

Road Safety Audit REPORT

WIS 441 Tri-County Project

Project Title: WIS 441 Tri-County Project

Date: Apr 25-26, 2012

RSA Team and Participants:

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Project Characteristics:

Audit Type: Preliminary Stage

Include Pedestrian: Yes

Land Use Development Proposal: No

Units of Measure: US

Adjacent Land Use: Urban

Design Speed (US): 70 mph

Opposite Flow Separation: Divided

Service Function (Urban): Freeway

Terrain: Flat

Climatic Conditions - Temperature: Cold Winter (freezing, icing possible)

Climatic Conditions - Snow: Snow in Winter

Background:

Realignment of WIS 441 and reconstruction of five interchanges.

Road Safety Audit REPORT

RSA Process:

RSA FINDINGS

Location: WIS 441 Mainline from Racine Rd to Appleton Rd

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 1: Barrier wall in clear zone

Description of Safety Issue:

There are concrete barrier walls shielding the abutments on both sides of WIS 441 under the County P Bridge that are close to the outside travel lanes and within the clear zone. The concrete barrier walls are used for protection for the abutments, but can become a hazard themselves.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Shorten the length of the bridge abutments on both sides to locate them further away from the travel lanes, preferably outside the clear zone.

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Issue 2: Crossover protection

Description of Safety Issue:

There are several segments with no crossover protection in the median on WIS 441. Vehicles that run off the road into the median do not have guardrail or other crossover protection to prevent them from traveling into the opposite lanes.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Add guardrail, barrier wall, cable barrier, or other crossover protection in the median on WIS 441.

Road Safety Audit REPORT

Issue 3: Overhead sign posts in clear zone

Description of Safety Issue:

There are large overhead destination guide signs in the median with the sign posts located within the clear zone on WIS 441. These are currently shielded by sand barrels or guardrail.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

The proposed new design includes double barrier wall in the median. Locate the overhead destination guide sign posts within the new proposed barrier wall.

Road Safety Audit REPORT

Issue 4: Guardrail end treatment

Description of Safety Issue:

There are large overhead “butterfly” destination guide signs in the median with the sign posts located within the clear zone on WIS 441. These are currently shielded by guardrail. The guardrail wraps around the sign posts without the proper end treatment. Guardrail is not designed to absorb an impact from a vehicle head-on.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Revise the guardrail around the overhead sign posts to add the appropriate end treatment on both approaches for the guardrail.

Road Safety Audit REPORT

Issue 5: Mitered end section in clear zone

Description of Safety Issue:

There is a mitered end section in the clear zone on the southeast side of the roadway near the bridge between the Racine Road and Midway Road interchanges.



Safety Risk:

Exposure: High

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Relocate mitered end sections outside the clear zone. If this is not possible, shield the hazard with guardrail or other protection.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

3 Marking and delineation

Issue 6: RPM's

Description of Safety Issue:

There are no reflective pavement markers in several areas on WIS 441. Reflective pavement markers help to delineate the roadway for motorists at night and in inclement weather.

Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install reflective pavement markers on the mainline and ramps for WIS 441.

Road Safety Audit REPORT

Location: WIS 441 Mainline from Appleton Rd to Oneida St

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 7: Depressed median

Description of Safety Issue:

The median is depressed in several sections along WIS 441 which could be a potential hazard. A depressed median may cause a vehicle that enters the median area to overturn.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Remove depression in median area to eliminate the potential hazard. The proposed reconstruction with double barrier wall in the median removes this as an issue.

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Issue 8: Steep front slope

Description of Safety Issue:

The front slope on the right side of WIS 441 eastbound, east of the Appleton Road interchange, is 40% that slopes down into a ditch. This slope is not considered to be recoverable.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Reconstruct the shoulder area of WIS 441 to provide more moderate slopes that are considered to be recoverable terrain. If this is not possible, these slopes and ditches should be shielded.

Road Safety Audit REPORT

Issue 9: "Butterfly" sign within clear zone

Description of Safety Issue:

There are large overