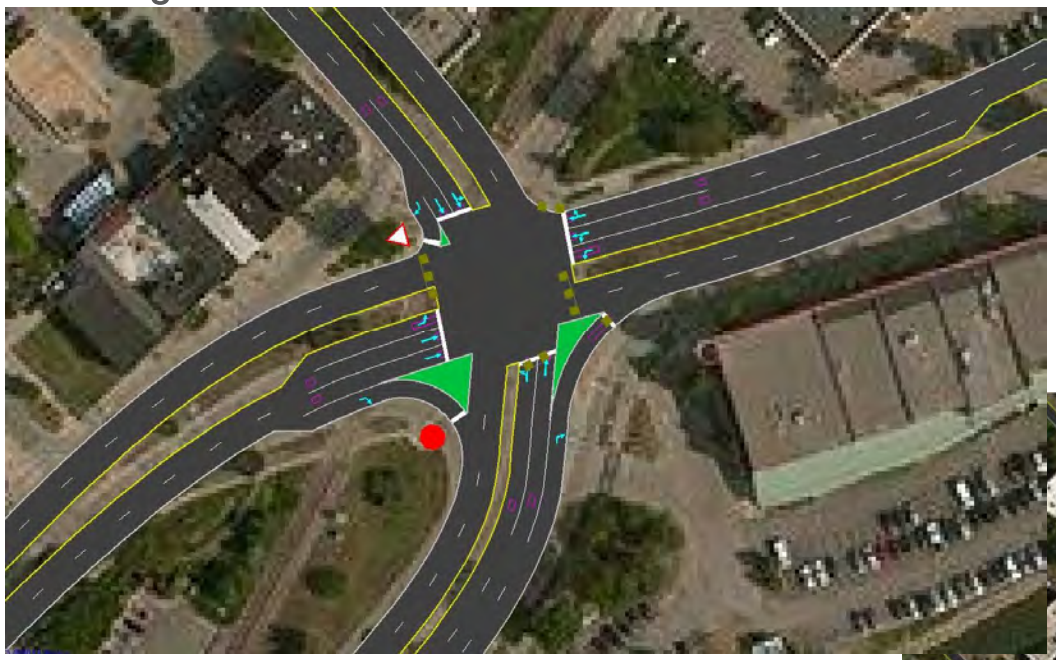
Yellow highlighted cell indicates v/c >= 1.2.

Orange highlighted cell indicates v/c >= 1.3.

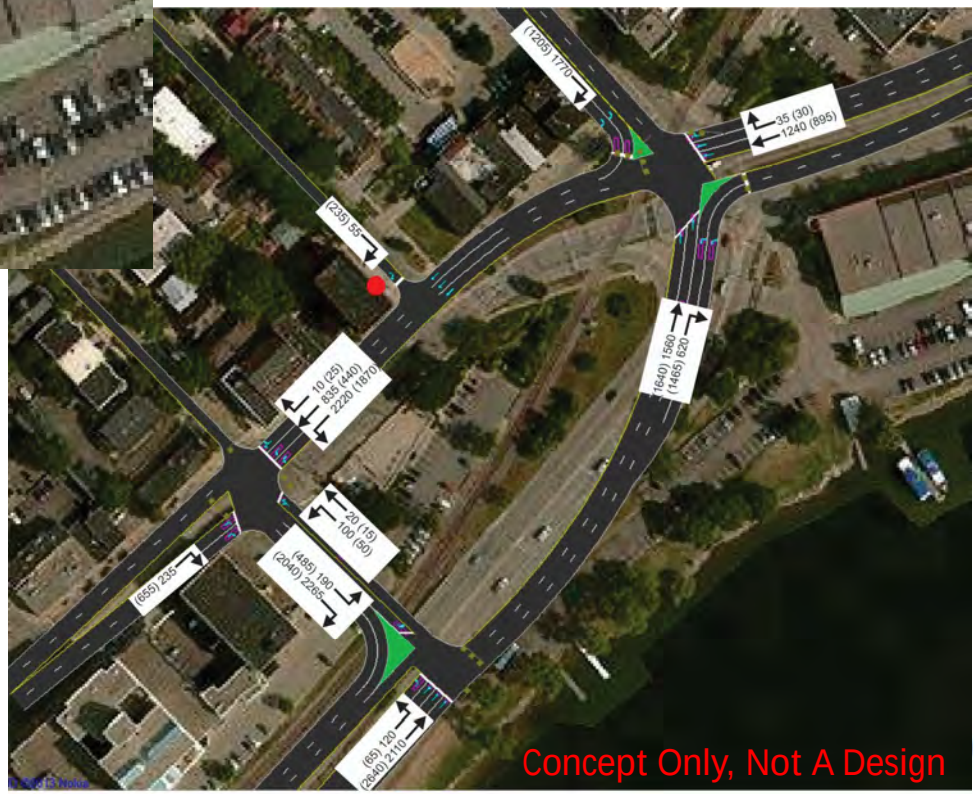
Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive, Blair Street, Wilson Street, and Williamson Street

Existing Geometrics



Alternative 4a



XX = AM Peak Hour Volumes

(XX) = PM Peak Hour Volumes

John Nolen Drive & Blair Street/Wilson Street/Williamson Street – Alternative 4a LOS and Queue Table

Year 2050 Forecast Traffic Operations & Queues

Alternative 4a Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach												Intersection HCM LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	LOS	--	--	--	--	D		--	A	B	--	--	D	C	29.6
			95th % Queue (ft)	--	--	--	--	*377*		--	*22*	*122*	--	--	*705*		
		PM	LOS	--	--	--	--	C		--	A	B	--	--	B	B	12.1
			95th % Queue (ft)	--	--	--	--	*211*		--	*8*	*306*	--	--	*268*		
John Nolen Drive & Hancock Street*	Traffic Signal	AM	LOS	D	--	A	--	--	--	A	A	--	--	--	--	A	5.2
			95th % Queue (ft)	*198*	--	*353*	--	--	--	*1*	*4*	--	--	--	--		
		PM	LOS	E	--	A	--	--	--	A	B	--	--	--	--	B	15.4
			95th % Queue (ft)	*340*	--	*13*	--	--	--	*2*	*617*	--	--	--	--		
Wilson Street & Hancock Street*	Traffic Signal	AM	LOS	--	--	D	A	A		C			--	--	--	A	9.8
			95th % Queue (ft)	--	--	*114*	*339*	*155*		*102*			--	--	--		
		PM	LOS	--	--	D	B	A		B			--	--	--	C	20.9
			95th % Queue (ft)	--	--	*298*	*618*	*160*		*42*			--	--	--		
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	D	--	D	--	A	A	A	A	--	A	3.1
			95th % Queue (ft)	--	--	--	*13*	--	*11*	--	*300*	*3*	*1*	*190*	--		
		PM	LOS	--	--	--	D	--	D	--	B	A	B	A	--	A	9.9
			95th % Queue (ft)	--	--	--	*110*	--	*40*	--	*480*	*6*	*3*	*171*	--		

Notes: (*) indicates HCM2000 output due to non-NEMA phasing; (---) indicates a movement that is prohibited or does not exist.

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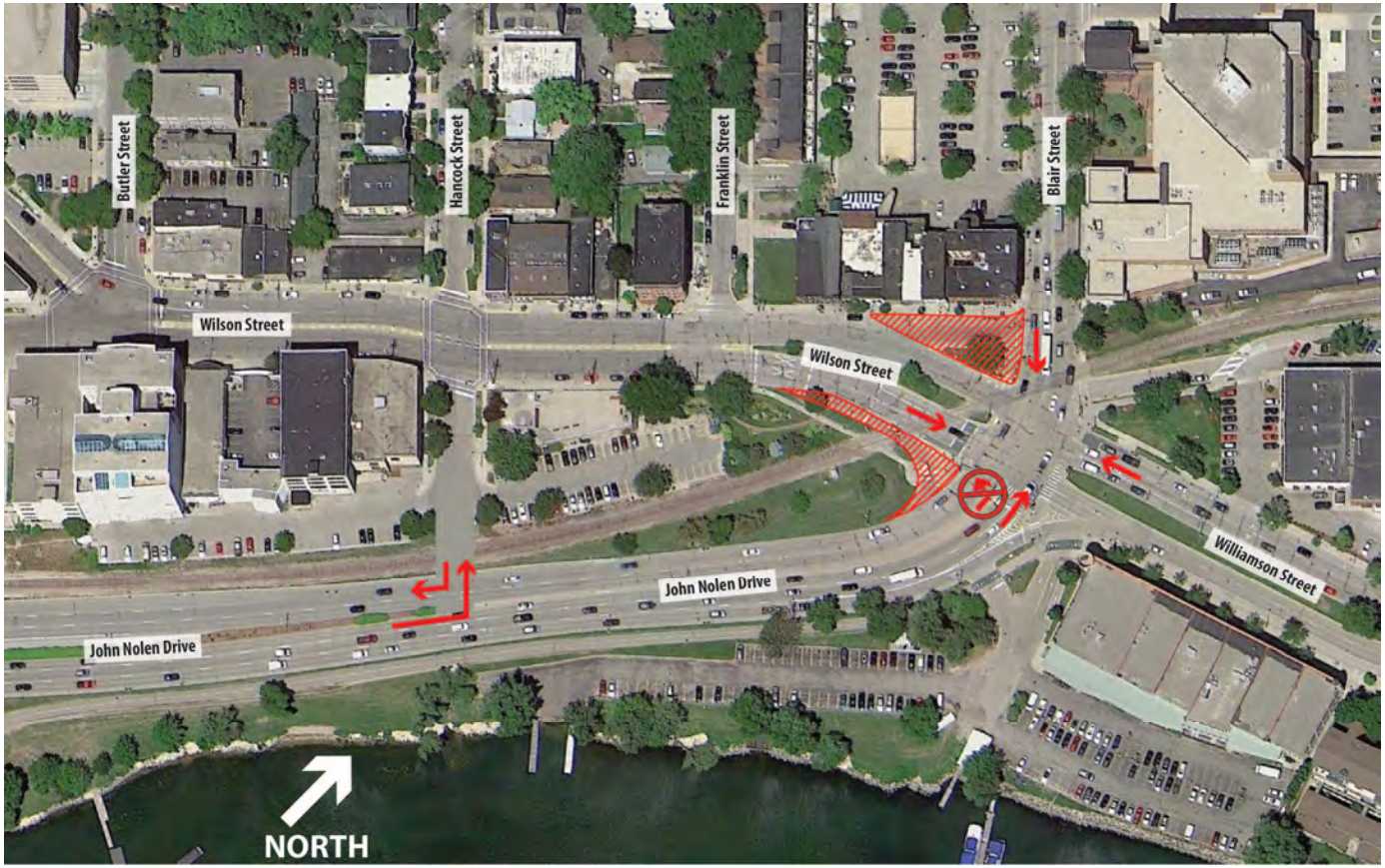
Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive at Blair Street, Wilson Street, & Williamson Street
Alternative 5 – Aerial and Description



- Restrict NBL at Blair Street, Wilson Street, Williamson Street
- Provide new signalized connection at John Nolen Drive and Hancock Street

John Nolen Drive at Blair Street, Wilson Street, & Williamson Street
Alternative 5 – Geometrics and Volumes

AM Peak Hour Volumes

PM Peak Hour Volumes

John Nolen Drive at Blair Street, Wilson Street, & Williamson Street Alternative 5 – LOS and Queue Table

Year 2050 Forecast Traffic Operations & Queues

Alternative 5 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach												Intersection HCM LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT/TH		RT		
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	LOS	E	E	--	F	F		--	C	A	F		B	F	132.2
			95th % Queue (ft)	*44*	*61*	--	*706*	*637*		--	*798*	*166*	*1103*		*77*		
		PM	LOS	D	E	--	F	D		--	D	B	F		B	D	50.8
			95th % Queue (ft)	*50*	*226*	--	*484*	*245*		--	*715*	*731*	*588*		*19*		
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	E	--	E	--	A	A	A	A	--	A	1.6
			95th % Queue (ft)	--	--	--	*17*	--	*13*	--	*274*	*3*	*0*	*2*	--		
		PM	LOS	--	--	--	D	--	D	--	B	A	C	A	--	A	8
			95th % Queue (ft)	--	--	--	*112*	--	*59*	--	*414*	*5*	*0*	*6*	--		
John Nolen Drive & Hancock Street*	Traffic Signal	AM	LOS	--	--	C	--	--	--	D	A	--	--	D		C	25.7
			95th % Queue (ft)	--	--	*55*	--	--	--	*101*	*166*	--	--	*336*			
		PM	LOS	--	--	C	--	--	--	A	A	--	--	A		A	3.7
			95th % Queue (ft)	--	--	*144*	--	--	--	*0*	*433*	--	--	*171*			

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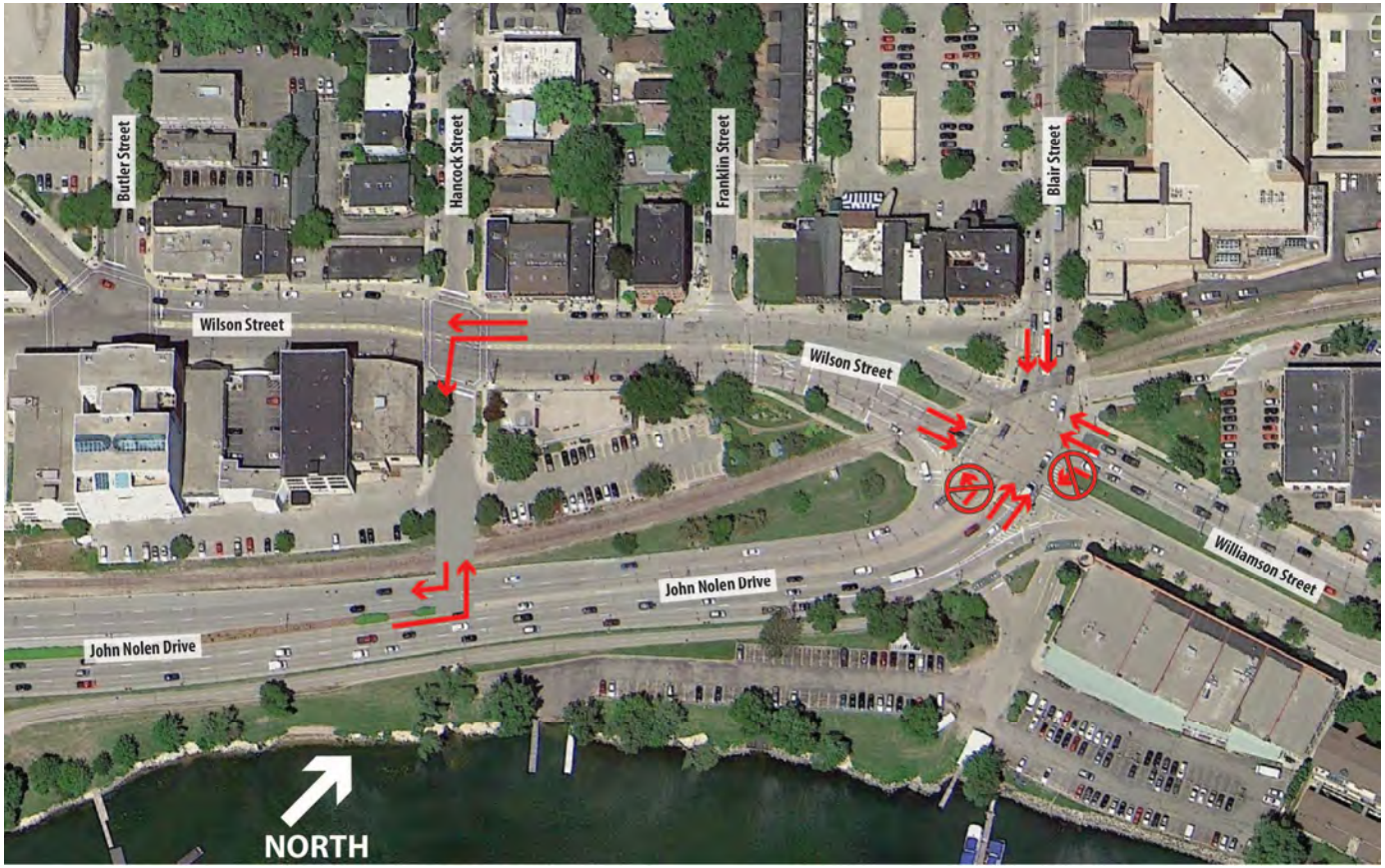
Red highlighted cell indicates v/c >= 1.4.

John Nolen Drive at Blair Street, Wilson Street, & Williamson Street
Alternative 6 – Aerial and Description



- Restrict NBL and WBL at Blair Street, Wilson Street, Williamson Street
- Provide new signalized connection at John Nolen Drive and Hancock Street
- Provide new signal at Hancock Street and Wilson Street

John Nolen Drive at Blair Street, Wilson Street, & Williamson Street
Alternative 6 – Geometrics and Volumes

AM Peak Hour Volumes

PM Peak Hour Volumes

John Nolen Drive at Blair Street, Wilson Street, & Williamson Street Alternative 6 – LOS and Queue Table

Year 2050 Forecast Traffic Operations & Queues

Alternative 6 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach												Intersection HCM LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT/TH		RT		
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street*	Traffic Signal	AM	LOS	E	E	---	F			--	C	A	F		B	F	180.7
			95th % Queue (ft)	*44*	*61*	---	*911*			--	*505*	*0*	*1164*		*92*		
		PM	LOS	D	F	---	F			--	C	A	D		B	D	47.9
			95th % Queue (ft)	*55*	*285*	---	*518*			--	*733*	*282*	*592*		*21*		
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	E	--	E	--	A	A	A	A	--	A	1.6
			95th % Queue (ft)	--	--	--	*17*	--	*13*	--	*274*	*3*	*1*	*141*	--		
		PM	LOS	--	--	--	D	--	D	--	B	A	B	A	--	A	8.3
			95th % Queue (ft)	--	--	--	*120*	--	*66*	--	*441*	*5*	*2*	*124*	--		
John Nolen Drive & Hancock Street*	Traffic Signal	AM	LOS	--	--	F	--	--	--	D	A	--	--	D		C	34
			95th % Queue (ft)	--	--	*543*	--	--	--	*95*	*166*	--	--	*109*			
		PM	LOS	--	--	D	--	--	--	A	A	--	--	D		C	21.3
			95th % Queue (ft)	--	--	*509*	--	--	--	*1*	*921*	--	--	*831*			

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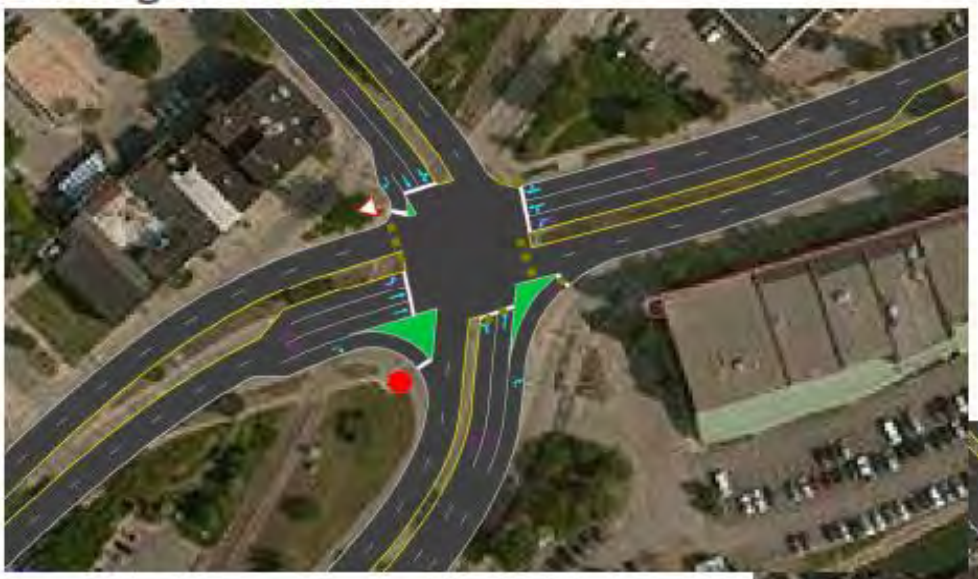
John Nolen Drive, Blair Street, Wilson Street, and Williamson Street

Existing Geometrics



Alternative 8

John Nolen Drive, Blair Street, Wilson Street, & Williamson Street

Year 2050 Forecast Traffic Operations & Queues
Alternative 8 Geometrics & Optimized Traffic Signal Timings

Intersection	Traffic Control	Peak Hour	MOE	Level of Service/Queue per Movement by Approach											Intersection LOS	Intersection Delay (s)
				Eastbound			Westbound			Northbound			Southbound				
				LT	TH	RT	LT	TH/RT		LT	TH	RT	LT	TH/RT			
John Nolen Drive, Blair Street, Wilson Street, & Williamson Street	Traffic Signal	AM	LOS	D	D	D	E	E		E	D	A	C	E		E	59.8
			95th % Queue (ft)	*43*	*60*	*0*	*475*	*486*		*159*	*821*	*120*	*79*	*949*			
		PM	LOS	D	D	D	D	D		C	C	B	C	C		C	28
			95th % Queue (ft)	*48*	*192*	*125*	*281*	*209*		*33*	*700*	*346*	*54*	*386*			
John Nolen Drive & Convention Center	Traffic Signal	AM	LOS	--	--	--	C	--	C	--	B	A	B	A	--	A	8.1
			95th % Queue (ft)	--	--	--	*10*	--	*8*	--	*282*	*4*	*1*	*279*	--		
		PM	LOS	--	--	--	D	--	D	--	B	A	C	A	--	A	9.6
			95th % Queue (ft)	--	--	--	*112*	--	*50*	--	*431*	*5*	*4*	*117*	--		

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Yellow highlighted cell indicates v/c >= 1.2.
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Red highlighted cell indicates v/c >= 1.4.

APPENDIX D
PUBLIC INVOLVEMENT MEETING NO. 2

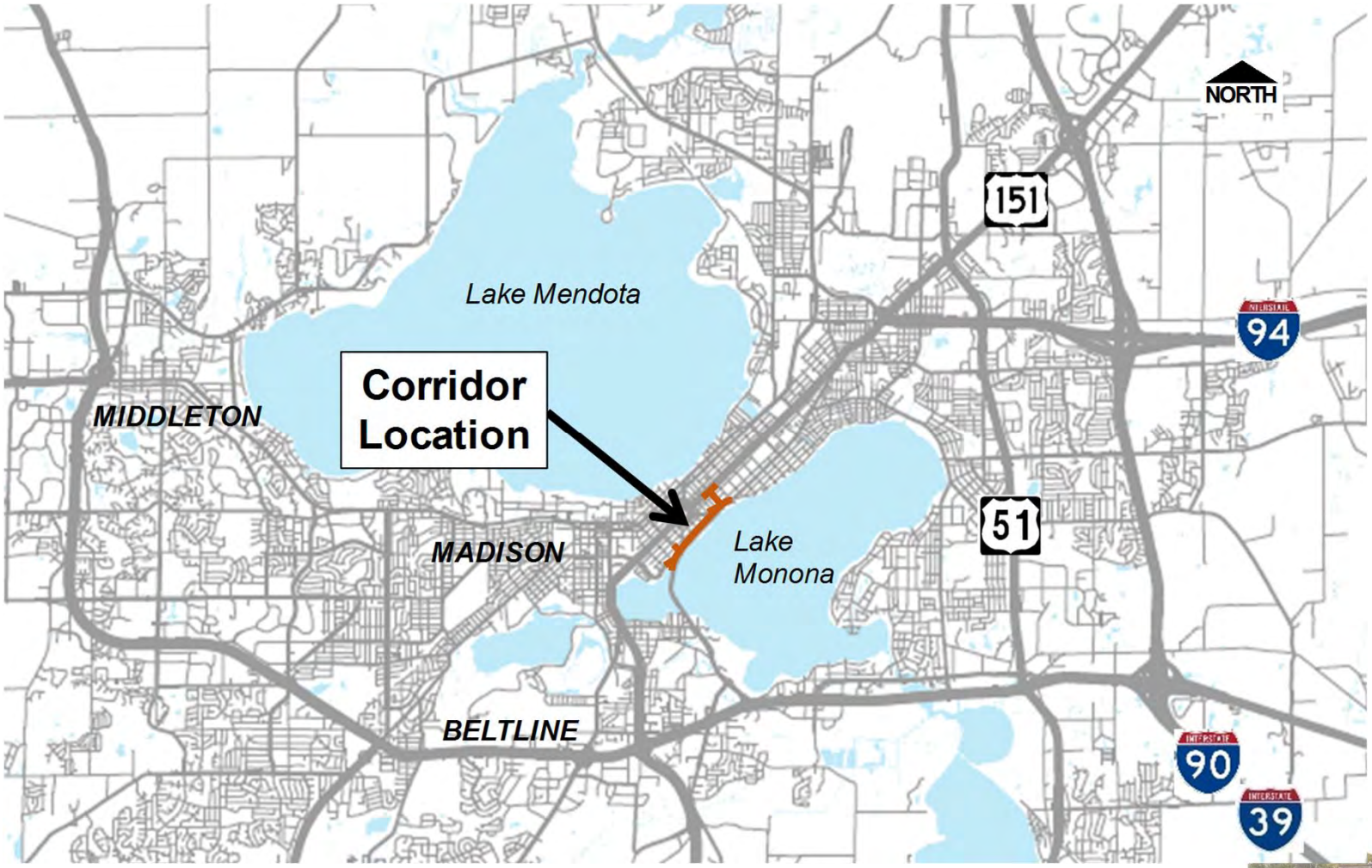

Public Involvement Meeting
April 17th 2017
Google Ear

Presentation Outline:

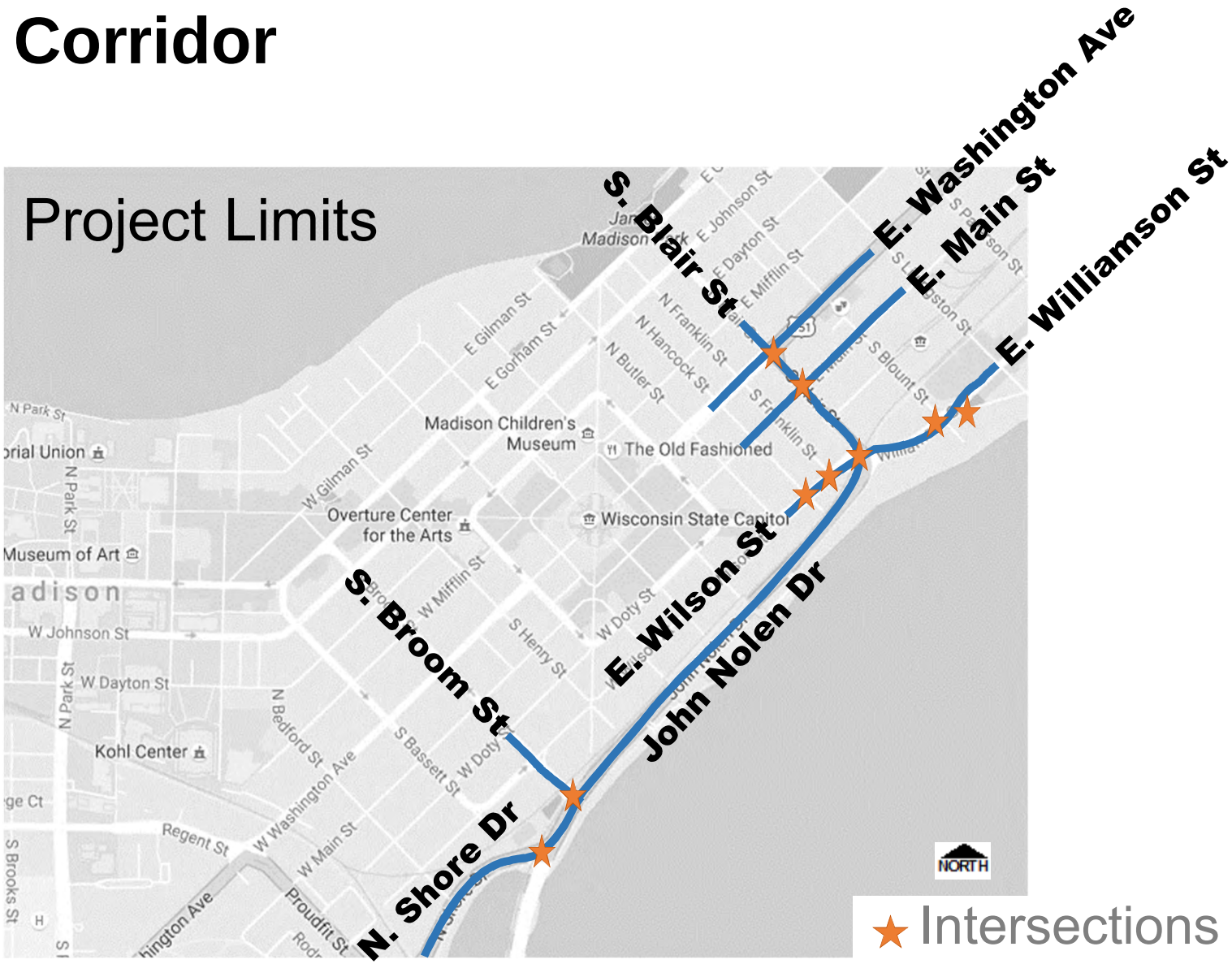
- Study Corridor and Reasons for Study
  - Upcoming Projects
  - Previous Studies and Longer Term Opportunities
- Williamson/Wilson/Blair/John Nolen Drive Intersection area
- East of Monona Terrace area
- John Nolen Drive/North Shore/Broom Street area
- Next Steps

Study Corridor and Reasons for Study

Project Location



Study Corridor



Study Corridor

Overview of Ideas

South Capitol Transit Oriented Development Study

Kenton Peters

Ken Saiki Law Park Concept

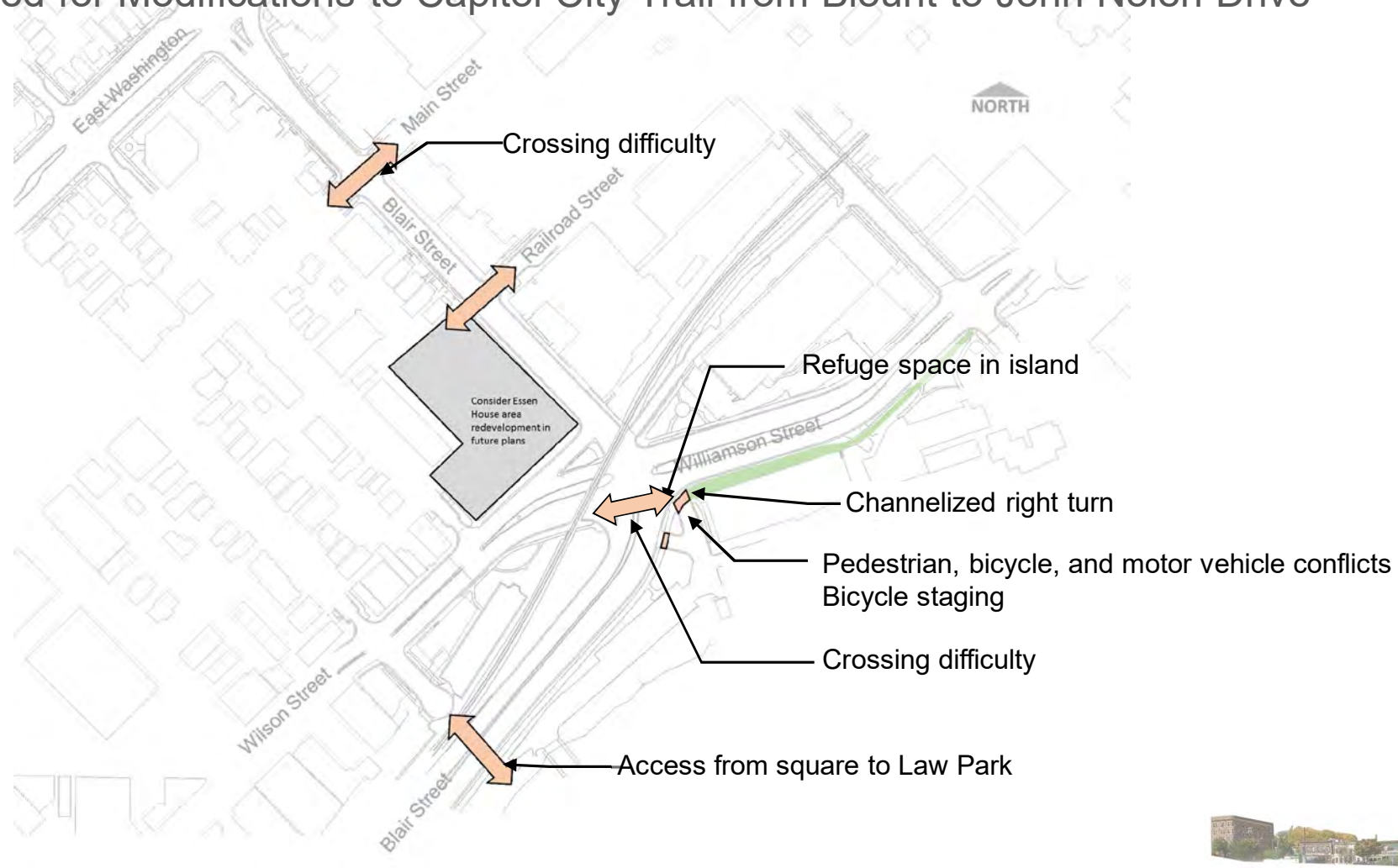
Ron Shutvet Underpass Concept

Madison Design Professionals Workgroup

John Nolen/Blair/Wilson/Williamson Area

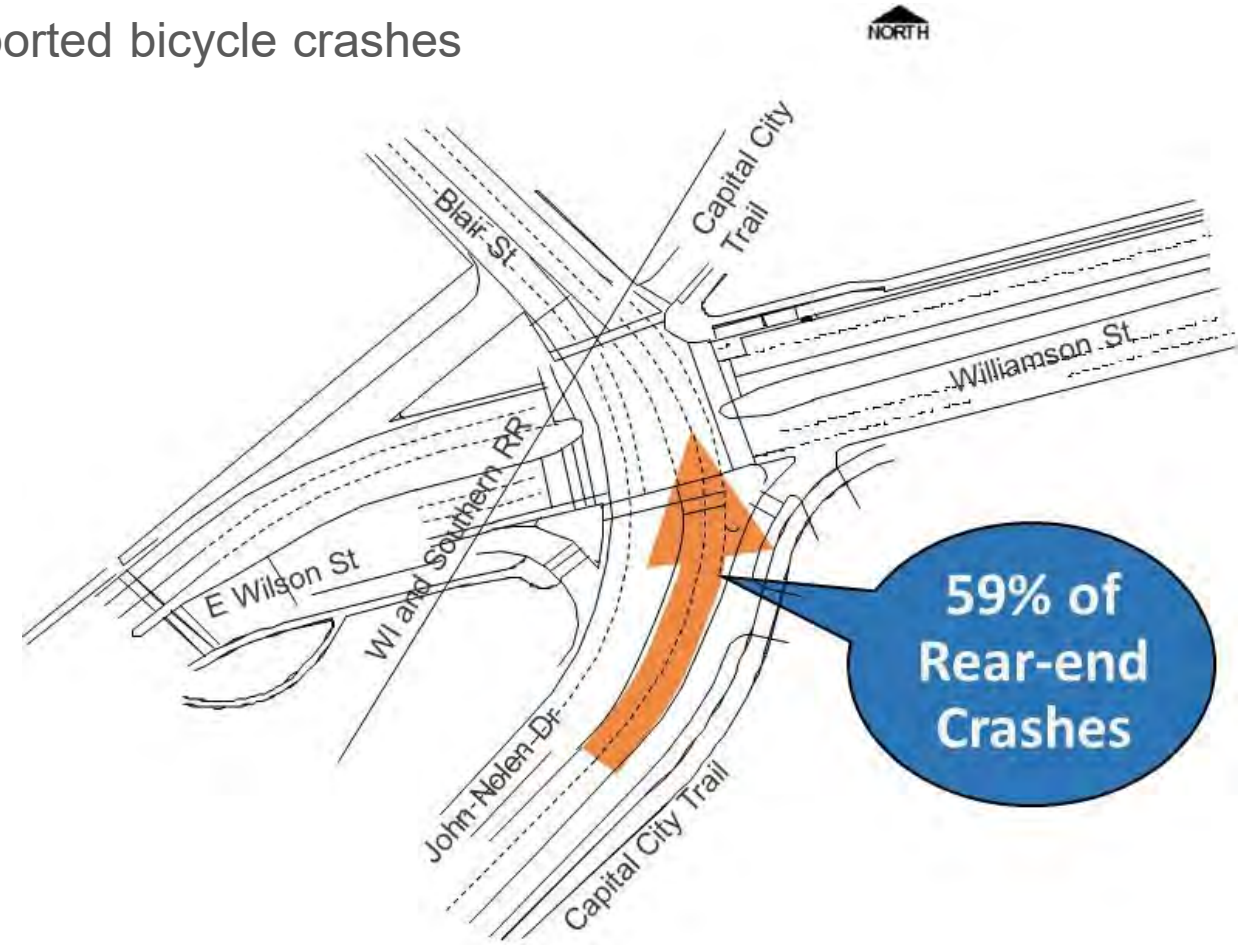
Blair/Williamson Intersection Expressed Needs

- Barrier Effect of Blair Street and John Nolen Drive for Pedestrians and Bicycles
- Need for Modifications to Capitol City Trail from Blount to John Nolen Drive



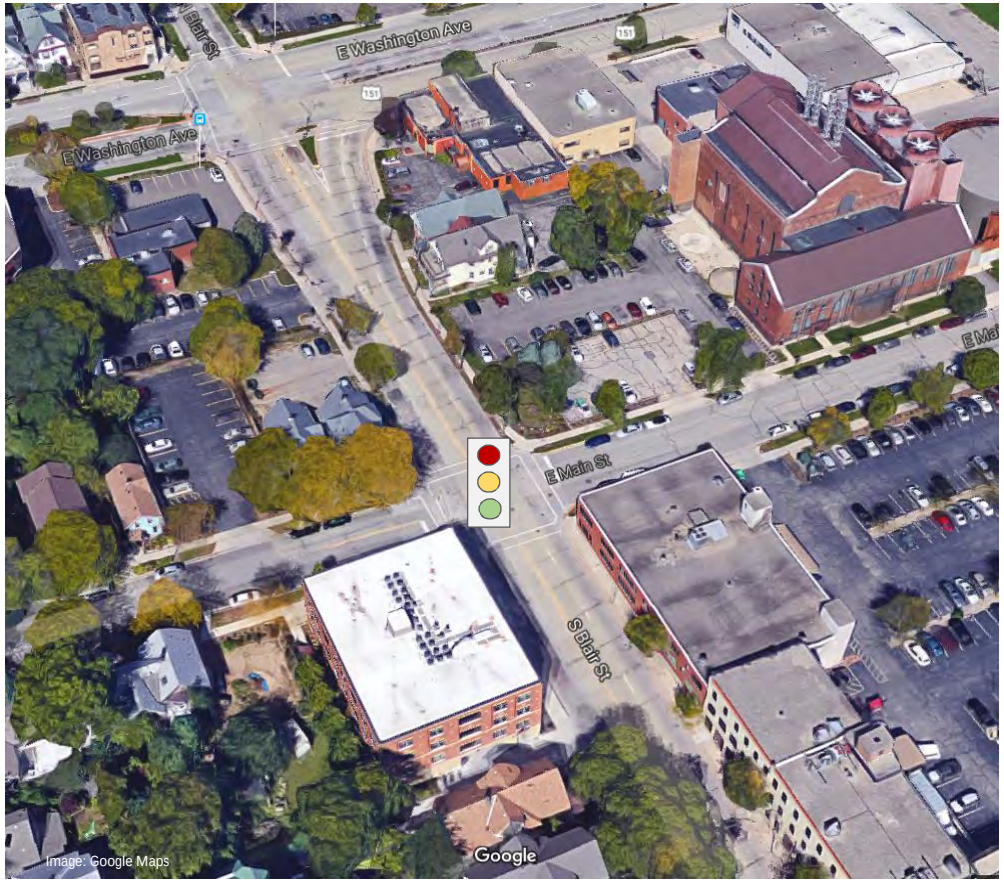
Blair/Williamson Intersection Crash Concerns

- 2011 – 2015, 92 Total Reported Crashes
- 46/92 (50%) were rear-end collisions (lack of left-turn bays)
- 9 reported bicycle crashes



Traffic Signal at Main Street and Blair Street

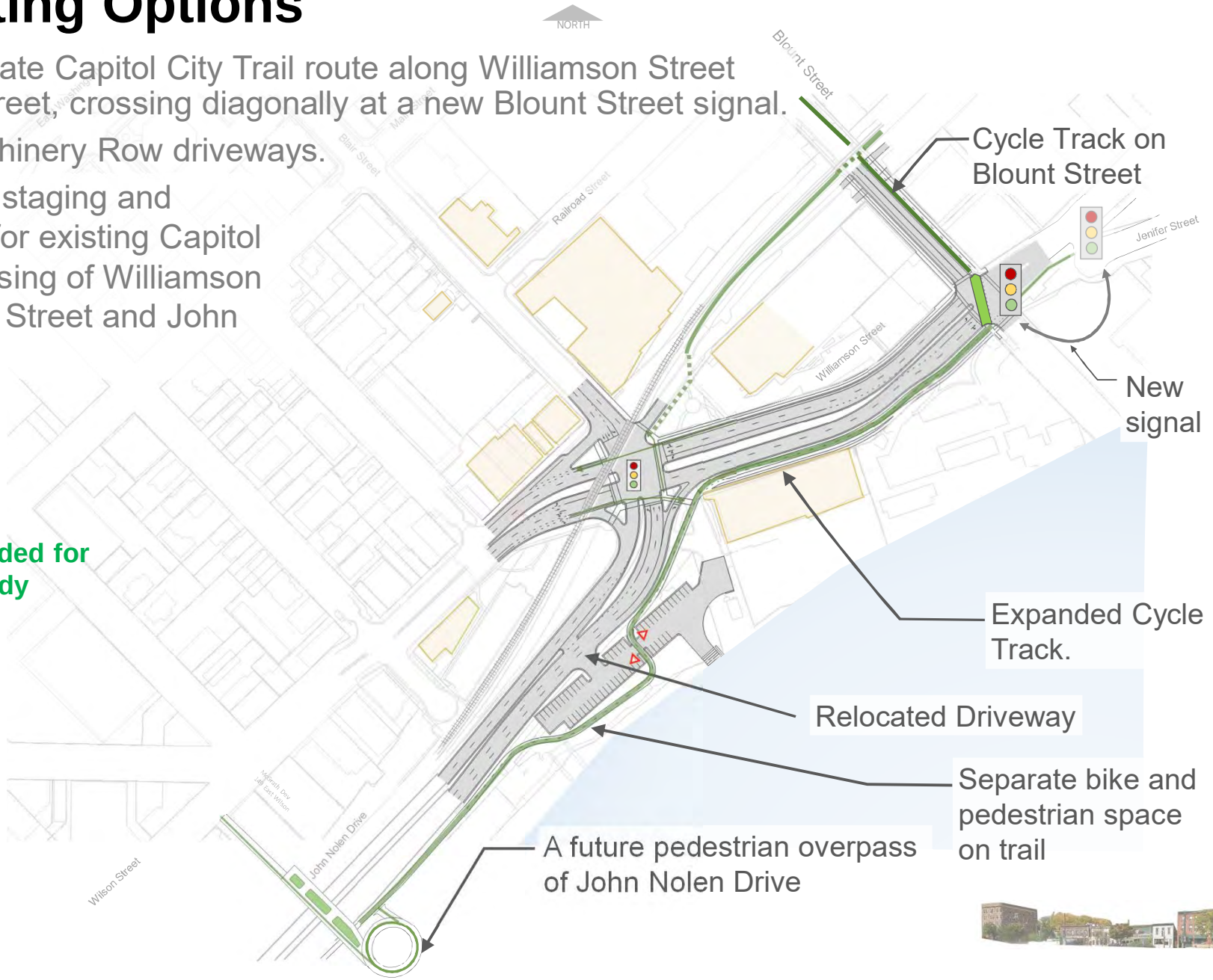
- Allows controlled crossing of Blair Street at Main Street for pedestrians, bicycles, and motor vehicles.
- May increase motor vehicle congestion and queuing on Blair Street.
- May draw additional motor vehicle traffic to Main Street.



Bike Routing Options

- Provide alternate Capitol City Trail route along Williamson Street and Blount Street, crossing diagonally at a new Blount Street signal.
- Relocate Machinery Row driveways.
- Provide more staging and storage area for existing Capitol City Trail crossing of Williamson Street at Blair Street and John Nolen Drive.

Recommended for Further Study



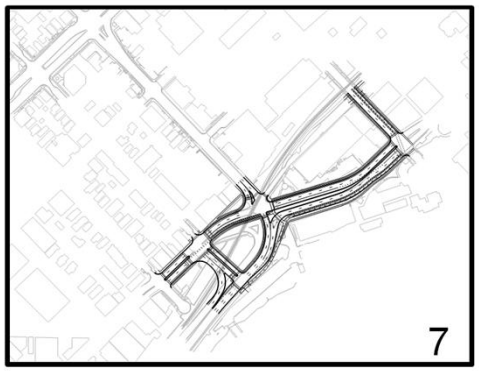
Bike Routing Options

- Separation of pedestrian and bicycle uses along Williamson Street from Blair Street to Blount Street.

Existing

Expanded Pedestrian Area

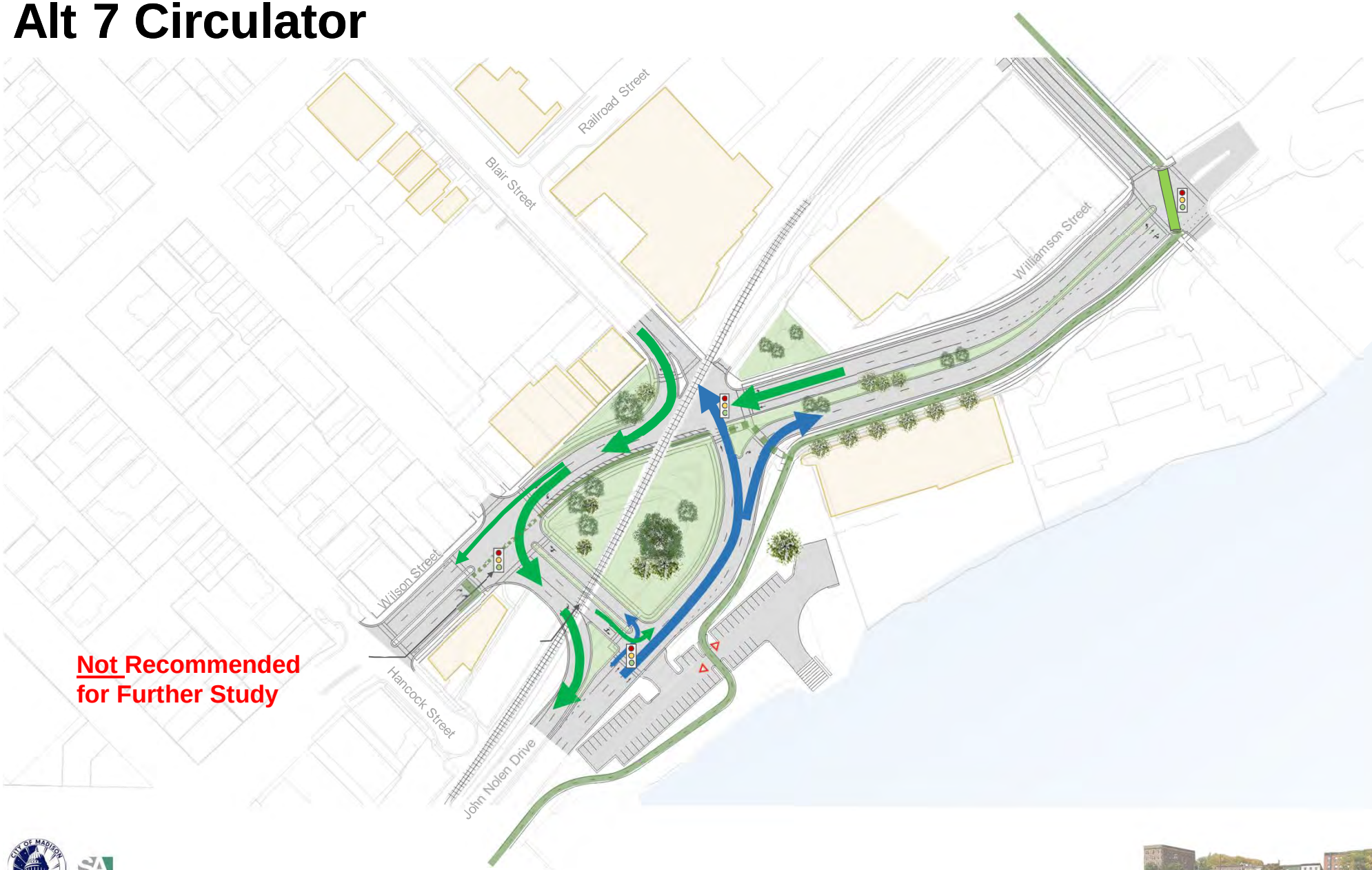
Multiple Motor Vehicle Options Reviewed



Alt 1 NB and SB Left Turn Lanes

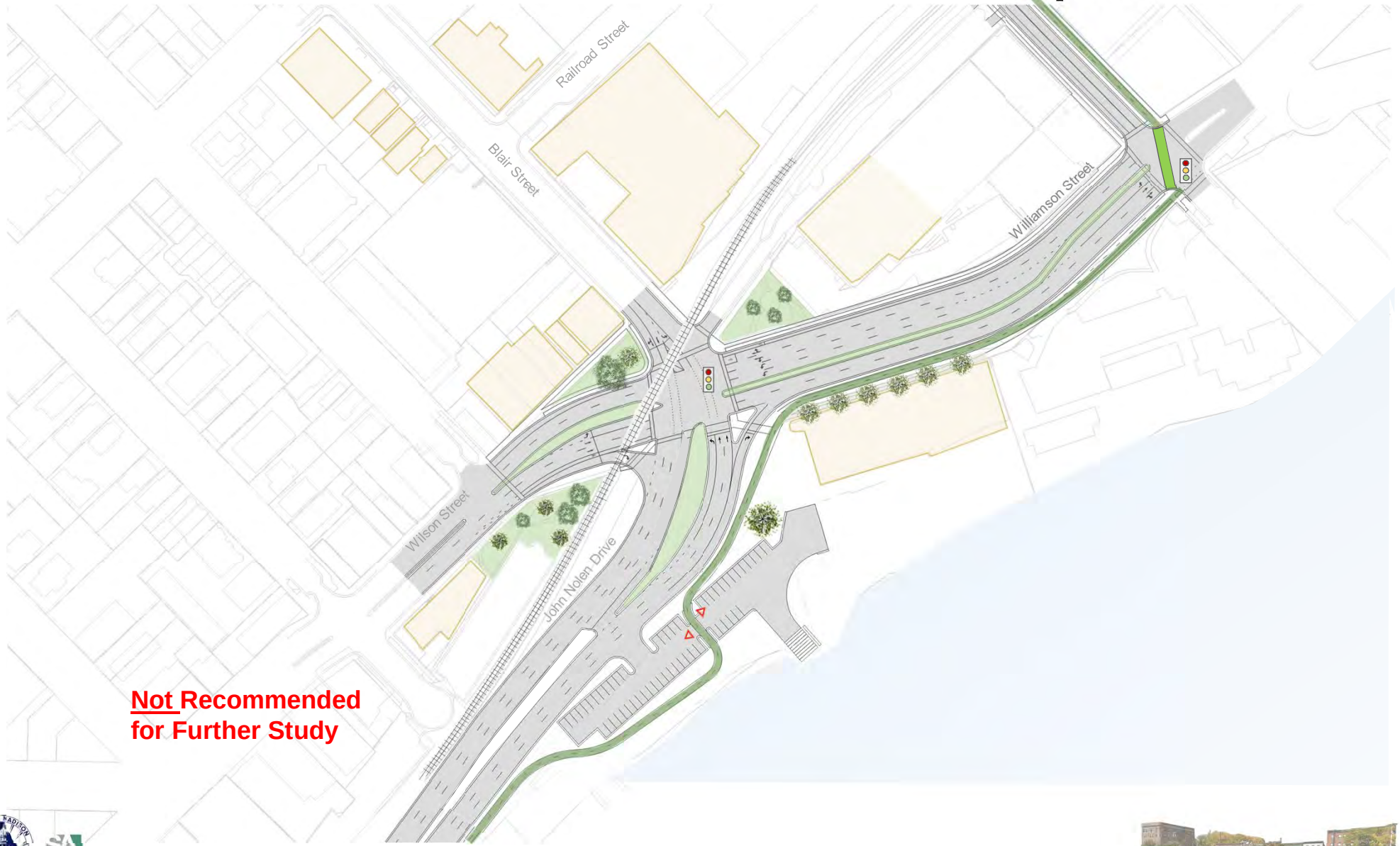
Recommended for Further Study

Alt 7 Circulator



Not Recommended for Further Study

Alt 8 NB and SB Left Turn Lanes with WB Triple Left



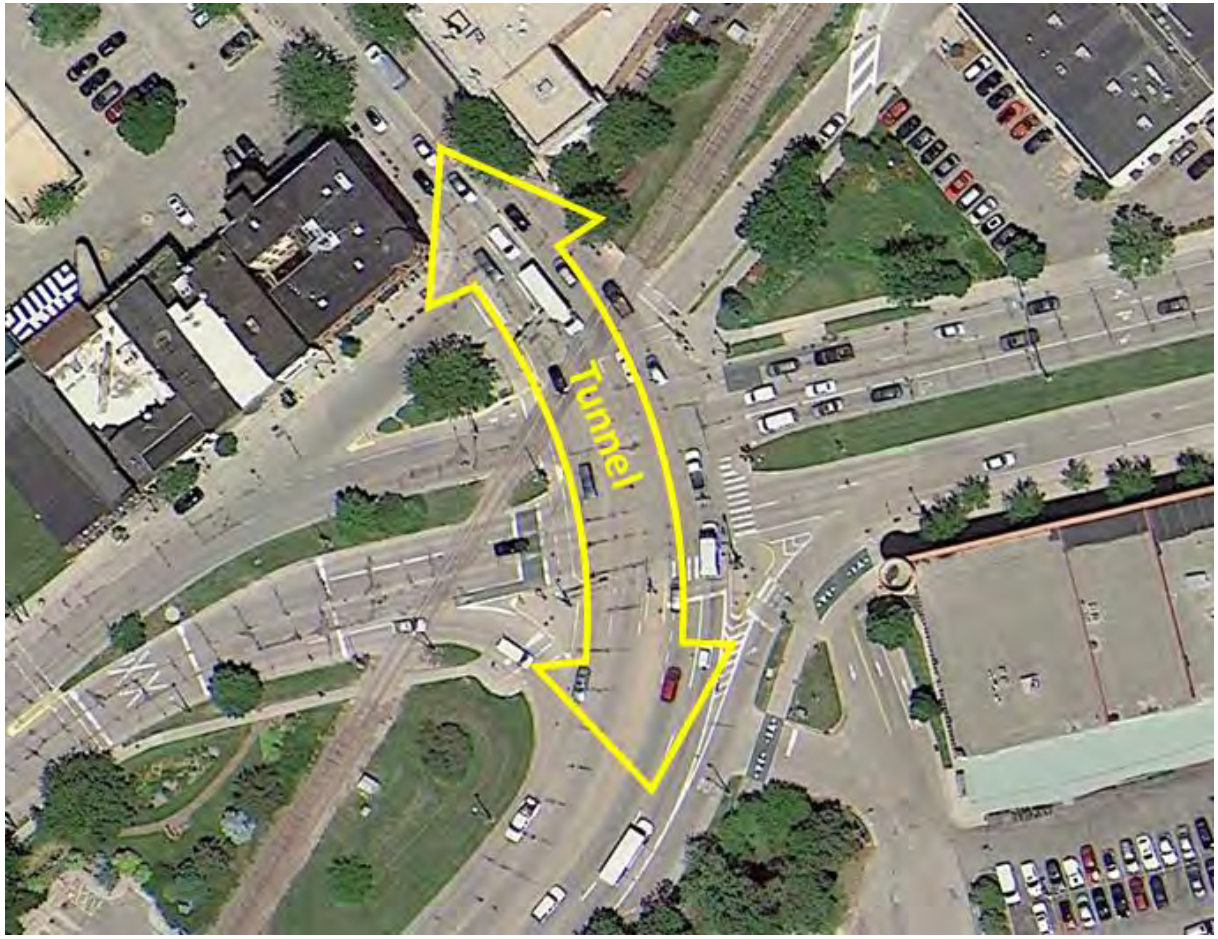
Not Recommended for Further Study

Alt 9 One-way Couplet

Recommended for Further Study

Tunnel Concept and Constraints/Challenges

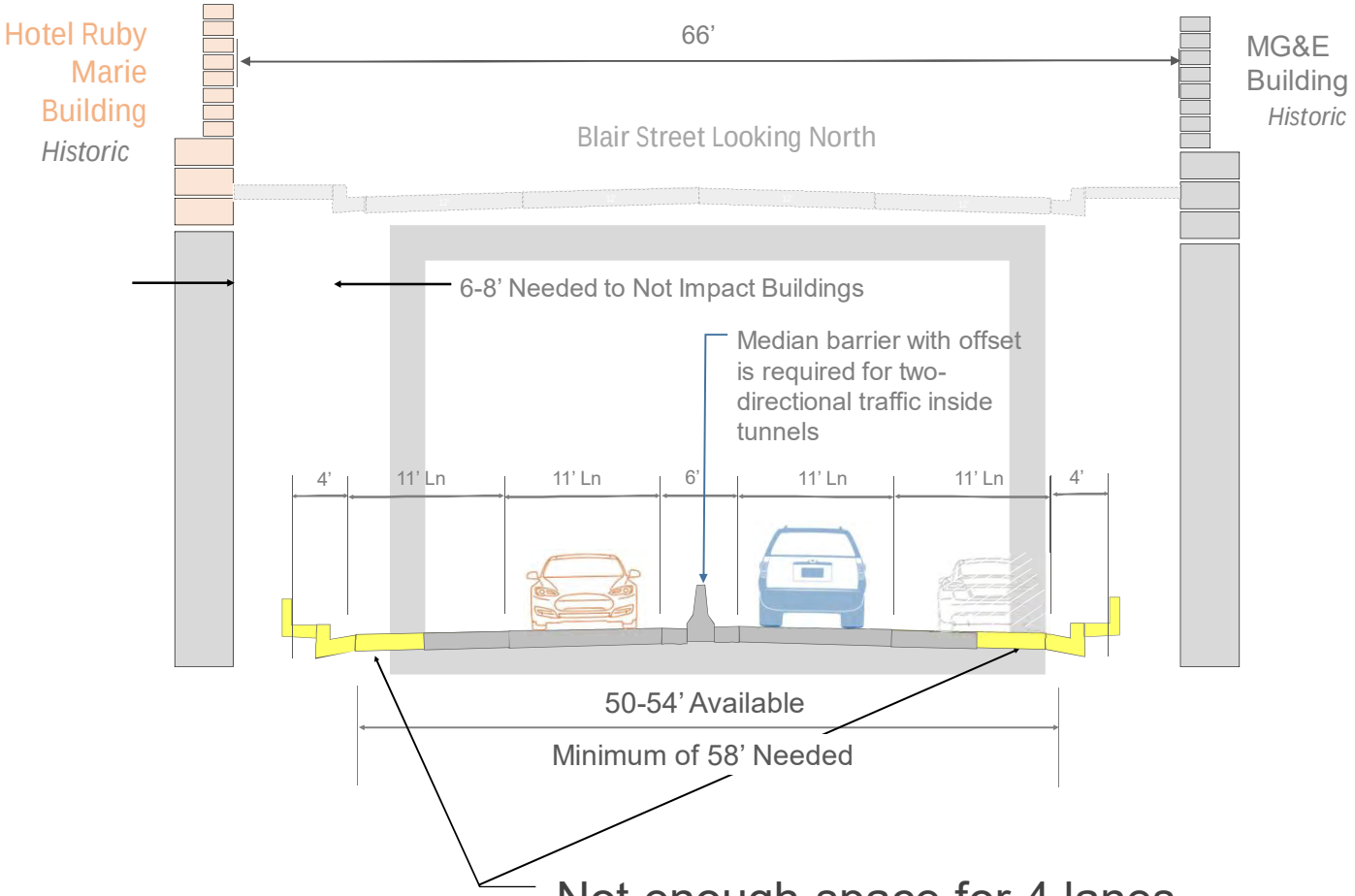
Concept



John Nolen/Blair/Williamson/Wilson Tunnel Alternative

- Width only allows one lane of traffic in each direction in the tunnel.

2. Constraints - Buildings

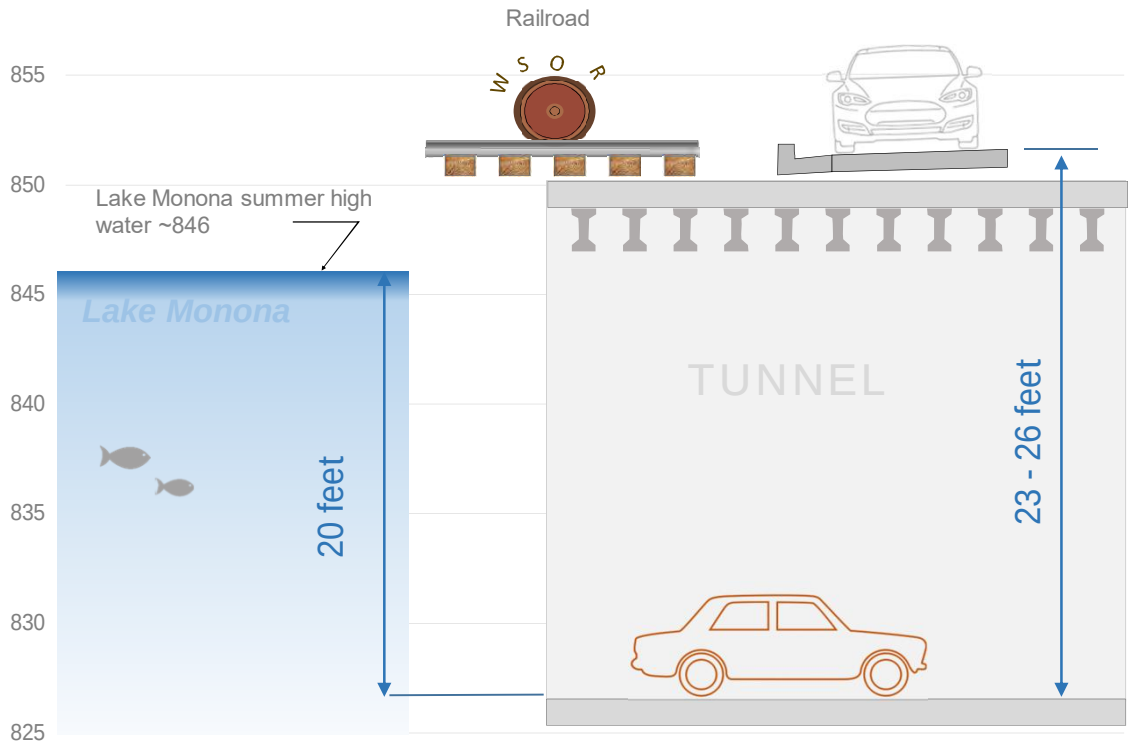


Not enough space for 4 lanes

John Nolen/Blair/Williamson/Wilson Tunnel Alternative

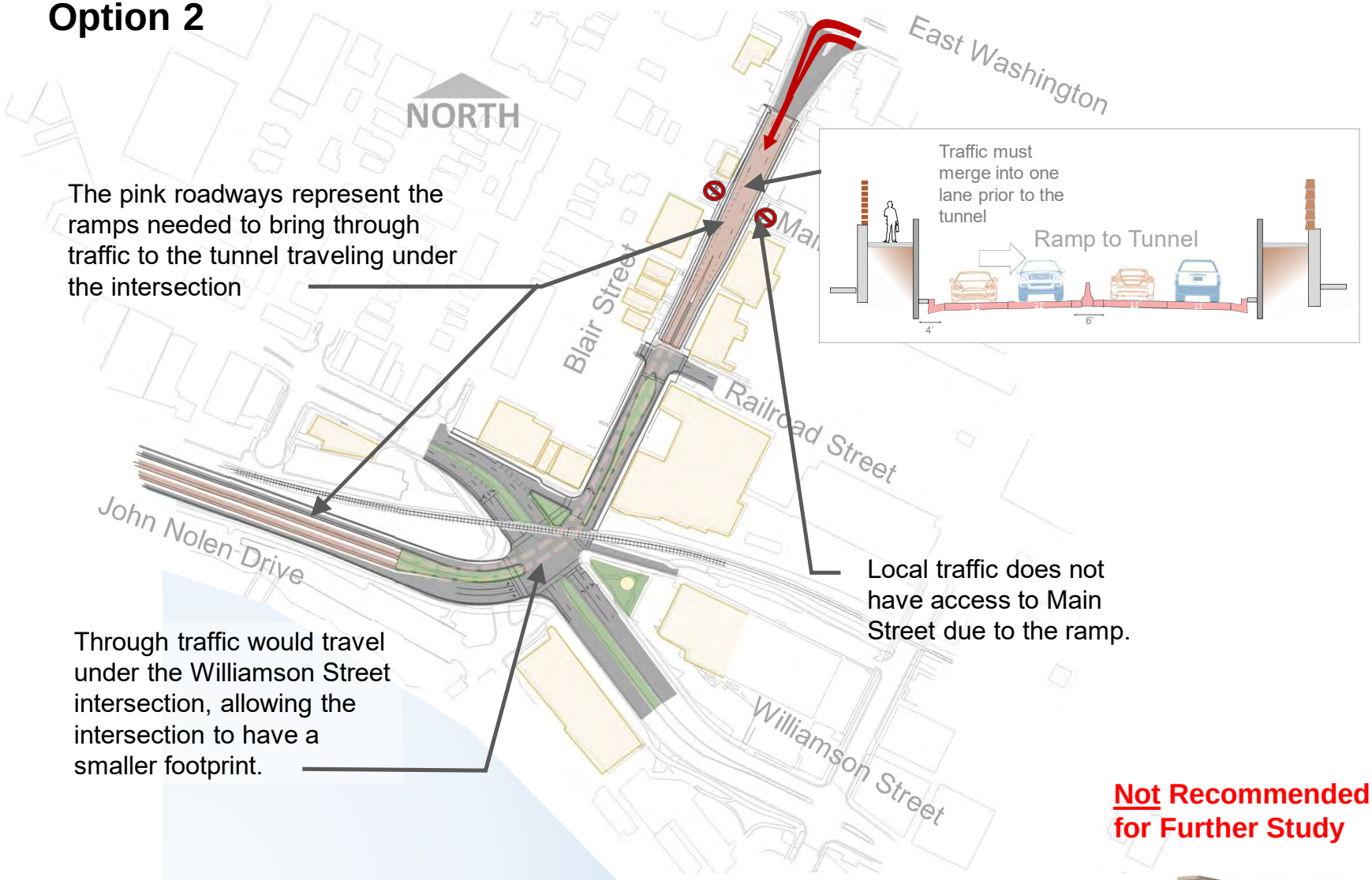
- Tunnel is well below lake level, must be water tight, will require pumping for stormwater.

4. Constraints - Elevation



Tunnel Layouts and Profile

Option 2



The pink roadways represent the ramps needed to bring through traffic to the tunnel traveling under the intersection

Local traffic does not have access to Main Street due to the ramp.

Through traffic would travel under the Williamson Street intersection, allowing the intersection to have a smaller footprint.

Not Recommended for Further Study

East of Monona Terrace Area

Pedestrian/Bicycle Connection to Law Park

The South Capitol Transit Oriented Development Study suggested an pedestrian bicycle overpass near 307 East Wilson Street

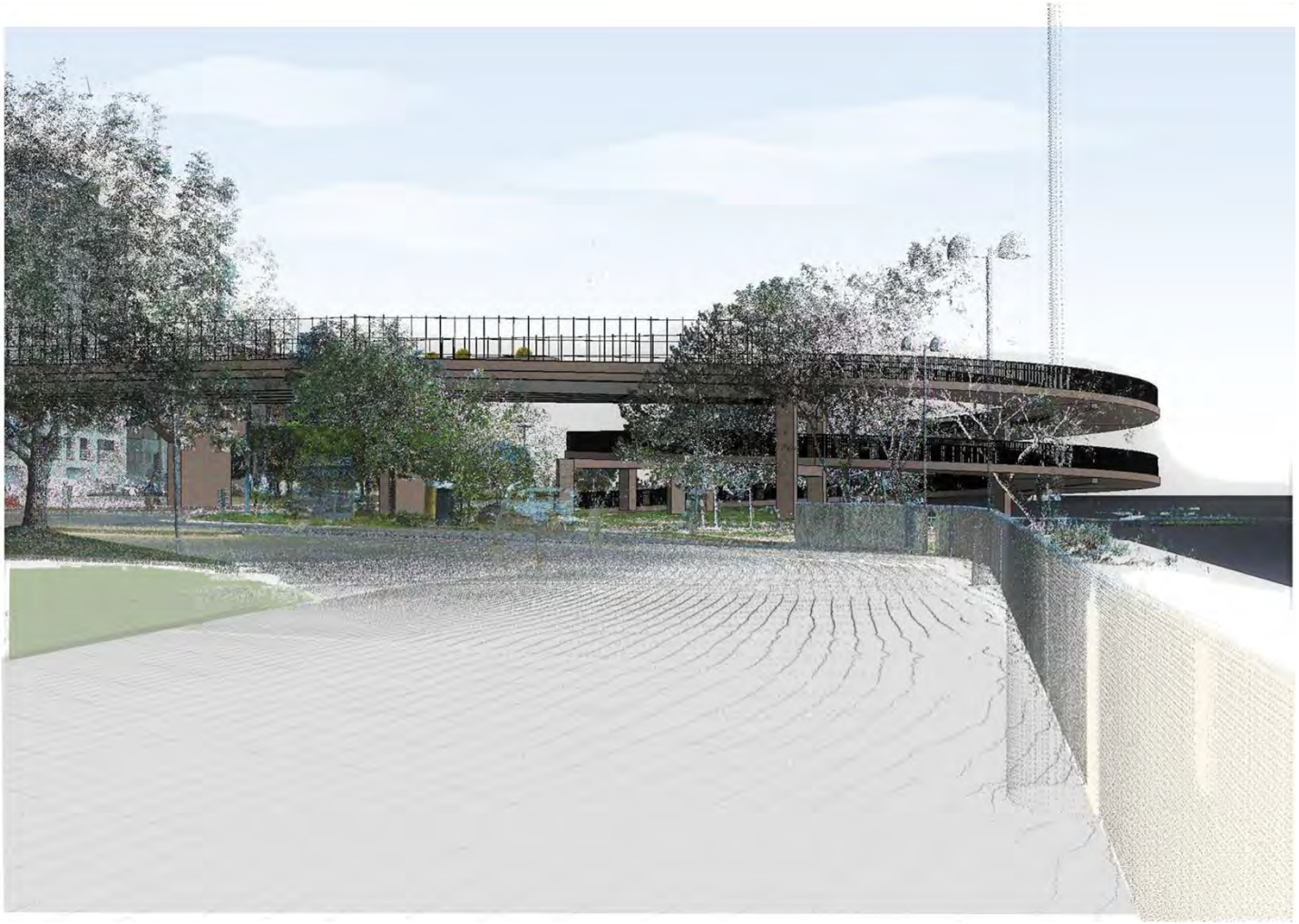
Current redevelopment proposals provide a crossing opportunity at 149/151 East Wilson Street

Pedestrian Bicycle Connection to Law Park

- Rendering is shown Within Design-Level Laser Scan Survey in Realistic Location
- Concept Only, Additional Design Modifications Expected

Pedestrian Bicycle Connection to Law Park

- Rendering is shown Within Design-Level Laser Scan Survey in Realistic Location
- Concept Only, Additional Design Modifications Expected



Pedestrian Bicycle Connection to Law Park

- Rendering is shown Within Design-Level Laser Scan Survey in Realistic Location
- Concept Only, Additional Design Modifications Expected

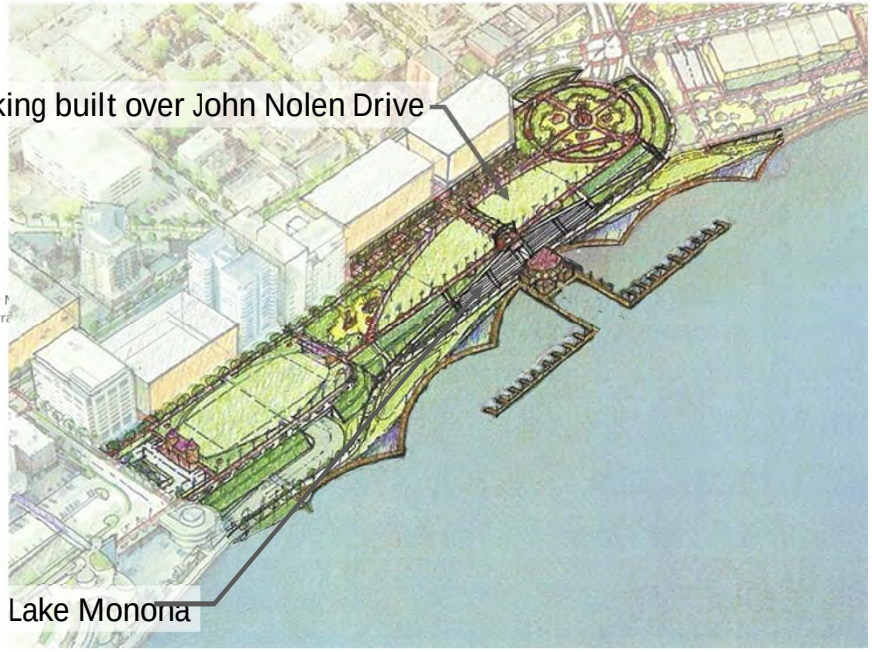
Pedestrian Bicycle Connection to Law Park

- Rendering is shown Within Design-Level Laser Scan Survey in Realistic Location
- Concept Only, Additional Design Modifications Expected

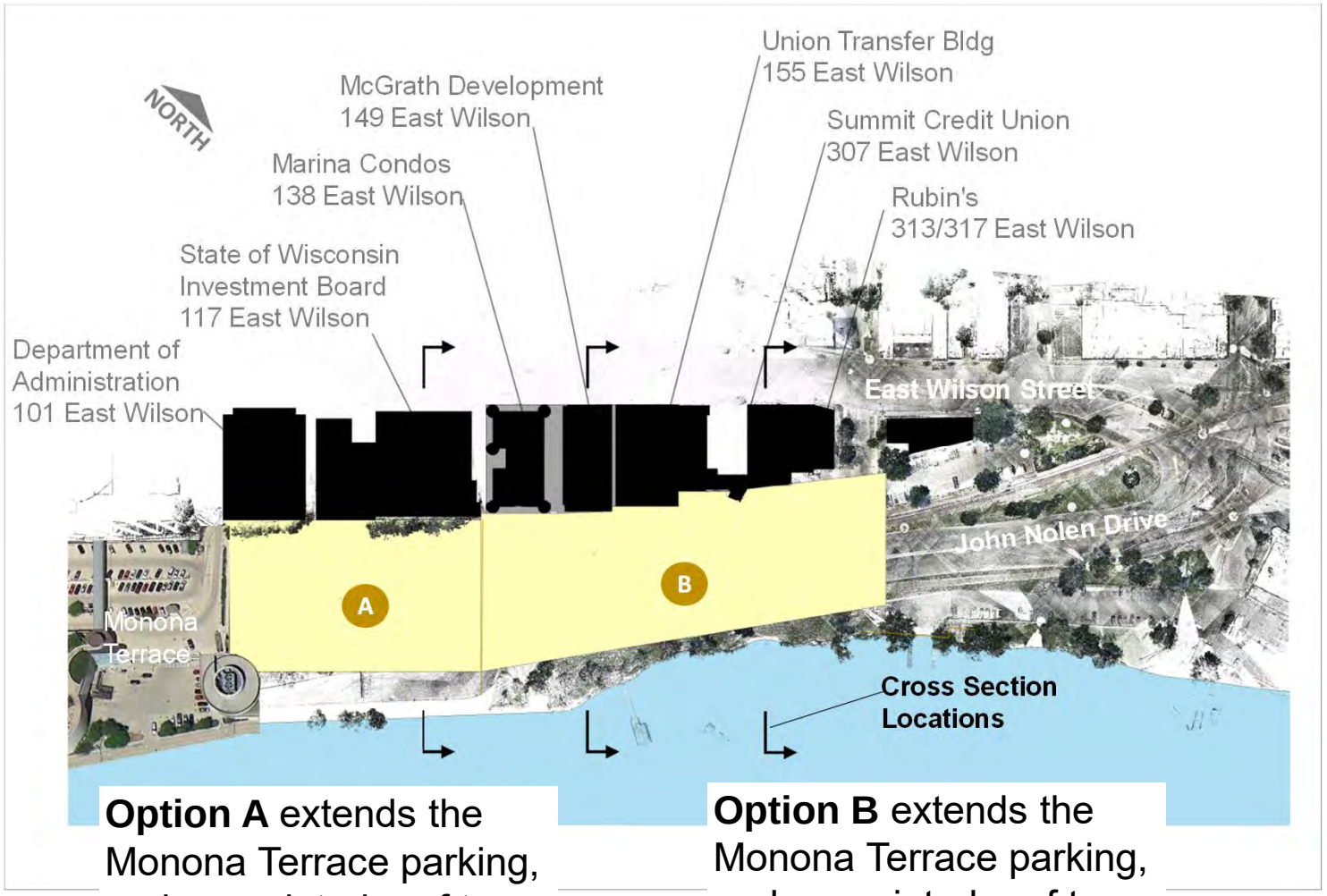
Long-Term Concepts East of Monona Terrace

Kenton Peters Concept
Looking Northwest

Madison Design Professionals Workgroup Concept
Looking Northeast



Long-Term Concepts East of Monona Terrace

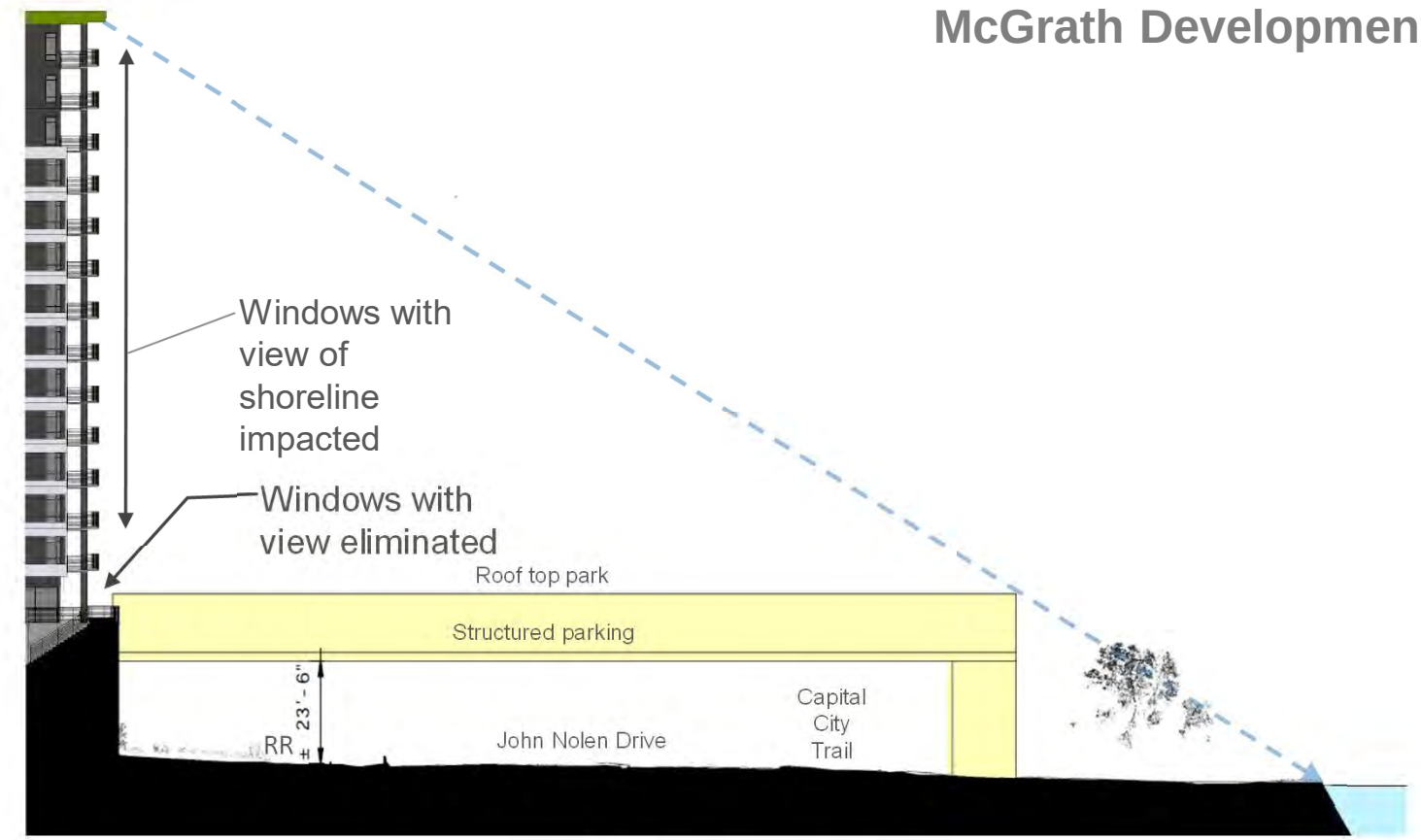


Option A extends the Monona Terrace parking, and associated roof top park, to 149 East Wilson

Option B extends the Monona Terrace parking, and associated roof top park beyond Hancock Street

Long-Term Concepts East of Monona Terrace

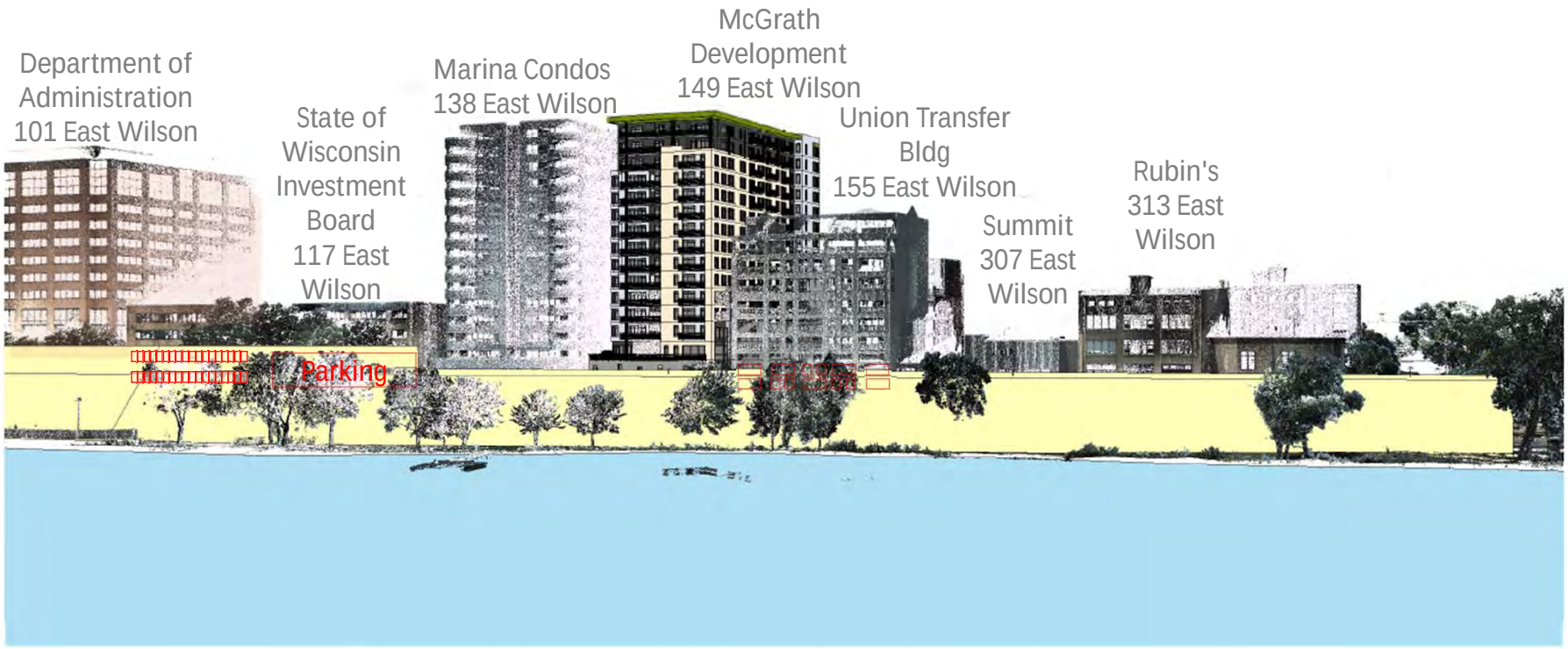
McGrath Development



149 East Wilson
With Structured Parking

Long-Term Concepts East of Monona Terrace

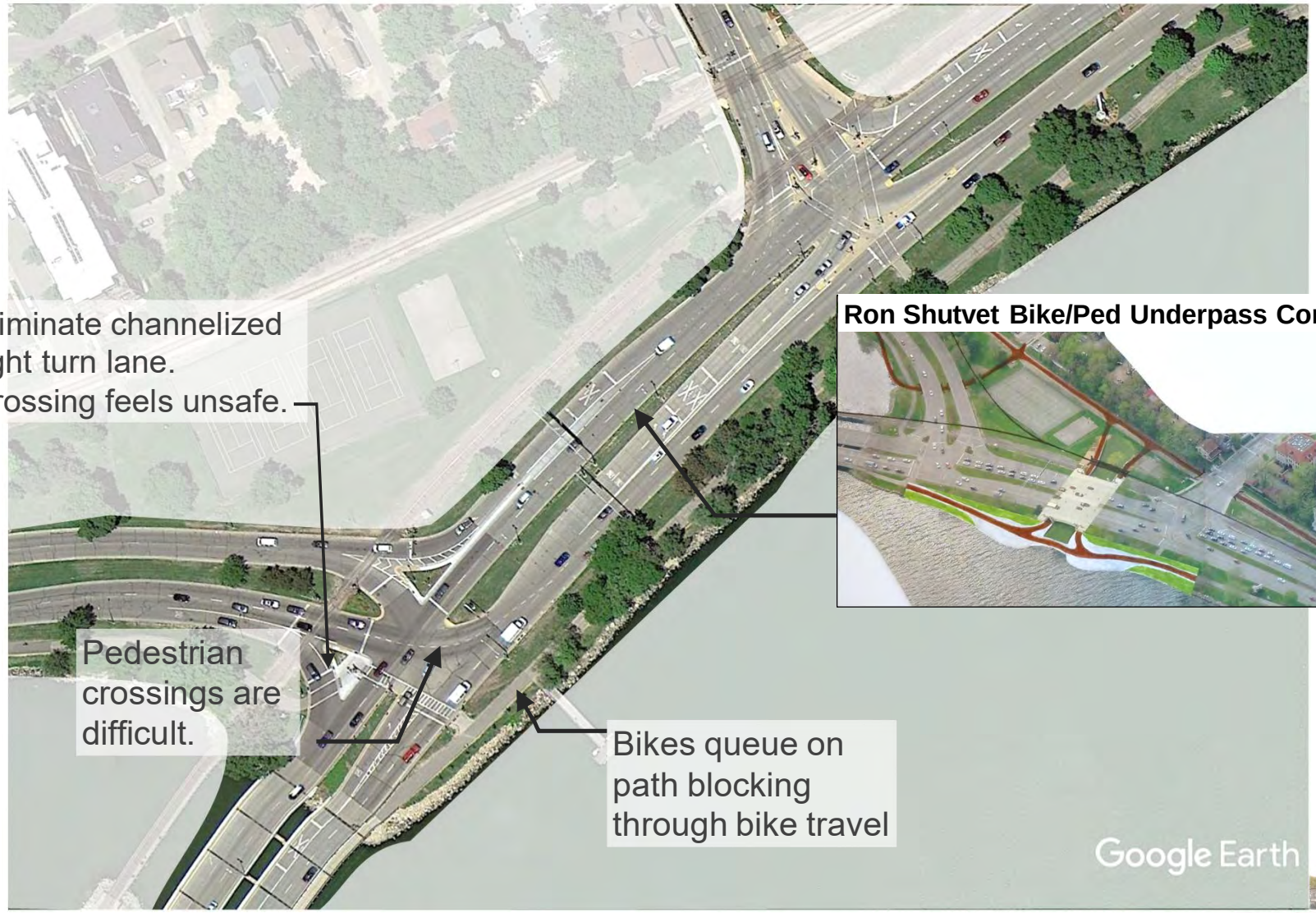
- Multiple Options Evaluated including With and Without One Deck of Parking Above John Nolen Drive
- Perspective Views show which Windows are Fully Blocked



VIEW 2 - A - STRUCTURED PARKING AND ROOF TOP PARK
B - ROOF TOP PARK ONLY

North Shore Drive Area

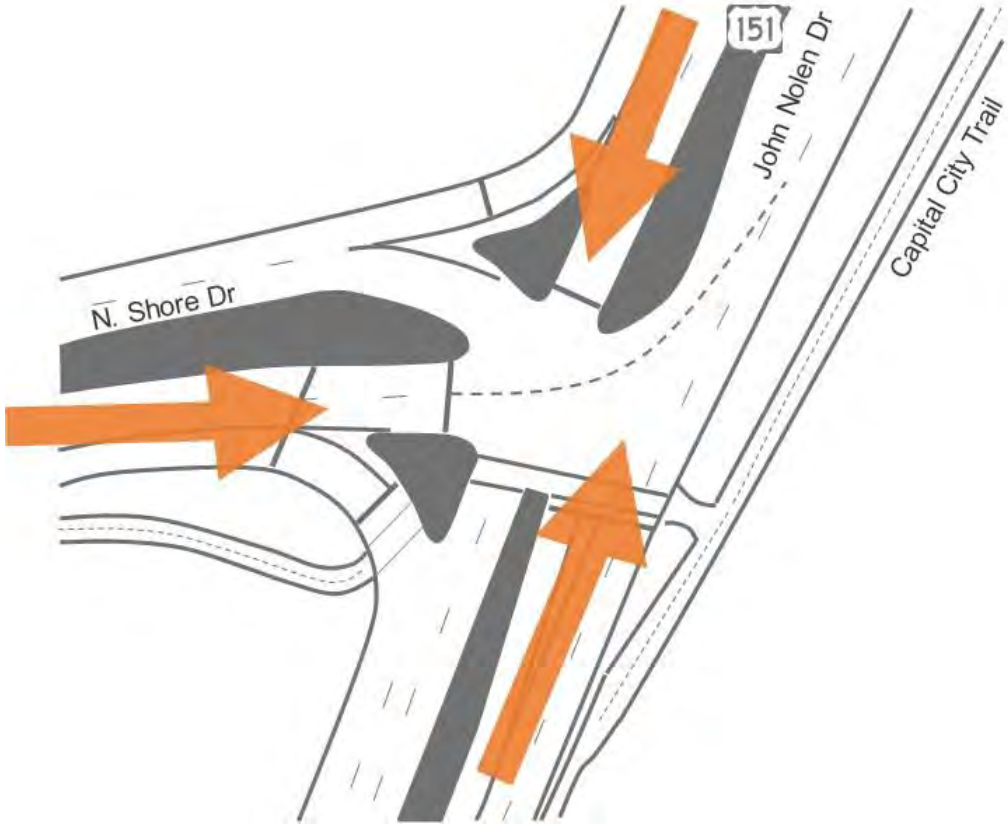
North Shore Drive/North Broom Street Expressed Needs



Ron Shutvet Bike/Ped Underpass Concept

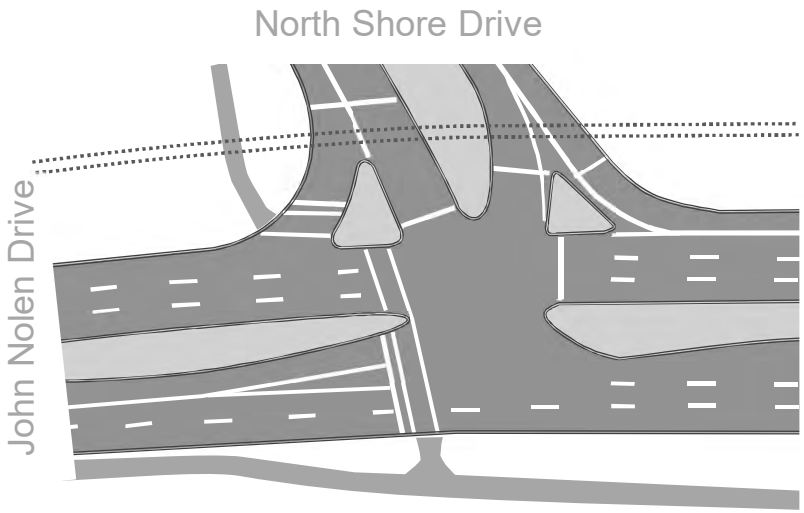
North Shore Intersection Crash Concerns

- 2011 – 2015, 119 Total Reported Crashes
- 58/119 (49%) were rear-end collisions (congestion and queuing)
- 6 reported bicycle crashes (4 prior to 2013 modifications)
- 15% reduction in total crashes after 2013



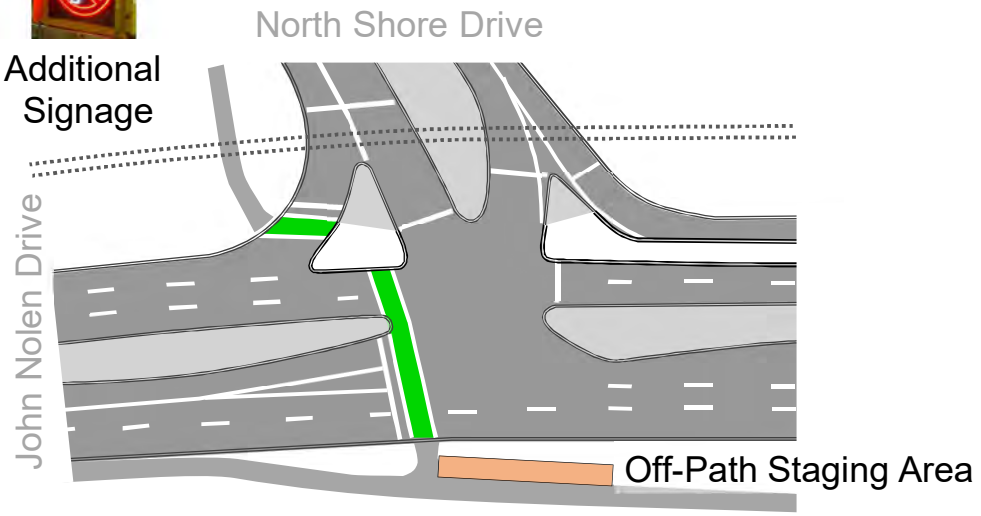
North Shore and Broom Street

- Recent Improvements Reduced Motor Vehicle Capacity to Improve Pedestrian and Bike Conditions
- Proposing Designated Bike Queuing Area for Cyclists Waiting to Cross



As constructed in 1995

Additional Signage

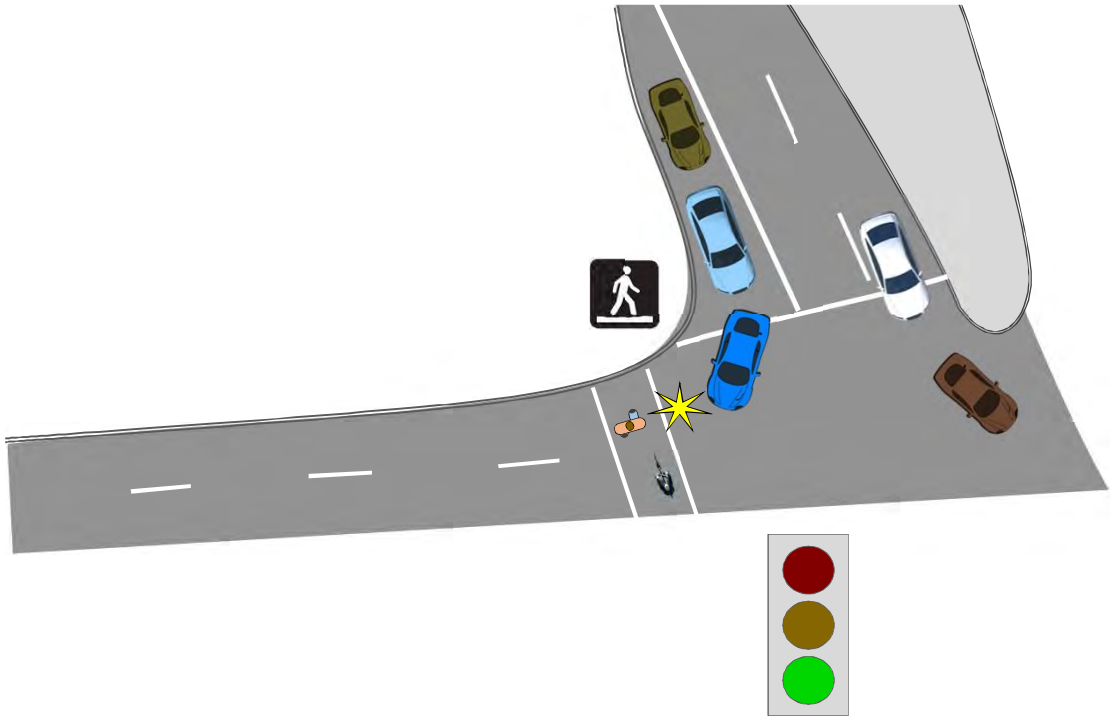


2013 Improvements

Proposed Short-term Solution

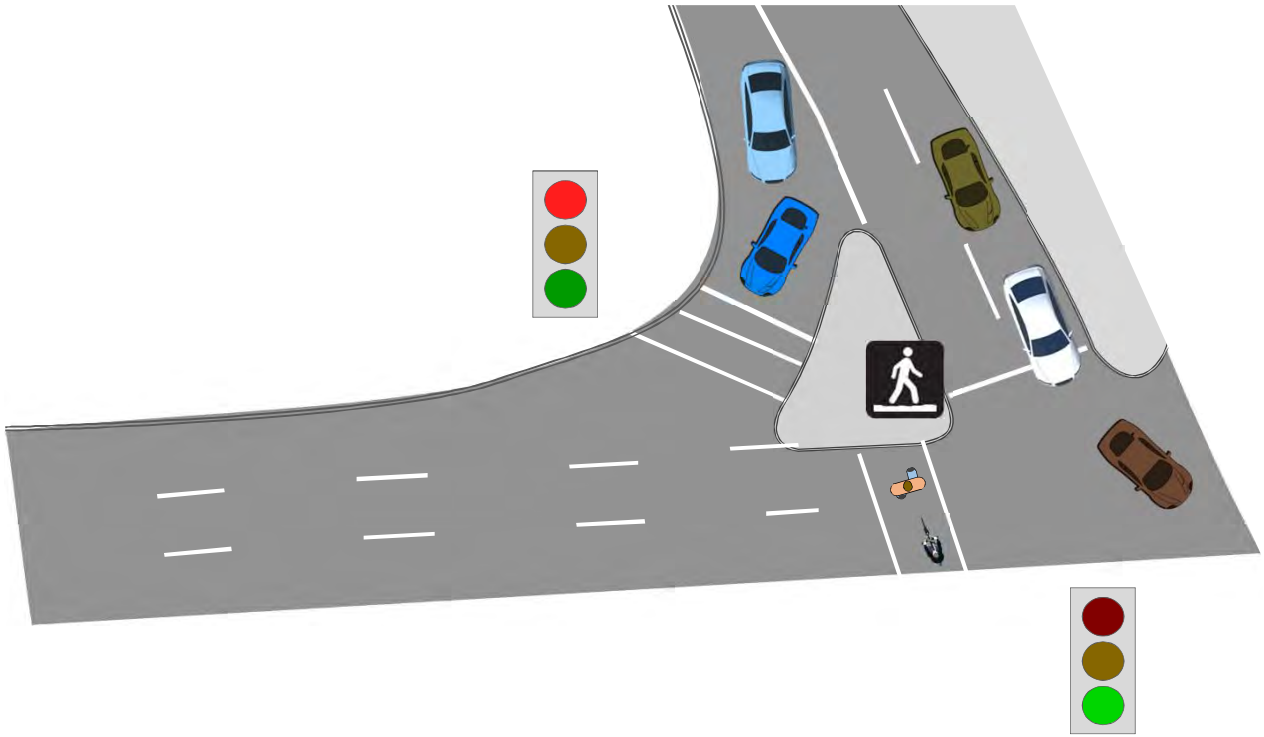
Role of Channelized Right Turn Lane

- Standard Right-Turn Lane Results in Higher Number of Conflicts when Right Turns and Pedestrian and Bicycle Volumes are High

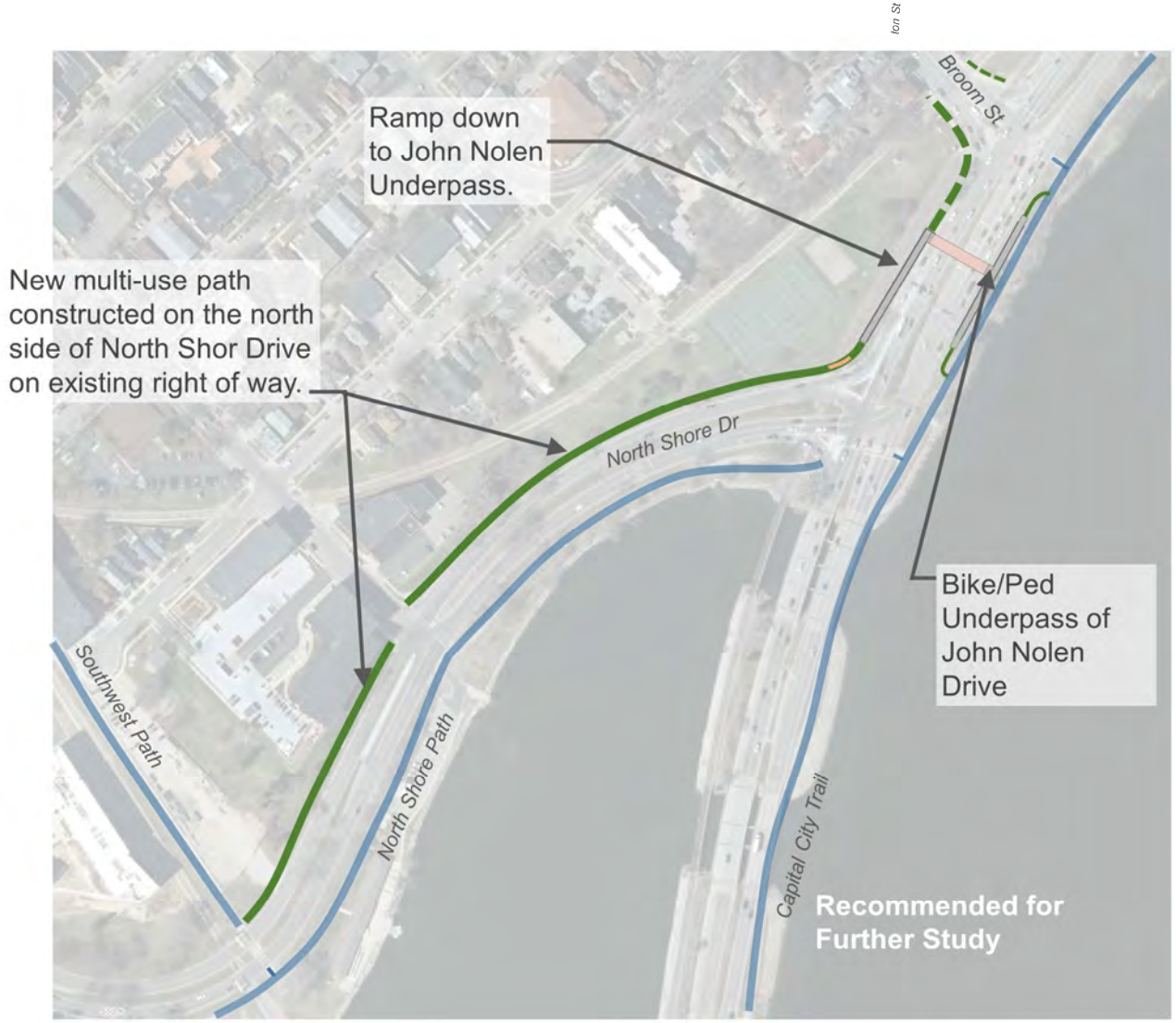


Role of Channelized Right Turn Lane

- Standard Right-Turn Lane Results in Higher Number of Conflicts when Right Turns and Pedestrian and Bicycle Volumes are High
- Channelized Right-Turn Lanes Provide More Options to Control Conflicts

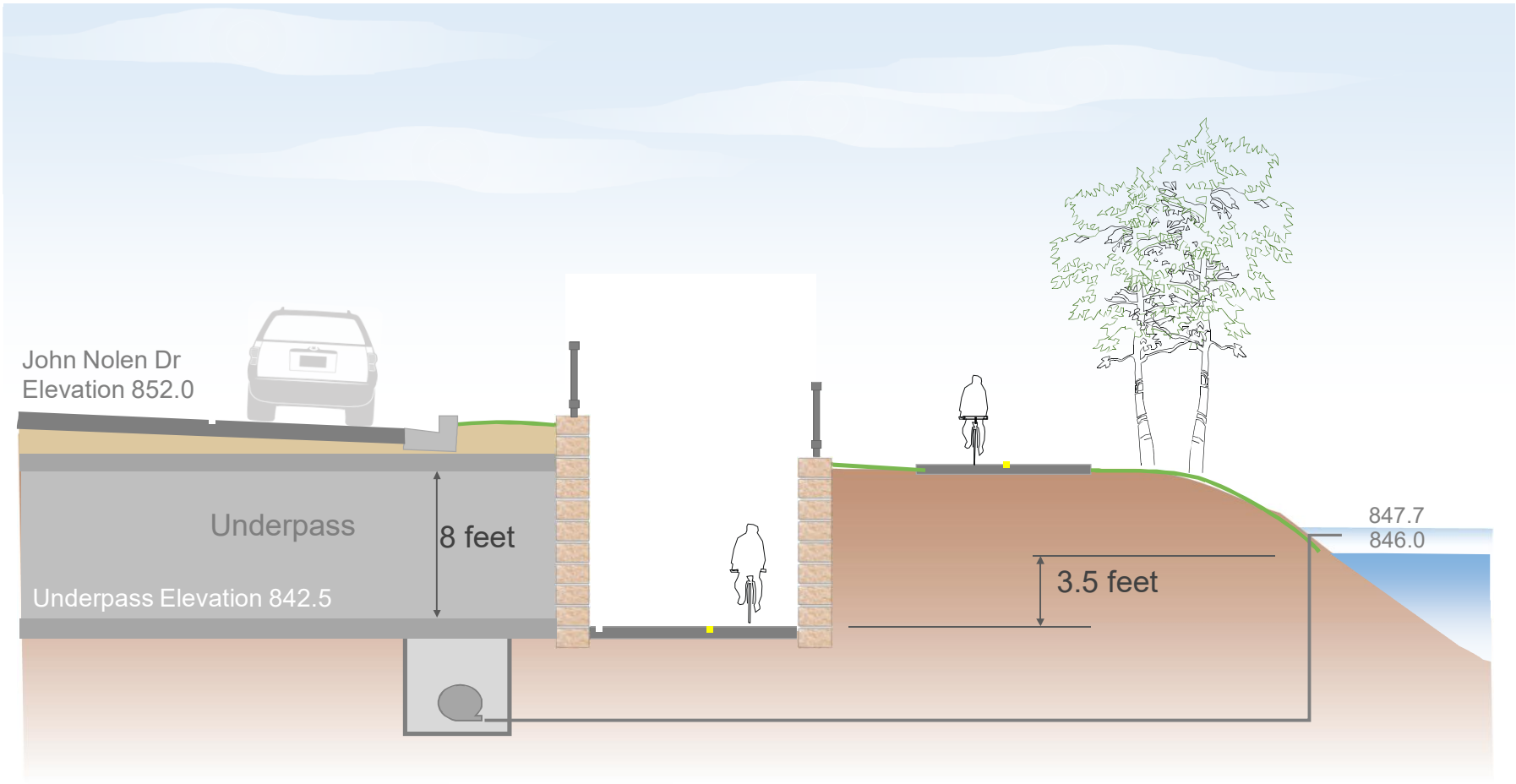


North Shore and Broom Street Bicycle Underpass



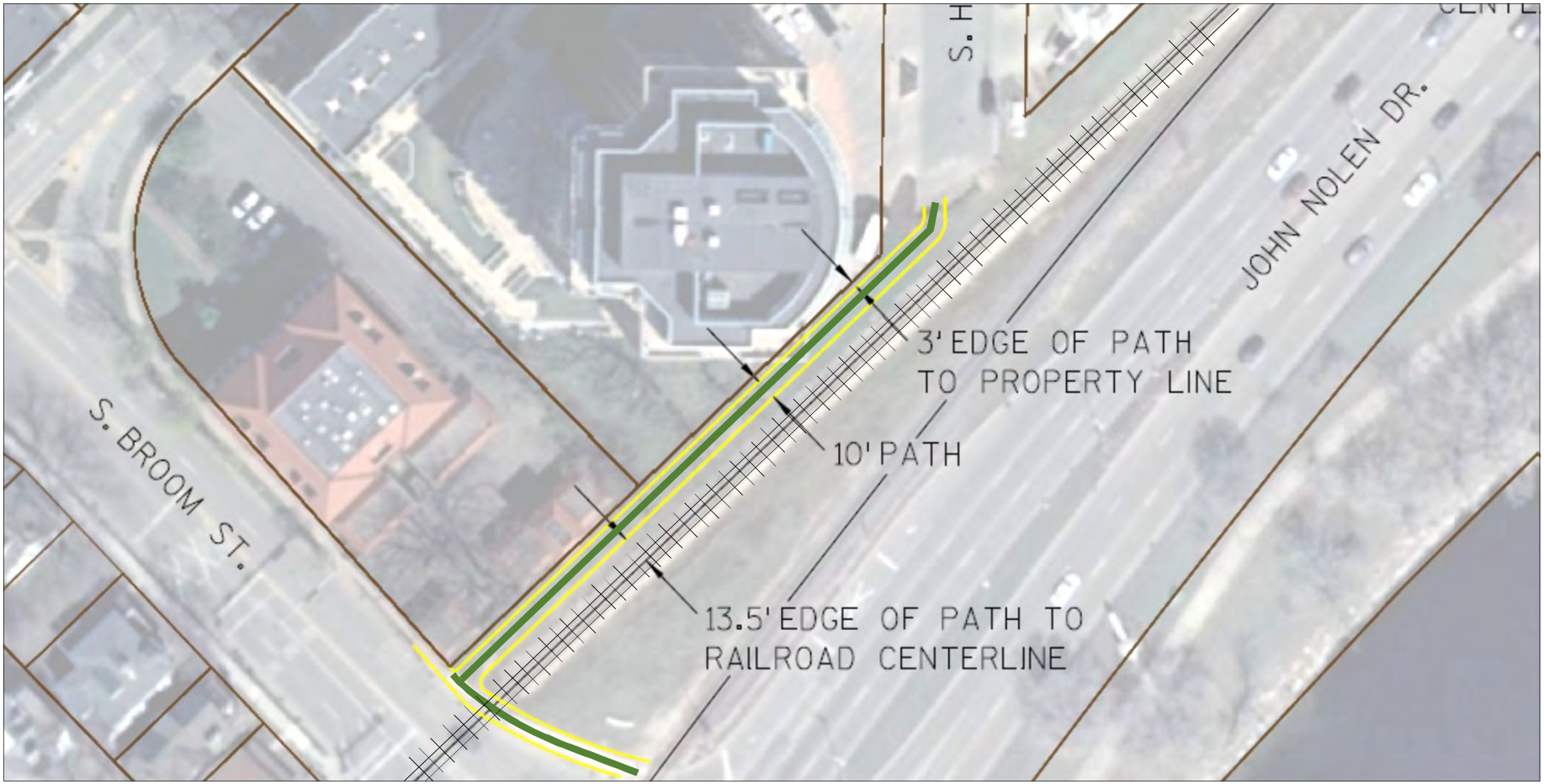
North Shore and Broom Street - Bicycle Underpass

- Underpass is Below Lake Level – Must be Water Tight (Designed like a Water Tank)
- Requires Pump System to Remove Stormwater



Broom Street and Hamilton Street Path Connection

- Possible Path Connection from Broom Street to Hamilton Street on Railroad ROW
- Could be Stand Alone or Included with Underpass



Study Schedule

Project Process and Schedule

Phase 1 – Needs & Alts Development

- PIM # 1, Needs and Priorities
- Range of Alternatives
- Alternatives Pros and Cons

Oct.'16-Mar.'17

Phase 2 – Alternatives Refinement

- PIM # 2, Range of Alternatives
- Refined Alternatives
- Preferred Combinations

Mar.'17-Jun.'17

Phase 3 - Recommendations

- PIM #3, Draft Recommendations
- Conceptual Layout, Range of Costs
- Layout Refinement
- Finalize Recommendations

Jun.'17-Jul.'17

Project Contact Information

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cpetykowski@cityofmadison.com

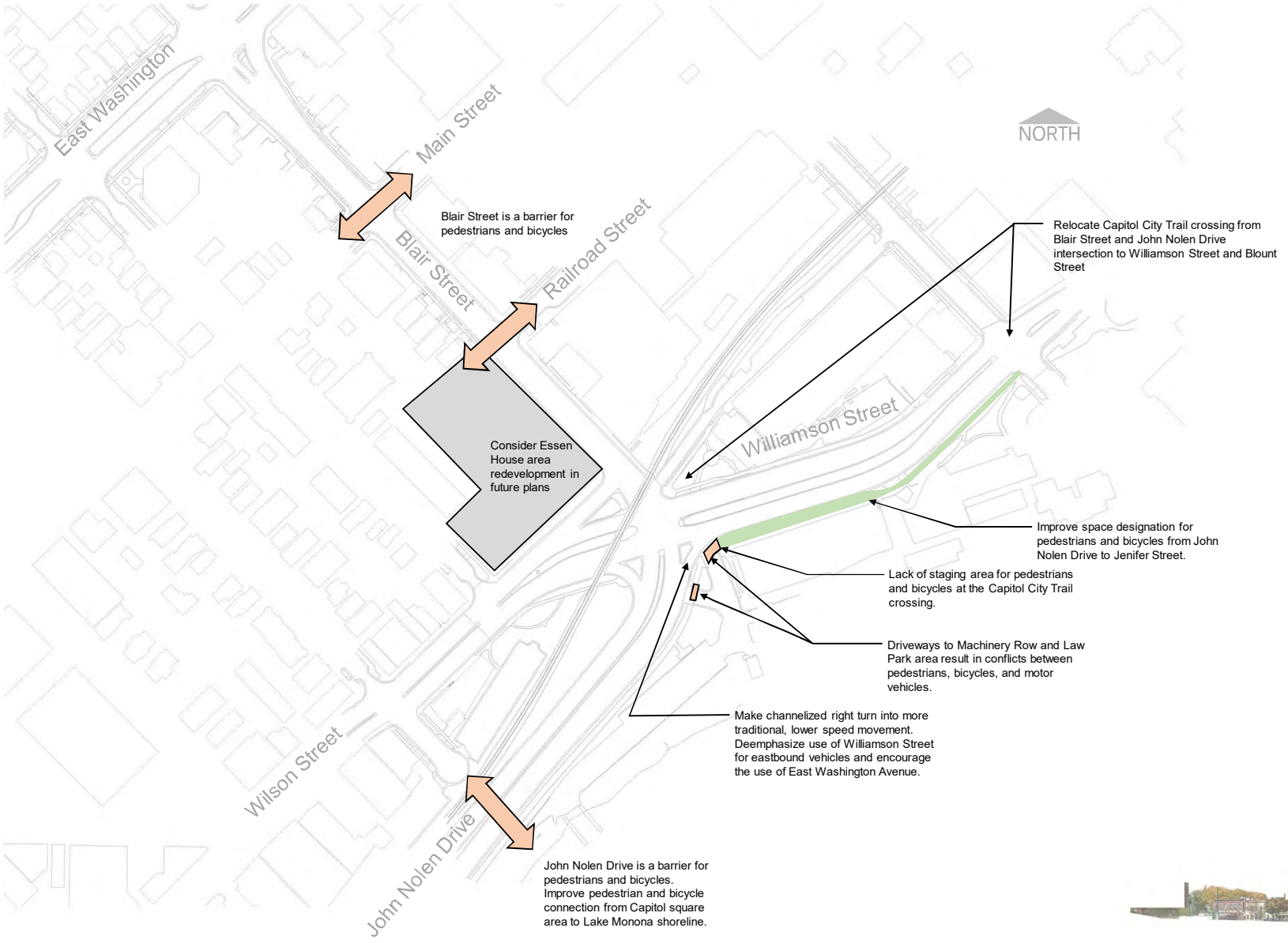
Jeff Held, Strand Associates, Inc.
Jeff.held@strand.com

City web page:
http://www.cityofmadison.com/engineering/projects/blair-st-john-nolen-dr-corridor-study

Blair Street and John Nolen Drive Corridor Study

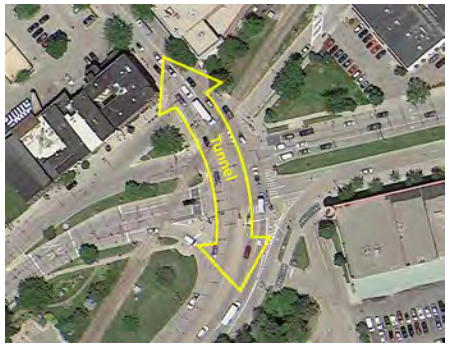
Public Involvement Meeting #2
Overview of Exhibits

Blair/Williamson Intersection Expressed Needs



John Nolen/Blair/Williamson/Wilson Tunnel Alternative

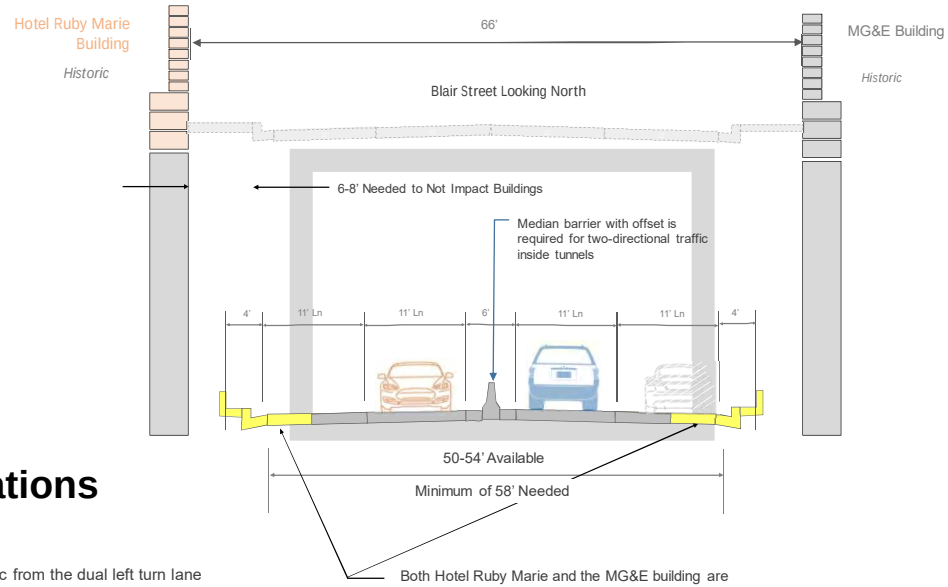
1. Concept



The John Nolen/Blair/Williamson/Wilson intersection is a hub for pedestrians, bicycles, and motor vehicles including transit. It is a focal point for all modes as they travel to the square, adjacent shops, and across the isthmus and is complicated by the fact that an active railroad line passes through the middle of it.

Because of this, some have suggested constructing a tunnel that would travel from John Nolen Drive, along Blair, and to East Washington. This tunnel could remove a large amount of motor vehicle traffic, making the intersection more friendly for pedestrians, bicyclists, and local motor vehicle trips.

2. Constraints - Buildings



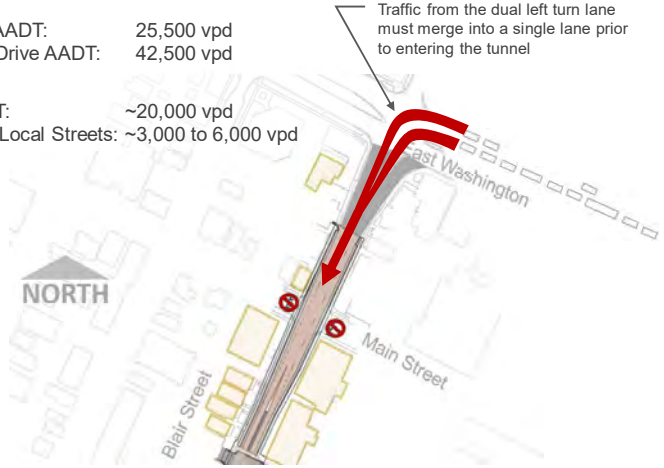
Both Hotel Ruby Marie and the MG&E building are likely eligible for the National Register of Historic Places. This designation would provide protections to the buildings and likely limit the right of way width to 66 feet. Because of clearance requirements, only a two-lane bi-directional tunnel would be able to fit under Blair Street.

3. Constraints – Traffic Operations

Average Annual Daily Traffic (AADT):

Existing
Blair Street AADT: 25,500 vpd
John Nolen Drive AADT: 42,500 vpd

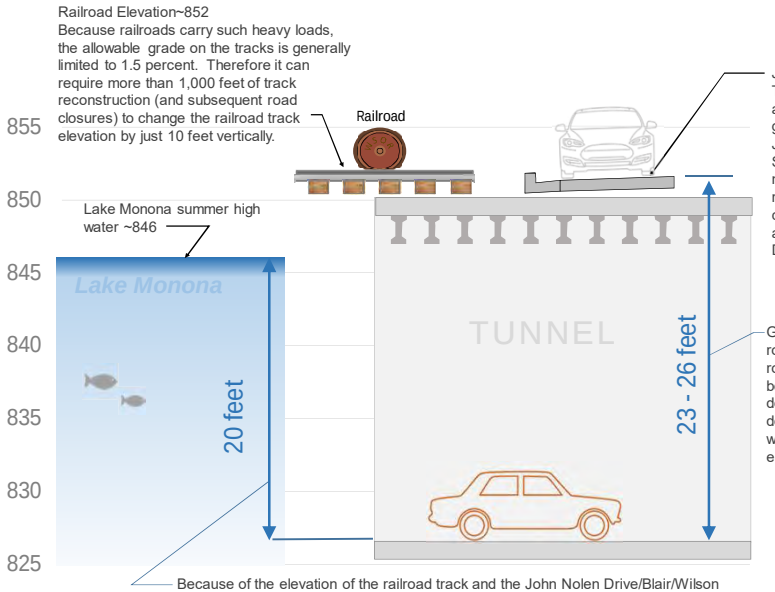
Estimated
Tunnel AADT: ~20,000 vpd
Diversion to Local Streets: ~3,000 to 6,000 vpd



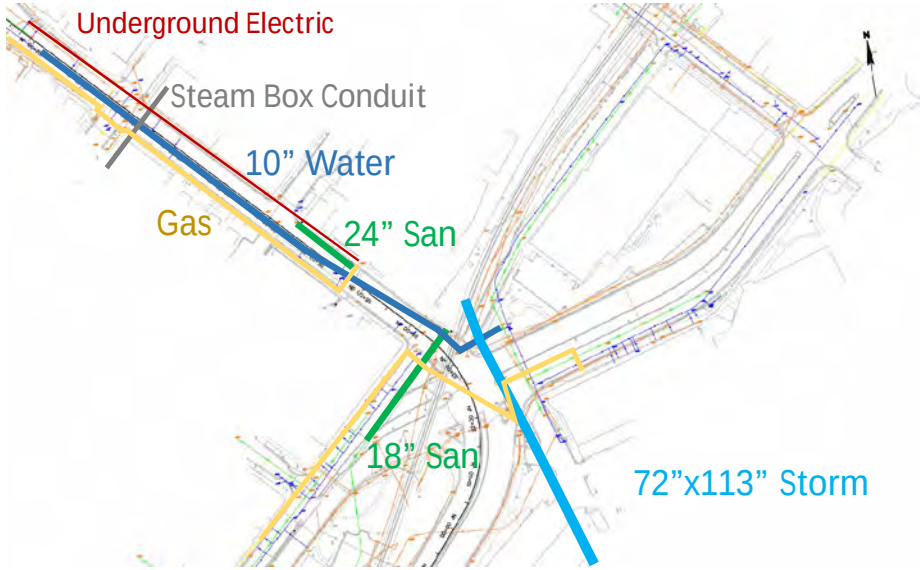
The dual left-turn movement from East Washington Ave. must merge to a single lane prior to entering the tunnel. Based on the estimated turning volume, this substandard merge length will result in unbalanced lane usage on East Washington Avenue. Modeling indicates that this left turn queue would will backup through the Blount Street and Livingston Street intersections, and possibly farther.

John Nolen/Blair/Williamson/Wilson Tunnel Alternative

4. Constraints - Elevation



5. Constraints – Utilities

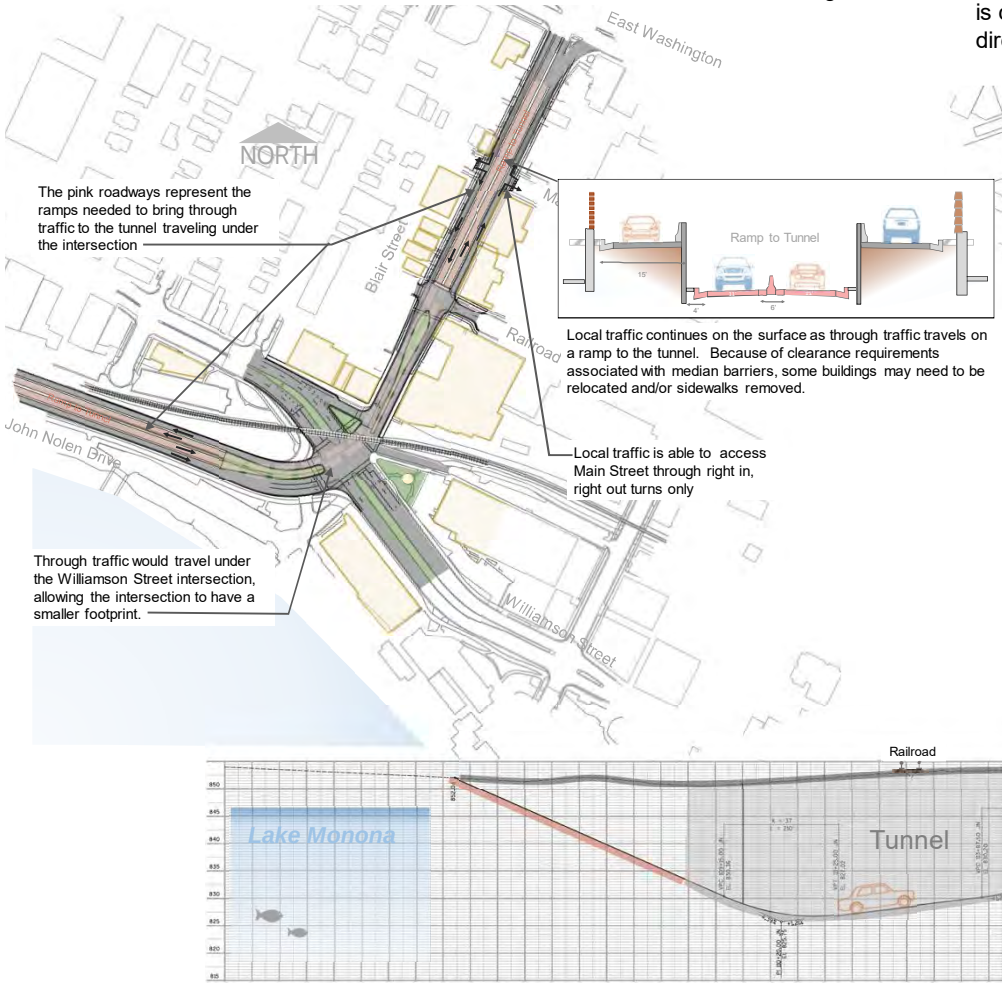


Utilities exist along Blair Street and through the intersection, including a steam box conduit associated with the Capitol power plant. Some utilities, such as underground electrical lines and water lines are difficult yet possible to relocate. Other utilities, such as storm sewer and sanitary sewers, rely on a constant grade to allow them to drain by gravity. These utilities are not easily relocated or lowered without installing pump stations. Of particular concern at this location is the 72 inch by 113 inch storm sewer draining to Lake Monona.

Tunnels

Option 1

Maintains local surface access to Railroad Street, Main Street, and East Washington Avenue

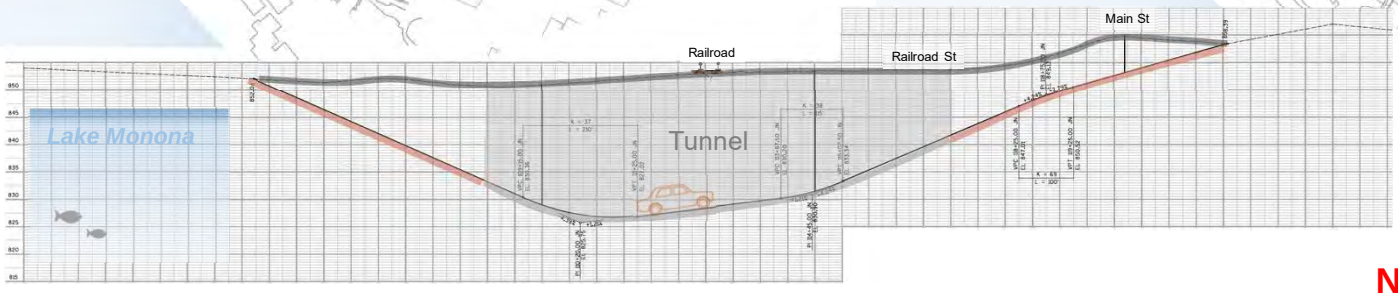


The pink roadways represent the ramps needed to bring through traffic to the tunnel traveling under the intersection

Local traffic continues on the surface as through traffic travels on a ramp to the tunnel. Because of clearance requirements associated with median barriers, some buildings may need to be relocated and/or sidewalks removed.

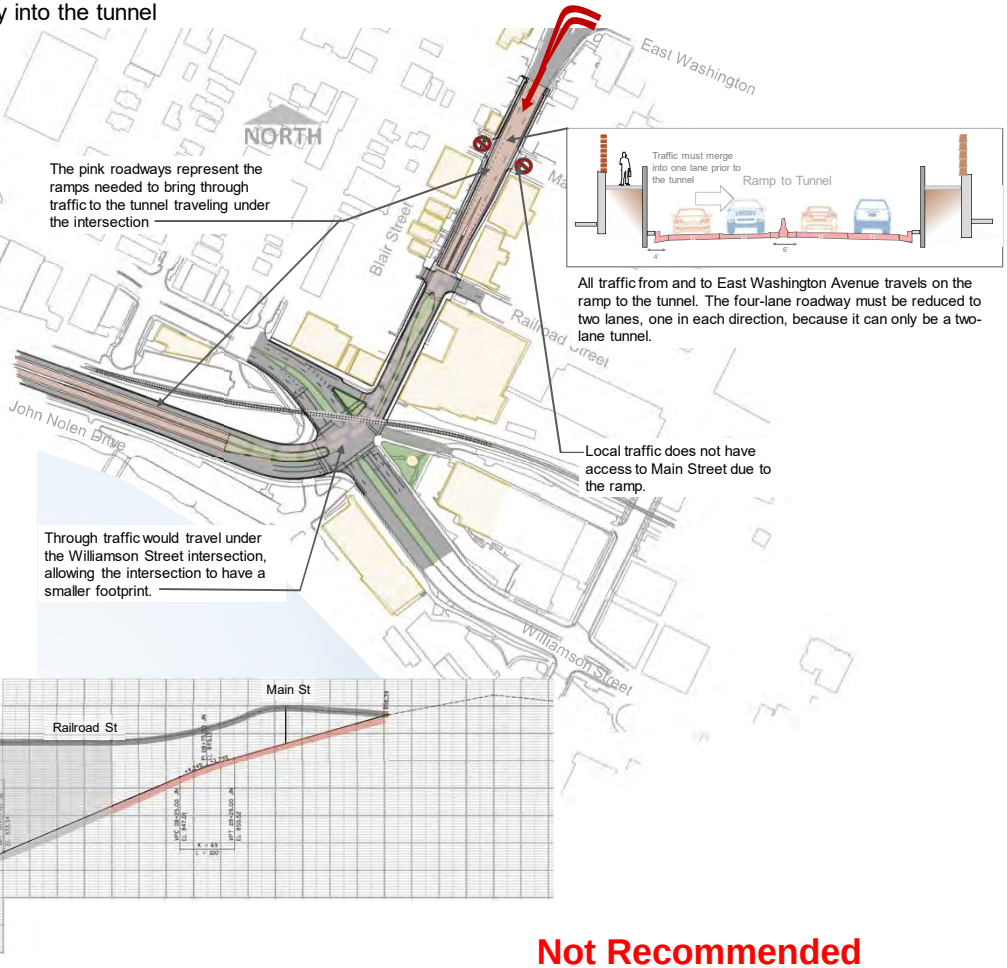
Local traffic is able to access Main Street through right in, right out turns only

Through traffic would travel under the Williamson Street intersection, allowing the intersection to have a smaller footprint.



Option 2

Maintains local surface access to Railroad Street. Access to Main Street is closed. The connection to and from East Washington Avenue flows directly into the tunnel



The pink roadways represent the ramps needed to bring through traffic to the tunnel traveling under the intersection

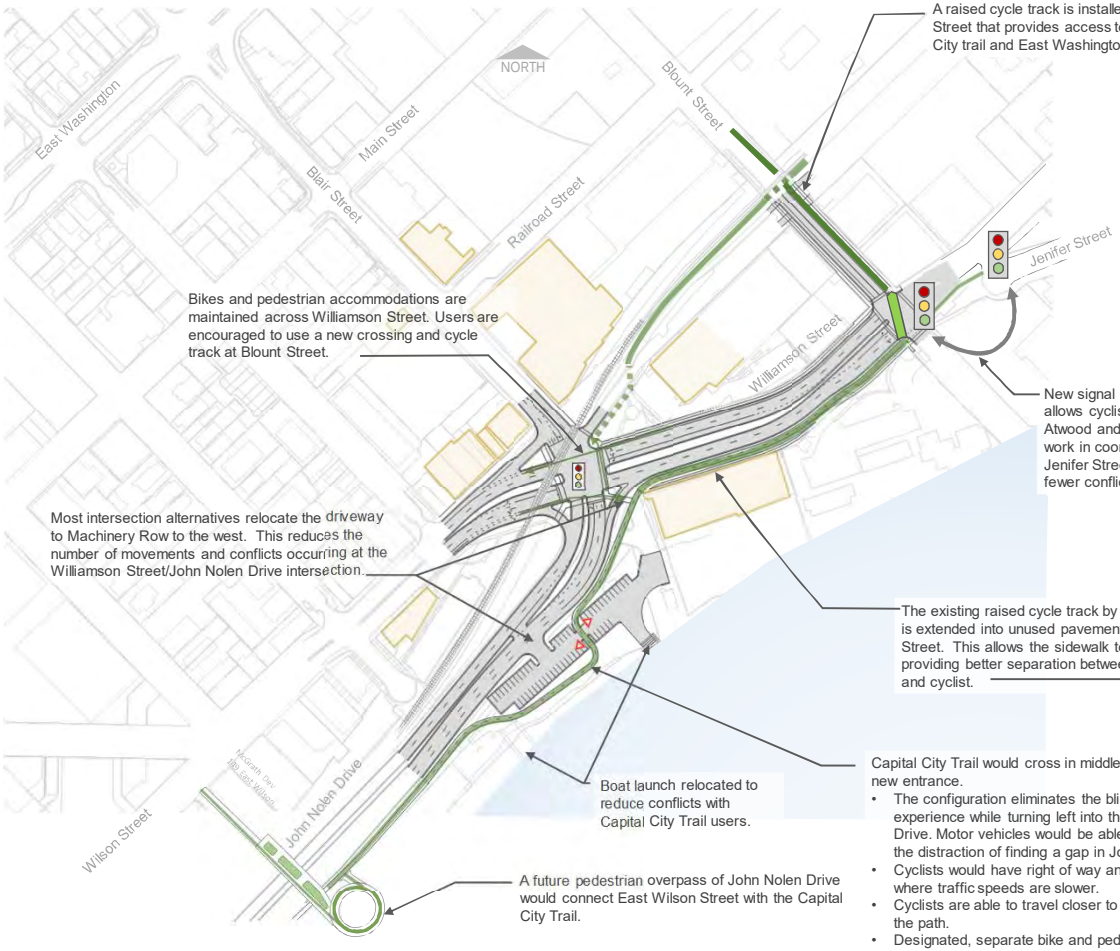
All traffic from and to East Washington Avenue travels on the ramp to the tunnel. The four-lane roadway must be reduced to two lanes, one in each direction, because it can only be a two-lane tunnel.

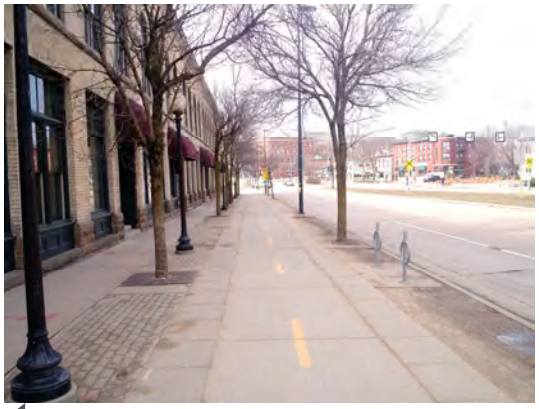
Local traffic does not have access to Main Street due to the ramp.

Through traffic would travel under the Williamson Street intersection, allowing the intersection to have a smaller footprint.

Not Recommended for Further Study

Bike Routing



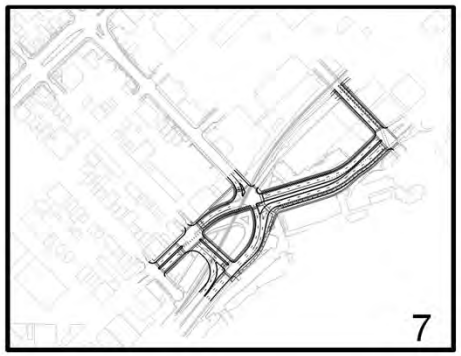


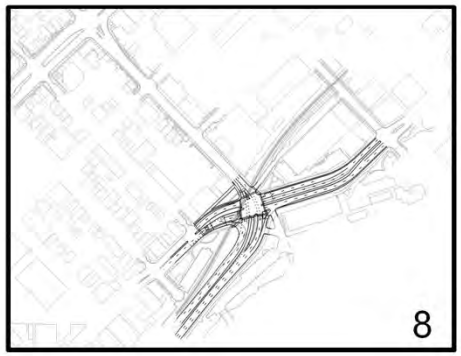
Existing

Expanded Pedestrian Area

Recommended for Further Study

Several At-grade Motor Vehicle Alternatives Evaluated





Alt 1 NB and SB Left Turn Lanes

Pedestrian Accommodations

- Maintains existing pedestrian crossings of Williamson, Wilson, and John Nolen Drive.
- Cycle track in front of Machinery Row expanded to separate pedestrian and cyclists.

Bicycle Accommodations

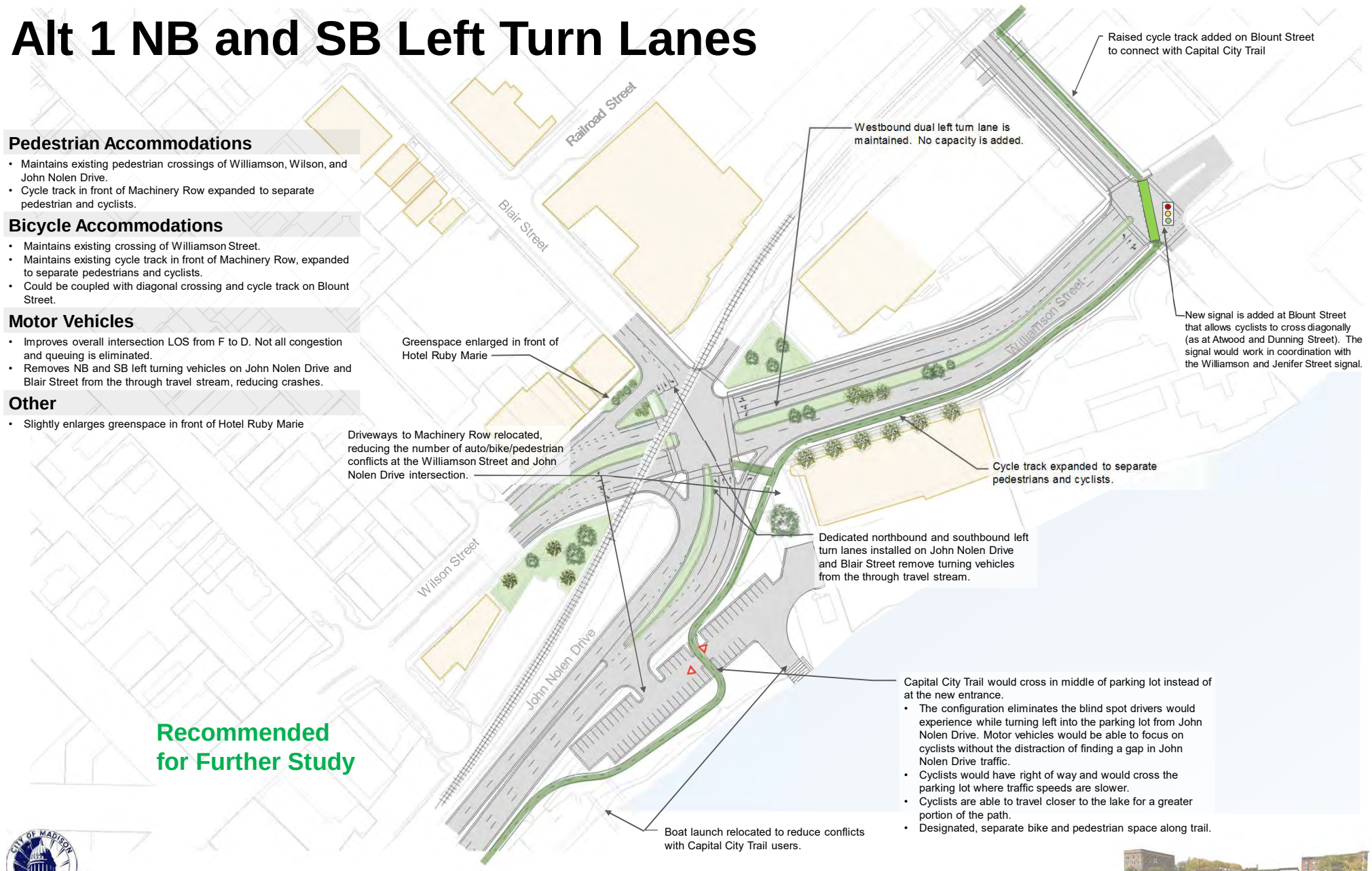
- Maintains existing crossing of Williamson Street.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.
- Could be coupled with diagonal crossing and cycle track on Blount Street.

Motor Vehicles

- Improves overall intersection LOS from F to D. Not all congestion and queuing is eliminated.
- Removes NB and SB left turning vehicles on John Nolen Drive and Blair Street from the through travel stream, reducing crashes.

Other

- Slightly enlarges greenspace in front of Hotel Ruby Marie



Recommended for Further Study

Alt 7 Circulator

Pedestrian Accommodations

- Pedestrian accommodations are basically maintained.
- Several pedestrian crossings are reduced to crossing just one direction of traffic.
- Pedestrian crossings at Franklin Street and E Wilson Street have greater traffic volumes.
- Cycle track in front of Machinery Row could be expanded to separate pedestrian and cyclists.

Bicycle Accommodations

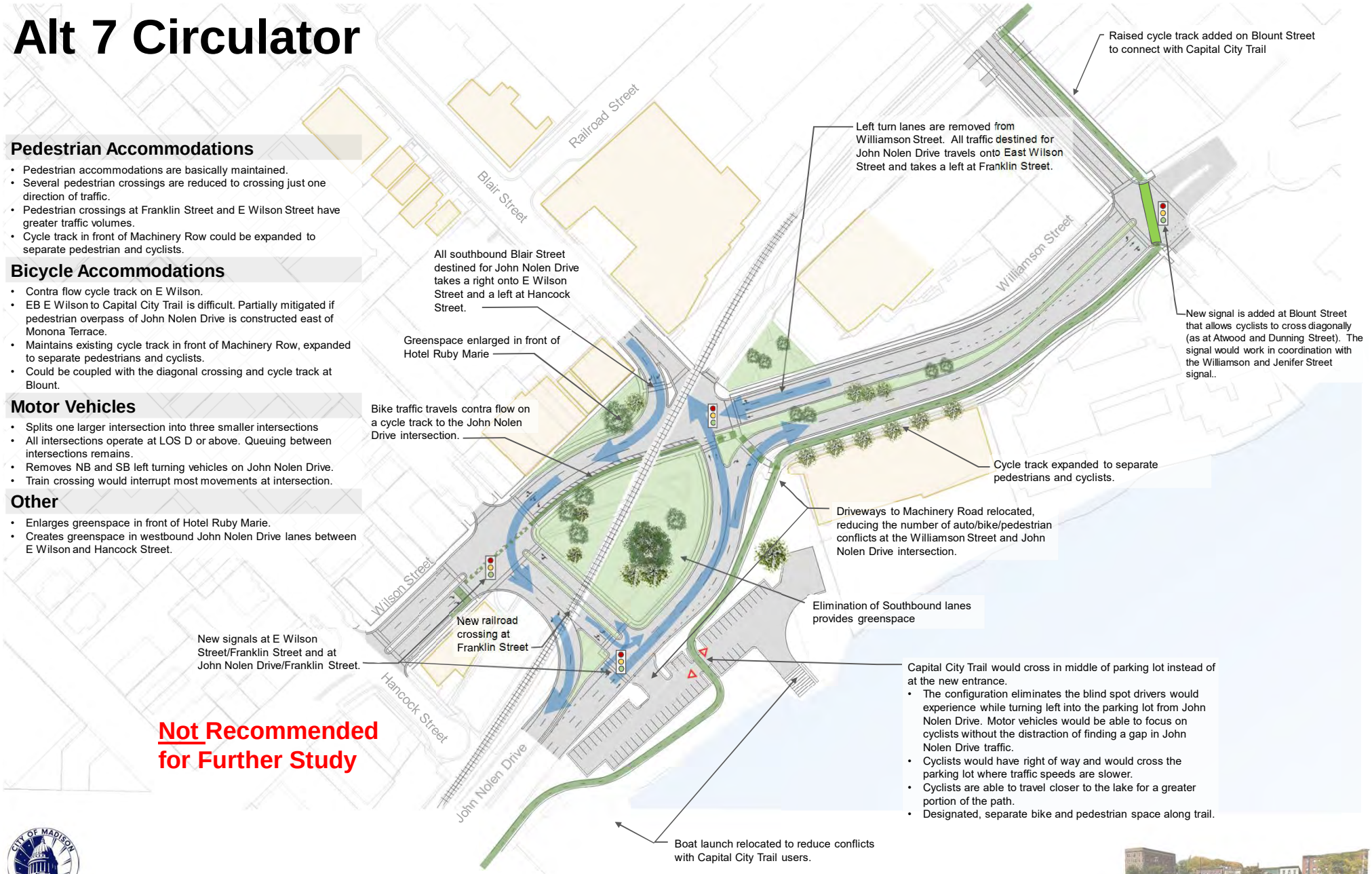
- Contra flow cycle track on E Wilson.
- EB E Wilson to Capital City Trail is difficult. Partially mitigated if pedestrian overpass of John Nolen Drive is constructed east of Monona Terrace.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.
- Could be coupled with the diagonal crossing and cycle track at Blount.

Motor Vehicles

- Splits one larger intersection into three smaller intersections
- All intersections operate at LOS D or above. Queuing between intersections remains.
- Removes NB and SB left turning vehicles on John Nolen Drive.
- Train crossing would interrupt most movements at intersection.

Other

- Enlarges greenspace in front of Hotel Ruby Marie.
- Creates greenspace in westbound John Nolen Drive lanes between E Wilson and Hancock Street.



Not Recommended for Further Study

Alt 8 Westbound Triple Left

Pedestrian Accommodations

- Maintains existing pedestrian crossings of Williamson, Wilson, and John Nolen Drive.
- Cycle track in front of Machinery Row could be expanded to separate pedestrian and cyclists.

Bicycle Accommodations

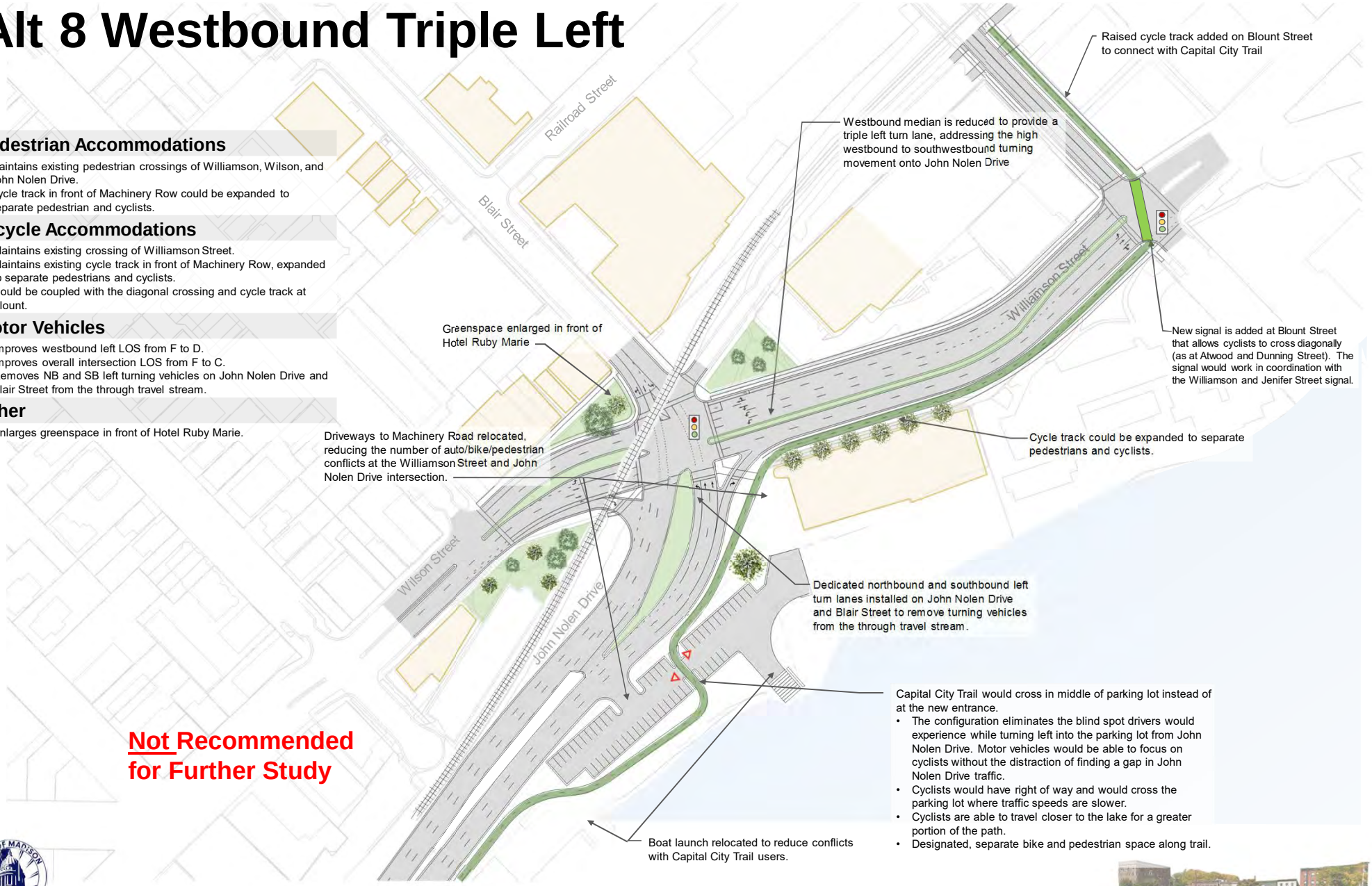
- Maintains existing crossing of Williamson Street.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.
- Could be coupled with the diagonal crossing and cycle track at Blount.

Motor Vehicles

- Improves westbound left LOS from F to D.
- Improves overall intersection LOS from F to C.
- Removes NB and SB left turning vehicles on John Nolen Drive and Blair Street from the through travel stream.

Other

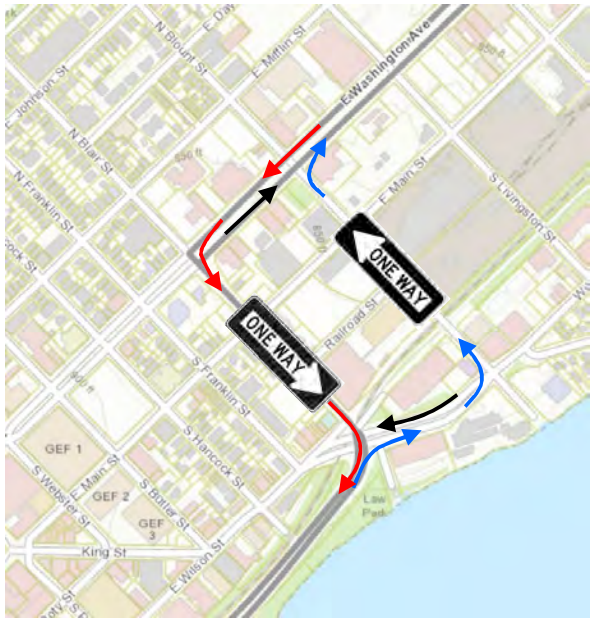
- Enlarges greenspace in front of Hotel Ruby Marie.



Not Recommended for Further Study

Alt 9 One-way Couplet

1. Concept



The one-way couplet alternative creates a one-way pair between East Washington Avenue and Williamson Street using Blair Street to carry inbound traffic and Blount Street to carry outbound traffic. All northbound John Nolen Drive traffic destined for Railroad Street, Main Street, and East Washington Avenue would make a right-turn on to Williamson Street followed by a left-turn on to Blount Street.

2. Pros and Cons

Mode	Advantages	Disadvantages
Pedestrians and Bicycles	• One-way Blair Street may allow for more space to be dedicated to terrace, pedestrian, and/or bicycle accommodations. • One-way Blount Street may provide an opportunity to reorganize the street section to find the appropriate balance between pedestrian and bicycle facilities, on-street parking, and motor vehicle travel lanes.	• Higher conflicting traffic volumes for the Capitol City trail crossing at Blair Street/ John Nolen Drive. • Increased traffic volumes along Williamson Street between Blair Street and Blount Street.
Transit	• Lower traffic volumes eastbound along East Washington Avenue between Blair Street and Blount Street which carries 9 weekday routes and has a bus stop at the southeast corner at Blount Street. • No significant impacts to current routing.	• Higher traffic volumes along eastbound Williamson Street between Blair Street and Blount Street which carries 4 weekday routes.
Motor Vehicle Traffic Operations	• Lower delay and queuing during the AM peak hour than modest conventional expansion (adding left-turn bays for John Nolen Drive and Blair Street).	• Higher delay and queuing during the PM peak hour than modest conventional expansion (adding left-turn bays for John Nolen Drive and Blair Street).
Additional Considerations	• Spreads traffic burden among two streets instead of one.	• Perception of encouraging John Nolen Drive northbound/ eastbound traffic to use Williamson Street instead of East Washington Avenue.

Alt 9 One-way Couplet

Pedestrian Accommodations

- Maintains existing pedestrian crossings of Williamson, Wilson, and John Nolen Drive.
- Cycle track in front of Machinery Row expanded to separate pedestrian and cyclists.

Bicycle Accommodations

- Removes portion of Capital City trail and requires use of cycle track and crossing at Blount Street.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.

Motor Vehicles

- Blair Street is converted to one-way southbound operation.
  - Frees up room for parking on both sides or parking on one side and a bike accommodation on the other side.
  - Increases terrace on both sides by about 3 feet.
- Blount Street is converted to one-way northbound operation.
- Improves overall intersection LOS for multiple intersections to LOS C or D.
- Removes NB left turning vehicles on Blair Street that block through vehicles today.

Other

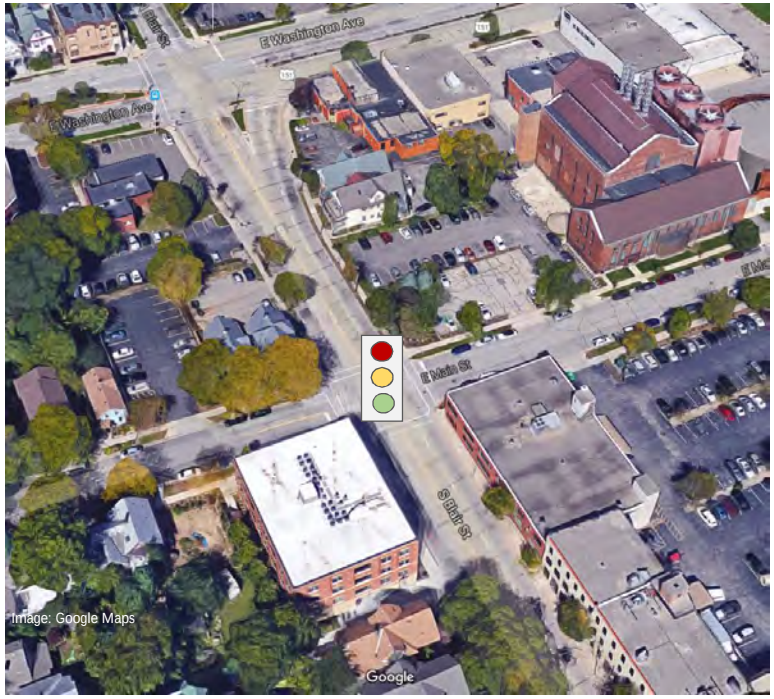
- Slightly enlarges greenspace in front of Hotel Ruby Marie

Recommended for Further Study

Traffic Signal at Main Street and Blair Street

Images: Google Maps

1. Concept



One of the comments received during the first public meeting stated that crossing Blair Street at Main Street on foot or on a bicycle is challenging during peak travel times. One option to improve east-west mobility for pedestrians, bicycles, and motor vehicles would be to install a traffic signal. The tradeoff is increased motor vehicle delays, congestion, and queuing for traffic on Blair Street.

The inability to provide left-turn bays on Blair Street at this signalized intersection is a potential safety concern. If installed, consideration could be given to prohibiting left-turns from Blair Street on to Main Street, perhaps during peak times only.

Recommended for Further Study

2. Pros and Cons

Mode	Pros	Cons
Pedestrians and Bicycles	• Provides a signal controlled crossing that stops Blair Street motor vehicle traffic to allow pedestrians and bicyclists to cross at Main Street.	• May draw more motor vehicle traffic to Main Street which is currently a low volume local street.
Transit	• No current Metro routes use the intersection. May provide new routing options for Metro routes due to improved access.	• None.
Motor Vehicle Traffic Operations	• Improved access for Main Street movements. • Total motor vehicle delays are acceptable.	• Higher queuing for Blair Street movements, including the potential for southbound Blair Street traffic to back into East Washington Avenue. • Potential for increased safety concerns due to inability to provide left-turn bays on Blair Street. • Northbound Blair Street traffic at East Washington Avenue likely to back into Main Street signal. • May need to consider prohibiting northbound and southbound left-turns from Blair Street on to Main Street.
Additional Considerations	• None.	• Buildings are close to or right on the back of sidewalk in three of the four intersection quadrants, making placement of signal equipment challenging and potentially more costly.

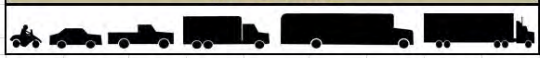
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

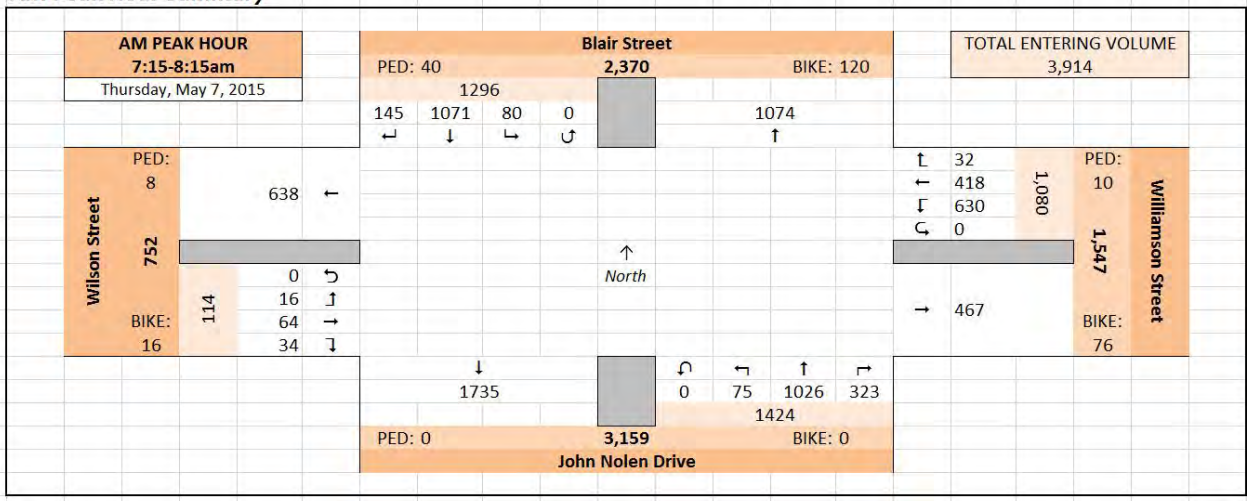
Blair Street/John Nolen Drive and Williamson Street

Count Basics			*Page 2 of 11*
Start Date:	Thursday, May 7, 2015	Weekday	Schools in Session
Total Number of Hours Counted: 3		Non-Holiday	No Special Events

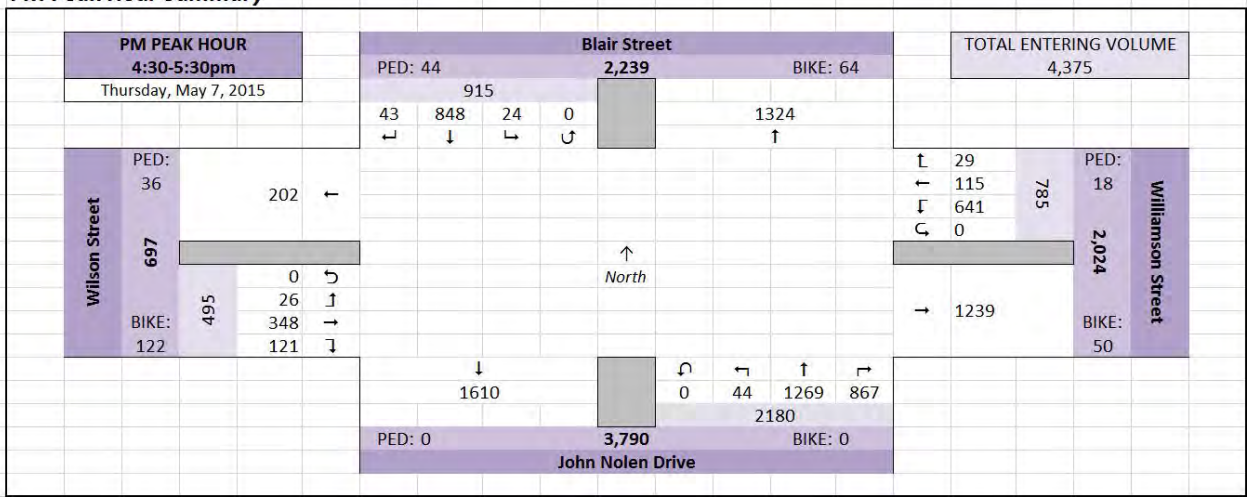
All Motor Vehicles



AM Peak Hour Summary



PM Peak Hour Summary



Pedestrian Bicycle Connection to Law Park

Stronger connections from the square to the lake are recommended in the South Capitol Transit Oriented Development study. With the potential redevelopment of 149 and 151 East Wilson, a pedestrian overpass could be constructed that links Wilson Street to Law Park. The City is currently making arrangements with the developer to preserve an easement allowing this overpass and exploring putting in the subsurface infrastructure needed for the overpass. Construction of the overpass will occur when funding becomes available.

Point Cloud Rendering

The City had portions of the John Nolen Corridor laser scanned. Laser scanning creates a series of points, arranged in a 3-dimensional model, that accurately represent the location of buildings, signs, pavements, trees, and other features. The renderings below illustrate a possible pedestrian and bicycle overpass superimposed on the point cloud developed by the laser scanning. The pedestrian bicycle overpass maintains appropriate clearances over the railroad, and seeks to minimize effects to the lake.

Aerial view of potential pedestrian bicycle overpass

Looking at pedestrian bicycle overpass from Monona Terrace

Pedestrian bicycle overpass viewed from the east

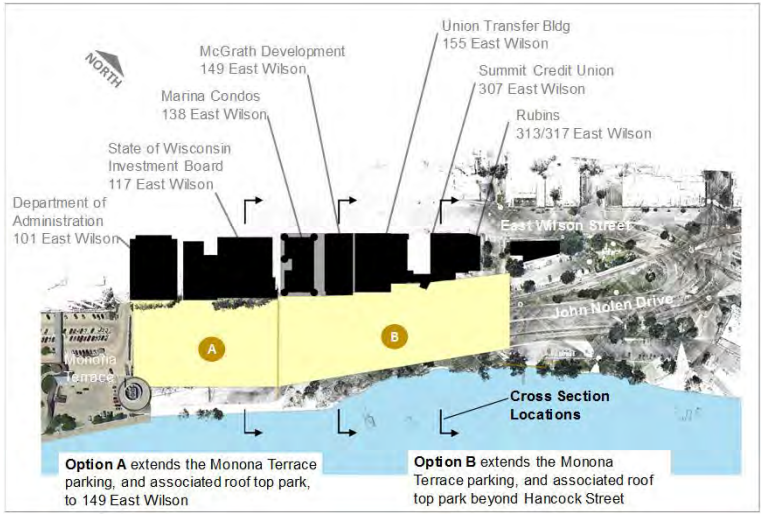
Pedestrian bicycle overpass could be made wider to accommodate planters, food carts, or other amenities.

The pier supporting the pedestrian bicycle overpass ramp can be cantilevered, yet some of the structure would still extend over the lake..

Discussion of Concepts East of Monona Terrace

Kenton Peters Concept
Looking Northwest

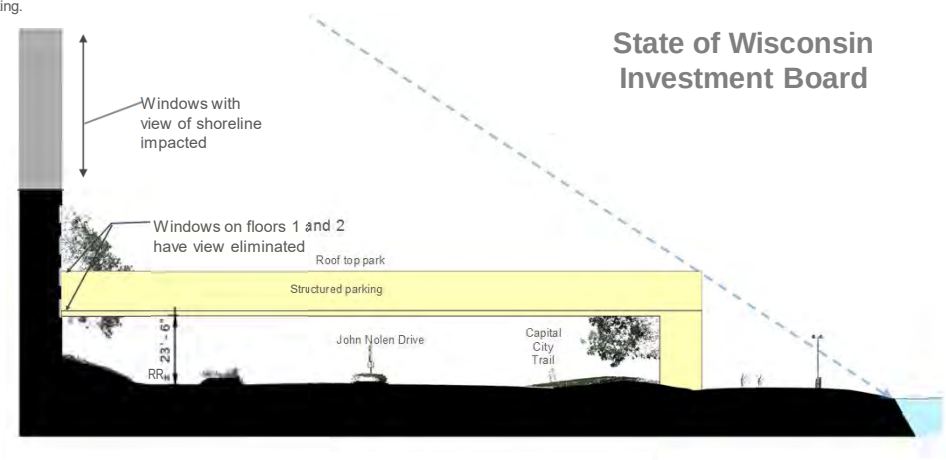
Madison Design Professionals Workgroup Concept
Looking Northeast



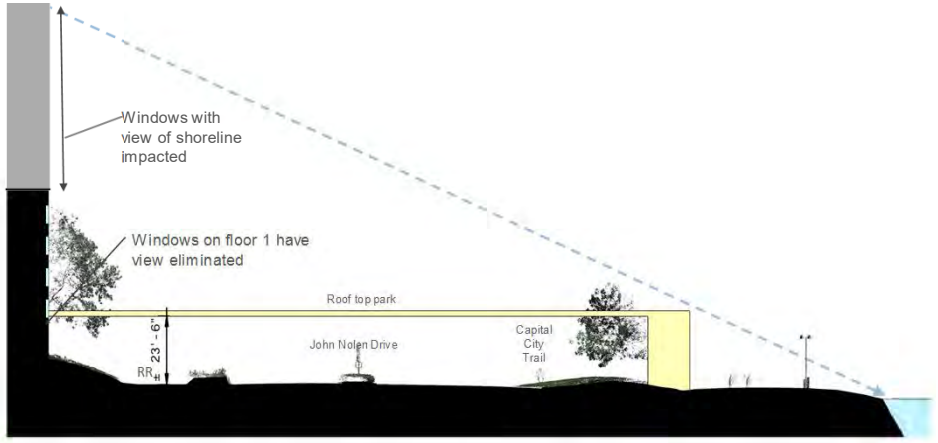
Both Kenton Peters and Madison Design Professionals Workgroup have developed concepts that would extend the Monona Terrace parking eastward over John Nolen Drive to the Blair Street intersection. While differing in details, both concepts incorporate a roof deck park on the top level, structured parking below the park, and a stepped terrace down to the lake.

Cross Sections and View Shed Analysis with Point Cloud

The City had portions of the John Nolen Corridor laser scanned. Laser scanning creates a series of points, arranged in a 3-dimensional model, that accurately represents the exact locations of buildings, signs, pavements, trees, and other features. The study team used this point cloud to investigate how an extended parking structure/park would affect the view from existing and proposed buildings. To perform this analysis, a trapezoid was superimposed above John Nolen Drive east of Monona Terrace. One of the scenarios used a trapezoid that assumed no structured parking and only a rooftop garden. Another scenario used a trapezoid that had one level of structured parking.



117 East Wilson
With Structured Parking



117 East Wilson
No Structured Parking

Discussion of Concepts East of Monona Terrace

Cross Sections and View Shed Analysis with Point Cloud

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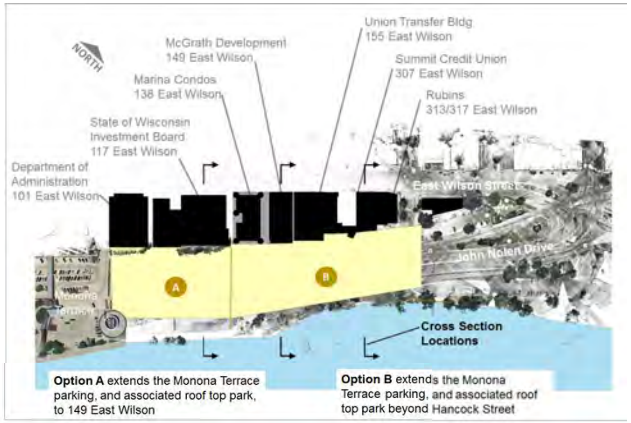
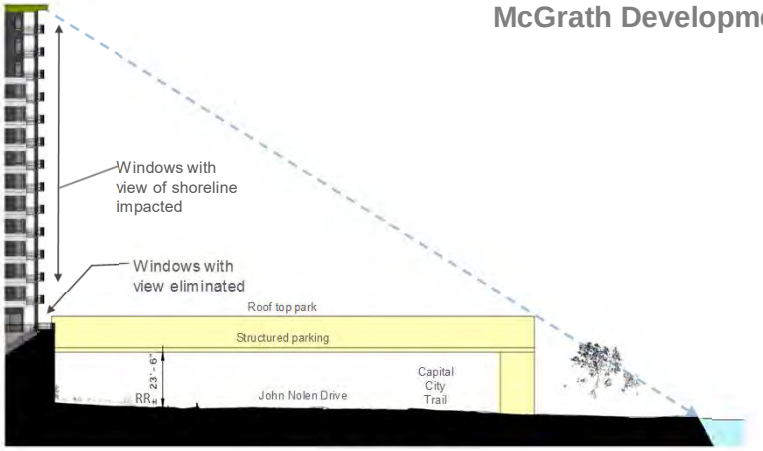
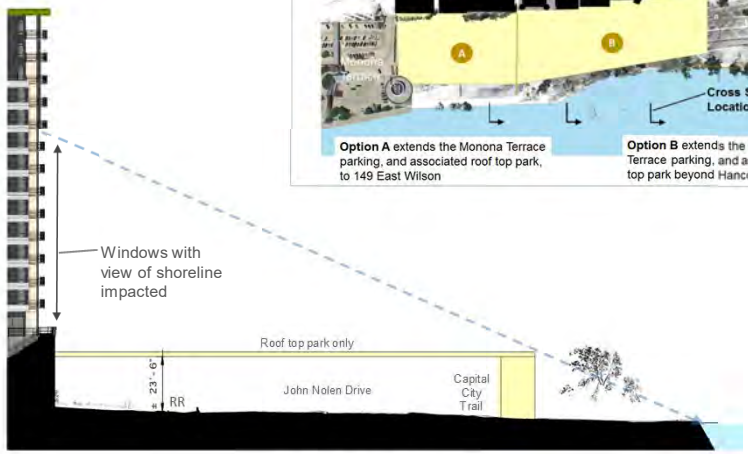


McGrath Development

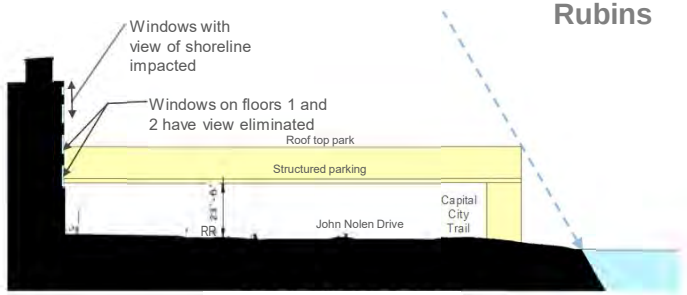


149 East Wilson
With Structured Parking

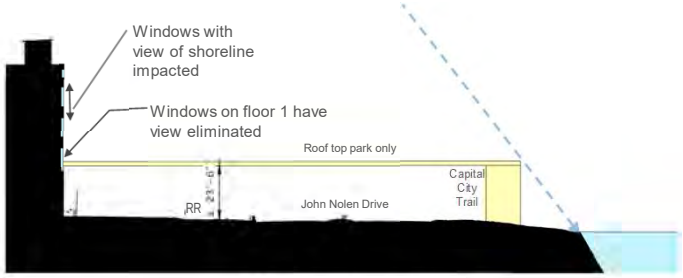


149 East Wilson
No Structured Parking

Rubins

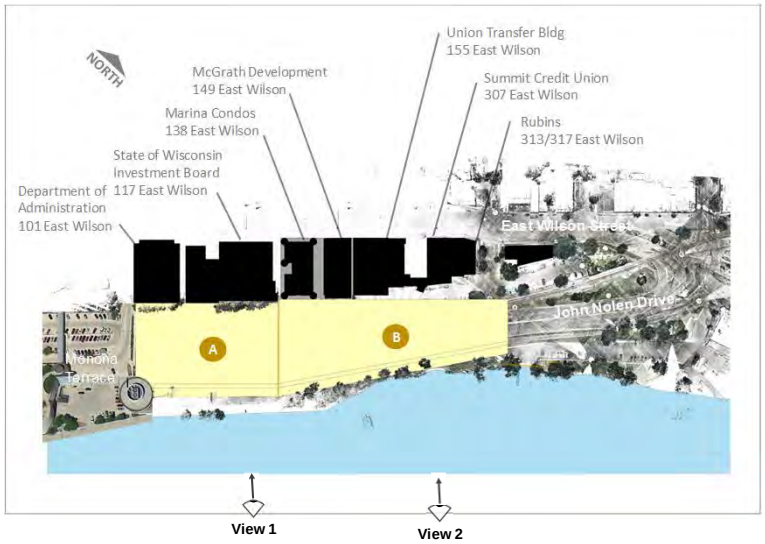


313 East Wilson
With Structured Parking



313 East Wilson
No Structured Parking

Discussion of Concepts East of Monona Terrace



View Shed Analysis with Point Cloud

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View 1 With and Without Structure Extension Over John Nolen Drive

VIEW 01 EXISTING

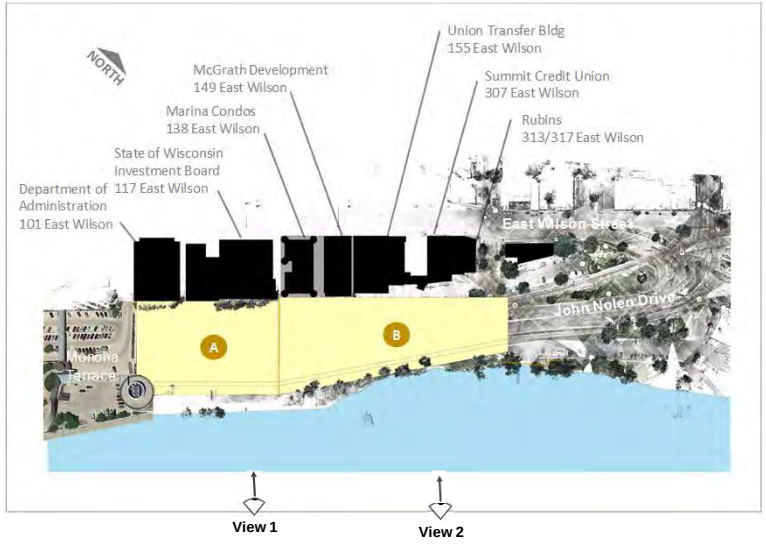
VIEW 1 – A - STRUCTURED PARKING AND ROOF TOP PARK

VIEW 1 – A - ROOF TOP PARK ONLY

Discussion of Concepts East of Monona Terrace

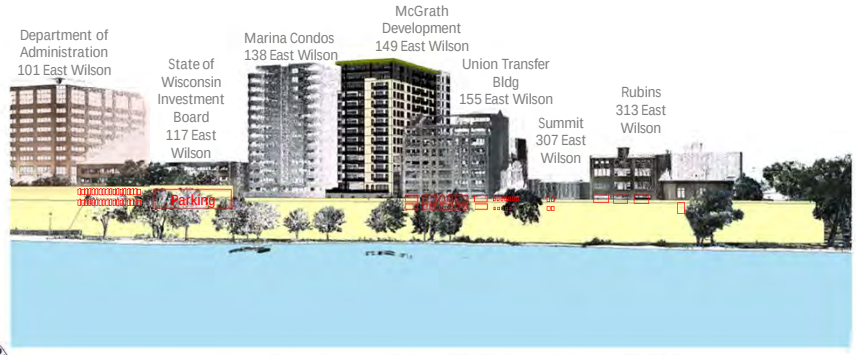
View Shed Analysis with Point Cloud

The City had portions of the John Nolen Corridor laser scanned. Laser scanning creates a series of points, arranged in a 3-dimensional model, that accurately represents the exact locations of buildings, signs, pavements, trees, and other features. The study team used this point cloud to investigate how an extended parking structure/park would affect the view from existing and proposed buildings. To perform this analysis, a block was superimposed above John Nolen Drive east of Monona Terrace.



View 2 With and Without Structure Extension Over John Nolen Drive

VIEW 02 EXISTING

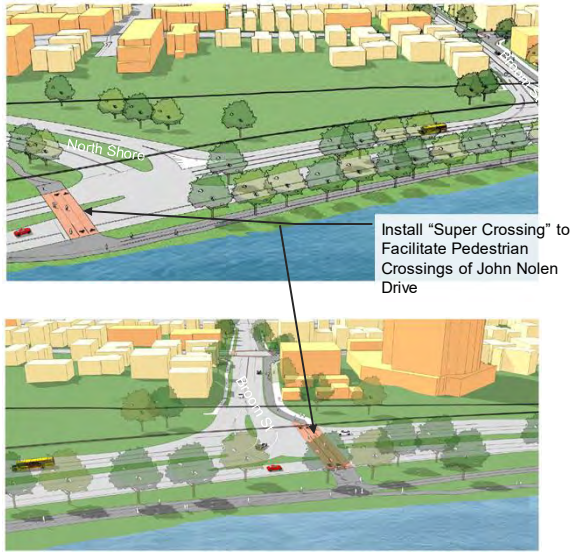


VIEW 2 - A - STRUCTURED PARKING AND ROOF TOP PARK
B - ROOF TOP PARK ONLY

VIEW 2 – A & B -STRUCTURED PARKING AND ROOF TOP PARK

Overview of Ideas

South Capitol Transit Oriented Development Study



The intersections of North Shore Drive and Broom Street with John Nolen Drive are recommended to have "super crossings" that provide dedicated directional bicycle lanes and a shared pedestrian lane. The study also recommends that bicycle and pedestrian queuing areas be expanded on both sides of John Nolen Drive.

The South Capitol District Planning Committee recommended a plaza bridge concept, east of the Monona Terrace be evaluated and refined to provide access to Law Park. The bridge concept should be coordinated with redevelopment concepts currently being planned on Wilson Street

Kenton Peters

Kenton Peters proposal would cover John Nolen Drive east of the Monona Terrace with both a parking structure and a park on top. The proposal includes one of Frank Lloyd Wright's original proposals for a boat house.

Ken Saiki Law Park Concept

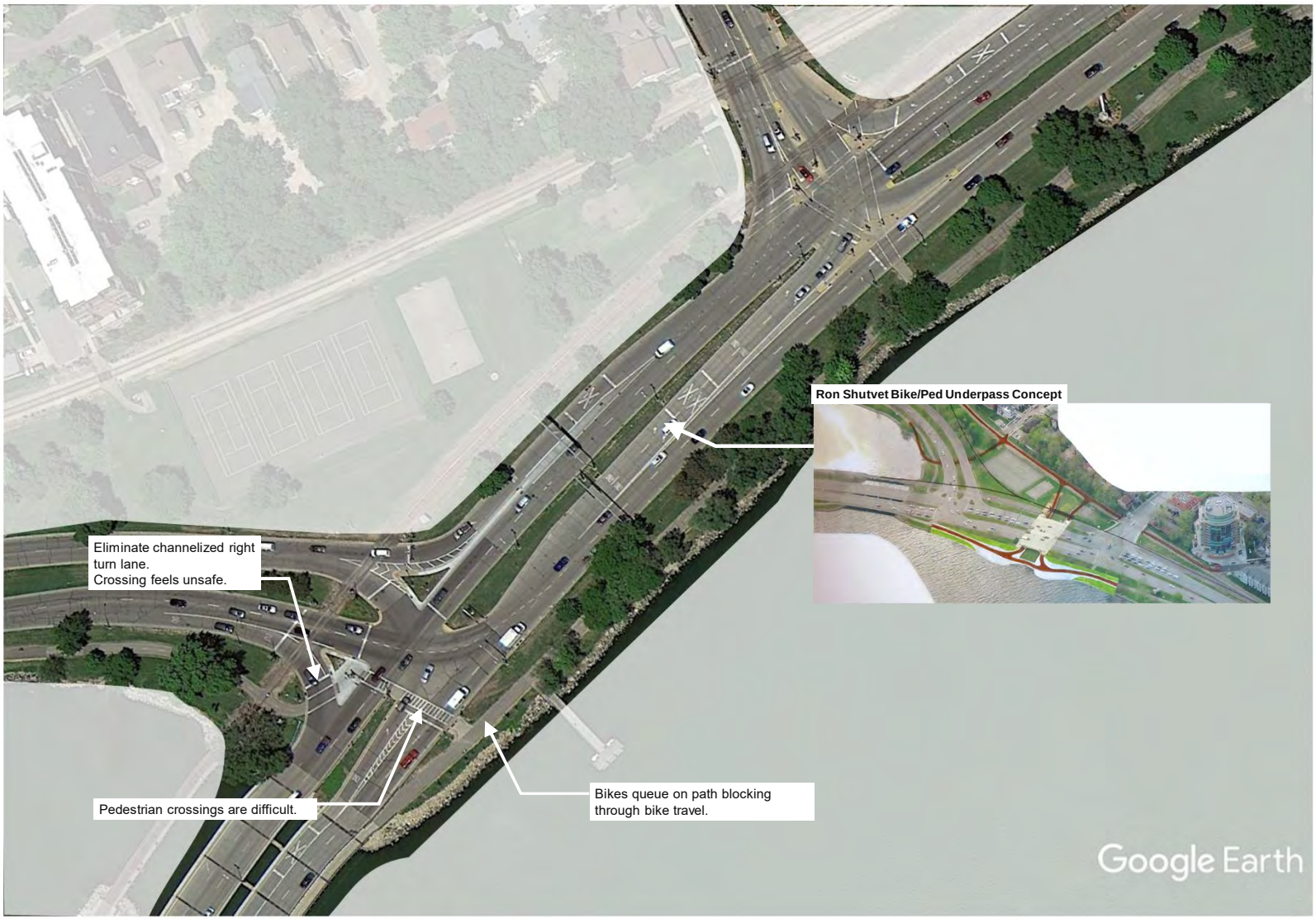
Ron Shutvet Bike/Ped Underpass Concept

Ron Shutvet proposed building a bike/ped underpass under John Nolen Drive to connect the Capital City Trail with the Southwest Path. He also included connections to Hamilton Street

Madison Design Professionals Workgroup

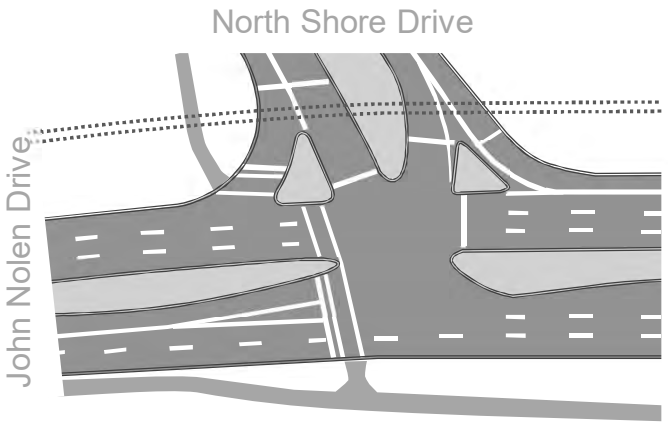
The Law Park plan proposed by the Madison Design Professionals Workgroup would build a park — 1,500 feet long and 200 feet wide over John Nolen Drive — and about 500 stalls of underground parking. It would feature a marina and hilly berms landscaped for casual outdoor gatherings. The shoreline would lose its riprap boulders for wetland plantings and boardwalk.

North Shore Drive/North Broom Street Expressed Needs

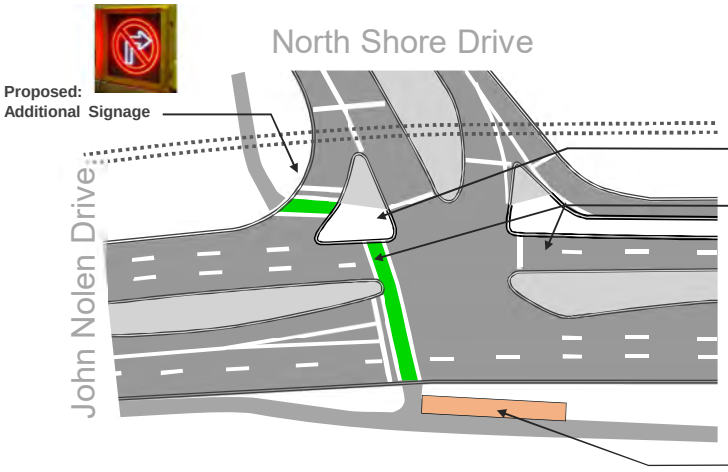


North Shore and Broom Street

Recent Improvements



As constructed in 1995

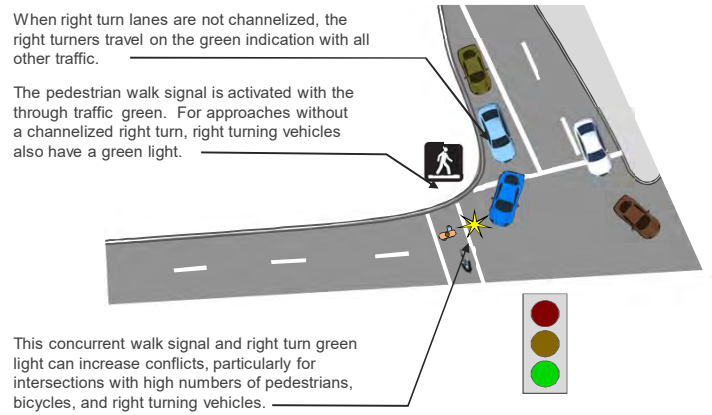


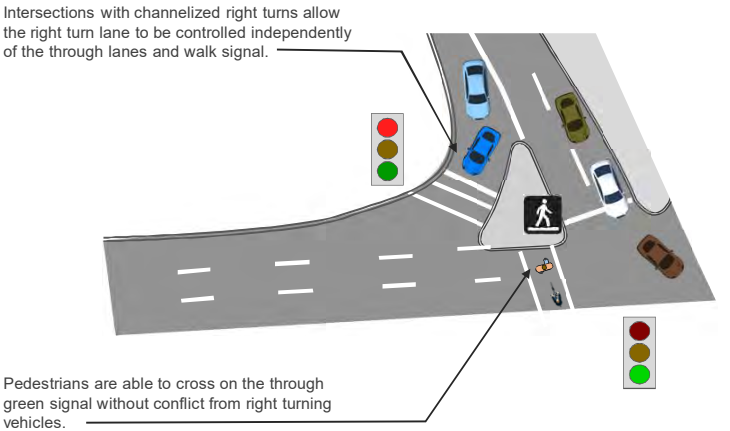
2013 Improvements

Proposed Short-term Solution

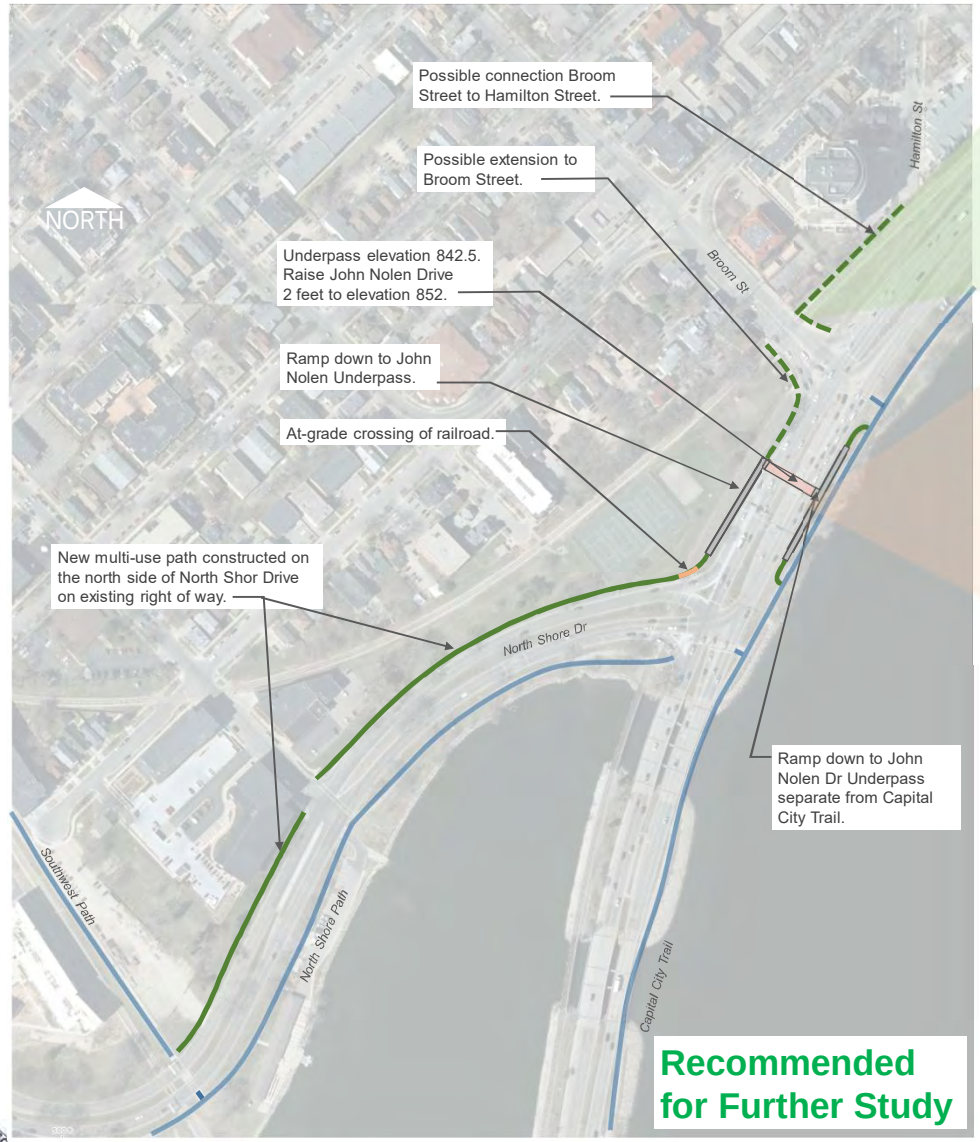
Role of the channelized right turn lane

Channelized right turn lanes with pork chop islands are often criticized for increasing the intersection footprint and increasing pedestrian crossing distances. However, for approaches with high volumes of right turning vehicles they can reduce pedestrian/turning vehicle conflicts. Channelizing the right turn lane allows it to be controlled independently of the through movements and the pedestrian walk signals. While making it a two-stage crossing for pedestrians and cyclists, it can substantially reduce conflicts.

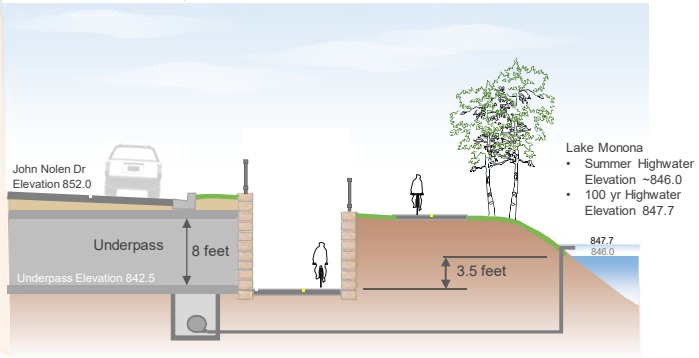




North Shore and Broom Street - Bicycle Underpass



It is possible to construct a path between Broom Street and Hamilton Street. This option could be stand alone or part of the system associated with an underpass of John Nolen Drive.



The underpass option places a pedestrian-bicycle tunnel underneath John Nolen Drive. This underpass would involve:

- Raising John Nolen Drive about 2 feet between North Shore Drive and Broom Street.
- Having the Capital City Trail run parallel to the ramp to the underpass.
- Constructing the underpass with a floor elevation of about 842.5.
- Because the underpass is beneath the normal lake level, the underpass would need to be watertight and would require a stormwater pump station.

Example of an underpass at the Verona Road interchange

2017-04-17 Blair Street Public Involvement Meeting #2
Comments and Questions Received

Group Questions and Discussion

- What will be done with stormwater? Specifically, not what has to be done, but what can be done.
- Is the Law Park parking lot needed? Can it be eliminated to expand the park?
- Continued concerns over the channelized right turn lane and the speeds associated with it. Can speeds be reduced through lane narrowing and smaller radii? Perhaps a raised crossing similar to the improvement at Milwaukee Street & Fair Oaks Boulevard.
- Not all of Blount is industrial. Near Williamson Street, the character is becoming more residential. Can Williamson traffic be calmed in the first block east of JND/Blair Street?
- Reduce the grass median size on the east approach (Williamson Street) and give that space to the area north of the Machinery Row building.
- Could the Wilson Green be redesigned/accounted for when an alternative is selected?
- Need to work out how to connect EB Wilson Street bikes with proposed cycle track in front of Machinery Row.
- When would signal at Main Street happen? Not a high priority at this point.
- Can the Haas mural be enhanced (repaired)? Could it have up lighting?
- Did we consider a tunnel for the trains instead? Costs and impacts are prohibitive.
- Could the possible boathouse that is being proposed by Kenton Peters and the Madison Design Professionals group have ferry service?
- If the parking lot extension over John Nolen Drive being considered with Kenton Peters and Madison Design Professionals occurs, could it have skylights?
- The proposed North Shore/Broom Street area bike underpass will probably catch a lot of snow in the winter - snow fencing should be considered.

Individual Questions and Discussion

- Can something be done to better protect the tree health along Williamson Street?
- The Marquette Neighborhood Association Transportation Committee would like to meet with the study team.
- The tunnel at JND/Blair/Wilson/Williamson should be east-west.
- There was not any proposal given for a short-term solution for a bike crossing at Broom Street. Can one be developed? The crossing is very difficult. (Received from 2 people)
- Supports the diagonal signalized bike/ped crossing at Blount.
- There needs to be a better bike connection between Wilson Street and the Capital City Trail in both directions. Westbound bikers use the current one-way street incorrectly, and cross onto Wilson at the wrong location. Eastbound bikers will need to somehow transition from the street on to the proposed cycle track in front of Machinery Row.
- On the proposed trail crossing through the parking lot, can the curves be softened?

- Bike/ped underpass at North Shore: put underpass where existing crossing is.
- Move Blair/JND/W/W intersection west/north closer to the tracks to create more Law Park space.
- Supports wider pedestrian “safe haven” in front of Machinery Row.

Written Comments

- Move Blair/JND/W/W intersection west/north closer to the tracks to create more Law Park space.
- Bike path across parking lot is a bad idea.
- One-way pair (couplet) is intriguing. Would need to encourage traffic to use Blount to East Washington and not Williamson.

- Eliminate the one-way Wilson leg that serves Gateway Mall and interferes with the Capital City trail.
- Narrow WB Wilson in front of Ruby Marie to improve the ped crossing.
- Supports moving Machinery Row driveways west.

- Supports moving Machinery Row driveways west. Supports reorganized/expanded bike/ped space in front of Machinery Row. Need to consider how EB Wilson bikes will connect to the cycle track.
- Does not support underpass of John Nolen Drive - puts bikes/peds on the wrong side of the causeway, tunnels in general not safe for peds/bikes.
- Remove parking from Law Park.

- Supports one-way couplet. Creative answer. Fears of encouraging more Williamson Street traffic are misplaced - there are ways to combat this.

- Include the preservation/conservation/enhancement (up lighting) of the Haas mural under Monona Terrace.

- No mention in the presentation of impacts to Metro routes and stops.
- If Main is signalized at Blair and more traffic is drawn to Main Street stop signs should be installed at Main Street and Franklin Street for pedestrian safety.

- Please preserve Blair Street Garden’s Gateway Garden (in front of Mall, NE quadrant of intersection).
- Please preserve Wilson Green (SW quadrant of intersection).
- Both have been maintained for over 30 years. Gateway just had $65,000 worth of investment.

- Eliminate Williamson Street peak-hour parking restrictions.
- Make Williamson Street narrower (42-feet) at Blair Street
- Do not encourage use of Main Street as a connector
- Plan for skateboarders

- Does not support alt 9 one-way couplet.
- Consider prohibiting JND NBL and Blair SBL

- Remove JND flying right on to Williamson Street
- Supports moving Machinery Row driveways east
- Supports reorganizing/expanding ped and bike space in front of Machinery Row - can this be extended to Jenifer Street?

- Does not support alt 9 one-way couplet. Funnels traffic to Williamson Street.
- Marquette neighborhood transportation committee would like to meet with the project team.

- Supports reorganizing/expanding ped and bike space in front of Machinery Row and providing a signal at Blount Street and Williamson Street.
- Does not support Alt 9, contrary to neighborhood goals of decreasing speeds and volumes on Williamson Street.
- Need to achieve bike/ped separation east of Machinery Row too - past Fauerbach building.

- Instead of just the north-south tunnel option, why not:
    - tunnel east-west
    - overpass east-west
    - overpass north-south
- The current alternatives keep bikes/peds in the intersection rather than move them away from it.

- Supports reorganizing/expanding ped and bike space in front of Machinery Row. Extend this separated space all the way to Jenifer Street.
- Supports bike routing to Blount Street signal and providing signalized motor vehicle access for the Fauerbach building, Elks club, etc.
- Supports bike/ped overpass east of Monona Terrace
- Supports bike/ped underpass between North Shore Drive and Broom Street
- Does not support Alt 9 (one-way couplet) since it does not appear to be significantly better than Alt 1 and it is confusing.

Held, Jeff

From: Arlene Zaucha [redacted]
Sent: Tuesday, April 18, 2017 11:53 AM
To: Held, Jeff
Cc: Lynch, Tom; Petykowski, Christopher
Subject: Re: Nolen Shore Corridor Study

Thanks, Jeff,
Here's what I wrote to a friend of mine from the Marquette neighborhood society, who is marshaling forces against Alternative 9:

I think that Scott's fears are way misplaced and very NIMBY. I thought that Alternative 9 was actually quite creative at solving a very difficult problem at that Blair/Nolen/Willy/Wilson intersection. I think cars can be encouraged to use the Blount Street diversion to East Wash - a dedicated left turn arrow, etc. just like current cars are encouraged to use the left turn lanes off East Washington onto Blair. I think bikes could be accommodated, as well as pedestrians. Thinking about Blair as a one way street seems smart.
I've gone to a number of meetings about this bad intersection. Everyone agrees that it's bad. No one likes that intersection. Yet, no one wants to make some major changes that could improve it. Different ideas have been discussed for years. A committee that one of our residents (Nolen Shore condos) was on couldn't come to any conclusions because they didn't want to hurt anyone's feelings - the businesses, the buses, the bikers, the cars, etc. Let's face it - madison is growing. Willy St is a major street. That first block is perfect for traffic, I think.
I have a problem with people who think that Madison is one thing - those of us who live downtown have to remember that some people are just trying to get from one side of the isthmus to the other. (sometimes that's me!) I'm not sure facilitating that will hurt those of us who live here. In fact, making it easier for them to get thru could make our lives easier. They won't be cutting thru neighborhoods as much.

Thanks again for your work on this,
Arlene

On Tue, Apr 18, 2017 at 11:12 AM, Held, Jeff <Jeff.Held@strand.com> wrote:

> Hi Arlene,
>
> Thanks for attending the meeting, I'm glad you found it informative. It is always impressive to see how informed and engaged our residents are. Thank you for your feedback on the Couplet, we'll add your comments to our records.
>
> Jeff
>
> From: Arlene Zaucha [redacted]
> Sent: Tuesday, April 18, 2017 10:41 AM
> To: Held, Jeff <Jeff.Held@strand.com>
> Subject: Nolen Shore Corridor Study
>
> Hi,

Thanks for an informative meeting about the Nolen Shore Corridor Project. You are very good at listening to everyone's opinions. I think the "One Way Couplet" sounds great. We have to do something about that tangle of an intersection. Now is the time to do it, regardless of how some people may not like it.

Thanks

Arlene Zaucha

downtown resident

Held, Jeff

From: Don Last [redacted]
Sent: Friday, April 28, 2017 10:56 AM
To: Held, Jeff
Cc: Marsha Rummel
Subject: Opposing Alt9 One-way Couplet-Fauerbach Condos
Attachments: Oppose ALT9.odt

Fauerbach Condominium Unit Owners Association
c/o Donald Last, Board President [redacted]
404 S. Blount Street Unit 306
[redacted]

April 30, 2017

PUBLIC INFORMATION MEETING COMMENTS
RE: Blair Street and John Nolen Drive Corridor Study

ATTN: Jeff Held (jeff.held@strand.com)
Strand Associates
910 West Wingra Drive
Madison WI 53715

COPY: Marsha Rummel, President, Madison Common Council (district6@cityofmadison.com)

Letter to be Delivered VIA EMAIL

Dear Mr. Strand:

This is to inform you that on April 26, 2017 the Board of Directors of the Fauerbach Condominium Unit Owners Association unanimously voted to **oppose** the intersection rebuild option called **Alt 9 One-way Couplet** (see document reference below). We strongly urge you as well as the elected representatives of the City of Madison to remove this option from further consideration relating to the on-going Blair Street and John Nolen Drive Corridor Rebuild Study.

For your information, the Fauerbach Condominium Unit Owners Association includes thirty-seven individual private residences that are located on the historic site of the former Fauerbach Brewery. These homes are on a property that is bounded by Lake Monona, Blount Street, Williamson Street, and the Machinery Row complex.

We would like you to know that these condominium units have occupied this prime residential property for thirty-five years. During that time, the unit owners (including several original owners) have observed dramatic increases in motorized vehicle traffic (bus, truck, automobile, motorcycle) on Williamson Street. Because of the popularity of the neighboring area for living, working, shopping, and playing, there has been a similarly great increase in pedestrian traffic on the Williamson Street sidewalk fronting the Fauerbach property. Even more dramatic has been the growth of bicycle and skateboard uses of this same stretch of sidewalk. The walkers,

bikers, and skateboards cross Blount Street which is the main entrance/exit to the Fauerbach Condominiums parking lot and underground garage.

It is not an overstatement to say that the driving of our condominium owner vehicles onto or from Williamson Street is an exceptionally perilous process. For instance, a vehicle coming from the Fauerbach during morning and afternoon rush periods may have to wait five minutes or more at the Blount/Williamson intersection until the stream of cars, walkers, and bikes has created a gap large enough to safely proceed. (Please plan to visit this intersection in the near future around 7:30 a.m. and again at 4:30 p.m. to get a first-hand perspective on this perilous situation.)

Motorists must simultaneously be alert for walkers/bikers coming from the west on the sidewalk bike path as well as walkers/bikers coming from the east on the sidewalk bike path. At the same time, while entering the vehicle traffic flow on Williamson or leaving the traffic flow from Williamson, Fauerbach motorists must navigate with great care. This intersection has no traffic signal to aid with this in or out motor vehicle travel. However, less than one block east is a traffic signal which is both a curse and a benefit. It is a motorist curse because vehicles on Williamson very often (while stopped for the red light) unlawfully block the Blount/Williamson intersection. Further, even when the vehicles do not block the intersection (the motorist benefit), the red light allows numerous buses (routes 3, 4, 7, 10, 38) to come off Jenifer Street westbound onto Williamson which means the motorist crossing Williamson or turning west on Williamson must use extreme caution to avoid the possibility of an auto-bus collision.

Given these facts, it should be clear why the Board of Directors of the Fauerbach Condominium Unit Owners Association strongly opposes Alt 9 One-way couplet because the routing of US Highway 151 traffic from John Nolen Drive along eastbound Williamson Street before turning north on Blount Street would make an already bad traffic situation much worse!

First, the vehicle count would go up. Second, the potential conflicts among and between motorists, pedestrians, cyclists, and users of businesses along this stretch of Williamson Street would escalate. Third, the rights of Fauerbach Condominium Unit Owners to expect a safe and convenient path to get in or out of these residences onto Williamson Street would be compromised. Fourth, the magnified traffic at the Williamson Street-Blount Street intersection would negatively impact the desirability of having a downtown home on Lake Monona in the Fauerbach complex. Fifth, increased traffic congestion will reduce the value of these special Fauerbach residential homes.

In summary, we have made our case why be believe it would be a bad idea to proceed with the Alt 9 One-way Couplet option because A) it would not solve the “hairball” problem at John Nolen and Blair. Instead, B) if the Alt 9 One-say Couplet option was implemented, the ONE existing hairball would mushroom instead into TWO hairball intersections within about one block of each other.

Accordingly, please take the Alt 9 One-way Couplet off the table as an option under consideration.

Sincerely,

Donald Last
Fauerbach Condominium Unit Owners Association
Board President

Document Reference: http://www.cityofmadison.com/sites/default/files/city-of-madison/engineering/documents/2017-04-17%20PIM%20Exhibits%20part%203.pdf

Fauerbach Condominium Unit Owners Association

[redacted]

April 30, 2017

PUBLIC INFORMATION MEETING COMMENTS
RE: Blair Street and John Nolen Drive Corridor Study

ATTN: Jeff Held (jeff.held@strand.com)
Strand Associates
910 West Wingra Drive
Madison WI 53715

COPY: Marsha Rummel, President, Madison Common Council (district6@cityofmadison.com)

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Accordingly, please take the Alt 9 One-way Couplet off the table as an option under consideration.

Sincerely,

Donald Last
Fauerbach Condominium Unit Owners Association
Board President

Document Reference: http://www.cityofmadison.com/sites/default/files/city-of-madison/engineering/documents/2017-04-17%20PIM%20Exhibits%20part%203.pdf

PUBLIC INFORMATION MEETING COMMENTS

Blair Street and John Nolen Drive Corridor Study
Public Information Meeting #2
April 17, 2017 at Monona Terrace, Hall of Ideas
7:00 to 8:30 PM

Madison

Please drop form in comment box provided at the meeting or mail to:

FROM:

Name: ERIC EBERSBERGER
Address: [redacted]
Representing: self

TO:

Attn: Jeff Held, P.E., PTOE
Strand Associates, Inc.
910 West Wingra Drive
Madison, WI 53715

Your input is very important to the City of Madison. In the space below, please provide your comments regarding the Blair Street and John Nolen Drive Corridor Study. (Please attach another sheet if needed.)

Jeff,

I write to oppose the "Alt 9 One Way Couplet" option under consideration for the Blair/Williamson intersection project. Traffic @ Willy/Blount & Willy/Jenifer is already a certifiable cluster#!! and Alt-9 would only compound the problems. Not only would it complicate ingress/egress for those of us who live on this stretch but I believe it would exacerbate existing bike/pedestrian/car safety challenges.

Thank you,

Eric Ebersberger

Held, Jeff

From:	Dayna Long [redacted]
Sent:	Thursday, May 25, 2017 6:33 AM
To:	cpetykowski@cityofmadison.com; Held, Jeff; Rummel, Marsha
Cc:	Lynn Lee
Subject:	[BULK] Alternative 9 Proposal for John Nolen Drive/Blair Street Intersection Reconstruction
Attachments:	MNA Endorsed Comments on John Nolen_Blair Street Reconstruction.pdf
Importance:	Low

Mr. Petykowski, Mr. Held, and Alder Rummel,

I'm writing on behalf of the Marquette Neighborhood Association to express our opposition to the Alternative 9 design for the John Nolen Dr./Blair Street intersection reconstruction and to share a report by Marquette resident Ashwat Narayanan that outlines the ways in which Alternative 9 is in conflict with our goals and priorities for traffic flow for our neighborhood. While this report was commissioned by Marquette neighborhood residents and not MNA, we agree with its assessment and have chosen to endorse this report and share it now as representative of our views.

We look forward to the reconstruction of the intersection which has been a concern for our traffic committee for many years. Marquette Neighborhood residents flow through the intersection on foot, on bicycle, and in cars day in and day out and we will be happy for an update that increases the safety of everyone who passes through.

Sincerely,

Dayna Long,
Secretary, Marquette Neighborhood Association

2017

Ashwat Narayanan

COMMENTS ON JOHN NOLEN DRIVE/BLAIR STREET INTERSECTION RECONSTRUCTION

Public comments on Alternative 9 of the John Nolen Drive/Blair Street intersection reconstruction project compiled by consultant Ashwat Narayanan and endorsed by the Marquette Neighborhood Association.

About the Author:

Ashwat Narayanan is Director of Transportation Policy of 1000 Friends of Wisconsin, and an independent transportation consultant. His consulting practice addresses several transportation policy issues including state and federal funding, context sensitive highway design, climate change solutions and sustainable transportation strategies. His recent work has included working with organizations to systematically achieve long term sustainability goals using a systems analysis process, authored an interdisciplinary report to reduce climate change emissions from transportation and provided transportation expertise on a major federal highway lawsuit. He has over 7 years of professional experience, including four years managing infrastructure projects at Atkins, Inc.

Ashwat is a nationally recognized expert on transportation and land use issues and has spoken widely at conferences and on television and radio. He holds a master's degree in transportation engineering from the University of Wisconsin-Madison.

Executive Summary:

As endorsed by the Marquette Neighborhood Association, I have completed a review of the alternatives put forth by the City of Madison, WI to reconstruct the John Nolen, Wilson Street and Williamson Street Intersection in central Madison, WI. In particular I have focused on alternative 9 that will turn Blount Street and Blair Street into a one-way couplet. My conclusions are that this alternative, and other associated two-way to one-way conversions within the project limits would increase automobile speeds on those streets while doing little to improve traffic flow. In addition, it would decrease pedestrian and bike safety, adversely impact economic development, reduce access to businesses and will generally reduce quality of life in the neighborhood. I recommend that the City of Madison not consider this alternative further.

Introduction:

The City of Madison is proposing to reconstruct the intersection of John Nolen Drive, South Blair Street, East Wilson Street and Williamson Street as part of a larger corridor study from the intersection of John Nolen Drive and East Washington Avenue to North Shore Drive. The intersection has a railroad that runs through it diagonally, several driveways within its functional area and the Capital City bike trail that runs along its east side. Several issues have been identified at the intersection—notably, a high level of difficulty for pedestrians and bikers to cross the intersection due to high speed motor traffic between John Nolen Drive and Wilson Street, a lack of wayfinding signs, and several conflict points between the railroad, motorists and other modes of traffic. [1] Blair Street has been found to be a barrier for bicyclists travelling along Main Street. John Nolen Drive is also a similar barrier for bicyclists and pedestrians. A channelized right turn from John Nolen Drive into Williamson Street appears to encourage high speed traffic. Drivers experience a blind spot while turning into a commercial bicycle sales establishment, Machinery Row Bicycles.

Images: views of the intersection at weekday evening peak hour, April 25th.

Traffic Counts:

Street Segment	Average Daily Traffic Count
John Nolen Drive (US 151)	39,050
Blair Street	27,350
Williamson Street	21,700
S Blount Street	1,800
East Washington Avenue	47,200

Data from City of Madison Traffic Engineering, Accessed 3/13/2017

Crash Data:

This intersection has had the 6th highest number of crashes in the City of Madison, according to 2015 data from the City of Madison traffic engineering department, with 13 crashes that year. Two of those crashes involved bicycles. [2]

Scope:

The City of Madison has put forward nine separate alternatives to address problems at this intersection. These range from a plan to increase bike and pedestrian connections including a pedestrian overpass that would connect John Nolen Drive to East Wilson Street (Alternative 1) to Alternative 9, that recommends converting Blount Street and Blair Street to one way progression. The scope of this report is alternative 9, and will address this henceforth. [3]

Analysis:

The main characteristic of Alternative 9 is the conversion of two Marquette Neighborhood Streets – Blount Street and Blair Street from two-way to one-way. Blair Street will funnel left turning traffic south from East Washington Avenue towards John Nolen Drive, while Blount Street will perform that function for eastbound traffic from John Nolen Drive towards East Washington. The city's plan states "this would create a one-way pair between East Washington Avenue and Williamson Street using Blair Street to carry inbound traffic and Blount Street to carry outbound traffic. Northbound traffic traveling to Railroad Street, Main Street and East Washington Avenue would make a right turn on to Williamson Street followed by a left turn on to Blount Street". The plan claims that automobile Level of Service over multiple intersections would go to C or D. The bike path in front of Machinery Row would be expanded

to separate cyclists and pedestrians. The plan will remove portions of the Capital City biking trail and require use of cycle track crossings at Blount Street instead. Cyclists would be prevented from crossing diagonally from Blount Street to Williamson Street and would have to maneuver this in two stages. [3]

This report will evaluate Alternative 9 under criteria developed by four broad plans that have been completed after due consultation with community members and have been generally accepted by the Marquette Neighborhood Association, The City of Madison and the Madison Area Transportation Planning Board.

1. Sustainable Madison's "The Madison Sustainability Plan: Fostering Environmental, Economic and Social Resilience". [4]
2. City of Madison's "Madison in Motion Transportation Plan" [5]
3. Madison Area Transportation Planning Board's "Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County, 2015"
4. MNA Traffic Committee's "Interior Streets Plan 2015" [6]

A literature review of these plans reveals shared criteria for future transportation infrastructure prioritization and implementation in Madison. The Madison in Motion transportation plan makes the following high level recommendations:

1. Roadway expansion is no longer a viable transportation enhancement option, as the roadway system is at or near capacity. Madison will need to be proactive on congestion management measures due to geographic constraints limiting roadway expansion alternatives.
2. To accommodate recent ridership increases and future population and job growth, the City must improve transit capacity and service – beginning by implementing BRT, and continuing with further study of potential service improvements. In addition, regional coordination and effective funding strategies must be developed.
3. Target growth patterns, including transit oriented development, will minimize congestion by increasing populations in areas with access to good transit.
4. Bike and pedestrian networks are already popular alternatives, but require strategic interventions to provide network connectivity and further develop walking and biking as viable modes. While Madison was recently named a Platinum bicycling community, key improvements could make biking a real alternative for a larger swath of residents.

The Madison Sustainability Plan among other goals calls for expanding the number of neighborhoods and commercial centers where sustainable transportation choices enable mobility without a car. The Madison Area Transportation Planning Board's plan has six goals centered around bicycling "Improving safety, increasing usage, improving connectivity, providing equitable bicycling access, enhancing livability and longevity of bicycle facilities". Finally, the Marquette Neighborhood's goals are "encouraging motorists to use neighborhood arterial streets, discouraging use of east-west streets: Jenifer, Spaight and Rutledge, switch traffic movement to North-South streets that are signalized on Williamson Street: Paterson, Ingersoll and Baldwin, and limit car traffic to make interior streets safer for bicycles and pedestrians."

The immediate effects of this conversion will be an increase in average automobile speeds along the corridors. [7] One way streets are correlated to higher speeds and consequent decreased driver attention. In general pedestrians and bikers prefer crossing two way streets due to slower speeds, and

increased predictability of vehicular conflicts. It is estimated that there are typically 30-40 percent more vehicle/pedestrian conflicts within a one-way street network than in a comparable two way system. [8] One way streets are also associated with discouraging non-auto travel and can sometimes facilitate illegal wrong-way driving. [9] They have been found to marginalize the elderly and the disabled. [10] The injury rate for child pedestrians on one way streets were 2.5 times higher compared to two-way streets. [11]

Higher speeds generally have a detrimental effect on local neighborhoods like the Marquette—and one way streets have been associated with several negative externalities like increased crime and decreased property values. [12]

Next, this conversion will also serve to increase total vehicle miles driven in the neighborhood. Whereas earlier cars could simply travel either direction along either street to reach their destination, the new route would require an increase in total travel distance for drivers trying to reach destinations on Wilson, Main, Blount or Blair Streets. Two way streets have also been found to be much less confusing for downtown visitors. According to the State Smart Transportation Initiative (SSTI) *"Visitors driving in a two-way grid network can easily approach their destination from any direction."* As this intersection is one of the key gateways into downtown Madison, these conversions run the risk of inconveniencing visitors unfamiliar to the area. [13]

One way streets appear to have the effect of reducing access to businesses and generally suppressing economic development. Hanka and Gilderbloom found that one way streets have adversely affected downtown commercial businesses. Their report states "*In Vine Street in Cincinnati, 40% of the businesses closed after conversion from a two way to a one way street. One way streets appear to have a negative impact on storefront exposure, which is lost when one direction of travel is eliminated, as well as when traffic speeded up due to one way traffic".*

There is evidence to suggest that even the traffic flow benefits expected to occur as a result of the conversions to one-way streets will not materialize. In *The Economic Impact of One to Two-way Street Conversions: Advancing a Context Sensitive Framework* Riggs, et.al. find "*Some of the best work, on the traffic functionality of two way vs one way streets indicates that two ways streets can actually be superior in terms of vehicular level of service. This traffic performance benefit is confirmed by microsimulation and by studies showing drivers engage in inefficient circling behavior when on one way streets, making the street configuration less functional than originally envisaged*".

Some of the most adverse impacts of this alternative would occur at the intersection of Blount Street and Williamson Street. It is likely that traffic volume would significantly increase on Blount Street due to the one-way conversion, leading to potential queues during peak hour. Currently, in the morning peak hour, traffic queues on Williamson Street often stretch as far back east as Paterson Street. It is likely that this traffic will now materialize instead on Blount Street. Not only will this be a significant impediment for Madison Metro buses and bikes on Williamson Street, it will also increase air pollution and have adverse safety impacts on the Red Caboose Day Care Center and the residential apartments at 404 South Blount Street. Finally, Blount Street was never envisioned to be the collector route that it will be under Alternative 9; this classification will result in significant land use changes that run counter to the goals of the neighborhood. Increased traffic volume and speeds will discourage transit oriented mixed use development, reducing property values in the neighborhood and suppressing tax revenues to the City.

The City of Madison has themselves identified issues with the planned alternative. This would increase conflicting traffic volumes for bikes at the Capital City crossing at the Blair Street/John Nolen Drive intersection. There would also be increased traffic volume along Williamson Street between Blair Street and Blount Street. The City of Madison believes that this option would increase the perception of encouraging John Nolen Drive northbound/eastbound traffic to use Williamson Street instead of East Washington Avenue.

Conclusions:

The likely outcomes of Alternative 9 are tested against the broad long range transportation goals of the region, city and neighborhood and presented in the matrix below.

Goal	**Satisfied by Alternative 9?**
Enable mobility without a car	No, discourages non-auto means of travel. Increased speeds appear to decrease the use of alternative modes of transportation.
Increase transit oriented development	Unclear, but does not appear to actively promote transit oriented development. One way streets are shown to decrease property values and increase crime rates--that are likely to deter TOD, and transit usage in the neighborhood.
Improve bike and pedestrian connectivity	No, the alternative does not appear to alleviate bike and pedestrian crossing issues at Blair Street. In addition, a two stage crossing will be required between Williamson Street and Blount Street, further impeding free cycling access.
Improve safety	No, increased speeds and lack of gaps for crossing are likely to lead to higher auto, bike and pedestrian crashes. One way conversions typically lead to a 30-40 percent increase in vehicle/pedestrian conflicts.
Switch traffic movement to signalized intersections on Williamson Street	No, instead traffic will be funneled through Blair and Blount Streets, both of which are not included in the neighborhood plan currently.
Limit car traffic to make interior streets safer for bikes and pedestrians	No, this alternative will increase total vehicle miles driven in the neighborhood and will also increase the likelihood of dangerous wrong-way driving.

An analysis of proposed alternative 9 to reconstruct the John Nolen-S Blair Street Intersection shows that not only does this not improve traffic flow; it also runs contrary to a broad range of livability goals put forward by the region, city and neighborhood. I recommend that the City discard this alternative and instead focus on those that advance safety, economic development, enhance property values, promote inclusion and improve multimodality within the project limits and the greater Downtown region.

References:

[1] Kimley Horn and Associates Inc, "Final Report: South Capitol Transit Oriented Development".

[2] City of Madison Traffic Engineering, "Crash Report," 2015. [Online]. Available: https://www.cityofmadison.com/trafficEngineering/documents/Current_CrashReport.pdf.

[3] City of Madison Traffic Engineering, "Blair St / John Nolen Dr Corridor Study," April 2017. [Online]. Available: https://www.cityofmadison.com/engineering/projects/blair-st-john-nolen-dr-corridor-study.

[4] Sustainable Madison, "The Madison Sustainability Plan: Fostering Environmental, Economic and Social Reliance," Madison, 2011.

[5] City of Madison, "Madison in Motion Transportation Plan," Madison, 2016.

[6] M. N. A. T. Committee, "Interior Streets Proposal," 2015.

[7] Federal Highway Administration, "One Way/Two Way Street Conversions," [Online]. Available: https://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/13.htm.

[8] K. M. Walker, "Are we strangling ourselves on one-way networks?," in *Urban Street Symposium*, Dallas, 2000.

[9] E. R. a. E. Dumbaugh, "The Built Environment and Traffic Safety, A Review of Empirical Evidence," *Journal of the Transportation Research Board,* vol. 23, no. 4, pp. 347-367, 2009.

[10] Oxley, Fildes, Ihsen, Charlton and Day, " Crossing roads safely:An experimental study of age differences in gap selection by pedestrians.," *Accident Analysis and Prevention,* vol. 37, no. 5, pp. 962-971, 2005.

[11] Wazana, Rynard, Raina, Krueger and Chambers, "Are child pedestrians at increased risk of injury on one-way compared to two-way streets?," *Canadian Journal of Public Health,* vol. 91, no. 3, pp. 201-6, 2000.

[12] Riggs and Gilderbloom, "Two-Way Street Conversion Evidence of Increased Livability in Louisville," *Journal of Planning Education and Research,* p. 0739456X15593147, 2015.

[13] C. Spahr, "One or two way streets more efficient? It depends on what you measure," 2013. [Online]. Available: http://www.ssti.us/2013/02/one-way-or-two-way-streets-more-efficient-it-depends-on-what-you-measure/.

APPENDIX E
PUBLIC INVOLVEMENT MEETING NO. 3

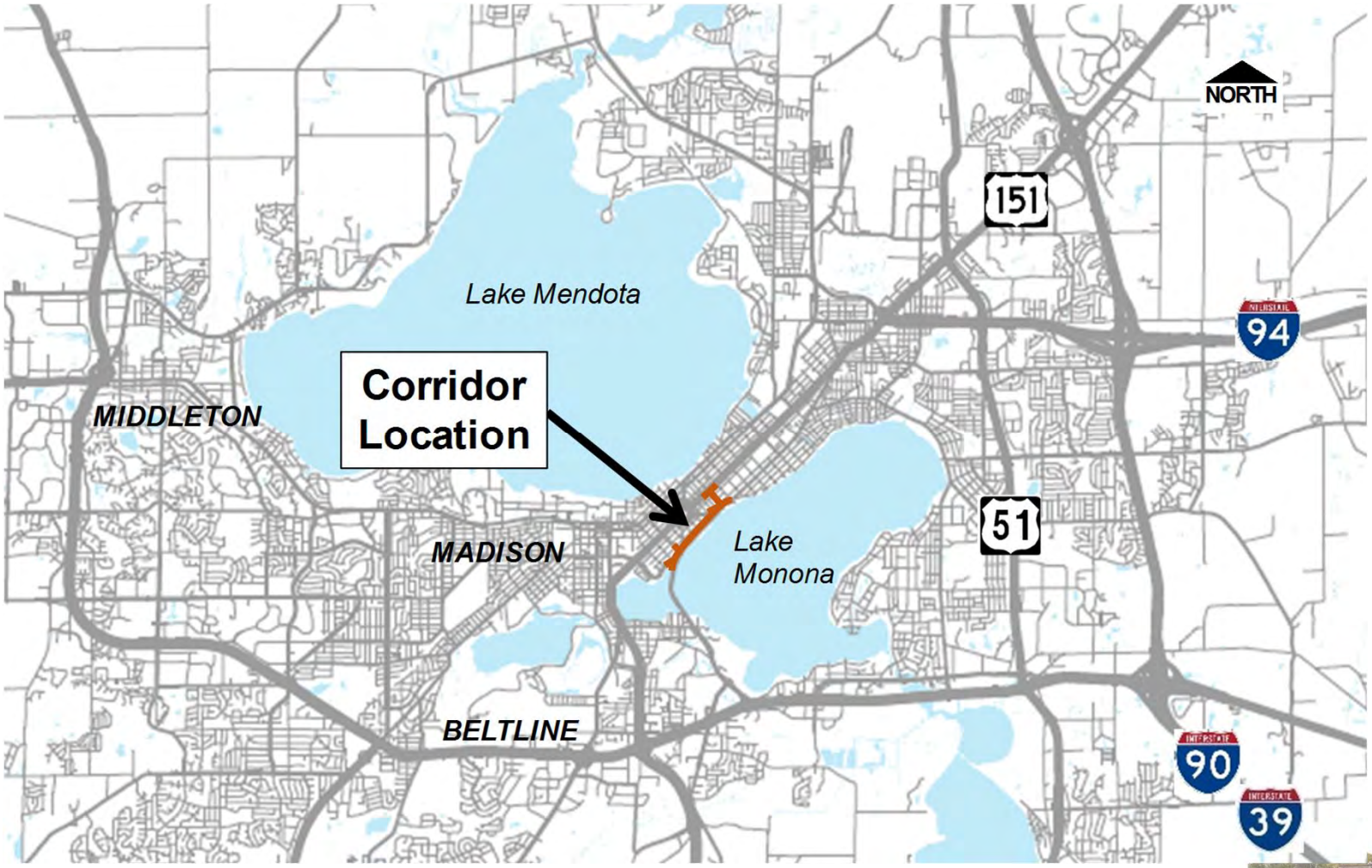

Public Involvement Meeting
August 9th 2017
Google Ear

Presentation Outline:

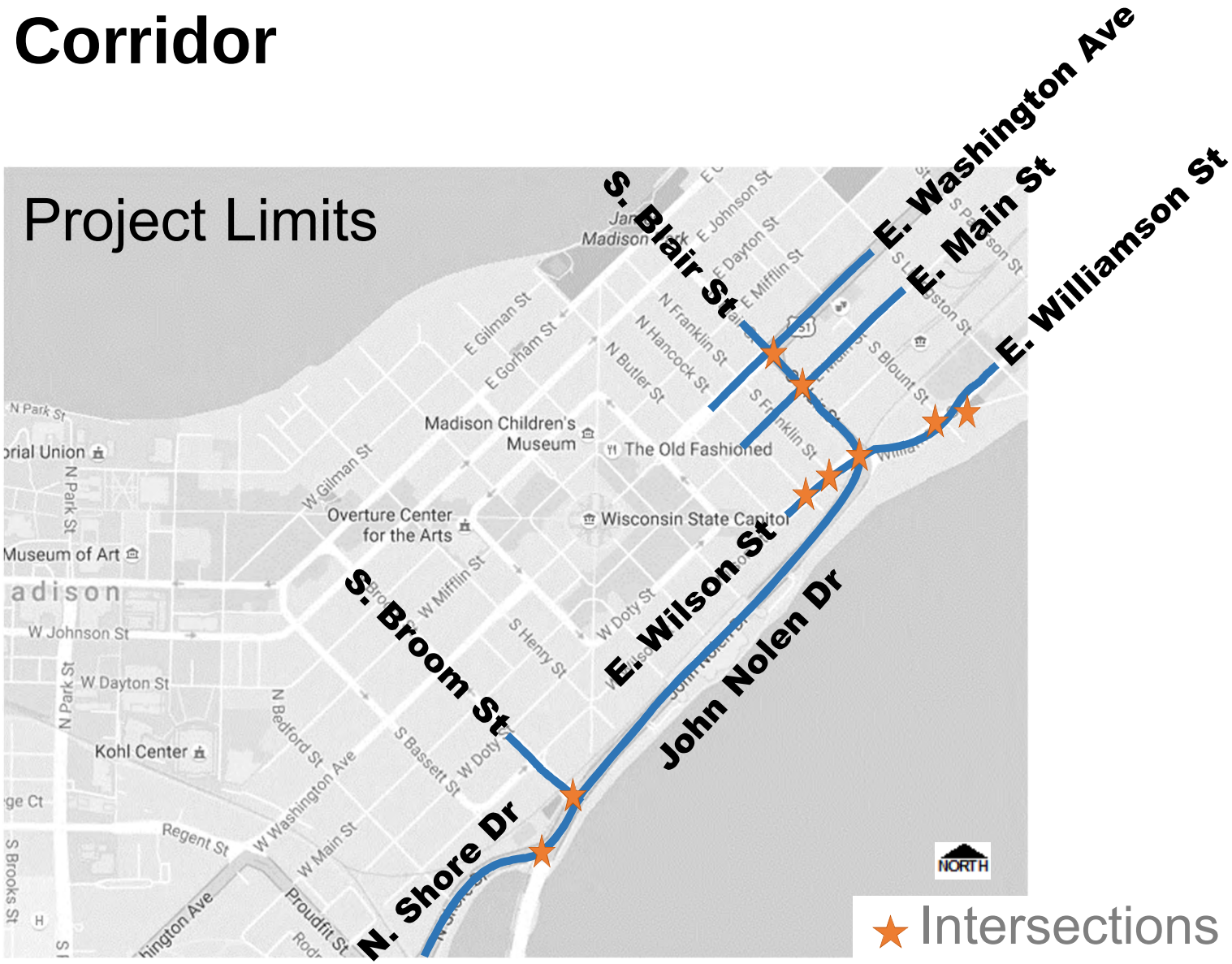
- Study Corridor and Reasons for Study
  - Upcoming Projects
  - Previous Studies and Longer Term Opportunities
- Williamson/Wilson/Blair/John Nolen Drive Intersection area
- John Nolen Drive/North Shore/Broom Street area
- Overview of PIM 3 Exhibits
- Study Schedule

Study Corridor and Reasons for Study

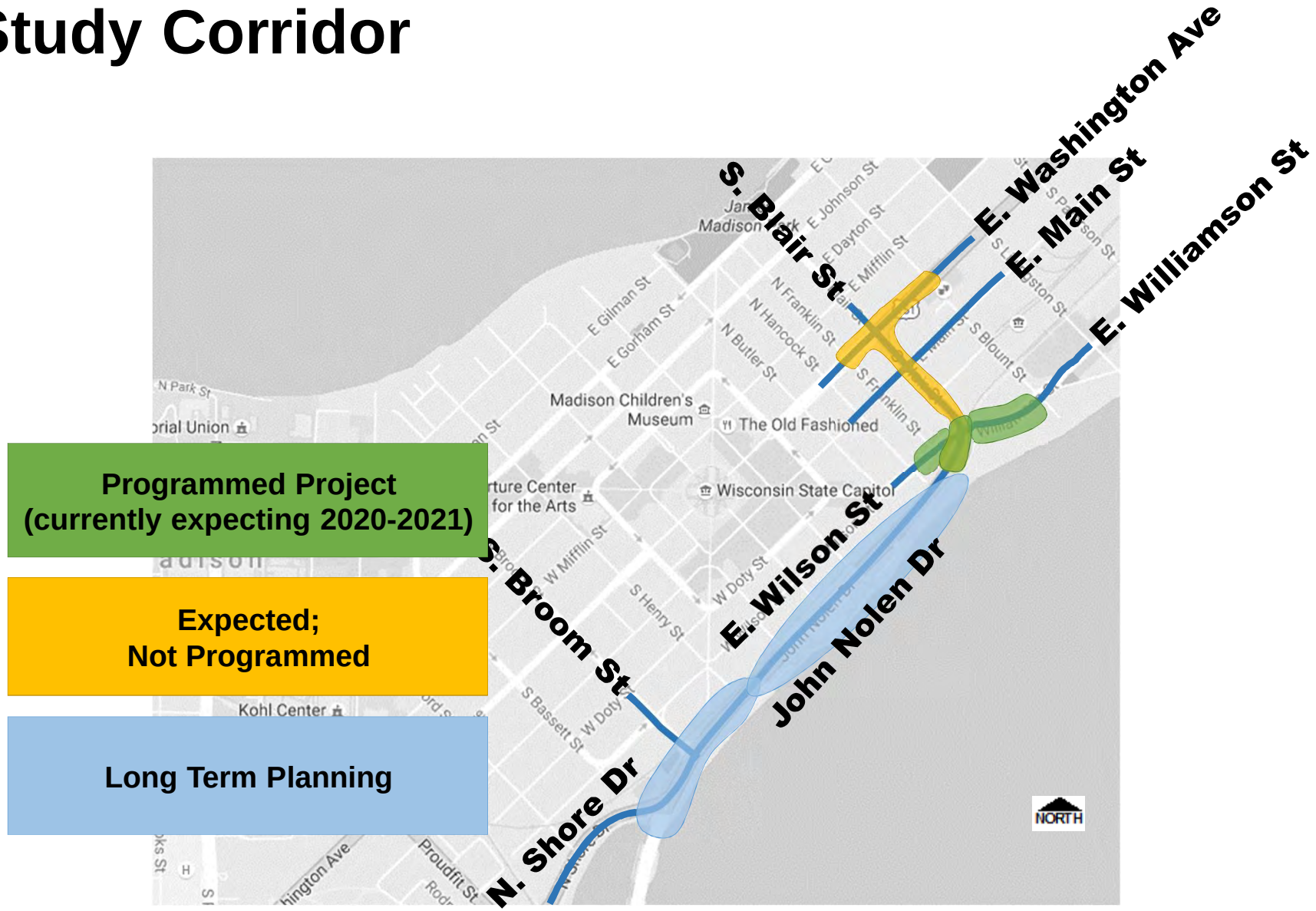
Project Location



Study Corridor



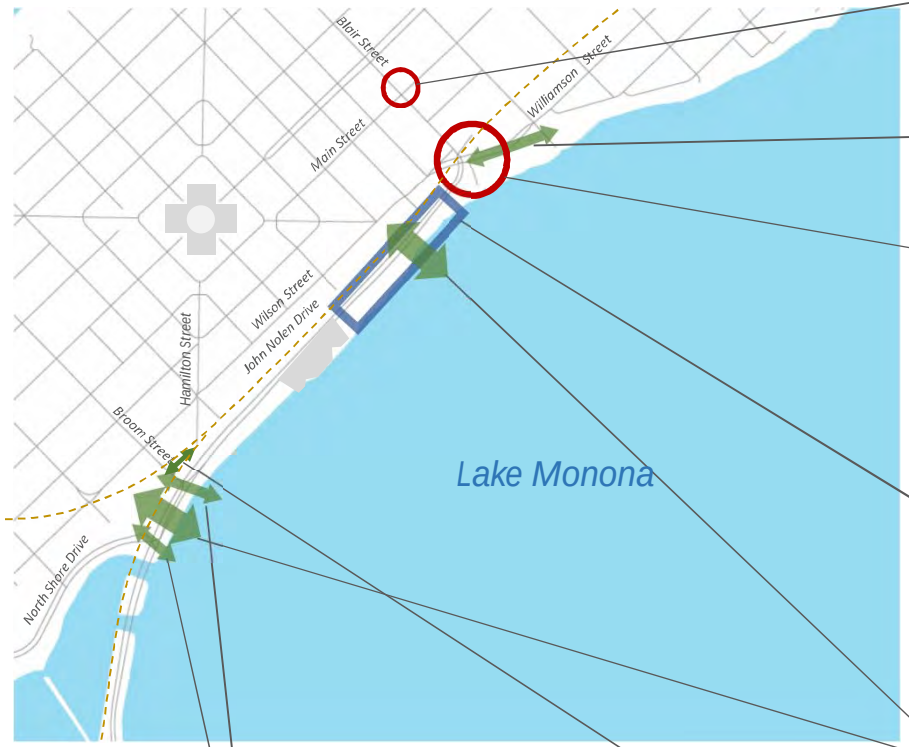
Study Corridor



Study Purpose

1. Develop a near-term solution for the Blair/John Nolen/Williamson Street intersection area that:
   - Can be reasonably funded with federal transportation monies
   - Improves operations and safety for
     - Pedestrians
     - Cyclists
     - Motorists
   - Addresses the poor pavement conditions
2. Evaluate short and long-term options that improve pedestrian and bicycle access to the lakeshore from North Shore Drive to Blair Street
3. Evaluate the viewshed effects of proposals that include a structure over John Nolen Drive

Review of April Public Meeting



Reviewed possible new signal at Main Street.

Reviewed re-allocation of space on Machinery Row cycle track.

Reviewed 5 primary intersection alternatives.

- 3 of them at-grade
- 2 of them with a tunnel
- 2 at-grade intersection alternatives brought forward (Alt 1 and 9)

Performed blocking exercise to determine viewshed effects of structure over John Nolen Drive

Investigated 2 grade separated crossings to provide better bicycle and pedestrian access to the lake.

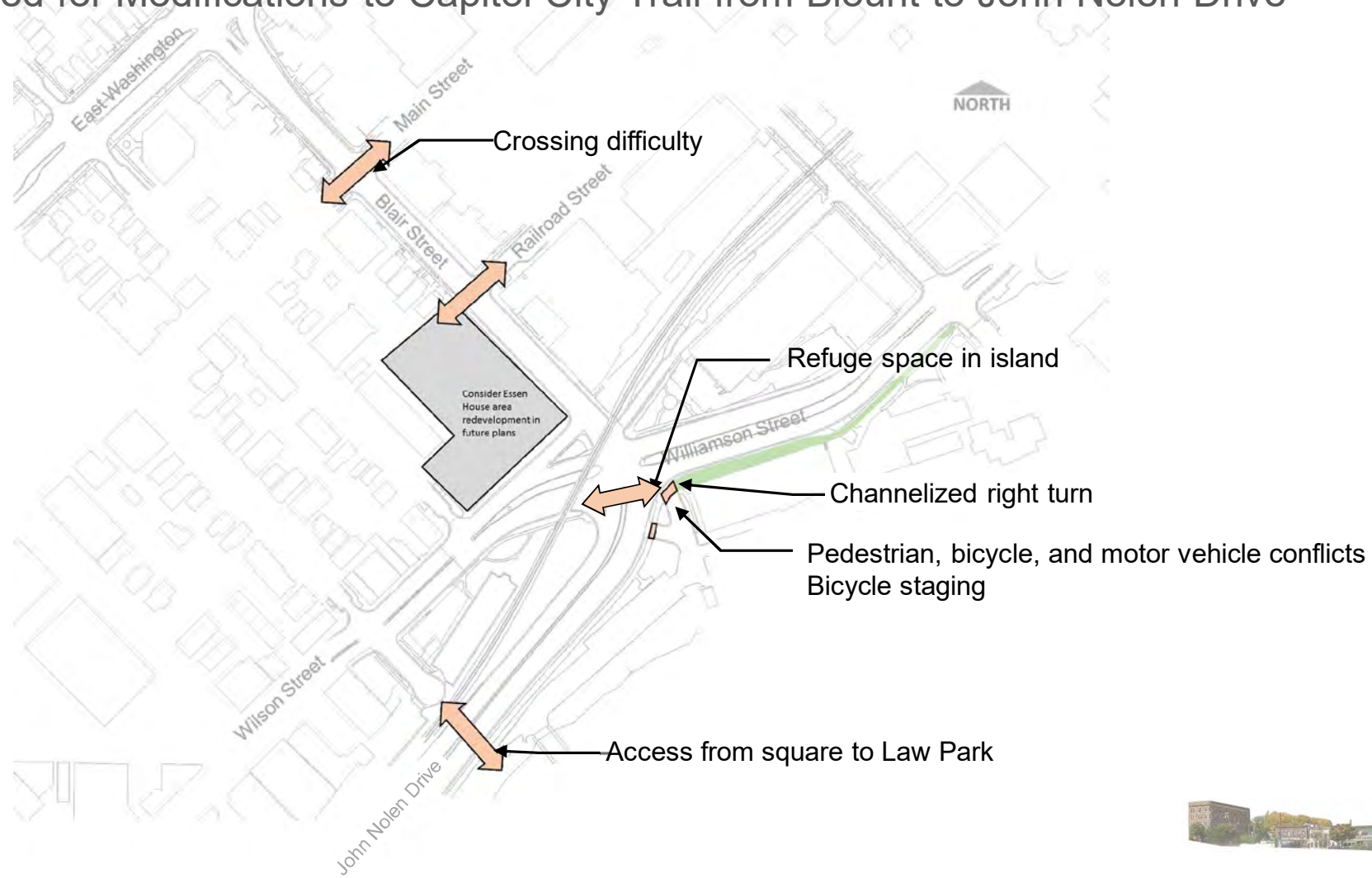
Investigated options to ease pedestrian and bicycle access across John Nolen Drive at North Shore and Broom Street

Investigated path connecting Broom Street with South Hamilton Street

John Nolen/Blair/Wilson/Williamson Area

Blair/Williamson Intersection Expressed Needs

- Barrier Effect of Blair Street and John Nolen Drive for Pedestrians and Bicycles
- Need for Modifications to Capitol City Trail from Blount to John Nolen Drive



Alternatives Brought Forward for Further Evaluation

Alt 1 and Alt 9 Comparison – Review of Concepts

Alt 1: Add NBL, SBL, Cycletrack

Alt 9: One-Way Couplet, Cycletrack

Alt 1 and Alt 9 Comparison – Expressed Needs

Expressed Concern/Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet
John Nolen Drive is a barrier for pedestrian/bicycle access to the lake.	• Ped/bike access to lake is enhanced when combined with proposed ped/bike overpass	• Reduced when combined with proposed overpass
Reduce Speeds of Northbound Right-Turns	• Smaller radii on northbound right-turn channelization should reduce right turn travel speeds.	• Providing a dual right turn lane for the northbound to eastbound movement requires larger radii and consequently may increase speeds.
Discourage Use of Williamson Street for Longer Trips	• Use of Williamson Street for longer trips is likely to remain unchanged from current conditions	• Directing all northbound traffic down Williamson Street until Blount Street may conflict with these goals.
Reduce Conflicts at Machinery Row Driveways	• Relocated parking lot access and realigned bike path reduces the number of conflicts at the intersection.	• Relocated parking lot access and realigned bike path reduces the number of conflicts at the intersection.
Provide Off-Path Staging Area for North-South bikes/peds crossing Williamson Street	• Additional staging area provided with the modified northbound right-turn channelization	• Modest staging area may be possible with dual channelized northbound through/right-turn.
Better Delineate Bicycle versus Pedestrian Space along south side of Williamson Street between Blair Street and Jennifer Street	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.
Relocate Capital City Trail Crossing of Williamson Street from Blair Street to Blount Street	• Achieved with signalized diagonal crossing and cycle track connection along Blount Street. Existing Capital City Trail crossing at Blair Street intersection remains.	• Achieved with signalized diagonal crossing and cycletrack connection along Blount Street. • Existing Capital City Trail crossing at Blair Street is eliminated.
Improve Pedestrian and Bicycle Access Across Blair Street	• Blair Street is easier to cross for pedestrians and bikes if Main Street signal is implemented.	• Blair Street is easier to cross for pedestrians and bikes because Blair Street carries about 50 percent less traffic. One-way operation on Blair Street also provides larger gaps in traffic.

Alt 1 and Alt 9 Comparison – Additional Measures

Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet

Accommodations for Pedestrians and Bicycles	• Enhanced accommodations for pedestrians and bicycles through:
	  • Reallocation of space along Machinery Road cycle track
	  • Relocating parking lot driveway to minimize ped/bike/auto conflicts at intersection.
	  • Better delineation of connection of Wilson Street to Capital City Trail for bicycles and pedestrians.
		• One-way Blair Street may allow for more space to be dedicated to terrace, pedestrian, and/or bicycle accommodations.
		• Enhanced accommodations along John Nolen Drive and Williamson Street
		• Increased traffic volumes along Williamson Street between Blair Street and Blount Street.

Transit	• No significant impacts.	• Lower traffic volumes eastbound along East Washington Avenue between Blair Street and Blount Street which carries 9 weekday routes and has a bus stop at the southeast corner at Blount Street. • Higher traffic volumes along eastbound Williamson Street between Blair Street and Blount Street which carries 4 weekday routes. • No significant impacts to current routing.
Motor Vehicles	• Modest improvement to delays and queuing compared to a Do Nothing scenario.	• Lower delay and queuing during the AM peak hour than Alt 1 • Higher delay and queuing during the PM peak hour than Alt 1
Stakeholder and Alder Comments	• Generally positive	• Generally negative
Cost	• $3.4 Million	• $5.5 Million
Additional Considerations	• Reduced crashes with the addition of left-turn bays.	• Reduced crashes with the addition of left-turn bays. • Spreads traffic burden among two streets instead of one. • Perception of encouraging John Nolen Drive northbound/ eastbound traffic to use Williamson Street instead of East Washington Avenue.
Result	**Recommended**	Dismissed

Alt 1 NB and SB Left Turn Lanes

Pedestrian Accommodations

- Maintains existing pedestrian crossings of Williamson, Wilson, and John Nolen Drive.
- Cycle track in front of Machinery Row expanded to separate pedestrian and cyclists.

Bicycle Accommodations

- Maintains existing crossing of Williamson Street.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.
- Includes signalized diagonal bike crossing and cycle track on Blount Street.

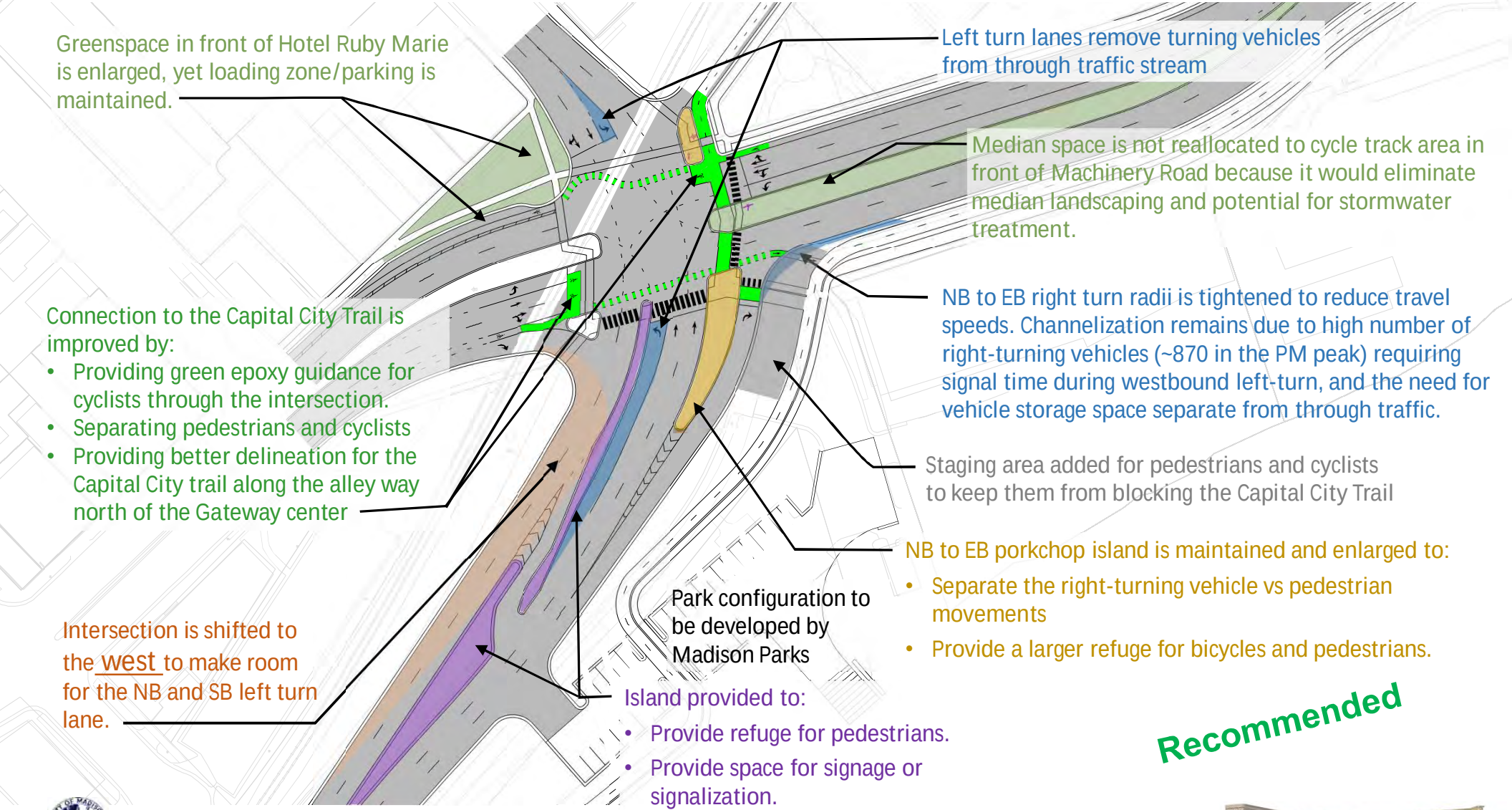
Motor Vehicles

- Improves overall intersection LOS from F to D. Not all congestion and queuing is eliminated.
- Removes NB and SB left turning vehicles on John Nolen Drive and Blair Street from the through travel stream, reducing crashes.
- Relocates and combines Machinery Row/Law Park driveways.

Other

- Enlarges greenspace/terrace space in front of Hotel Ruby Marie.
- Stormwater features to be established during final design.
- Left-in to Machinery Row/Law Park could be signalized.
- Relocates boat launch, final Law Park details TBD.

Alt 1 Revisions Responding to Public Comments



Greenspace in front of Hotel Ruby Marie is enlarged, yet loading zone/parking is maintained.

Left turn lanes remove turning vehicles from through traffic stream

Median space is not reallocated to cycle track area in front of Machinery Road because it would eliminate median landscaping and potential for stormwater treatment.

NB to EB right turn radii is tightened to reduce travel speeds. Channelization remains due to high number of right-turning vehicles (~870 in the PM peak) requiring signal time during westbound left-turn, and the need for vehicle storage space separate from through traffic.

Connection to the Capital City Trail is improved by:

- Providing green epoxy guidance for cyclists through the intersection.
- Separating pedestrians and cyclists
- Providing better delineation for the Capital City trail along the alley way north of the Gateway center

Staging area added for pedestrians and cyclists to keep them from blocking the Capital City Trail

NB to EB porkchop island is maintained and enlarged to:

- Separate the right-turning vehicle vs pedestrian movements
- Provide a larger refuge for bicycles and pedestrians.

Park configuration to be developed by Madison Parks

Intersection is shifted to the west to make room for the NB and SB left turn lane.

Island provided to:

- Provide refuge for pedestrians.
- Provide space for signage or signalization.
- Prevent left turns out of parking lot.

Recommended

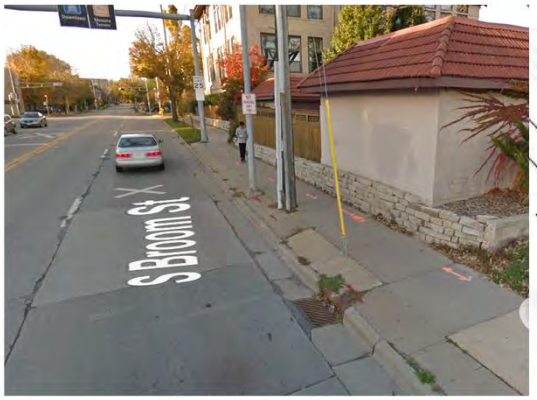
Law Park Connection

Pedestrian Bicycle Connection to Law Park

- Rendering is shown Within Design-Level Laser Scan Survey in Realistic Location
- Concept Only, Additional Design Modifications Expected

Broom/North Shore Area

Broom Street



Long term solution
- Reconstruct Broom Street with 10-foot lanes
- Install a 10-foot multiuse path on east side.

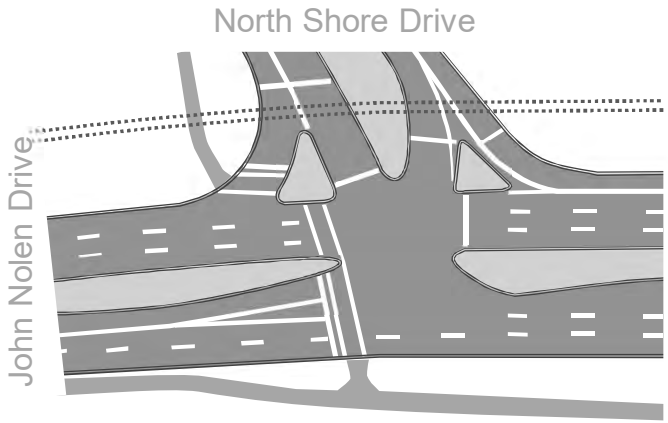
Long term solution
Path connecting Broom Street to Hamilton Street

Short term solution
- Restripe Broom to 10', 10', 12.5', 10', 12.5'
- Place sharrow on 12.5' lanes (SB middle lane, NB outside lane)

Short term solution
- Ladder cross walk markings

Short term solution
- Colored pavement directing cyclists to island
- Bike box for EB to NB cyclist

North Shore Drive



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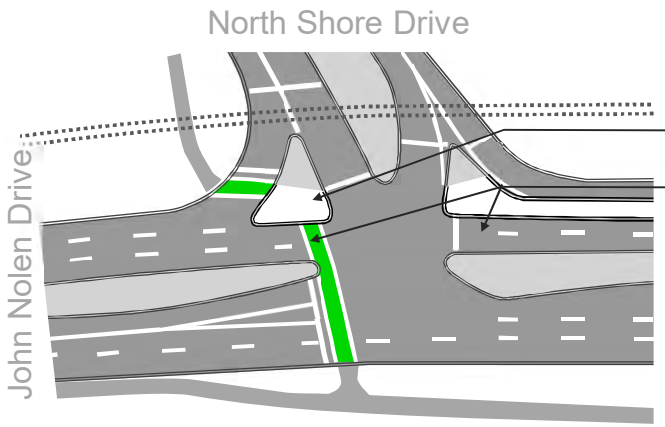
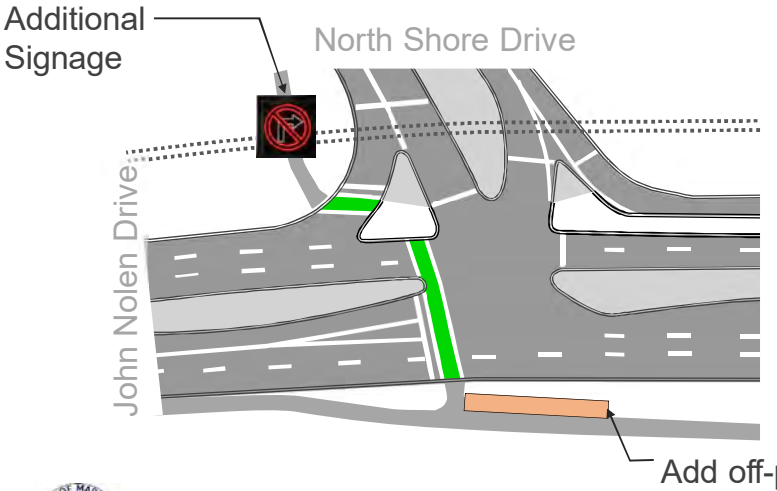


Island enlarged to provide more storage for pedestrians and bicyclists.

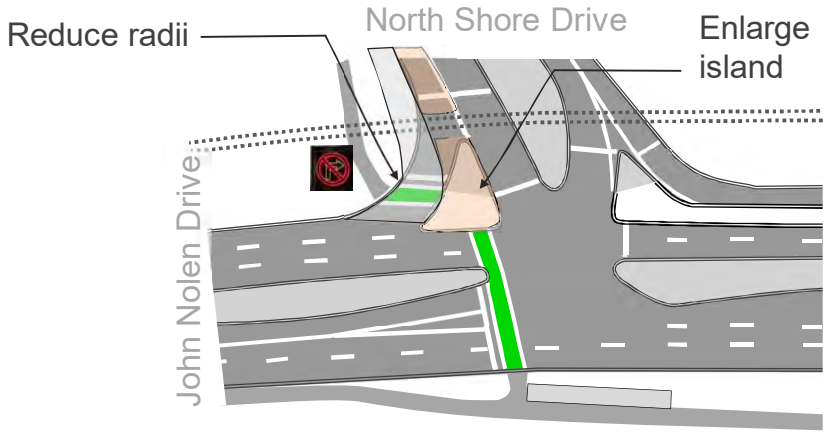
Crossing distance reduced by removing one through lane on westbound John Nolen Drive

2013 Improvements



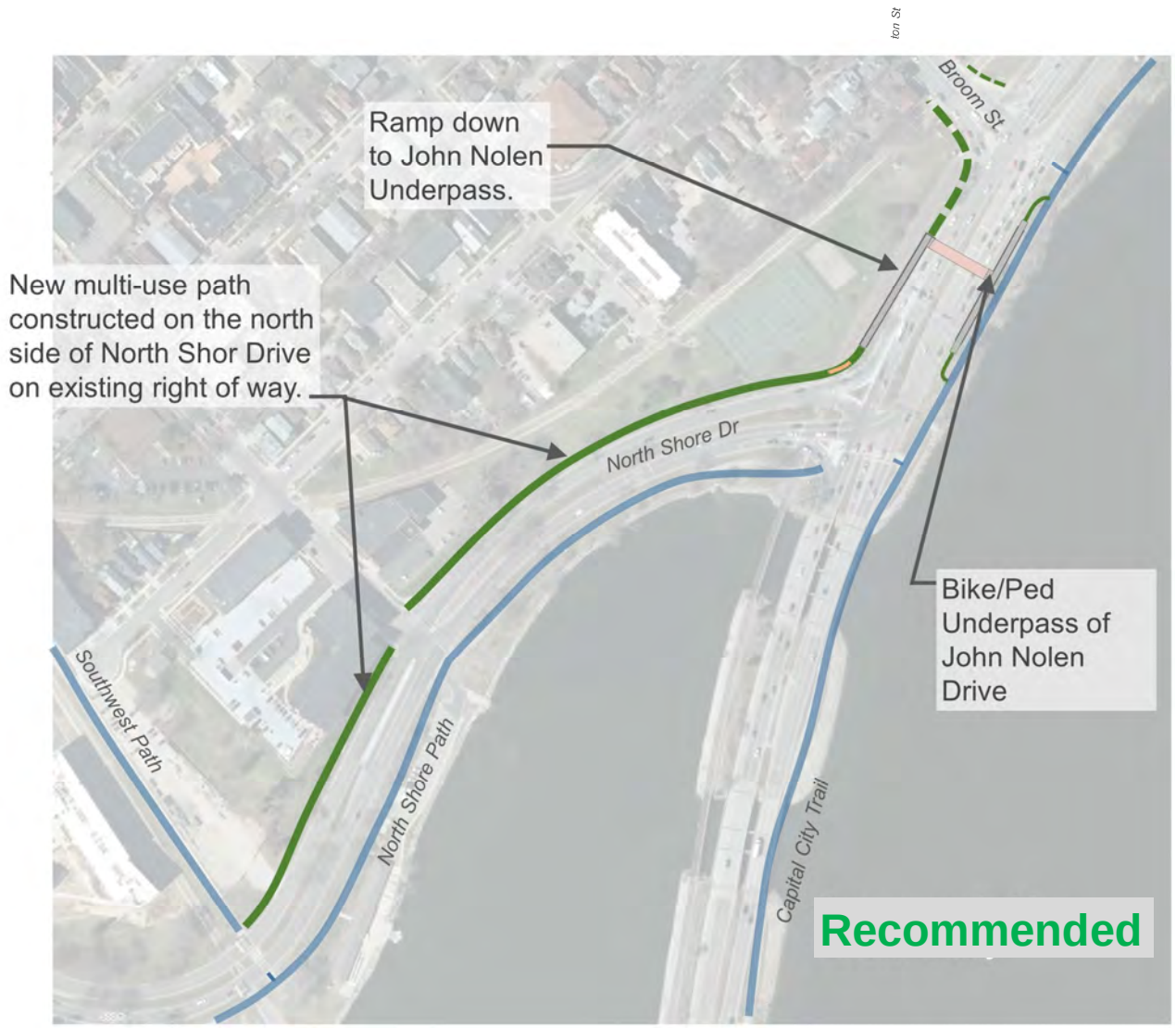
Short Term Solution

Recommended



Longer Term Option

North Shore and Broom Street Long-Term Bicycle Underpass



Overview of All PIM Exhibits

Study Purpose and Background
- 2 exhibits

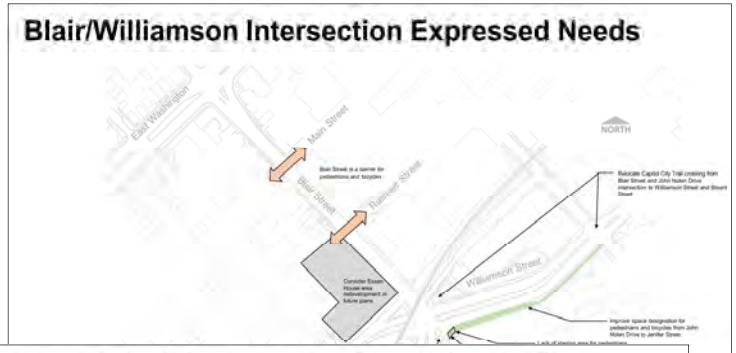
Study Purpose

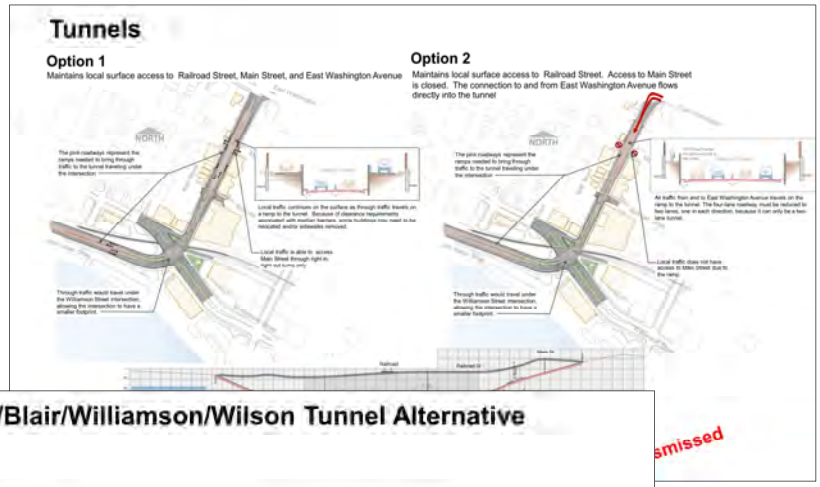
1. Develop a near-term solution for the Blair/John Nolen/Williamson Street intersection area that:
   - Can be reasonably funded with federal transportation monies within the next 5 to 10 years.
   - Improves operations and safety for
     - Pedestrians
     - Cyclists
     - Motorists
   - Addresses the poor pavement conditions
2. Evaluate short and long-term options that improve pedestrian bicycle access to the lakeshore from North Shore Drive to Bla Street
3. Evaluate the viewshed effects of proposals that include a stru over John Nolen Drive

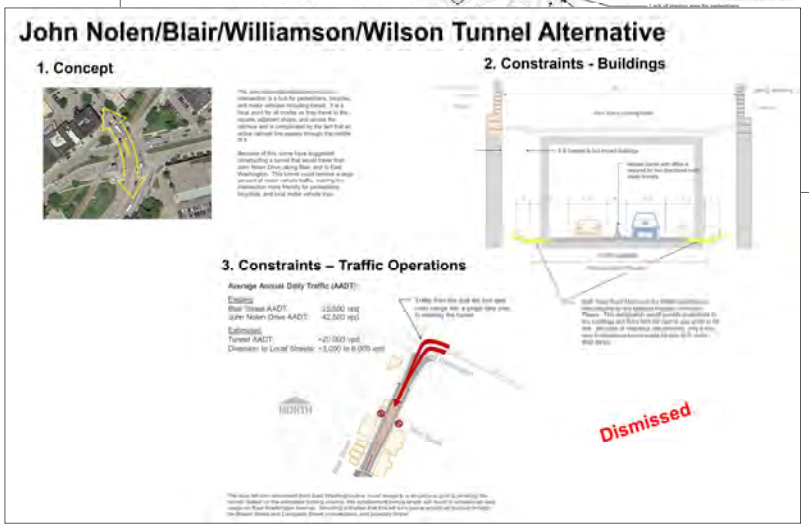
Overview of Ideas

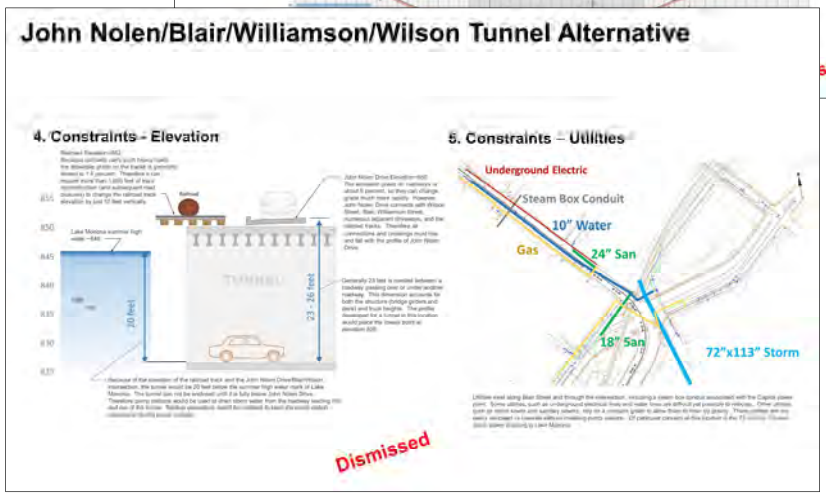
John Nolen/Blair/Wilson/Williamson Area

- 4 exhibits on Needs and Tunnel Investigations



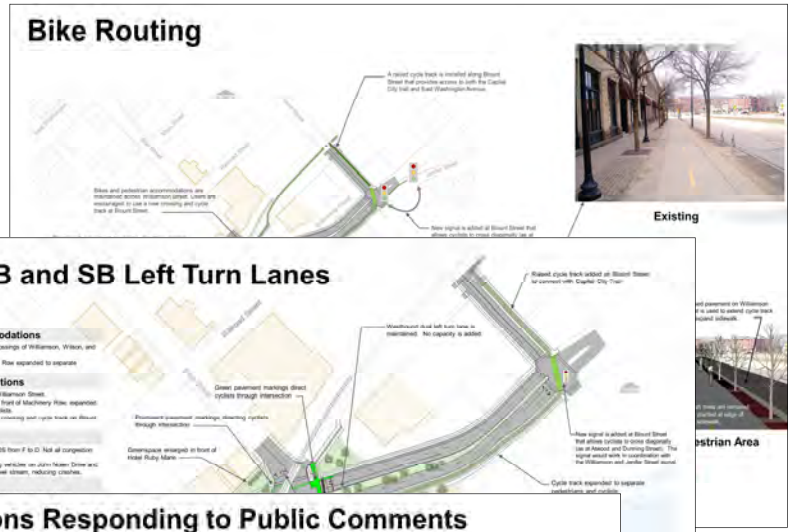


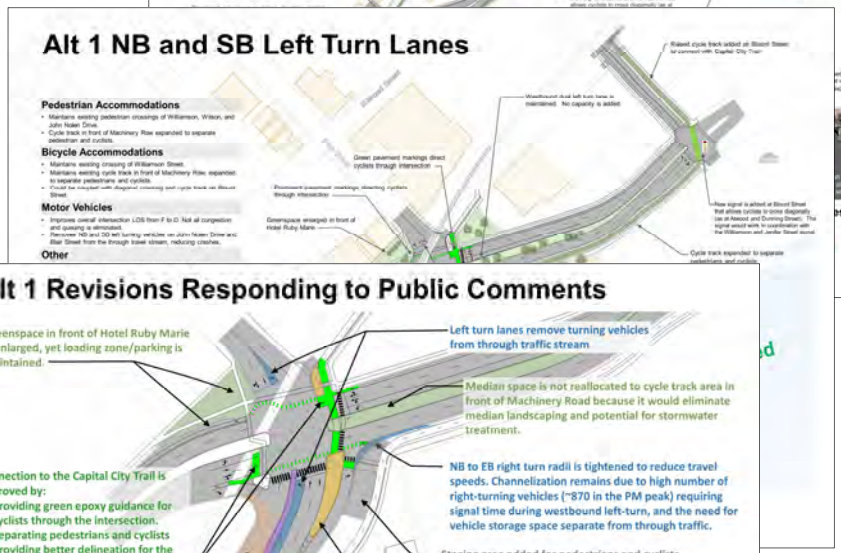


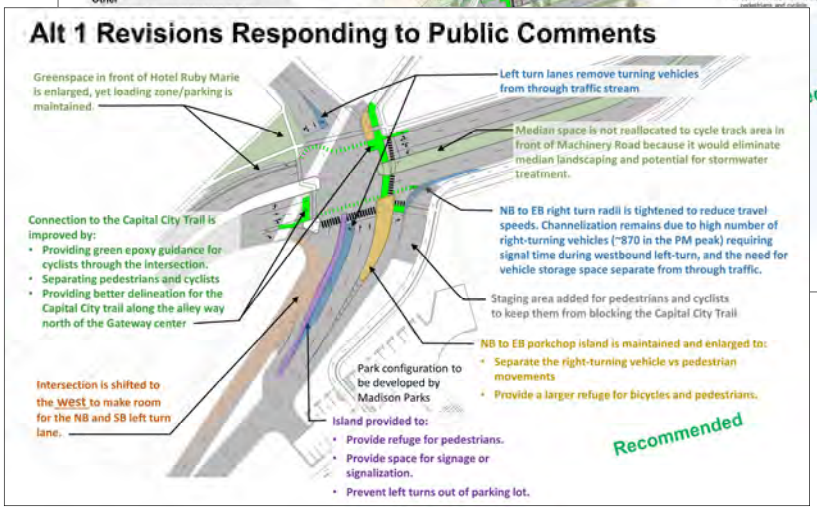


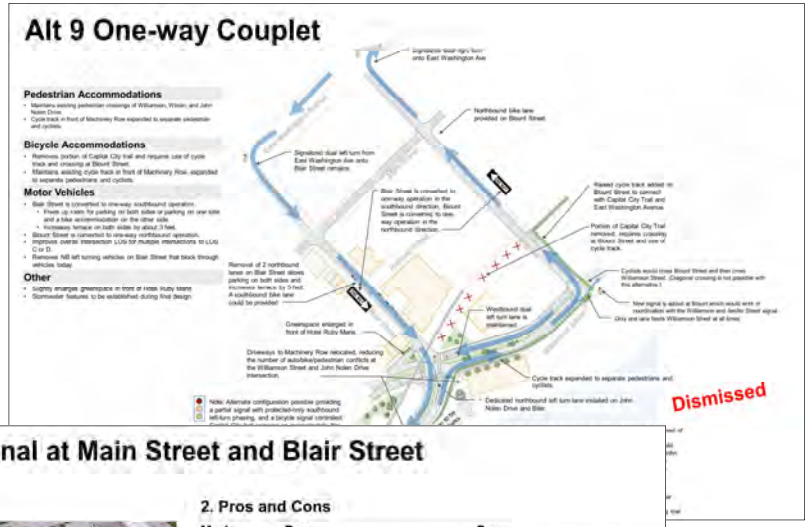
John Nolen/Blair/Wilson/Williamson Area

- 5 exhibits on Alternatives









John Nolen/Blair/Wilson/Williamson Area
- 2 exhibits comparing Alternative 1 and Alternative 9

Alt 1 and Alt 9 Comparison – Expressed Needs

Expressed Concern/Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet
John Nolen Drive is a barrier for pedestrian/bicycle access to the lake.	• Ped/bike access to lake is enhanced when combined with proposed ped/bike overpass	• Reduced when combined with proposed overpass
Reduce Speeds of Northbound Right-Turns	• Smaller radii on northbound right-turn channelization should reduce right turn travel speeds.	• Providing a dual right turn lane for the northbound to eastbound movement requires larger radii and consequently may increase speeds.
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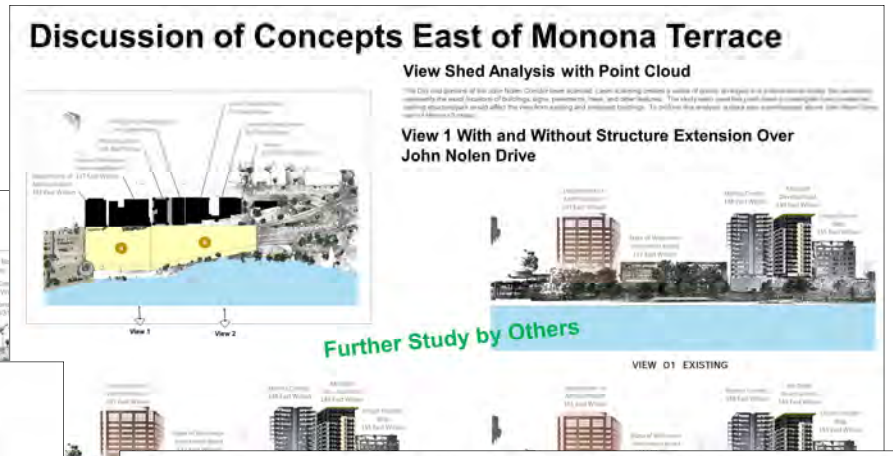
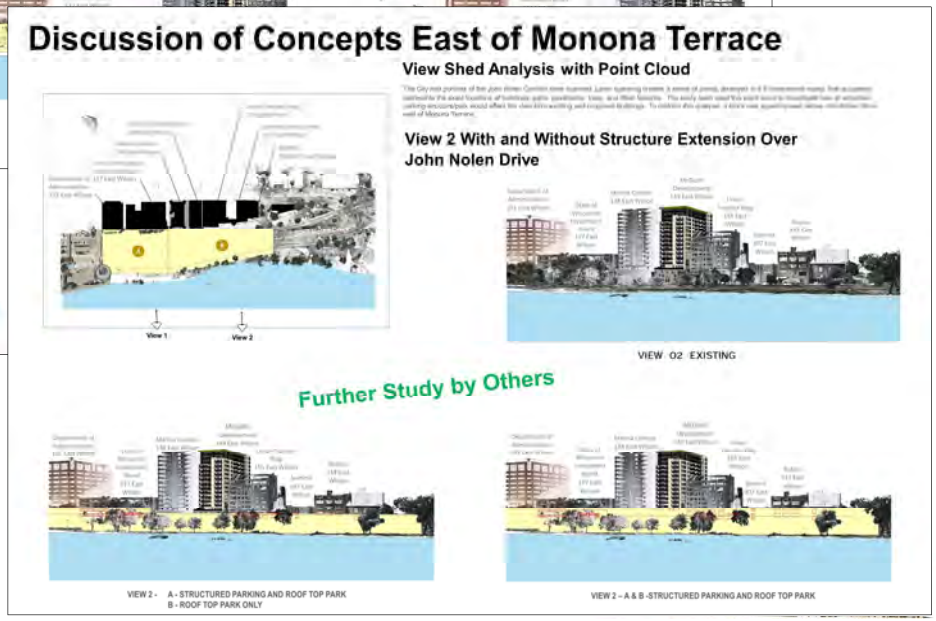
Better Delineate Bicycle versus Pedestrian Space along south side of Williamson Street between Blair Street and Jennifer Street	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.	• Reallocation of space along the track provide better delineation, pedestrians and bicycles.
Relocate Capital City Trail Crossing of Williamson Street from Blair Street to Blount Street	• Achieved with signalized diagonal crossing and cycle track connection along Blount Street. Existing Capital City Trail crossing at Blair Street intersection remains.	• Achieved with signalized diagon cycletrack connection along Blo • Existing Capital City Trail cross eliminated.
Improve Pedestrian and Bicycle Access Across Blair Street	• Blair Street is easier to cross for pedestrians and bikes if Main Street signal is implemented.	• Blair Street is easier to cross fo because Blair Street carries abo traffic. One-way operation on B larger gaps in traffic.

Alt 1 and Alt 9 Comparison – Additional Measures

Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet
Accommodations for Pedestrians and Bicycles	- Enhanced accommodations for pedestrians and bicycles through: • Reallocation of space along Machinery Road cycle track - Relocating parking lot driveway to minimize ped/bike/auto conflicts at intersection. • Better delineation of connection of Wilson Street to Capital City Trail for bicycles and pedestrians.	- One-way Blair Street may allow for more space to be dedicated to terrace, pedestrian, and/or bicycle accommodations. • Enhanced accommodations along John Nolen Drive and Williamson Street • Increased traffic volumes along Williamson Street between Blair Street and Blount Street.
Transit	• No significant impacts	• Lower traffic volumes eastbound along East Washington Avenue between Blair Street and Blount Street which carries 9 weekday routes and has a bus stop at the southeast corner at Blount Street. • Higher traffic volumes along eastbound Williamson Street between Blair Street and Blount Street which carries 4 weekday routes. • No significant impacts to current routing.
Motor Vehicles	• Modest improvement to delays and queuing compared to a Do Nothing scenario.	• Lower delay and queuing during the AM peak hour than Alt 1 • Higher delay and queuing during the PM peak hour than Alt 1
Stakeholder and Alder Comments	• Generally positive	• Generally negative
Cost	• $3.4 Million	• $5.5 Million
Additional Considerations	• Reduced crashes with the addition of left-turn bays.	• Reduced crashes with the addition of left-turn bays. • Spreads traffic burden among two streets instead of one. • Perception of encouraging John Nolen Drive northbound/ eastbound traffic to use Williamson Street instead of East Washington Avenue.
Result	Recommended	Dismissed

Law Park Area
- 5 exhibits





Broom and North Shore Area
- 5 exhibits

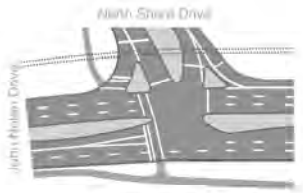
North Shore Drive/North Broom Street Expressed Needs

Broom Street

- Reconstruct Broom Street with 10-foot lanes
- Install a 10-foot cycle track on east side.

Long term solution
Path connecting Broom Street to Hamilton Street

North Shore Drive



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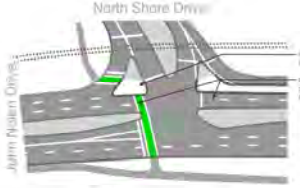
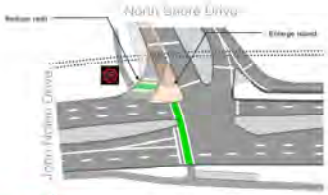


2013 Improvements

Short Term Solution

Recommended



Longer Term Option

Right Turn Channelization

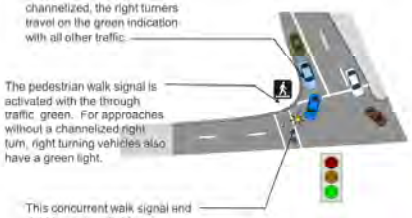
Role of the channelized right turn lane

Channelized right turn lanes with pork chop islands are often criticized for increasing the intersection footprint and increasing pedestrian crossing distances. However, for approaches with high volumes of right turning vehicles they can reduce pedestrian/turning vehicle conflicts. Channelizing the right turn lane allows it to be controlled independently of the through movements and the pedestrian walk signals. While making it a two-stage crossing for pedestrians and cyclists, it can substantially reduce conflicts.

When right turn lanes are not channelized, the right turners travel on the green indication with all other traffic.

The pedestrian walk signal is activated with the through traffic green. For approaches without a channelized right turn, right turning vehicles also have a green light.

This concurrent walk signal and right turn green light can increase conflicts, particularly for



Intersections with channelized right turns allow the right turn lane to be controlled independently of the through lanes and walk signal.

Pedestrians are able to cross on the through green signal without conflict from right-turning

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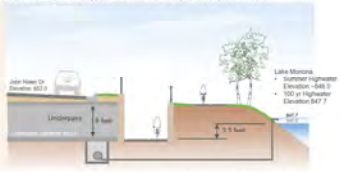
Making im

North Shore and Broom Street - Bicycle Underpass

Recommended as Long Term Solution

Recommended as Long Term Solution



Project Process and Schedule

Phase 1 – Needs & Alts Development

- PIM # 1, Needs and Priorities
- Range of Alternatives
- Alternatives Pros and Cons

Oct.'16-Mar.'17

Phase 2 – Alternatives Refinement

- PIM # 2, Range of Alternatives
- Refined Alternatives
- Preferred Combinations

Mar.'17-Jun.'17

Phase 3 - Recommendations

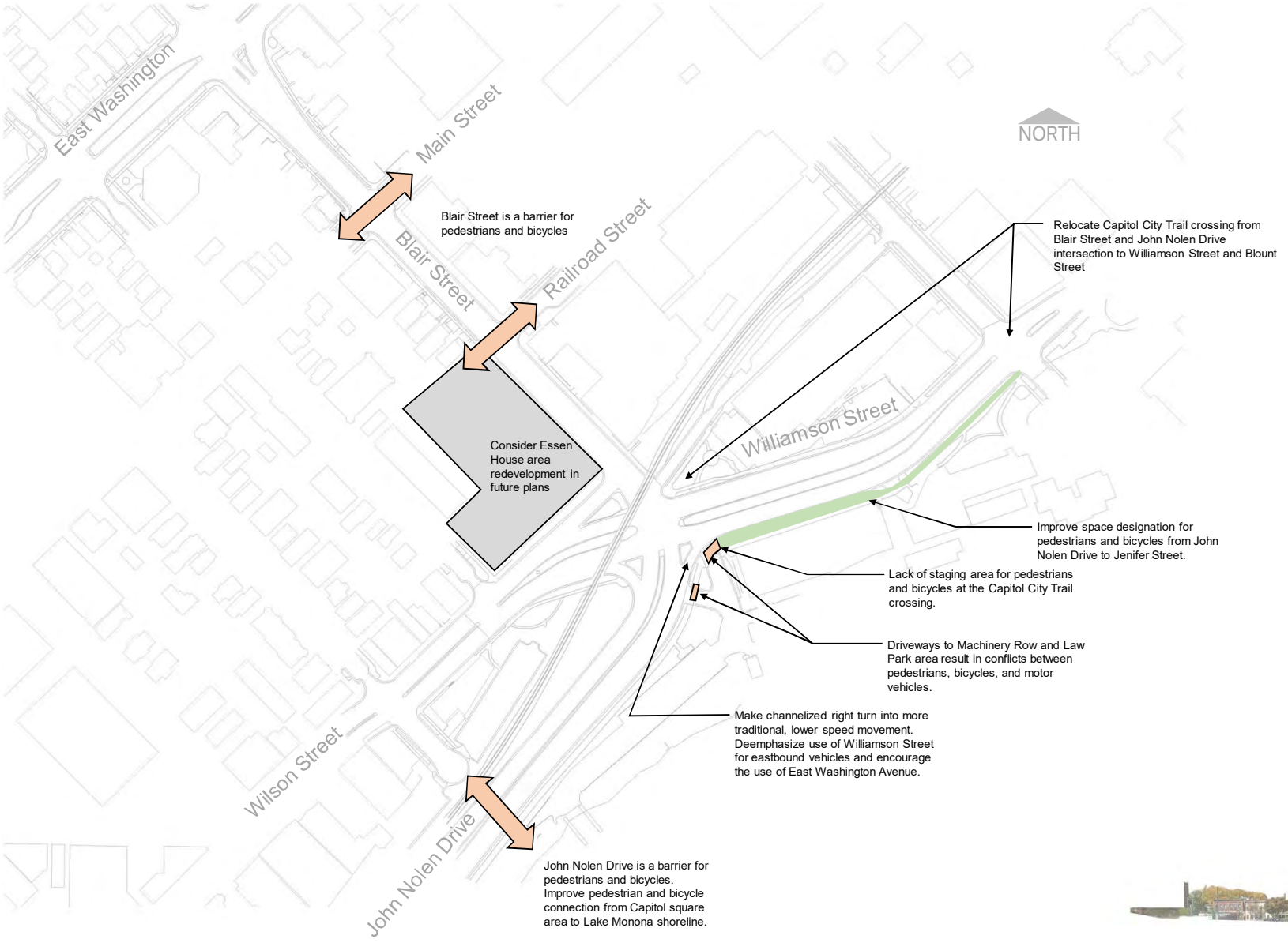
- PIM #3, Draft Recommendations
- Conceptual Layout, Range of Costs
- Layout Refinement
- Finalize Recommendations

Jun.'17-Sep.'17

Next Steps

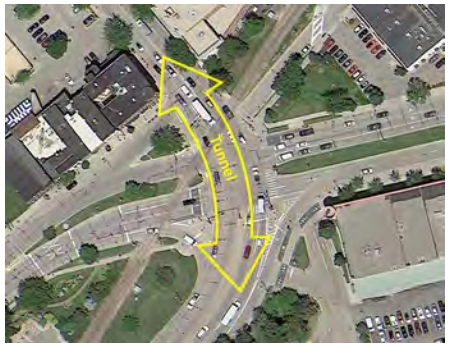
1. Develop the final study report: September/October
   - Present to City Committees/Boards
   - Present to Common Council
2. Advance Alternative 1 at John Nolen Drive/Blair Street
   - Apply for Highway Safety Improvement Program (HSIP) funding
   - City engineering to begin final design
3. Begin formal planning process for Law Park area

Blair/Williamson Intersection Expressed Needs



John Nolen/Blair/Williamson/Wilson Tunnel Alternative

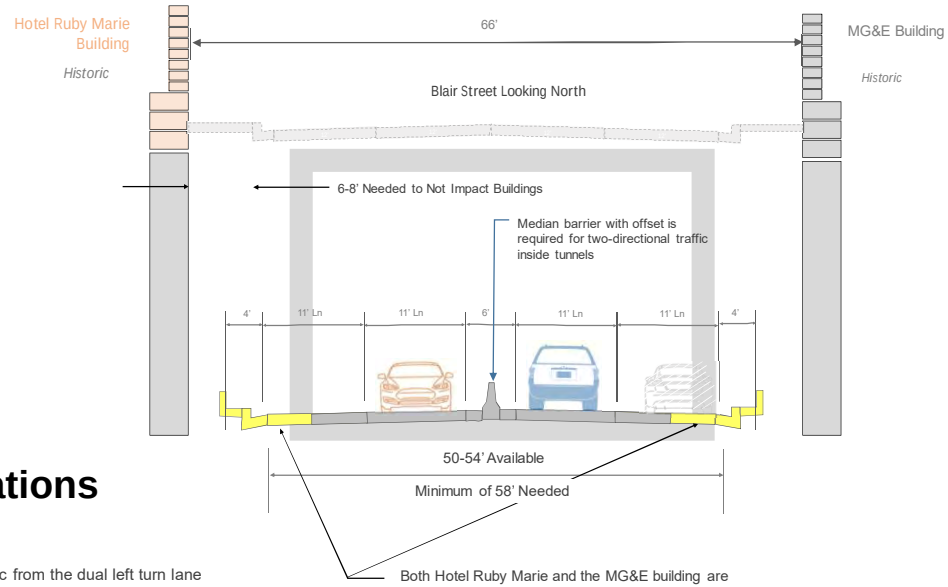
1. Concept



The John Nolen/Blair/Williamson/Wilson intersection is a hub for pedestrians, bicycles, and motor vehicles including transit. It is a focal point for all modes as they travel to the square, adjacent shops, and across the isthmus and is complicated by the fact that an active railroad line passes through the middle of it.

Because of this, some have suggested constructing a tunnel that would travel from John Nolen Drive, along Blair, and to East Washington. This tunnel could remove a large amount of motor vehicle traffic, making the intersection more friendly for pedestrians, bicyclists, and local motor vehicle trips.

2. Constraints - Buildings



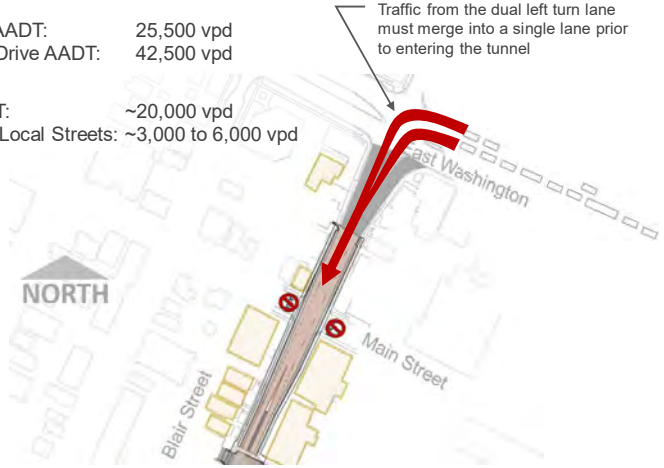
Both Hotel Ruby Marie and the MG&E building are likely eligible for the National Register of Historic Places. This designation would provide protections to the buildings and likely limit the right of way width to 66 feet. Because of clearance requirements, only a two-lane bi-directional tunnel would be able to fit under Blair Street.

3. Constraints – Traffic Operations

Average Annual Daily Traffic (AADT):

Existing
Blair Street AADT: 25,500 vpd
John Nolen Drive AADT: 42,500 vpd

Estimated
Tunnel AADT: ~20,000 vpd
Diversion to Local Streets: ~3,000 to 6,000 vpd

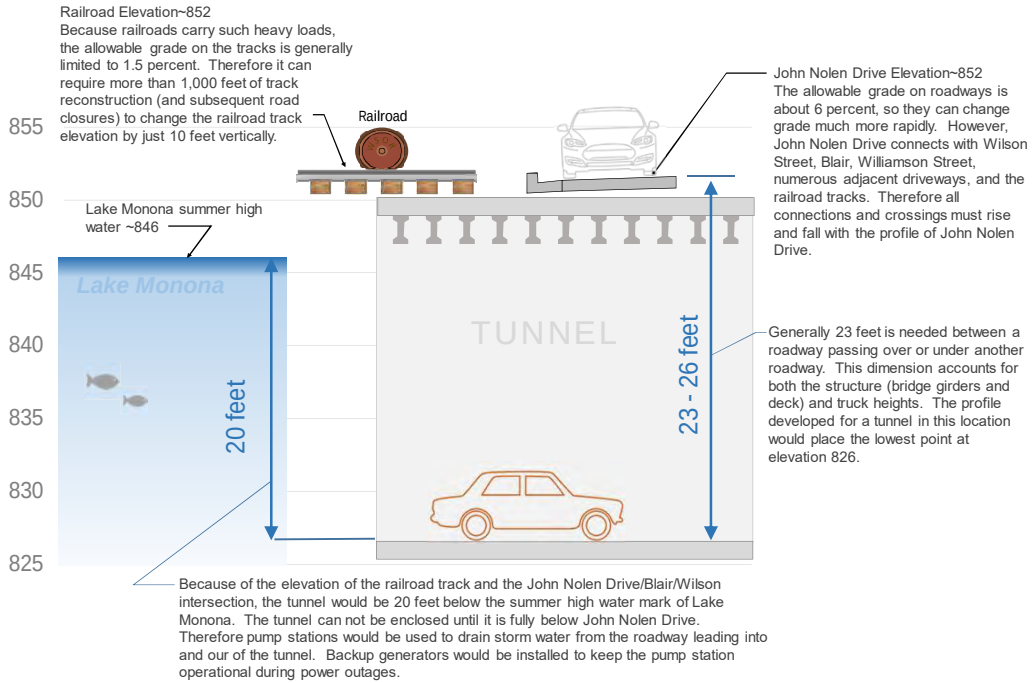


Dismissed

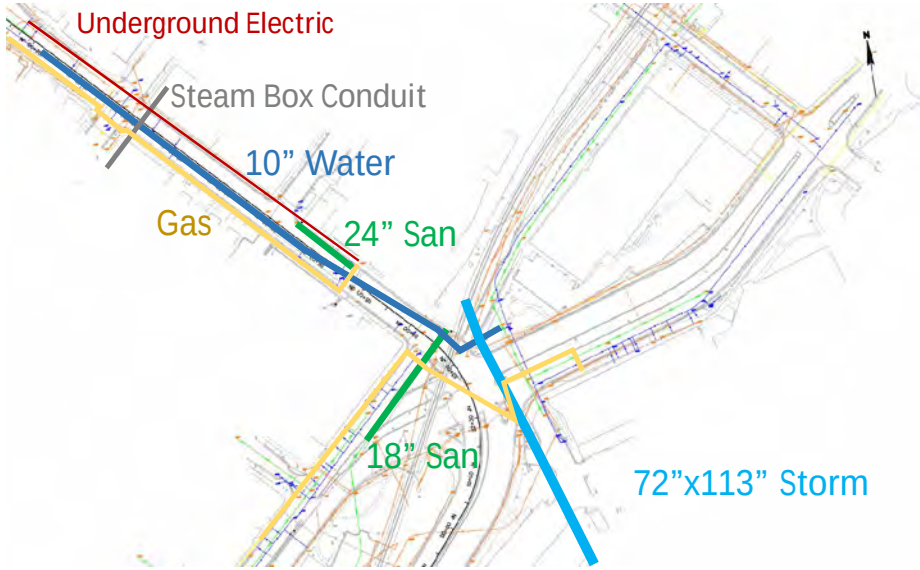
The dual left-turn movement from East Washington Ave. must merge to a single lane prior to entering the tunnel. Based on the estimated turning volume, this substandard merge length will result in unbalanced lane usage on East Washington Avenue. Modeling indicates that this left turn queue would will backup through the Blount Street and Livingston Street intersections, and possibly farther.

John Nolen/Blair/Williamson/Wilson Tunnel Alternative

4. Constraints - Elevation



5. Constraints – Utilities



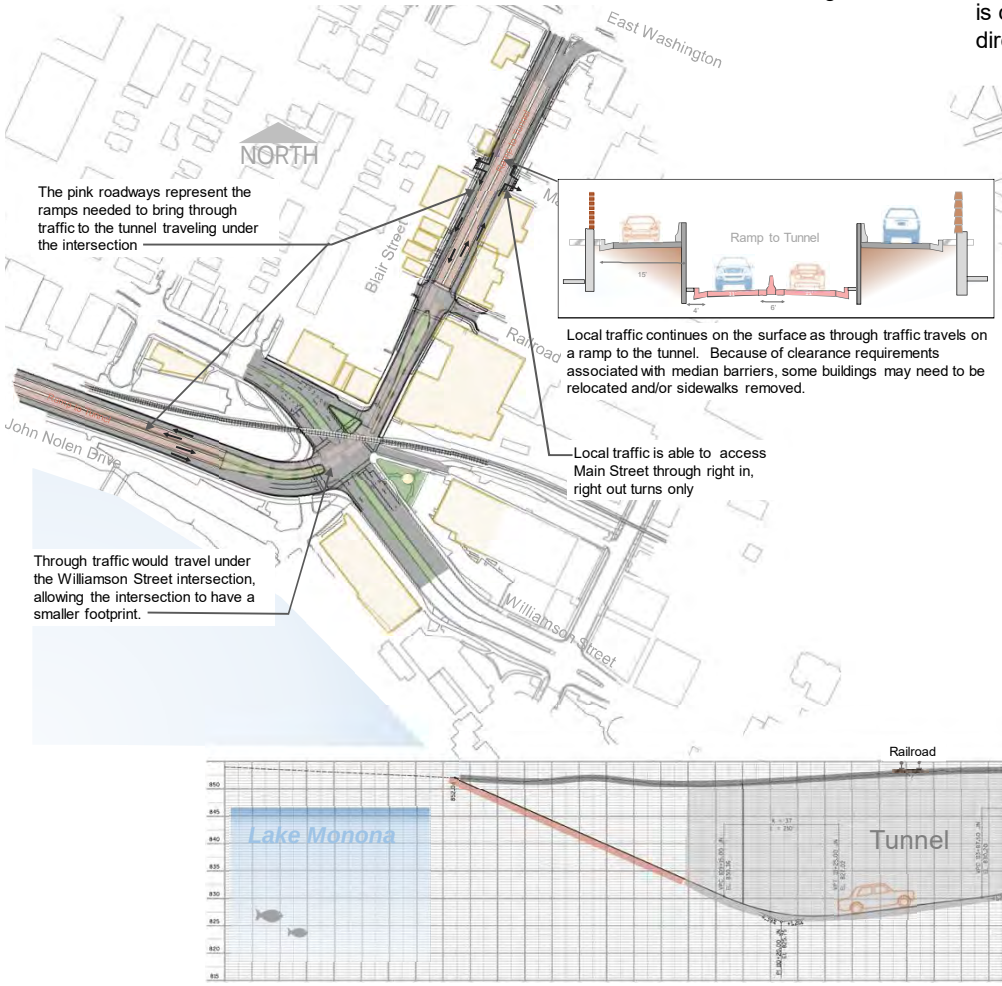
Utilities exist along Blair Street and through the intersection, including a steam box conduit associated with the Capitol power plant. Some utilities, such as underground electrical lines and water lines are difficult yet possible to relocate. Other utilities, such as storm sewer and sanitary sewers, rely on a constant grade to allow them to drain by gravity. These utilities are not easily relocated or lowered without installing pump stations. Of particular concern at this location is the 72 inch by 113 inch storm sewer draining to Lake Monona.

Dismissed

Tunnels

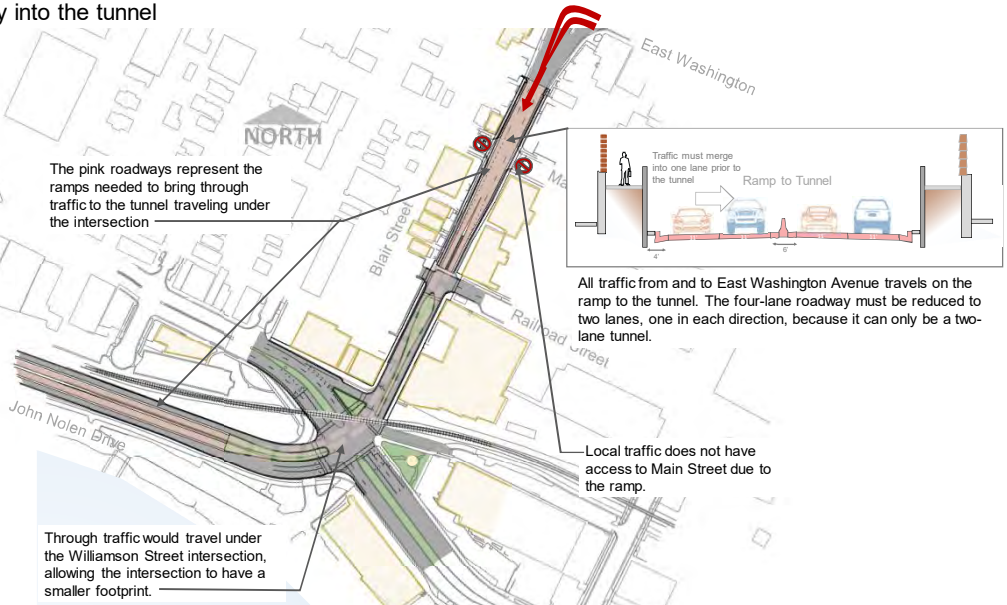
Option 1

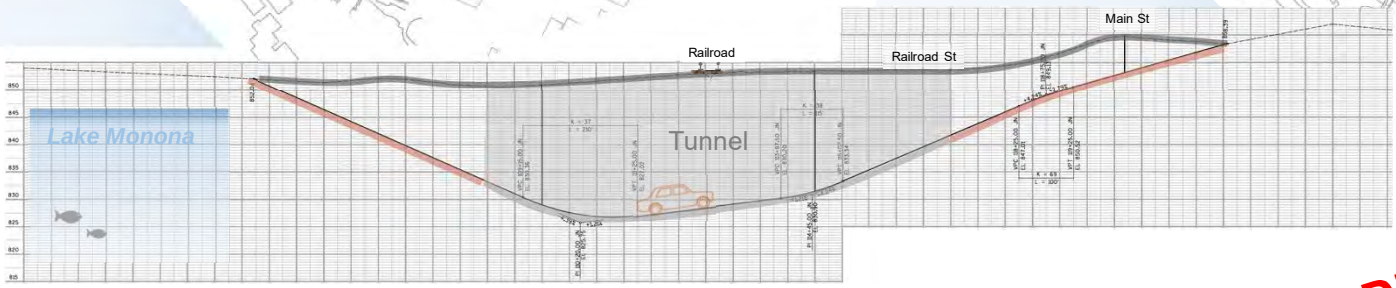
Maintains local surface access to Railroad Street, Main Street, and East Washington Avenue



Option 2

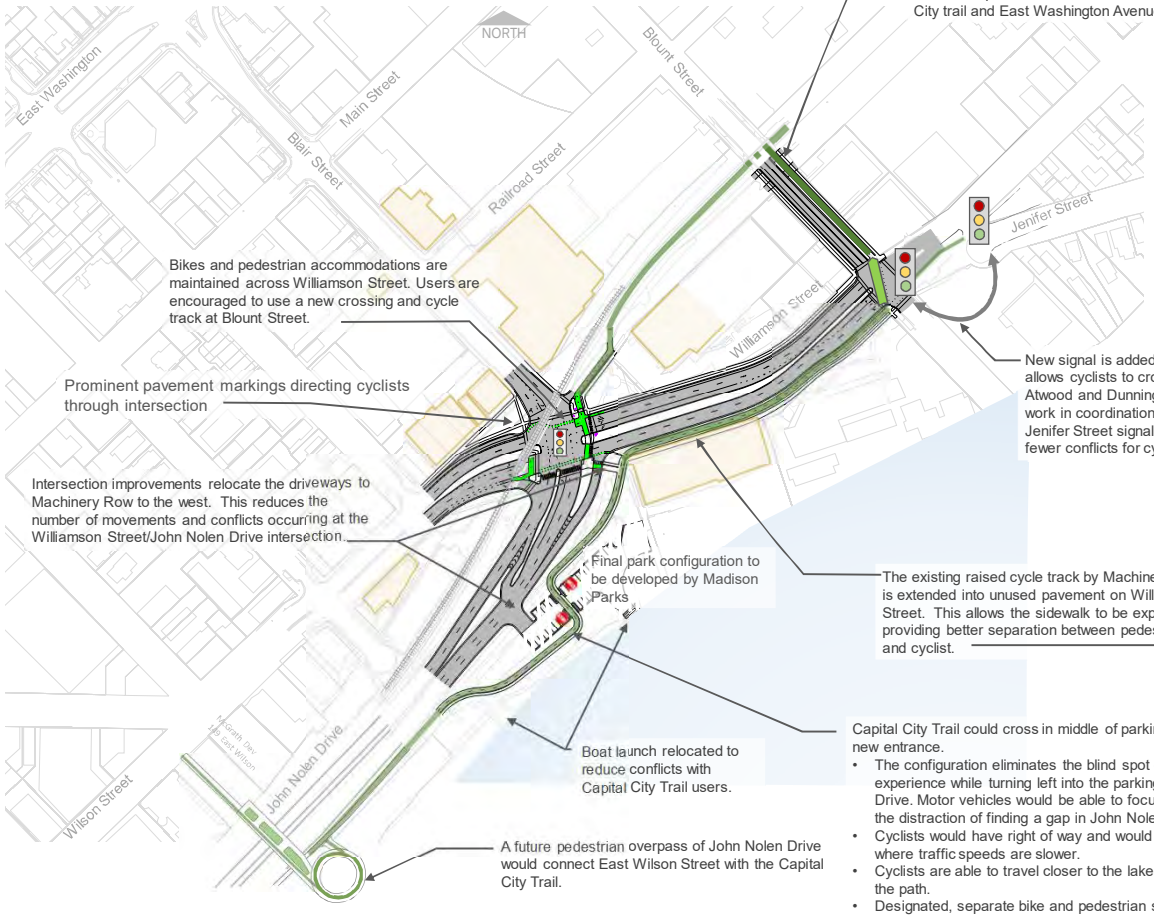
Maintains local surface access to Railroad Street. Access to Main Street is closed. The connection to and from East Washington Avenue flows directly into the tunnel

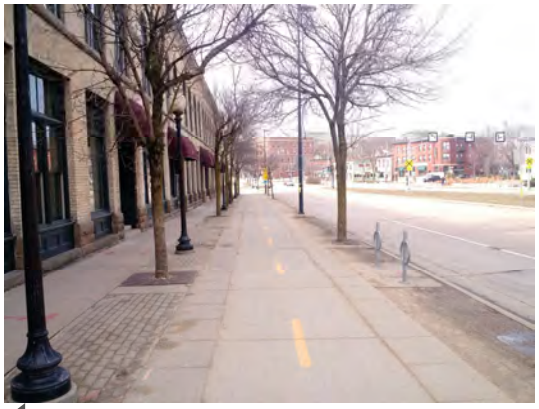




Dismissed

Bike Routing





Existing

Expanded Pedestrian Area

Recommended

Alt 1 NB and SB Left Turn Lanes

Pedestrian Accommodations

- Maintains existing pedestrian crossings of Williamson, Wilson, and John Nolen Drive.
- Cycle track in front of Machinery Row expanded to separate pedestrian and cyclists.

Bicycle Accommodations

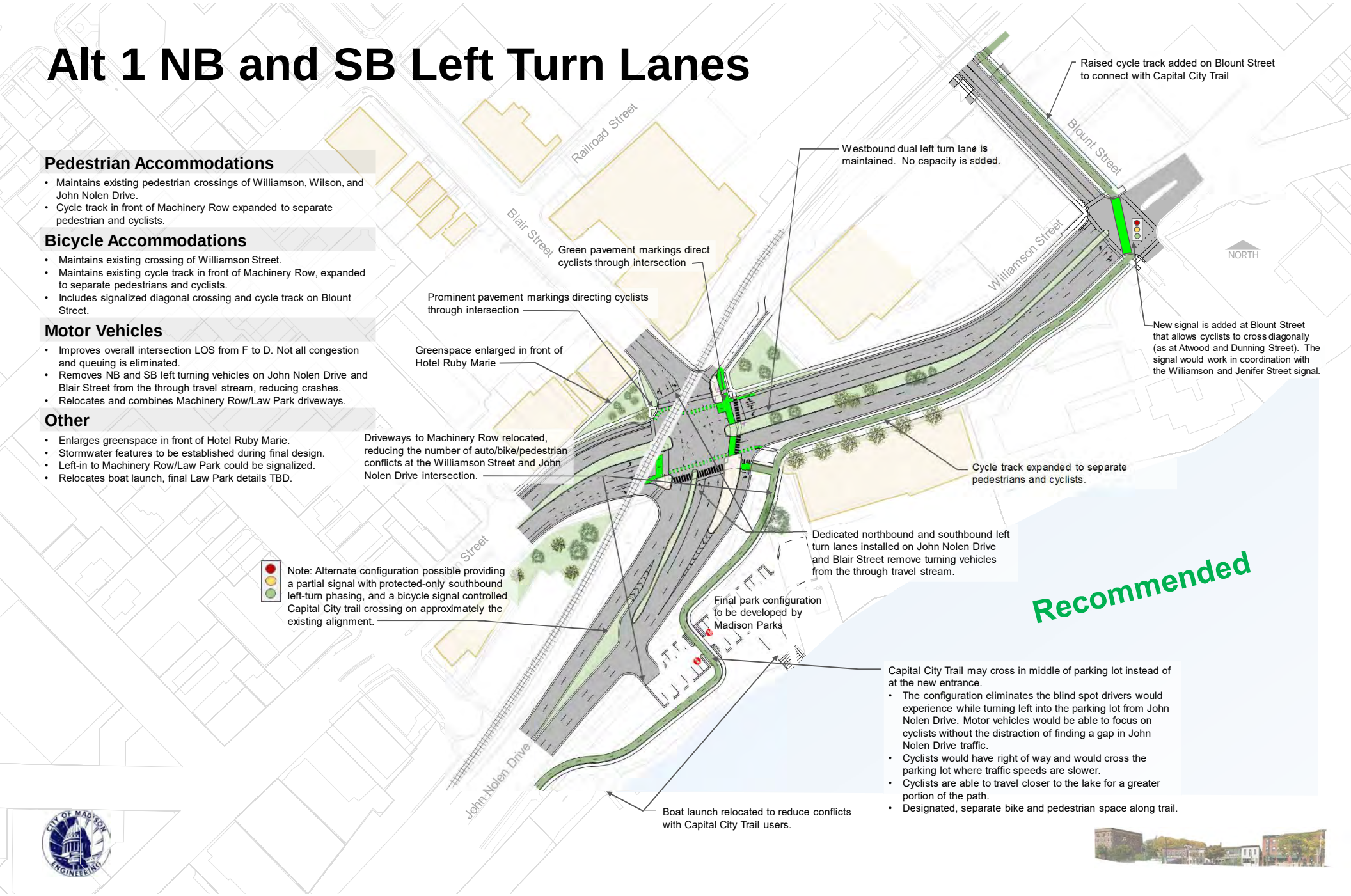
- Maintains existing crossing of Williamson Street.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.
- Includes signalized diagonal crossing and cycle track on Blount Street.

Motor Vehicles

- Improves overall intersection LOS from F to D. Not all congestion and queuing is eliminated.
- Removes NB and SB left turning vehicles on John Nolen Drive and Blair Street from the through travel stream, reducing crashes.
- Relocates and combines Machinery Row/Law Park driveways.

Other

- Enlarges greenspace in front of Hotel Ruby Marie.
- Stormwater features to be established during final design.
- Left-in to Machinery Row/Law Park could be signalized.
- Relocates boat launch, final Law Park details TBD.



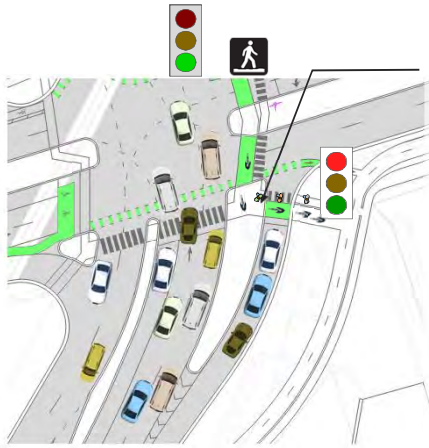
Why is the Channelized Right Turn Remaining?

There are 900 vehicles making a right turn onto Williamson Street in the evening rush hour. Pedestrians and cyclists crossings likely exceed 200 during the evening rush hour.

Without a refuge island, these right turn vehicles have the same signal phase as the pedestrian walk phase.

This concurrent walk signal and right turn green light increases conflicts between peds/cyclist and right turning vehicles.

Delays for both peds/cyclists and right turning vehicles increases.



The channelization of the right turns allow the right turn lane to be controlled independently of the through lanes and walk signal. So the 900 vehicles and the 200 pedestrians/cyclist each have a separate signal phase.

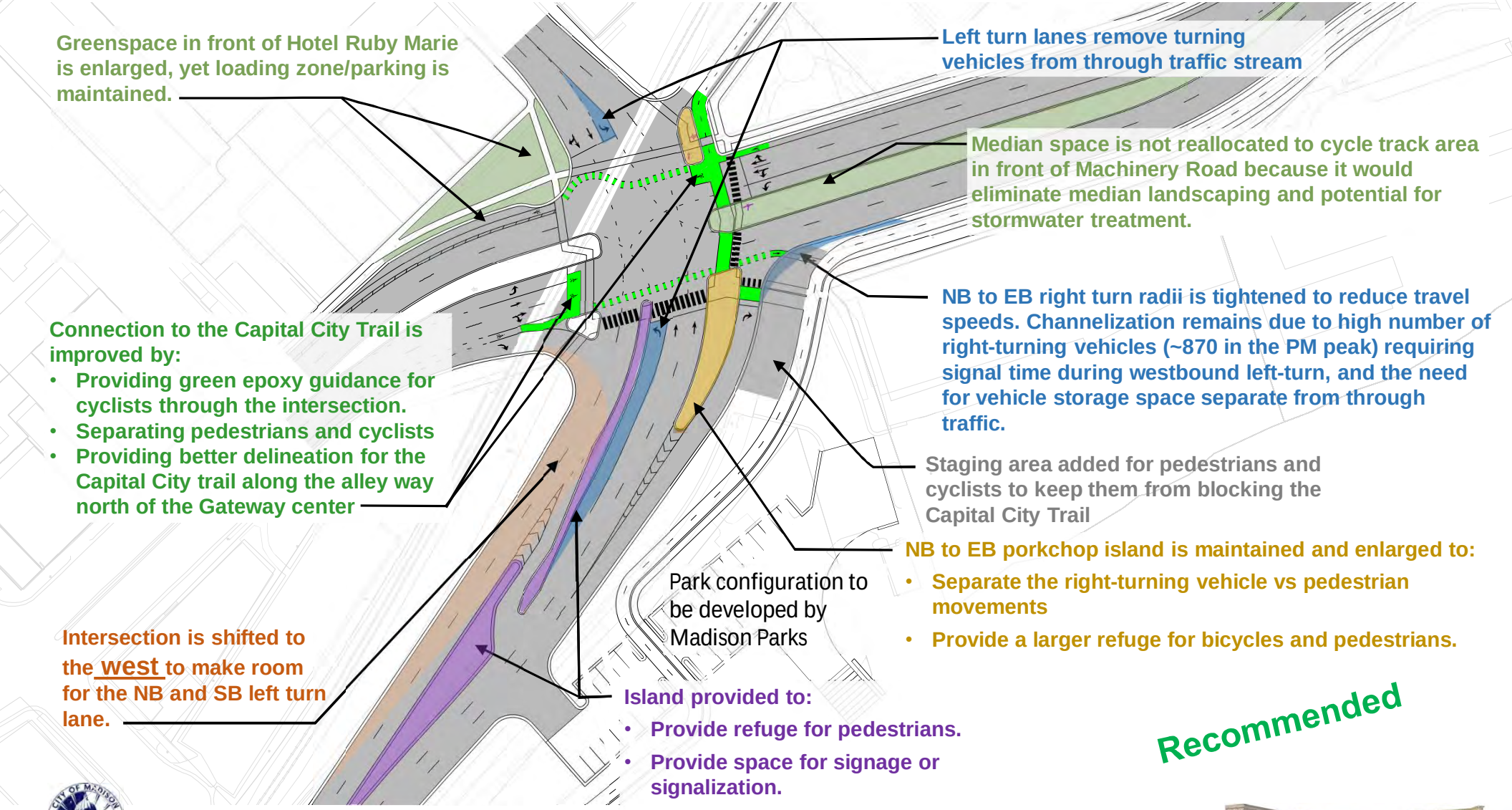
Pedestrians/cyclist are able to cross Williamson on the through green signal without conflict from right turning vehicles. Pedestrians/cyclist are able to cross John Nolen Drive right turn lane on their own phase.

Why is the Driveway Entrance Being Relocated?

There is no entrance to Machinery Row for vehicles originating from the east or the north. Many vehicles choose to access Machinery row by traveling south on Blair and making a maneuver around the pork chop island. This move typically conflicts with the right turn movement and pedestrian/bike crossings. Because gaps are small, the vehicle makes the maneuver quickly, adding to the risk.

Vehicles turning out of the Machinery Row driveway must look for motor vehicles coming from the west, and look for pedestrians/cyclists coming from both directions. Buildings make it difficult to see path users. This makes it difficult for the motor vehicle to judge appropriate gaps in all directions and leads to numerous near misses.

Alt 1 Revisions Responding to Public Comments



Greenspace in front of Hotel Ruby Marie is enlarged, yet loading zone/parking is maintained.

Left turn lanes remove turning vehicles from through traffic stream

Median space is not reallocated to cycle track area in front of Machinery Road because it would eliminate median landscaping and potential for stormwater treatment.

NB to EB right turn radii is tightened to reduce travel speeds. Channelization remains due to high number of right-turning vehicles (~870 in the PM peak) requiring signal time during westbound left-turn, and the need for vehicle storage space separate from through traffic.

Connection to the Capital City Trail is improved by:

- Providing green epoxy guidance for cyclists through the intersection.
- Separating pedestrians and cyclists
- Providing better delineation for the Capital City trail along the alley way north of the Gateway center

Staging area added for pedestrians and cyclists to keep them from blocking the Capital City Trail

NB to EB porkchop island is maintained and enlarged to:

- Separate the right-turning vehicle vs pedestrian movements
- Provide a larger refuge for bicycles and pedestrians.

Park configuration to be developed by Madison Parks

Intersection is shifted to the west to make room for the NB and SB left turn lane.

Island provided to:

- Provide refuge for pedestrians.
- Provide space for signage or signalization.
- Prevent left turns out of parking lot.

Recommended

Alt 9 One-way Couplet

Pedestrian Accommodations

- Maintains existing pedestrian crossings of Williamson, Wilson, and John Nolen Drive.
- Cycle track in front of Machinery Row expanded to separate pedestrian and cyclists.

Bicycle Accommodations

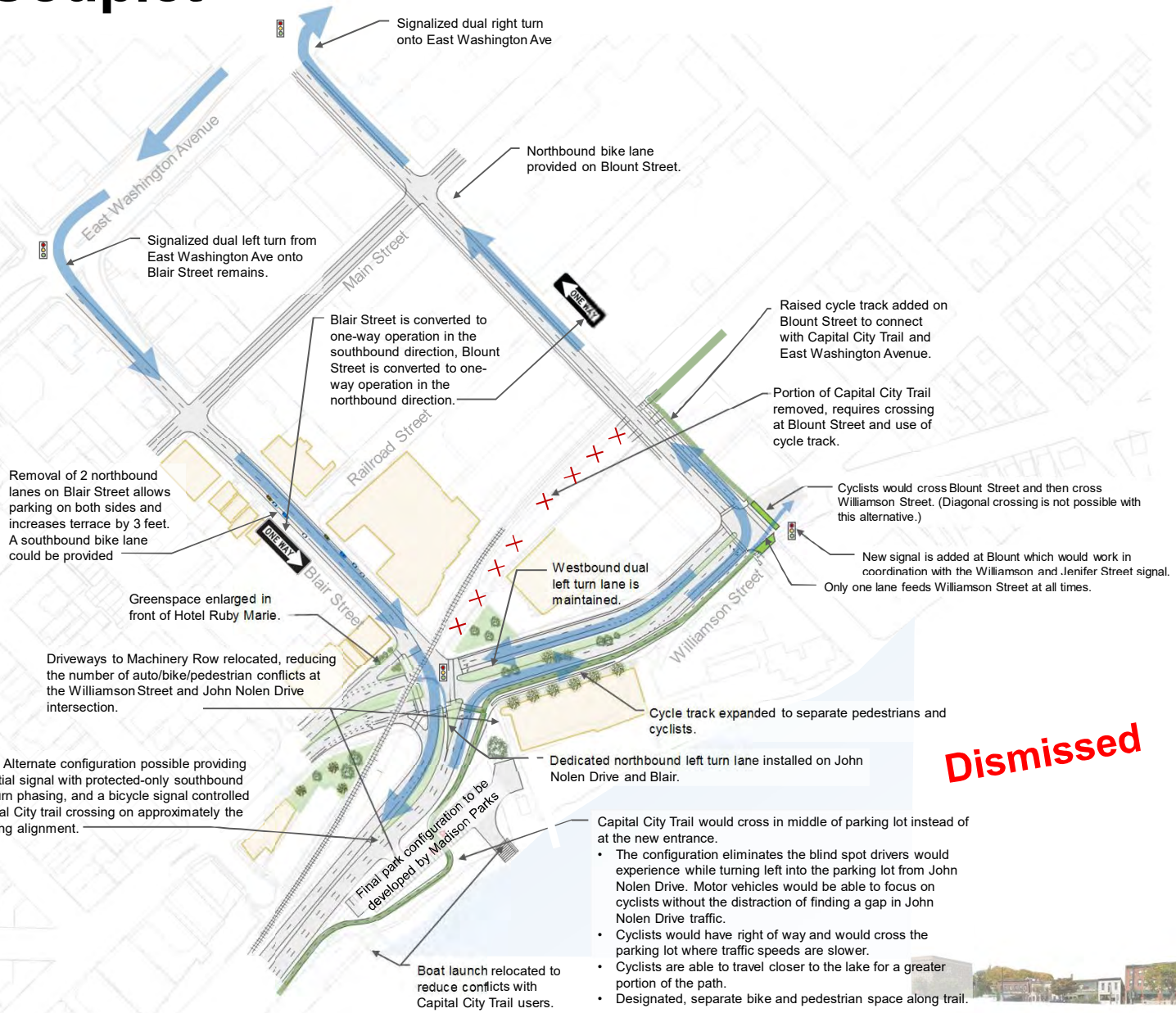
- Removes portion of Capital City trail and requires use of cycle track and crossing at Blount Street.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.

Motor Vehicles

- Blair Street is converted to one-way southbound operation.
  - Frees up room for parking on both sides or parking on one side and a bike accommodation on the other side.
  - Increases terrace on both sides by about 3 feet.
- Blount Street is converted to one-way northbound operation.
- Improves overall intersection LOS for multiple intersections to LOS C or D.
- Removes NB left turning vehicles on Blair Street that block through vehicles today.

Other

- Slightly enlarges greenspace in front of Hotel Ruby Marie
- Stormwater features to be established during final design



Dismissed

Alt 1 and Alt 9 Comparison – Expressed Needs

Expressed Concern/Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet
John Nolen Drive is a barrier for pedestrian/bicycle access to the lake.	• Ped/bike access to lake is enhanced when combined with proposed ped/bike overpass	• Reduced when combined with proposed overpass
Reduce Speeds of Northbound Right-Turns	• Smaller radii on northbound right-turn channelization should reduce right turn travel speeds.	• Providing a dual right turn lane for the northbound to eastbound movement requires larger radii and consequently may increase speeds.
Discourage Use of Williamson Street for Longer Trips	• Use of Williamson Street for longer trips is likely to remain unchanged from current conditions	• Directing all northbound traffic down Williamson Street until Blount Street may conflict with these goals.
Reduce Conflicts at Machinery Row Driveways	• Relocated parking lot access and realigned bike path reduces the number of conflicts at the intersection.	• Relocated parking lot access and realigned bike path reduces the number of conflicts at the intersection.
Provide Off-Path Staging Area for North-South bikes/peds crossing Williamson Street	• Additional staging area provided with the modified northbound right-turn channelization	• Modest staging area may be possible with dual channelized northbound through/right-turn.
Better Delineate Bicycle versus Pedestrian Space along south side of Williamson Street between Blair Street and Jennifer Street	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.	• Reallocation of space along the Machinery Row cycle track provide better delineation, and more room, for pedestrians and bicycles.
Relocate Capital City Trail Crossing of Williamson Street from Blair Street to Blount Street	• Achieved with signalized diagonal crossing and cycle track connection along Blount Street. Existing Capital City Trail crossing at Blair Street intersection remains.	• Achieved with signalized diagonal crossing and cycletrack connection along Blount Street. • Existing Capital City Trail crossing at Blair Street is eliminated.
Improve Pedestrian and Bicycle Access Across Blair Street	• Blair Street is easier to cross for pedestrians and bikes if Main Street signal is implemented.	• Blair Street is easier to cross for pedestrians and bikes because Blair Street carries about 50 percent less traffic. One-way operation on Blair Street also provides larger gaps in traffic.

Alt 1 and Alt 9 Comparison – Additional Measures

Evaluation Factor	Alt 1 – Add NBL, SBL	Alt 9 – One-Way Couplet

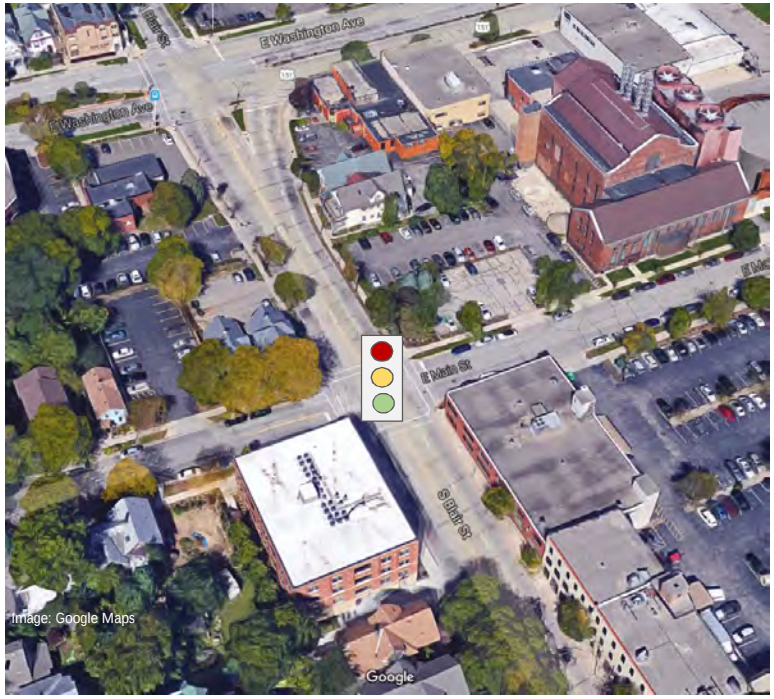
Accommodations for Pedestrians and Bicycles	• Enhanced accommodations for pedestrians and bicycles through:
	  • Reallocation of space along Machinery Road cycle track
	  • Relocating parking lot driveway to minimize ped/bike/auto conflicts at intersection.
	  • Better delineation of connection of Wilson Street to Capital City Trail for bicycles and pedestrians.
		• One-way Blair Street may allow for more space to be dedicated to terrace, pedestrian, and/or bicycle accommodations.
		• Enhanced accommodations along John Nolen Drive and Williamson Street
		• Increased traffic volumes along Williamson Street between Blair Street and Blount Street.

Transit	• No significant impacts.	• Lower traffic volumes eastbound along East Washington Avenue between Blair Street and Blount Street which carries 9 weekday routes and has a bus stop at the southeast corner at Blount Street. • Higher traffic volumes along eastbound Williamson Street between Blair Street and Blount Street which carries 4 weekday routes. • No significant impacts to current routing.
Motor Vehicles	• Modest improvement to delays and queuing compared to a Do Nothing scenario.	• Lower delay and queuing during the AM peak hour than Alt 1 • Higher delay and queuing during the PM peak hour than Alt 1
Stakeholder and Alder Comments	• Generally positive	• Generally negative
Cost	• $3.7 Million	• $6.0 Million
Additional Considerations	• Reduced crashes with the addition of left-turn bays.	• Reduced crashes with the addition of left-turn bays. • Spreads traffic burden among two streets instead of one. • Perception of encouraging John Nolen Drive northbound/ eastbound traffic to use Williamson Street instead of East Washington Avenue.
Result	**Recommended**	Dismissed

Traffic Signal at Main Street and Blair Street

Images: Google Maps

1. Concept



One of the comments received during the first public meeting stated that crossing Blair Street at Main Street on foot or on a bicycle is challenging during peak travel times. One option to improve east-west mobility for pedestrians, bicycles, and motor vehicles would be to install a traffic signal. The tradeoff is increased motor vehicle delays, congestion, and queuing for traffic on Blair Street.

The inability to provide left-turn bays on Blair Street at this signalized intersection is a potential safety concern. If installed, consideration could be given to prohibiting left-turns from Blair Street on to Main Street, perhaps during peak times only.

2. Pros and Cons

Mode	Pros	Cons
Pedestrians and Bicycles	• Provides a signal controlled crossing that stops Blair Street motor vehicle traffic to allow pedestrians and bicyclists to cross at Main Street.	• May draw more motor vehicle traffic to Main Street which is currently a low volume local street.
Transit	• No current Metro routes use the intersection. May provide new routing options for Metro routes due to improved access.	• None.
Motor Vehicle Traffic Operations	• Improved access for Main Street movements. • Total motor vehicle delays are acceptable.	• Higher queuing for Blair Street movements, including the potential for southbound Blair Street traffic to back into East Washington Avenue. • Potential for increased safety concerns due to inability to provide left-turn bays on Blair Street. • Northbound Blair Street traffic at East Washington Avenue likely to back into Main Street signal. • May need to consider prohibiting northbound and southbound left-turns from Blair Street on to Main Street.
Additional Considerations	• None.	• Buildings are close to or right on the back of sidewalk in three of the four intersection quadrants, making placement of signal equipment challenging and potentially more costly.

Recommended

Alt 7 Circulator

Pedestrian Accommodations

- Pedestrian accommodations are basically maintained.
- Several pedestrian crossings are reduced to crossing just one direction of traffic.
- Pedestrian crossings at Franklin Street and E Wilson Street have greater traffic volumes.
- Cycle track in front of Machinery Row could be expanded to separate pedestrian and cyclists.

Bicycle Accommodations

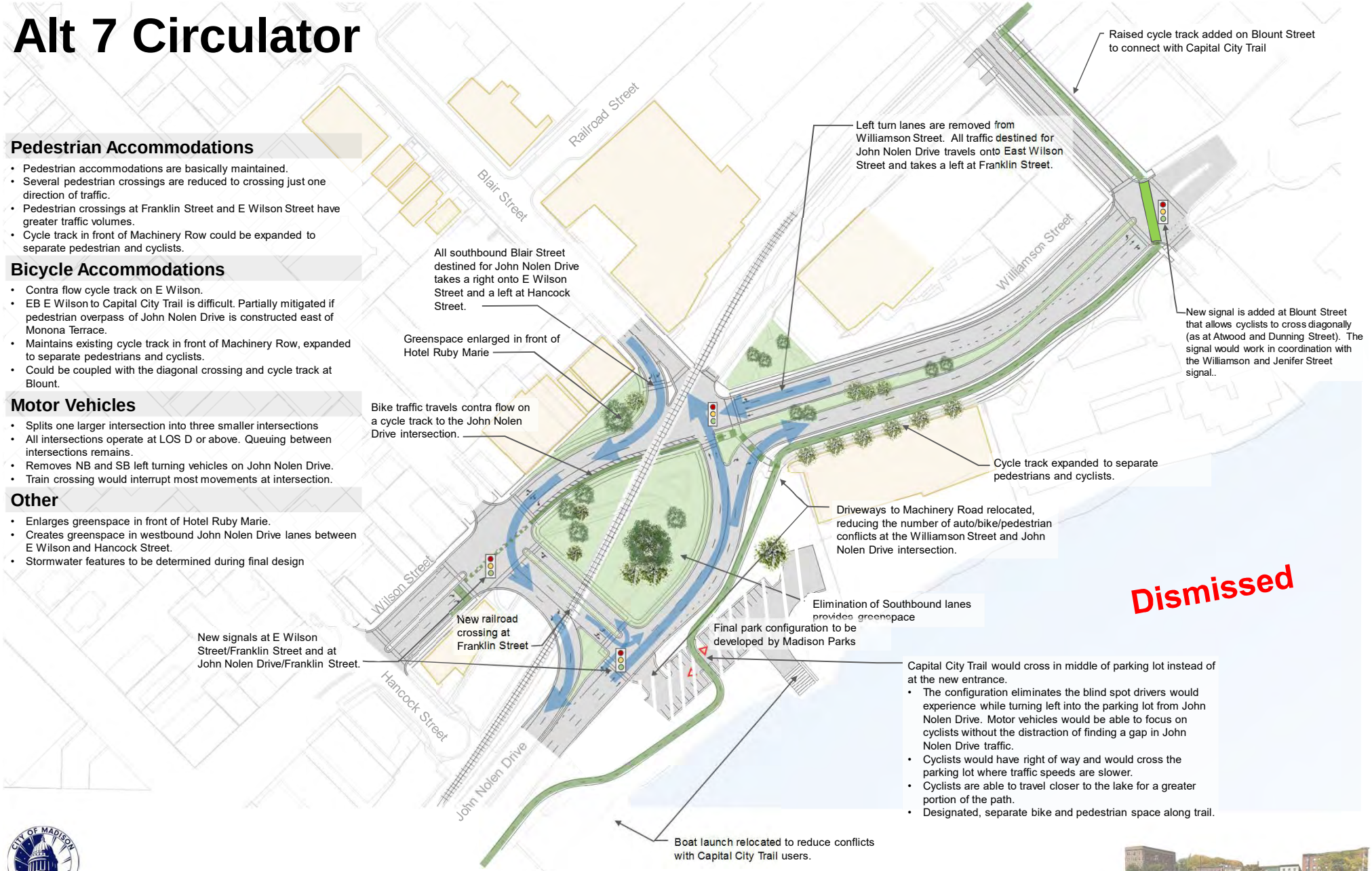
- Contra flow cycle track on E Wilson.
- EB E Wilson to Capital City Trail is difficult. Partially mitigated if pedestrian overpass of John Nolen Drive is constructed east of Monona Terrace.
- Maintains existing cycle track in front of Machinery Row, expanded to separate pedestrians and cyclists.
- Could be coupled with the diagonal crossing and cycle track at Blount.

Motor Vehicles

- Splits one larger intersection into three smaller intersections
- All intersections operate at LOS D or above. Queuing between intersections remains.
- Removes NB and SB left turning vehicles on John Nolen Drive.
- Train crossing would interrupt most movements at intersection.

Other

- Enlarges greenspace in front of Hotel Ruby Marie.
- Creates greenspace in westbound John Nolen Drive lanes between E Wilson and Hancock Street.
- Stormwater features to be determined during final design



Dismissed

Pedestrian Bicycle Connection to Law Park

Stronger connections from the square to the lake are recommended in the South Capitol Transit Oriented Development study. With the potential redevelopment of 149 and 151 East Wilson, a pedestrian overpass could be constructed that links Wilson Street to Law Park. The City is currently making arrangements with the developer to preserve an easement allowing this overpass and exploring putting in the subsurface infrastructure needed for the overpass. Construction of the overpass will occur when funding becomes available.

Point Cloud Rendering

The City had portions of the John Nolen Corridor laser scanned. Laser scanning creates a series of points, arranged in a 3-dimensional model, that accurately represent the location of buildings, signs, pavements, trees, and other features. The renderings below illustrate a possible pedestrian and bicycle overpass superimposed on the point cloud developed by the laser scanning. The pedestrian bicycle overpass maintains appropriate clearances over the railroad, and seeks to minimize effects to the lake.

Aerial view of potential pedestrian bicycle overpass

Looking at pedestrian bicycle overpass from Monona Terrace

Pedestrian bicycle overpass viewed from the east

Pedestrian bicycle overpass could be made wider to accommodate planters, food carts, or other amenities.

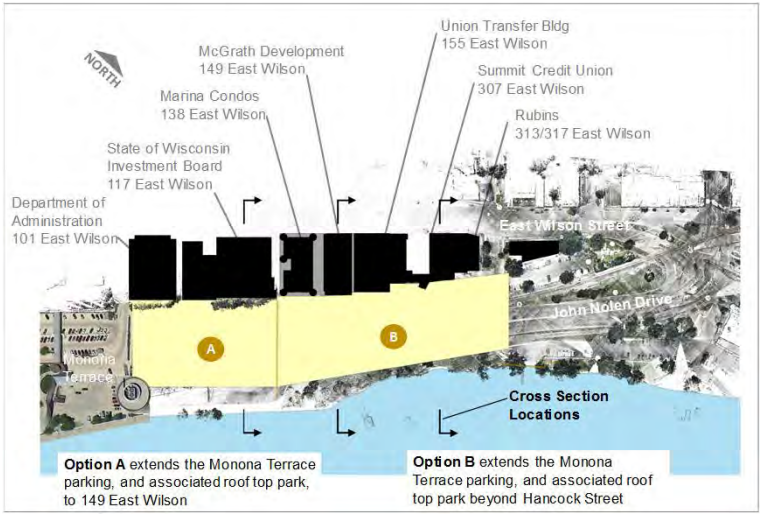
The pier supporting the pedestrian bicycle overpass ramp can be cantilevered, yet some of the structure would still extend over the lake..

Recommended:
Design details to be determined, rendering is intended to communicate concept only

Discussion of Concepts East of Monona Terrace

Kenton Peters Concept
Looking Northwest

Madison Design Professionals Workgroup Concept
Looking Northeast

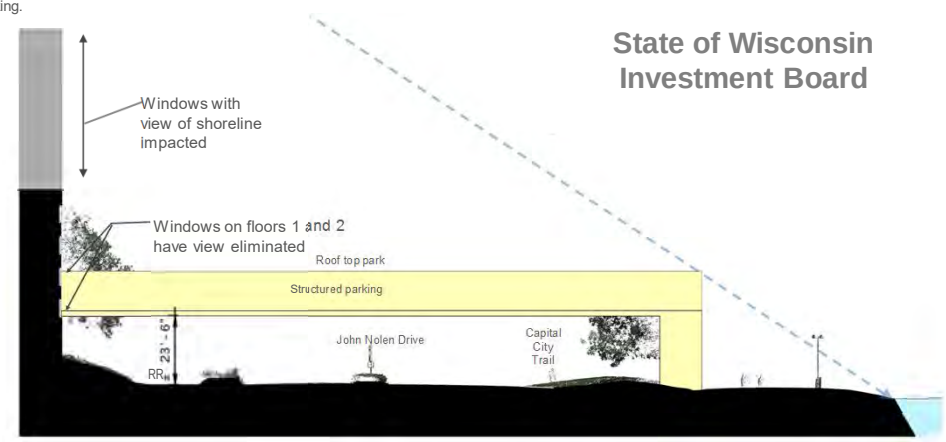


Both Kenton Peters and Madison Design Professionals Workgroup have developed concepts that would extend the Monona Terrace parking eastward over John Nolen Drive to the Blair Street intersection. While differing in details, both concepts incorporate a roof deck park on the top level, structured parking below the park, and a stepped terrace down to the lake.

Cross Sections and View Shed Analysis with Point Cloud

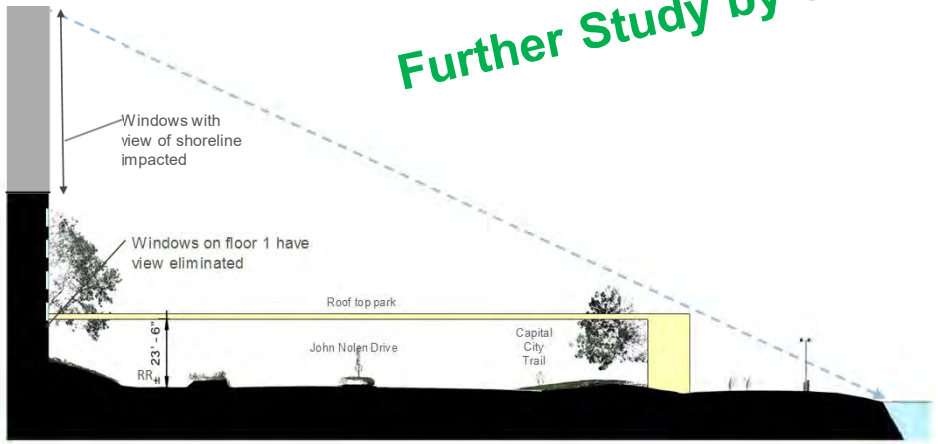
The City had portions of the John Nolen Corridor laser scanned. Laser scanning creates a series of points, arranged in a 3-dimensional model, that accurately represents the exact locations of buildings, signs, pavements, trees, and other features. The study team used this point cloud to investigate how an extended parking structure/park would affect the view from existing and proposed buildings. To perform this analysis, a trapezoid was superimposed above John Nolen Drive east of Monona Terrace. One of the scenarios used a trapezoid that assumed no structured parking and only a rooftop garden. Another scenario used a trapezoid that had one level of structured parking.

State of Wisconsin Investment Board



117 East Wilson
With Structured Parking

Further Study by Others



117 East Wilson
No Structured Parking

Discussion of Concepts East of Monona Terrace

Cross Sections and View Shed Analysis with Point Cloud

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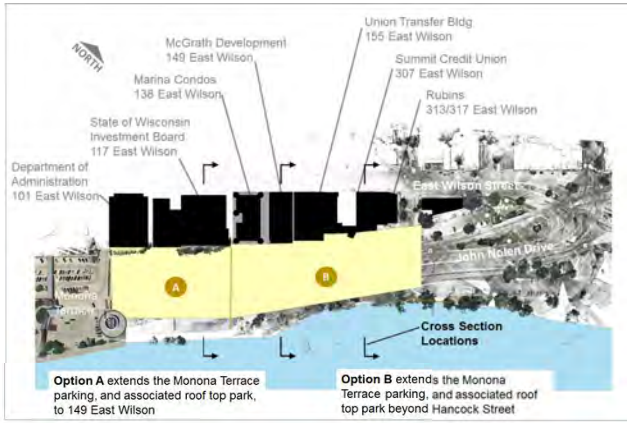
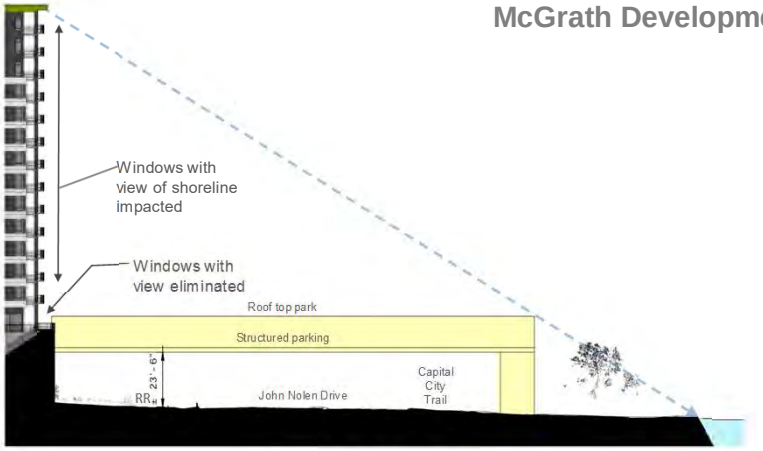
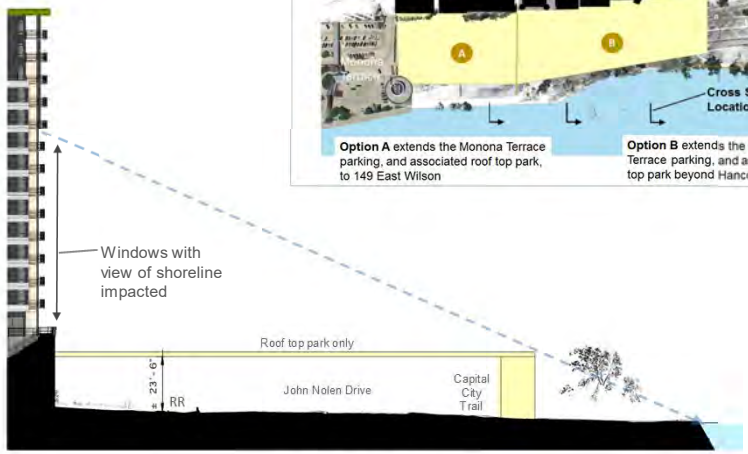


McGrath Development

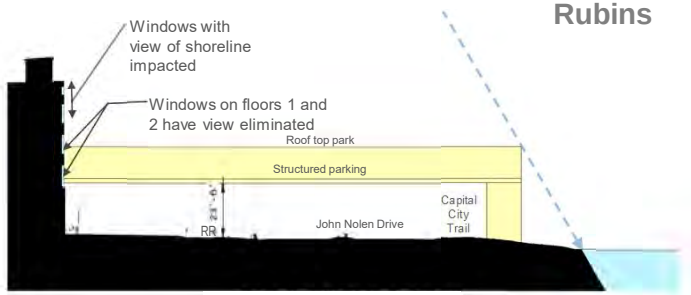


149 East Wilson
With Structured Parking



149 East Wilson
No Structured Parking

Rubins



313 East Wilson
With Structured Parking

313 East Wilson
No Structured Parking

Further Study by Others

Discussion of Concepts East of Monona Terrace

View Shed Analysis with Point Cloud

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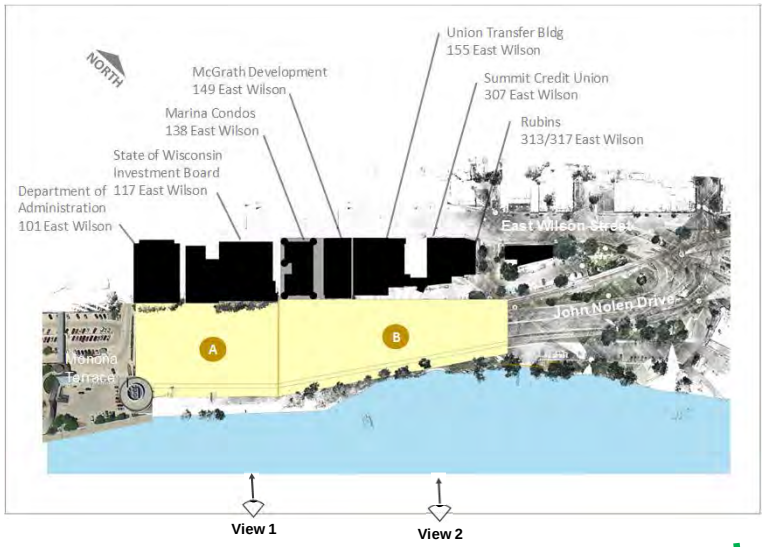
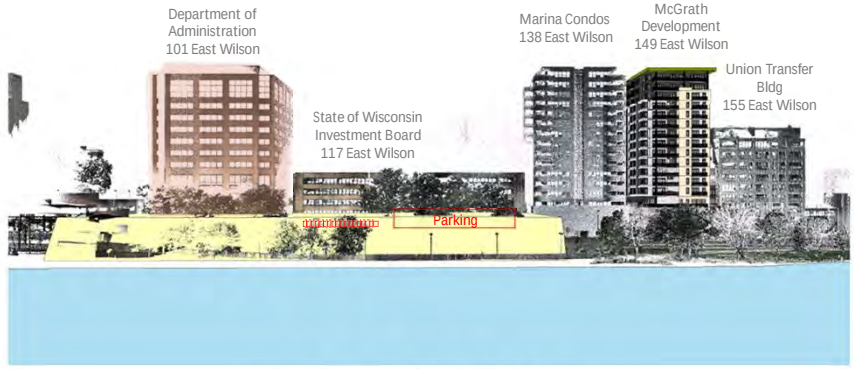


View 1 With and Without Structure Extension Over John Nolen Drive

VIEW 01 EXISTING

Further Study by Others

VIEW 1 – A - STRUCTURED PARKING AND ROOF TOP PARK



VIEW 1 – A - ROOF TOP PARK ONLY

Discussion of Concepts East of Monona Terrace

View Shed Analysis with Point Cloud

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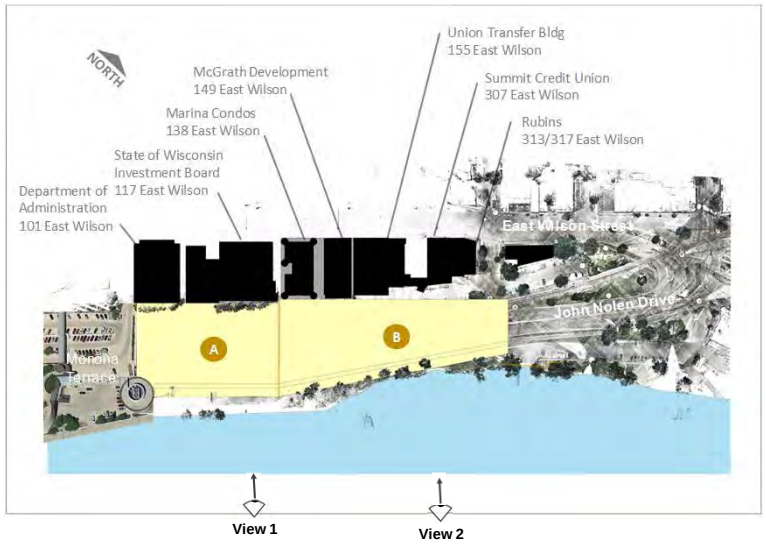
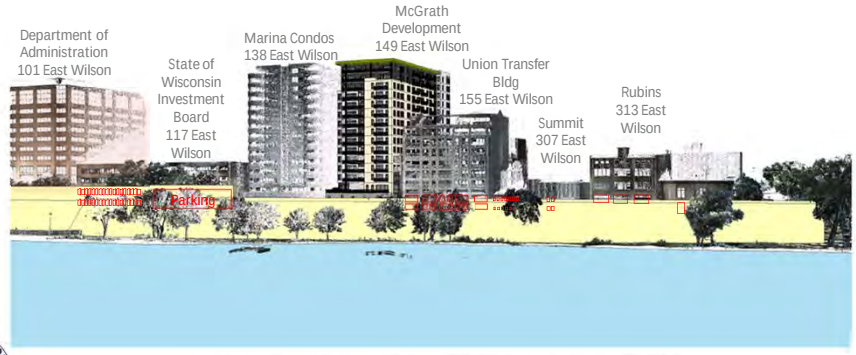


View 2 With and Without Structure Extension Over John Nolen Drive

VIEW 02 EXISTING

Further Study by Others



VIEW 2 - A - STRUCTURED PARKING AND ROOF TOP PARK
B - ROOF TOP PARK ONLY

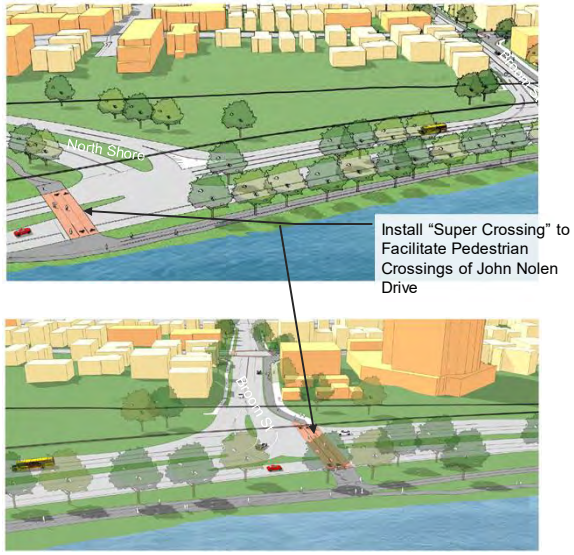
VIEW 2 – A & B -STRUCTURED PARKING AND ROOF TOP PARK

Study Purpose

1. Develop a near-term solution for the Blair/John Nolen/Williamson Street intersection area that:
   - Can be reasonably funded with federal transportation monies within the next 5 to 10 years.
   - Improves operations and safety for
     - Pedestrians
     - Cyclists
     - Motorists
   - Addresses the poor pavement conditions
2. Evaluate short and long-term options that improve pedestrian and bicycle access to the lakeshore from North Shore Drive to Blair Street
3. Evaluate the viewshed effects of proposals that include a structure over John Nolen Drive

Overview of Ideas

South Capitol Transit Oriented Development Study



The intersections of North Shore Drive and Broom Street with John Nolen Drive are recommended to have "super crossings" that provide dedicated directional bicycle lanes and a shared pedestrian lane. The study also recommends that bicycle and pedestrian queuing areas be expanded on both sides of John Nolen Drive.

The South Capitol District Planning Committee recommended a plaza bridge concept, east of the Monona Terrace be evaluated and refined to provide access to Law Park. The bridge concept should be coordinated with redevelopment concepts currently being planned on Wilson Street

Kenton Peters

Kenton Peters proposal would cover John Nolen Drive east of the Monona Terrace with both a parking structure and a park on top. The proposal includes one of Frank Lloyd Wright's original proposals for a boat house.

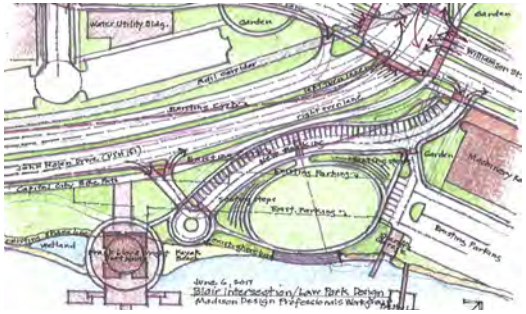
Ken Saiki Law Park Concept

Ron Shutvet Bike/Ped Underpass Concept

Ron Shutvet proposed building a bike/ped underpass under John Nolen Drive to connect the Capital City Trail with the Southwest Path. He also included connections to Hamilton Street

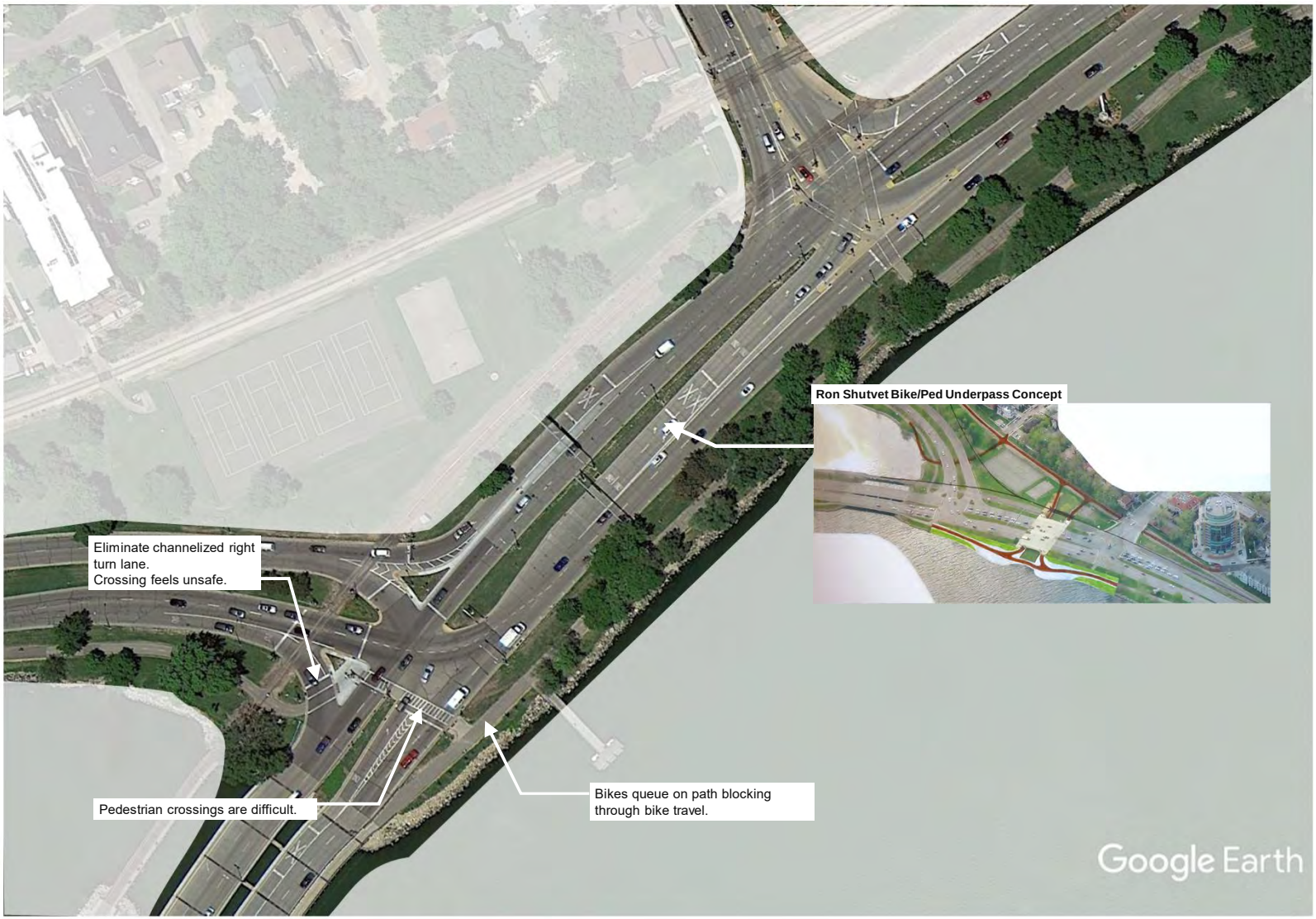
Madison Design Professionals Workgroup

The Law Park plan proposed by the Madison Design Professionals Workgroup would build a park — 1,500 feet long and 200 feet wide over John Nolen Drive — and about 500 stalls of underground parking. It would feature a marina and hilly berms landscaped for casual outdoor gatherings. The shoreline would lose its riprap boulders for wetland plantings and boardwalk.

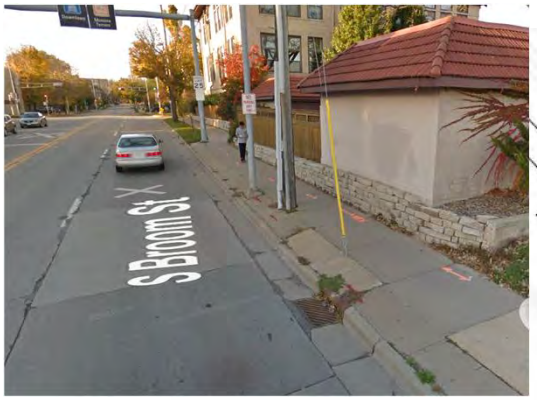


The graphic above shows a more recent rendition from the Madison Design Professionals of Law Park and the boathouse. This concept does not initially include extending the Monona Terrace eastward over John Nolen Drive.

North Shore Drive/North Broom Street Expressed Needs



Broom Street



Long term solution
- Reconstruct Broom Street with 10-foot lanes
- Install a 10-foot multiuse path on east side.

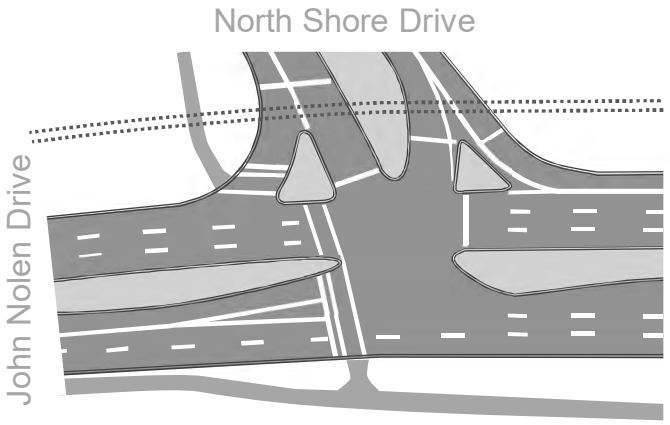
Long term solution
Path connecting Broom Street to Hamilton Street

Short term solution
- Restripe Broom to 10', 10', 12.5', 10', 12.5'
- Place sharrow on 12.5' lanes (SB middle lane, NB outside lane)

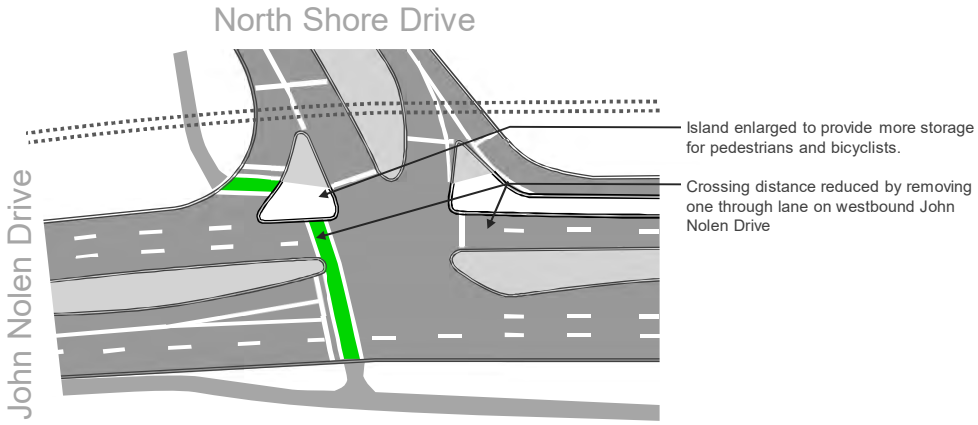
Short term solution
- Ladder cross walk markings

Short term solution
- Colored pavement directing cyclists to island
- Bike box for EB to NB cyclist

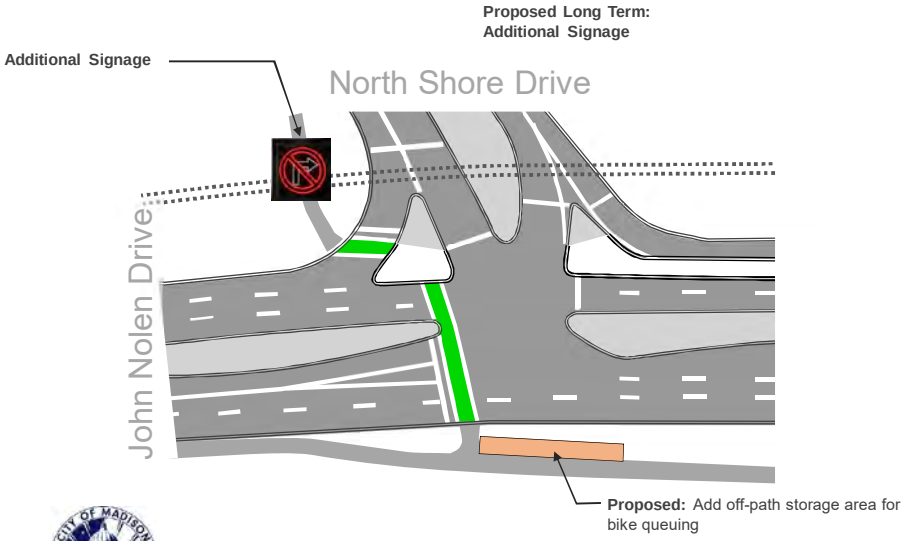
North Shore Drive



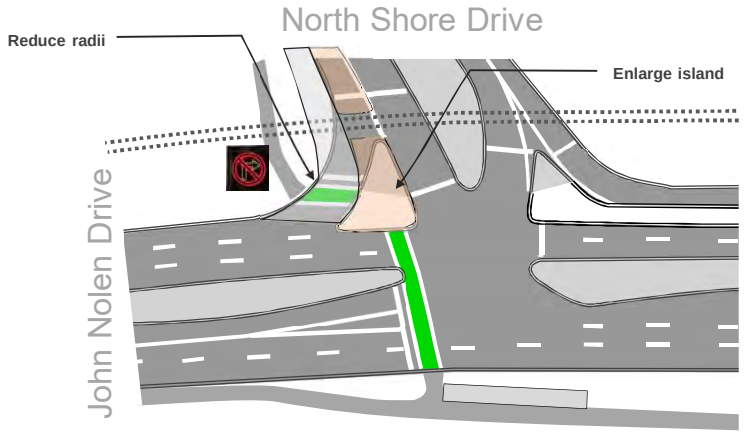
As constructed in 1995



2013 Improvements



Short Term Solution



Longer Term Option

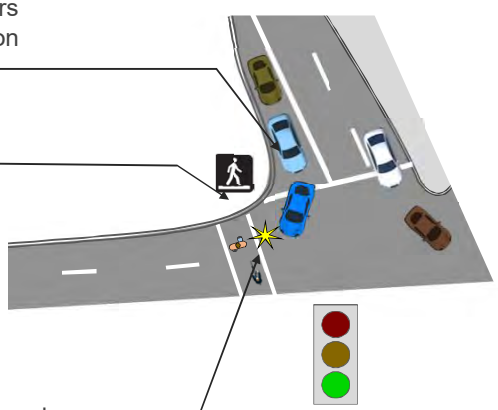
Right Turn Channelization

Role of the channelized right turn lane

Channelized right turn lanes with pork chop islands are often criticized for increasing the intersection footprint and increasing pedestrian crossing distances. However, for approaches with high volumes of right turning vehicles they can reduce pedestrian/turning vehicle conflicts. Channelizing the right turn lane allows it to be controlled independently of the through movements and the pedestrian walk signals. While making it a two-stage crossing for pedestrians and cyclists, it can substantially reduce conflicts.

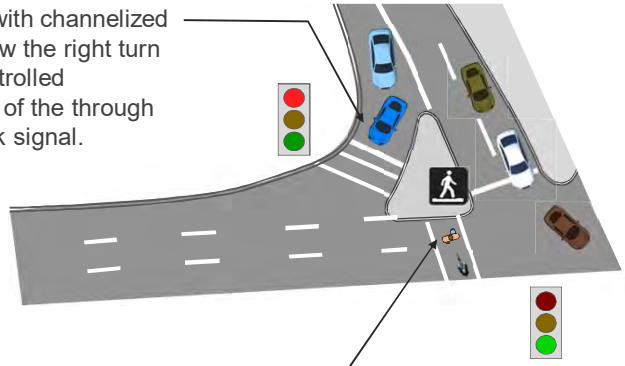
When right turn lanes are not channelized, the right turners travel on the green indication with all other traffic.

The pedestrian walk signal is activated with the through traffic green. For approaches without a channelized right turn, right turning vehicles also have a green light.



This concurrent walk signal and right turn green light can increase conflicts, particularly for intersections with high numbers of pedestrians, bicycles, and right turning vehicles.

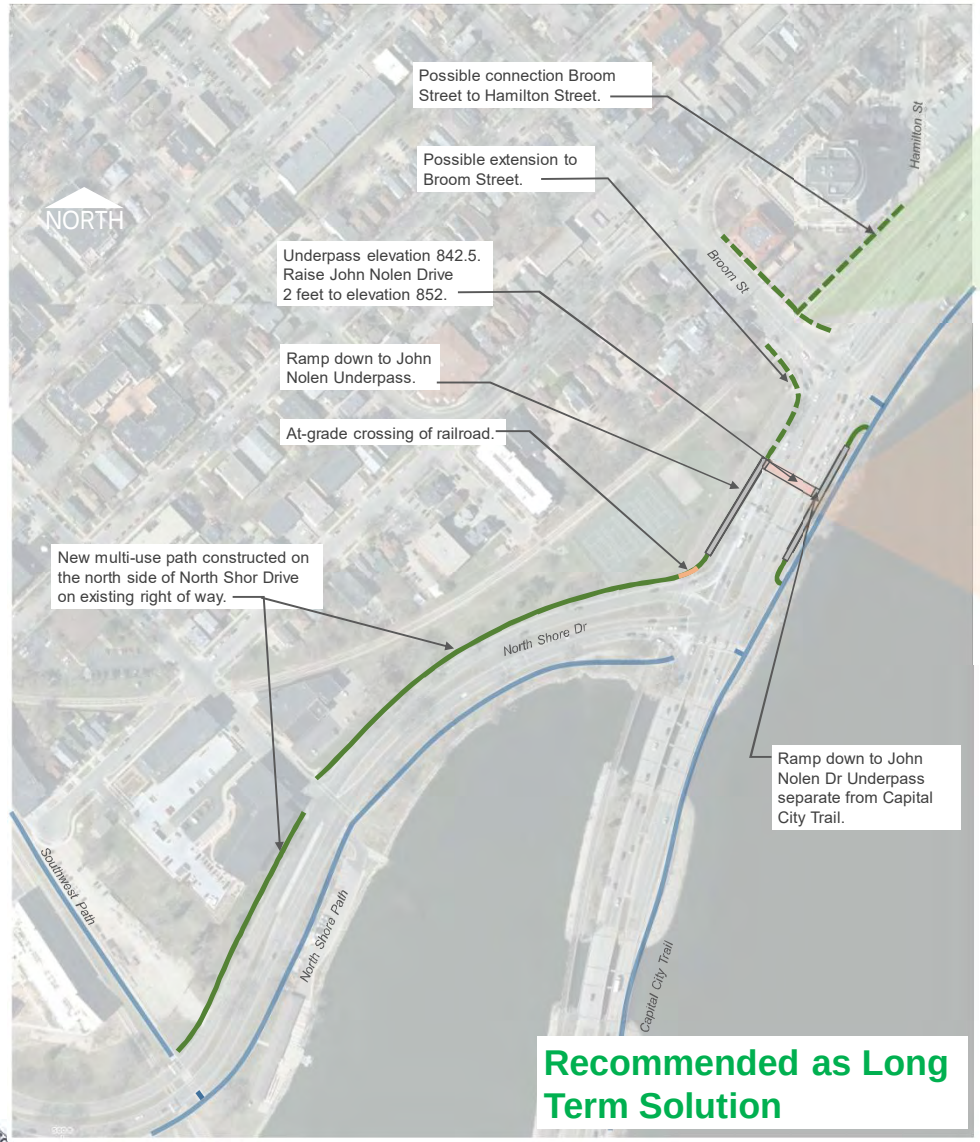
Intersections with channelized right turns allow the right turn lane to be controlled independently of the through lanes and walk signal.

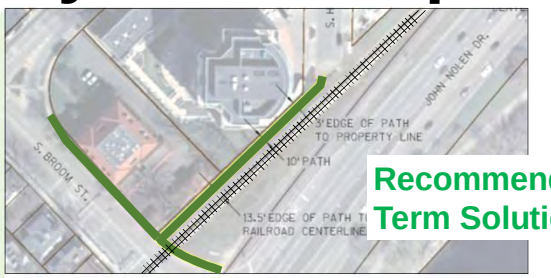


Pedestrians are able to cross on the through green signal without conflict from right turning vehicles.

Studies show providing a dedicated right-turn lane can reduce all crashes by 15 to 25 percent.
Making improvements to an existing channelized right-turn lane can reduce right-turn crashes by 60 percent.

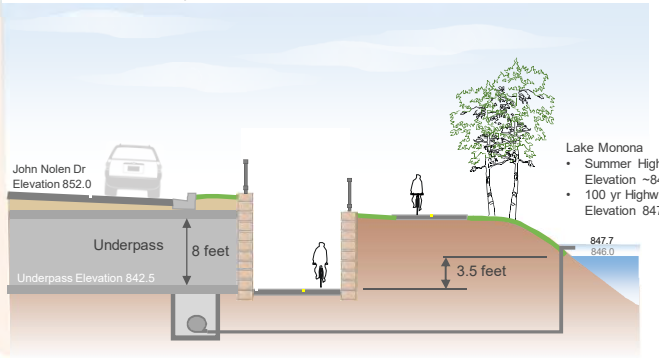
North Shore and Broom Street - Bicycle Underpass





Recommended as Long Term Solution

It is possible to construct a path between Broom Street and Hamilton Street. This option could be stand alone or part of the system associated with an underpass of John Nolen Drive.



The underpass option places a pedestrian-bicycle tunnel underneath John Nolen Drive. This underpass would involve:

- Raising John Nolen Drive about 2 feet between North Shore Drive and Broom Street.
- Having the Capital City Trail run parallel to the ramp to the underpass.
- Constructing the underpass with a floor elevation of about 842.5.
- Because the underpass is beneath the normal lake level, the underpass would need to be watertight and would require a stormwater pump station.

Example of an underpass at the Verona Road interchange

2017-08-09 Blair Street Public Involvement Meeting #3
Comments and Questions Received

Sign-In Sheets: 45 signed in.

Presentation Summary

After introductions, Jeff Held opened the presentation that gave a background of the study including reasons for the study and expressed desires. Jeff summarized the final recommendations for the North Shore Drive, Broom Street, Blair Street and Main Street intersections. Tom Lynch provided more detail on the refinements made to the Blair Street intersection design based on comments received at the last PIM. He also discussed bike and pedestrian movements through the intersection with the proposed design. Jeff Held then finished the presentation by outlining the next steps in the process, including the Highway Safety Improvement Program application and when improvements might occur. A copy of the presentation is attached to this summary.

Group Questions and Discussion

- Alder Rummel noted that she is pleased with the study results. Many of the ideas suggested by neighbors have been incorporated, and some new ideas as well.
- Alder Verveer reminded the audience that the study seeks to identify improvements that can be implemented with the pavement replacement and improve access and safety. It is not the end of the discussion for the more visionary concepts for Law Park and the John Nolen Drive corridor.
- If the City Parks Department will be working on a longer-term planning process for Law Park, how do we ensure any improvements made in the near-term are compatible with the park improvements?
    - *That's part of the reason for this study. City Parks wanted engineering to determine what the intersection should look like before starting their Law Park planning efforts. The key design factor for the southern quadrant is the relocation of the Machinery Row driveway. Most other characteristics are flexible and can adapt to a park design.*
- Is it possible to eliminate the push buttons to actuate the walk phases and use detection instead? Alternatively, design the locations so they don't conflict with bicyclists/path users? (Comment made twice).
    - *Optical detection is still relatively expensive and not perfectly reliable. It's likely push buttons would still be provided.* ***The design will seek to locate the buttons or add buttons in a way that reduces or eliminates conflicts between pedestrians and bicyclists****.*
- The bicycle/pedestrian space along Williamson Street between Blount Street and Jenifer Street needs improvement too.
- Can the John Nolen Drive right-turn on to Williamson Street be shortened to a turn bay instead of a full lane? This may reduce occurrences of traffic choosing to bypass the through movement queue and diverting to Williamson Street. This diverted traffic then takes a left on a side street to access East Washington Avenue instead of staying on Blair Street.
    - ***The team will review forecasted motor vehicle queue lengths to evaluate this idea****. It should be noted that the addition of left-turn bays will improve operations and reduce through movement queuing, which should reduce traffic diversion onto Williamson Street.*
- Why provide an "accommodation" on eastbound Williamson Street with the 13.5-ft lane? Instead give more space to the cycletrack and sidewalk <or> take some space from the median and provide a full 5 or 6-foot on-street bike lane. Maybe on street bicycles should take the full lane (Comment made twice).

    - *A wide outside lane is an established bike accommodation measure. Higher skilled cyclists may want to stay on the street, and many appreciate the slightly wider lane.*

- Is there any way the project could be advanced (sooner than 2020 or 2021)? The driveways for Machinery Row are dangerous. Could there be interim measures, such as stop signs on the path at the driveways?
    - *It's possible the City could make some improvements sooner to the portions outside the core of the intersection.* ***The team will discuss interim treatments for the Machinery Row driveways****.*
- Is the Capital City Trail on the eastern Wilson Street spur on-street? Is the on-street parking eliminated?
    - *Yes, the on-street parking is eliminated (about 3 stalls) and the bicycle cycle track is at street level.*
- Would a simultaneous pedestrian crossing phase work here (Barnes Dance)?
    - *No, not in the study team's judgment. That scheme requires too much of the signal cycle. Because there is limited time, pedestrians and motor vehicles need to be accommodated concurrently.*
- What is the width of the loading zone in front of Ruby Marie?
    - *There is sufficient space to provide a standard loading zone width.*
- Neighbors support eliminating the John Nolen Drive channelized right-turn on to Williamson Street.
- Are there alternatives to crossing the Capital City Trail through the reconfigured Law Park/Machinery Row paring area?
    - *Yes. The current proposal has cyclists crossing the parking lot where motor vehicles are traveling slowly and are not trying to enter Williamson Street - eliminating the number of decisions the motor vehicle driver has to make. The final configuration of the path and the parking and boat launch can be modified as the design is refined.*
- The Marquette Neighborhood Transportation Committee feels Williamson Street is too wide near Blair Street and feels like a "thoroughfare". They support reducing the size of the median and putting the cycletrack on-street with a curb/barrier separation.
- If the intersection will still be near capacity after these changes, why not build the tunnel?
- During construction, be sure to communicate to the neighbors and intersection users why they are suffering - that the intersection will be better when it is done.
- Take the Capital City trail along Lake Monona and then up and over on to an extended park/deck over John Nolen Drive.
- Squaring up the northbound John Nolen Drive channelized right on to Williamson Street is an improvement, but cars will still be able to take it too fast.
- Will the Blount Signal work with the Jenifer Street signal so close?
    - *Yes, the team is confident the two can be made to work together. It's likely westbound buses will need to stop at Blount Street after getting a green signal at Jenifer Street.*
- When will the Blount Street signal be installed?
    - *Most likely similar to construction of the main intersection: 2020 or 2021.*

- Could a raised pedestrian/bicycle crossings (table) be installed at the John Nolen Drive channelized northbound right-turn on to Williamson Street?

Individual Questions and Discussion

- Can the bike/pedestrian crossing of the John Nolen Drive channelized northbound right-turn on to Williamson Street be raised?
- Ron Shutvet asked if the study webpage could provide links to previous studies, and other ideas submitted by citizens (such as Kenton Peters' ideas, and Ron's bike/pedestrian concepts).

Written Comments

- John Nolen Drive channelized northbound right-turn on to Williamson Street is too fast/eliminate the channelized right-turn. (4 comments)
- Support for the improvements at John Nolen Drive/Blair Street/Wilson Street/Williamson Street intersection. (3 comments)
- Provide detection instead of pedestrian push buttons. (3 comments)
- Provide raised pedestrian/bicycle crossings of John Nolen Drive channelized northbound right-turn on to Williamson Street. (2 comments)
- Williamson Street needs to look like a "Main Street" not a continuation of US 151. (2 comments)
- Provide large, canopy developing trees.
- Provide enhanced, better than status-quo stormwater treatment.
- Do not reduce the size of the pork chop island created by the John Nolen Drive channelized northbound right-turn on to Williamson Street.
- Make sure loading zone in front of Ruby Marie is wide enough that trucks don't block the on-street bicycle lane.
- Support for the short-term improvements at Broom Street and North Shore Drive.
- Viewshed impacts of a park/deck over John Nolen Drive should also consider street-level views from Blair Street and Wilson Street.
- Consider angle parking for Law Park so Capital City Trail can cross diagonally.
- Provide a bike crossing of Williamson Street at the Jennifer Street signal to get westbound cyclists on to westbound Williamson Street.
- Can you remove the channelization for the Wilson Street eastbound right-turn on to John Nolen Drive?
- Build the tunnel.
- Support for moving the Machinery Row/Law Park driveways.
- Eliminate third lane on John Nolen Drive from Broom Street to Blair Street.
- Support for the Blount Street signal.
- Provide separate space for pedestrians and bicycles from Blair Street all the way to Jenifer Street.
- Do not favor deck/park over John Nolen Drive - severe viewshed impacts for some property owners.

Held, Jeff

From: Petykowski, Christopher <CPetykowski@cityofmadison.com>
Sent: Monday, August 7, 2017 12:06 PM
To: Held, Jeff; Lynch, Tom
Subject: FW: Blair St/John Nolan Corridor Study

Hi Jeff, Received this input today from the owner of Machinery Row. I met with him today. In general he seemed very supportive of our alternative.

Chris Petykowski, P.E.
Principal Engineer
City of Madison
210 Martin Luther King Jr. Blvd. Rm. 115
Madison, WI 53703
608-267-8678

From: Jeff Coatta [redacted]
Sent: Monday, August 7, 2017 11:51 AM
To: Petykowski, Christopher
Subject: Re: Blair St/John Nolan Corridor Study

Hi Chris,

One thing I thought of as I was leaving your office is semi-truck traffic. The restaurant and bike shop get regular deliveries via semi and they typically turn around and back in along the building drive aisle. Could there be some pavement left in the vacated area to accommodate this? Thanks,

Jeff

From: Petykowski, Christopher <CPetykowski@cityofmadison.com>
Sent: Friday, August 4, 2017 12:03 PM
To: 'Jeff Coatta'
Subject: RE: Blair St/John Nolan Corridor Study

Thanks Jeff, If you would like to stop in sometime, I can walk through the plan with you.

Chris Petykowski, P.E.

Principal Engineer

City of Madison

210 Martin Luther King Jr. Blvd. Rm. 115

Madison, WI 53703

608-267-8678

From: Jeff Coatta [redacted]
Sent: Friday, August 4, 2017 11:54 AM
To: Petykowski, Christopher
Subject: Blair St/John Nolan Corridor Study

Hi Chris,

I know Kelly Forman emailed you with some of her concerns regarding the access to the Machinery Row parking lot and she echoes the issues that all of my tenants face on a daily basis. I hear the stories and complaints on a regular basis and I worry about the tragedy that is inevitable given the current conditions. The concerns are from daily tenants who are educated on the intricacies of safely maneuvering in and out with the safety of drivers, bikers and pedestrians in mind. The many infrequent visitors going to the bike shop, restaurant, yoga class, cruise boat or Law Park sometimes make very dangerous moves simply do to sensory overload and they often get no help from the bikers and pedestrians.

I am happy to see that access to Law Park is a focused issue and I am assuming that includes (and is one in the same) for Machinery Row. I cannot attend the meeting on Wednesday but I look forward to seeing where this study is taking us.

Thank you for your work on this project!

Jeff Coatta
Machinery Row Owner
[redacted]

FANTASTIC IDEA! Thankyou!

Proposed intersection changes

The Madison Engineering Division and Strand Associates are proposing that a series of changes to the clogged and dangerous intersection of John Nolen Drive, South Blair, East Wilson and Williamson streets be brought to final design.

State Journal

I bike through this intersection daily for the last 28 years. I have seen so many personal injury accidents and ten times that many near misses.
This redesign is a huge improvement!
Thank you City Engineering!

Blair Street and John Nolen Drive Corridor Study Comments regarding the Public Information Meeting #3 Presentation; Display Materials; and the Recommended Alternatives

I feel strongly that the final report of the Blair Street and John Nolen Drive Corridor Study should include links to available documentation regarding the various concepts created by other individuals and groups that are referenced in the study documents. These independent concepts including details of the various aspects of each concept were provided by Kenyon Peters, Ken Saiki, Madison Design Professionals Workgroup, and myself during the South Capitol Transit Orientated Development Study and during the course of the Blair Street and John Nolen Drive Corridor Study itself. The detailed specifics of these concepts need to be made available to the general public. Only providing an individual image portraying each concept without the concept details is not acceptable.

This will allow the public to review each concept with access to the same concept details that the study consultant has had the opportunity to review during the course of this study and in the making of the final study report and final recommendations.

Details of each of these concepts should be made available to the public in digital format with links provided on the City of Madison Engineering website. These concept details should also be included in the appendix of the final study report.

Details of my Broom/North Shore/ John Nolen Drive underpass concept are already available online, included in a much larger digital document of public comments received so far for the Dane County Alliant Energy Center Master Planning process. This document can be accessed by clicking on the following link: https://aecstudy.countyofdane.com/documents/Public%20Comments_8.11.17.pdf

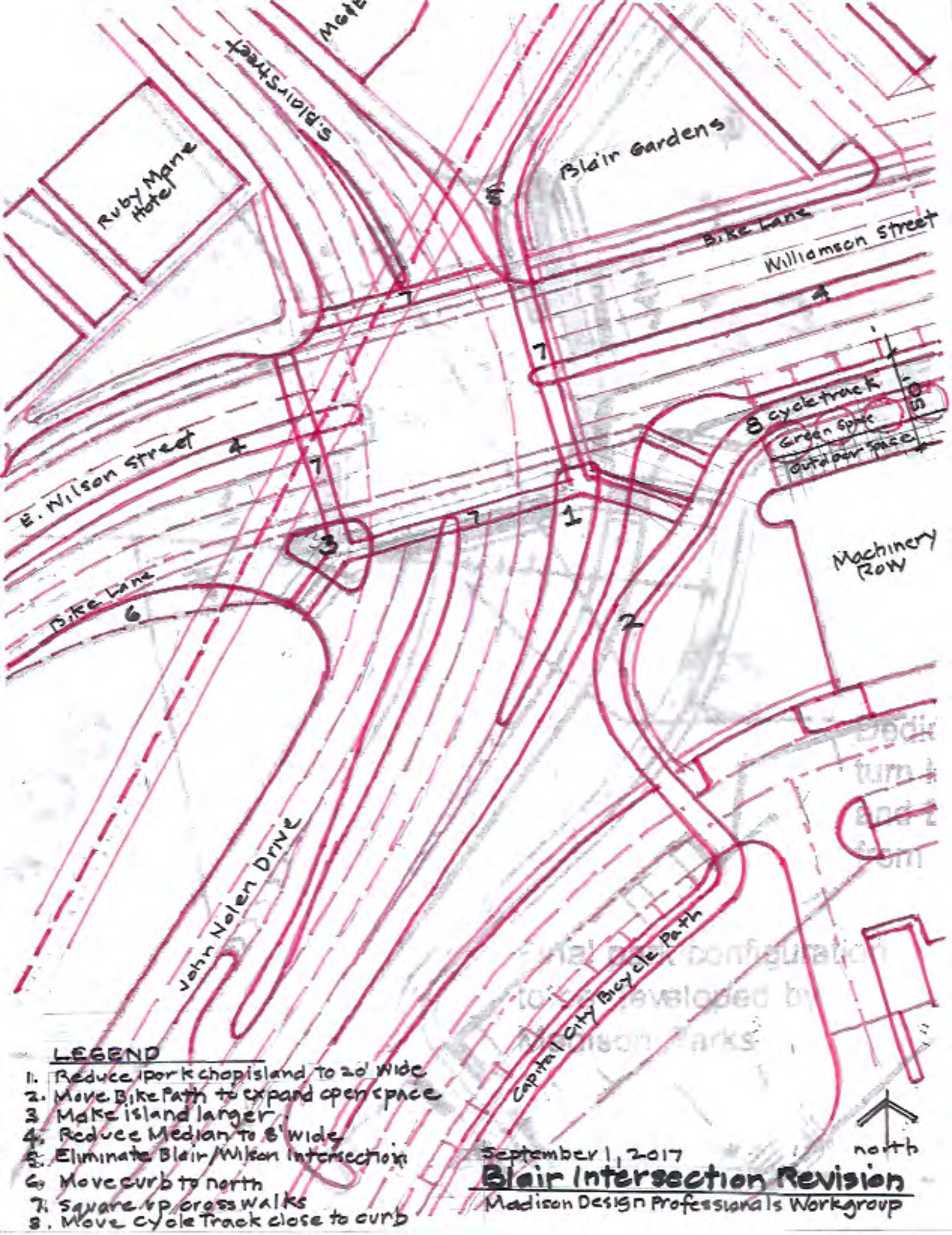
Also, here is the link to a page from the AEC Master Plan study website containing links to all documents, presentations and public input so far for that ongoing study: https://aecstudy.countyofdane.com/Documents-and-Presentations

I feel the City of Madison Engineering website needs to provide the same level of detail in its display of all comments received from the general public and for display of all the individual concept plans received and reviewed for the Blair Street and John Nolen Drive Corridor Study.

I also feel strongly that the recommended long term alternative suggested by Strand Associates for improving ped/bike issues in the vicinity of Broom/North Shore/John Nolen Drive does not go far enough to truly resolve the ped/bike issues in this area. I believe the more expansive underpass system that I originally proposed would be far more capable in providing safe and esthetically pleasing grade separated connections to users of the various ped/bike trails converging in this area of John Nolen Drive.

This area of John Nolen Drive will need to be reconstructed at some point in the near future to better handle the increasing congestion of this multimodal transportation corridor. It would be disheartening to see your more simplistic, less costly, and less esthetically pleasing underpass concept incorporated into the final roadway design when a more capable and far more esthetically pleasing, abet more expensive, underpass concept is possible.

Ron Shutvet



LEGEND

1. Reduce 'pork chop' island to 20' Wide
2. Move Bike Path to expand open space
3. Make island larger
4. Reduce Median to 8' wide
5. Eliminate Blair/Wilson Intersection
6. Move curb to north
7. Square up cross walks
8. Move Cycle Track close to curb

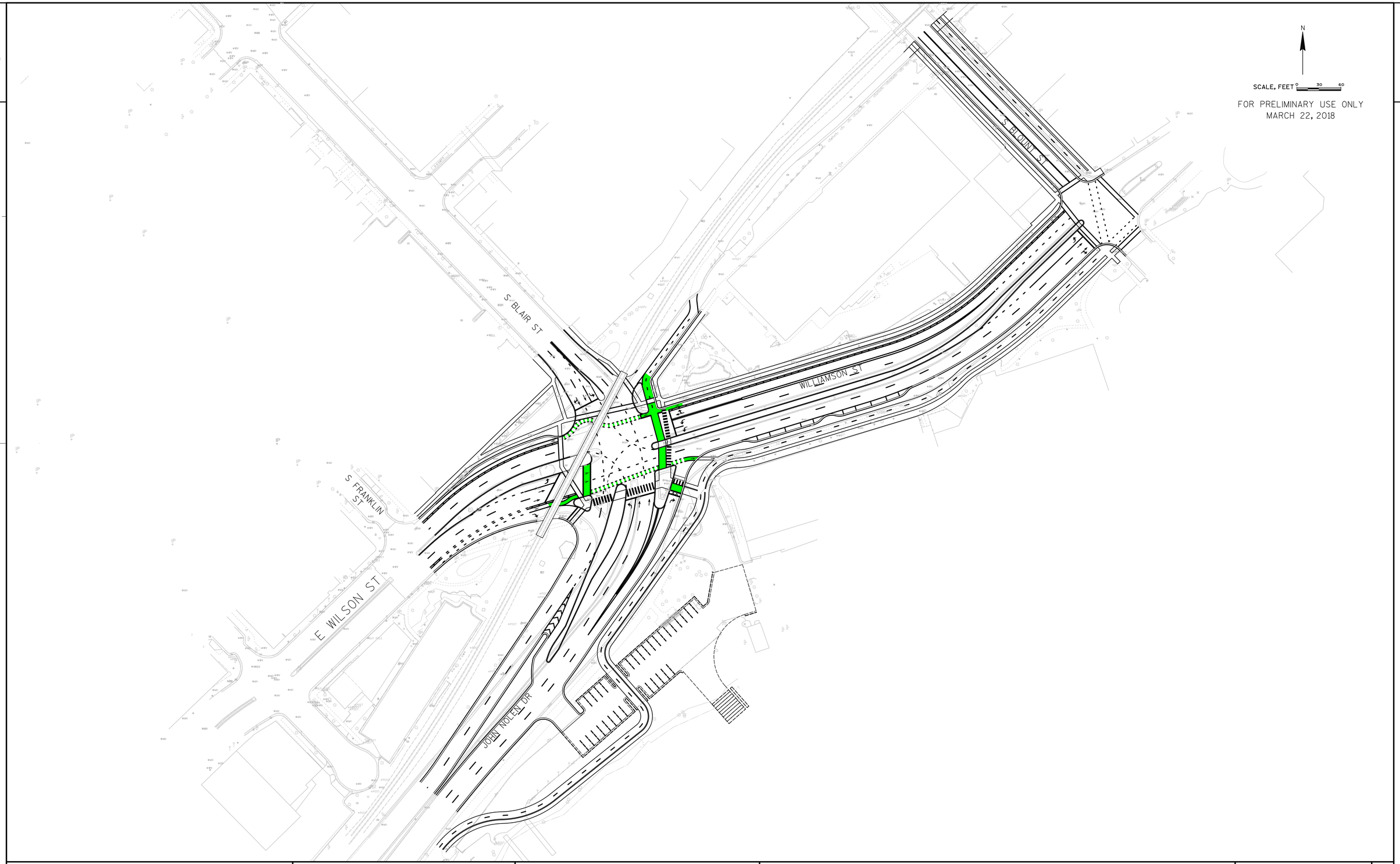
September 1, 2017

Blair Intersection Revision

Madison Design Professionals Workgroup

APPENDIX F
RECOMMENDED JOHN NOLEN DRIVE/BLAIR STREET AND WILSON STREET/WILLIAMSON STREET INTERSECTION CONFIGURATION

2



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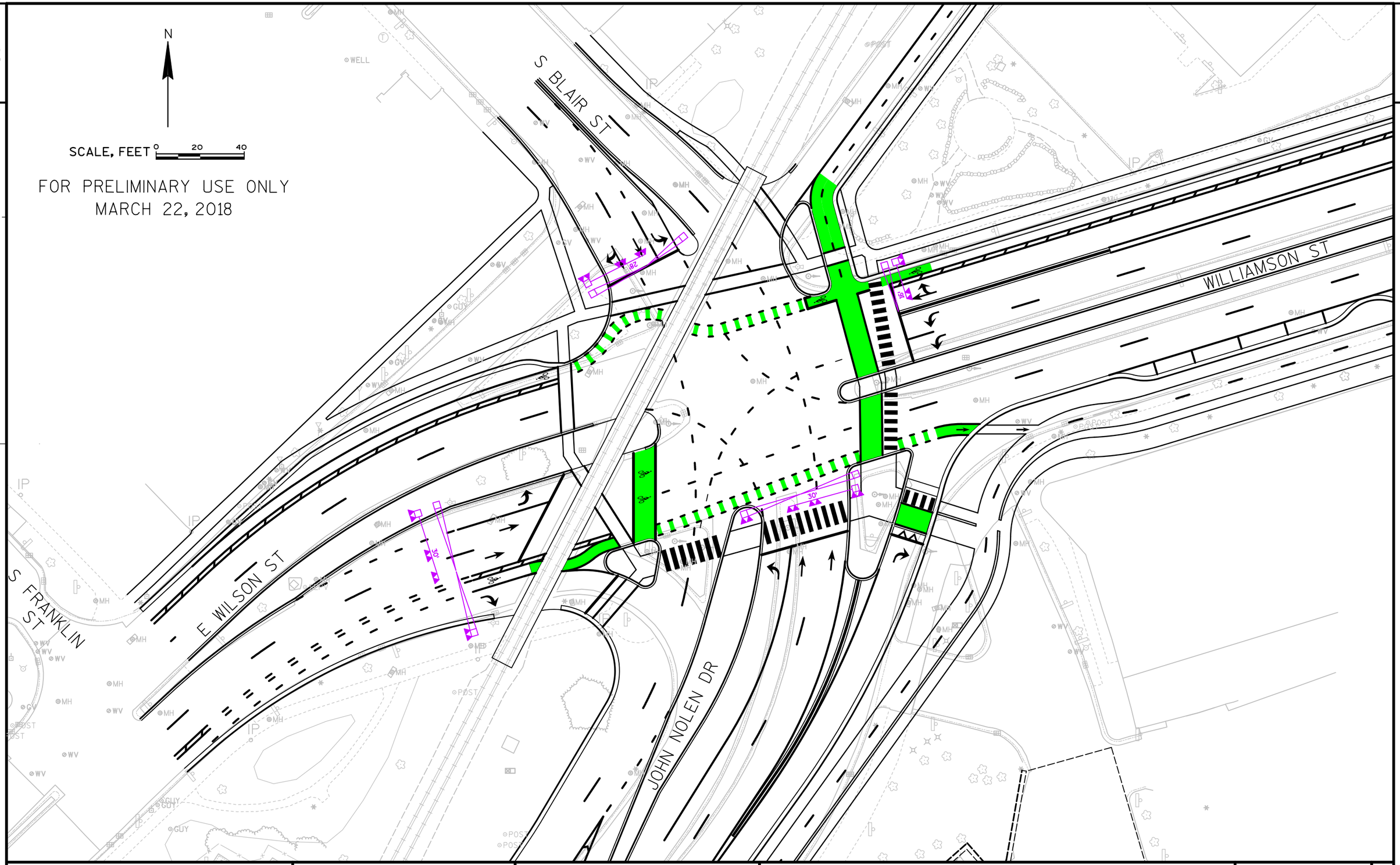
FOR PRELIMINARY USE ONLY
MARCH 22, 2018



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APPENDIX G
RAILROAD QUIET ZONE REPORT

Final Report

Review of the preliminary design of the Blair, John Nolen, Wilson & Williamson intersection/crossing.

For the City of Madison.

Mark Morrison, P.E.

January 30, 2018

FINAL REPORT:

This report covers the review of the design of the intersection/crossing after Strand Associates revised the plan sheets to address some of the issues contained in the interim report and information received after contacting the Federal Railroad Administration on the proposed design. Further review may be required during the final design phase of the project.

GENERAL:

The design of the Blair, John Nolen, Wilson and Williamson intersection has been reviewed with respect to grade crossing safety, railroad operations and Quiet Zone implications. Of utmost importance to the design in this regard is the impact to the active warning devices that will most likely be Ordered by the Wisconsin Office of the Commissioner of Railroads (OCR). As a first step the intersection/crossing was reviewed to determine what warning devices will most likely be Ordered. It needs to be understood that the OCR has jurisdiction over warning devices and their Orders carry the weight of law. Based on my twenty plus years of experience with railroad crossings it is my judgement that lights and gates with several cantilevers and preemption will be ordered.

The City has expressed the desire to include this intersection/crossing in a Quiet Zone. Since the Train Horn Rule for Quiet Zones requires lights and gates as the minimum warning devices for a public highway crossing in a Quiet Zone, the City should support their installation. In general, some sort of additional safety measures, generally referred to as Supplemental Safety Measures (SSM) or Alternative Safety Measurers (ASM), are necessary to qualify for a Quiet Zone in areas with heavy train and/or heavy highway traffic. This intersection is subject to very high volumes of highway traffic which generally mean that some sort of safety measures are needed to be included in a Quiet Zone.

Cost and practical implications of the active warning devices was also considered when reviewing the intersection/crossing. Of particular note is that cantilevers in excess of 30 or 32 feet, depending on the manufacturer, are significantly more expensive than ones only two feet shorter due to the base and uprights needed for the longer cantilever arm. It is also important to note that railroads will object to gate arms longer than 30 feet. This is mainly due to health concerns for employees who physically have to handle the gates and also wind implications for the gates once installed. Due to this my recommendation is keep cantilevers and gate arm lengths no longer than 30 feet. It should be noted that with how the gate mechanism is constructed the distance from the center of the mast to the gate arm is approximately 2 feet. Therefore a 30 ft. gate arm can cover almost 32 feet.

WisDOT standard is to provide at least 3 feet on the backside of a gate mechanism from the center of mast to edge of sidewalk to prevent the gate's counterweight from extending over the sidewalk and interfering with sidewalk users. MUTCD standards require a minimum setback of 4' – 3" from center of mast to face of curb. In addition, this means islands or medians with active warning devices need to be a minimum width of 8' – 6" as measured from face of curb to face of curb. These standards were used in the review.

WisDOT FDM standards for the needed for cantilevers were used in this report. Similar to MUTCD standards for traffic signal head per lane, the WisDOT guidance on cantilevers is based on the ability to easily see a pair of flashing light signals from any lane even if there are vehicles, such as trucks, in adjacent lanes.

FINDINGS AND RECOMMENDATIONS:

Existing gate location for north bound traffic;

There is an existing flashing light signal with a gate located in the northeast quadrant of the intersection. Due to the proposed reconfiguration of the intersection, this location will not be able to be used for a gate location. A gate would need to be 40 feet long with the new configuration and as stated above, this exceeds the 30 ft. maximum length required by the railroad. In addition, a gate at this location would mean the non-traversable medians on John Nolen Drive and Williamson Street would not be utilized as a SSM or ASM negatively impacting the Quiet Zone. The same applies to the gate located in the East Wilson Street median immediately west of the intersection. It also appears that with the widening of the intersection the island nose is being moved to the west and there won't be room to place a warning device at that location.

South Blair Street Approach;

During the review process is was determined the design could be altered to include raised median of at least 100 feet with room for a mast mounted signal and gate (8'-6" face to face at the device) to cover the left turn lane. A right side of the road 28' cantilever with gate is being recommended at this location (except as noted below) to go along with the median device. The gate arms can come down tip to tip and be less than 30 ft. each. Due to some curvature in the street and sight obstructions adjacent to the roadway it is recommended to have two sets of flashing light signal pairs on the cantilever arm.

Williamson Street Approach;

During the review process is was determined the design could be altered to include a raised median of at least 100 feet between the shared through/right turn lane and dual left turn lanes. A mast mounted side of road flashing light signal with gate is being recommended at this location. Due to the gate location it is recommended to continue to evaluate bicycle operations

and the location of any bike box for the through and right turn movements. Due to the traffic split (70% left turns and 30% through and right turns) it is proposed to continue to allow left turning traffic to operate during train movements, so the dual left turn lanes will not be covered by a gate arm or flashing light signals. After conferring with the Federal Railroad Administration this negates the ability to create a SSM at this crossing but will qualify for an ASM. The recommended proposed ASM effectiveness rating is included later in this report.

John Nolen Drive Approach;

A side of road cantilever (except as noted below) with gate mounted in the splitter island and a mast mounted flashing-light signal with gate in the median on the south side of the intersection is recommended. Two approximately 27 ft. gate arms can span the length between the two devices and come tip to tip. Due to the curvature of the John Nolen Drive roadway, I'm recommending flashing light pairs over both through lanes. The left turn lane is covered by the median mounted flashing light signals and drivers will also be able to see the lights on the cantilever.

East Wilson Street Approach;

A median mounted 30 ft. cantilever with gate (except as noted below) and a side of road mast mounted flashing-light signal with gate is recommended. Two approximately 27 ft. gate arms can span the length between the two devices and come tip to tip. The new warning devices will be in approximately the same location as the existing warning devices. As discussed in the preemption section below, the crosswalk across the right turn lane will need to be signalized so that a "do not walk" indication can be displayed during preemption track clearance.

Traffic Signal Preemption/Interconnection;

Section 8C.09 of the MUTCD states "if a highway-rail grade crossing is equipped with a flashing-light signal system and is located within 200 feet of an intersection… controlled by a traffic control signal, the traffic control signal should be provided with preemption." It is recommended that the traffic signals be interconnected with the railroad crossing signals and provide preemption during train movements.

Section 4D.27 of the MUTCD states "traffic control signals with railroad preemption or coordinated with flashing-light signal systems should be provided with a back-up power supply." It is recommended that a battery back-up system be included as part of the traffic control signal system.

The preemption of traffic signals will need to consist of a track clearance interval for the east bound approach of East Wilson Street since the railroad crosses this approach leg of the intersection. Due to the significant amount of bicycles and the existence of bike boxes, this needs to be taken into consideration when determining the appropriate amount of preemption clearance time. To prevent crosswalk users from interfering with the track clearance for right

turning traffic from East Wilson Street to John Nolen Drive, pedestrian indications will need to be provided for the move across the turn bay. It is further recommended that these pedestrian indications operate full time and not just during preemption. Since the railroad crosses through the intersection and not the approaches for the remainder of the crossing, track clearance intervals are not necessary for the other approaches.

Due to the configuration of the intersection/crossing, the only non-conflicting traffic movements are for north bound John Nolen Drive traffic turning right on to Williamson Street and west bound Williamson Street traffic turning left on to John Nolen Drive. The crosswalk movement across John Nolen Drive and Williamson Street also do not conflict with the train movement. These movements can be allowed during the preemption dwell time alternating with the conflicting crosswalk movements if desired.

It should also be noted that in determining the amount of advance preemption time necessary that a Minimum Track Clearance Distance of around 250 feet will need to be used in the calculations. This distance is due to a left turning vehicle from east bound Wilson Street to north bound Blair Street will have to clear the track twice, once on Wilson Street and once on Blair Street. This long clearance distance will add significant time to the advance preemption time. Also, as mentioned above, the impacts of bicycle movements on clearance times will need to be considered.

DO NOT STOP ON TRACKS signs should be installed on the South Blair Street approach. Consideration should also be given to placing dynamic envelope markings per Section 8B.29 of the WisMUTCD on this approach.

Quiet Zone Impacts;

It is recommended that a Quiet Zone diagnostic be conducted prior to finalizing the design.

The now proposed design of the intersection includes non-traversable medians on all four approaches which should be utilized as an ASM for the crossing. Three of the four approaches have at least 100 feet of non-traversable medians for all traffic. In addition, the fourth approach, Williamson Street, has a median of at least 100 feet for the through and right turning traffic which covers 30% of the traffic on this approach. I would propose an effectiveness rating of .75 X .80 + (.25) .30 X .80 = 0.66 when using the Quiet Zone calculator. For informational purposes if the Williamson Street approach were gated and left turns not allowed during train movements, then the crossing would qualify for a SSM and the 0.80 effectiveness rating.

Crossing Surface;

The existing crossing surface consists of flange and guard timbers with asphalt. The crossing is solid and generally in good shape, but a number of the timbers are worn and in need of replacement. Due to the complexity of this crossing it would be preferable to renew the crossing during the reconstruction of the intersection. It is my understanding that the WSOR

intends to replace the crossing at the time of construction of the intersection. Scaled from the plan sheet the existing crossing needs to 216 feet to cover the existing configuration. For the currently proposed configuration it will need to be 223 feet, an increase of approximately 3 percent. The City should expect to reimburse the WSOR for 3% of the cost to replace the entire crossing but can use the fact the project will be paving the asphalt within the railroad's limit of responsibility and use that to offset the 3%. It should be noted that if the intersection is to be paved in concrete that sufficient distance should be provided from the edge of the crossing surface to the concrete so that asphalt can be properly placed and compacted to ensure a full life of that pavement. I would recommend somewhere in the range of 10 feet should be provided, including for sidewalks.

Warning Device Costs;

As currently recommended the costs of the warning devices would most likely be around $500,000. I believe that an argument can easily be made to eliminate all but the cantilever on the East Wilson Street approach. It should be noted that the flashing-light signals are what normally directs highway users of the need to stop for a railroad crossing. Due to the interconnection and preemption at this location the highway users will already be stopped by the traffic signals upon the approach of a train except for the East Wilson Street approach due to its track clearance phase. This should reduce the warning devices cost to around $400,000 and still provide for safe operations. The cantilevers should still be shown on design drawings to ensure that it can be constructed if the OCR Orders the cantilevers. Early discussions with WSOR and their signal contractor, CDL Electric, are recommended.

Flagging Costs;

Due to the significant amount of construction that will occur in close proximity to the WSOR track, extensive amounts of flagging will be required. Due to the roughly $1000 per cost for railroad flagging, the construction phasing and contract should take this into consideration. Early coordination with the WSOR during the design phase should occur.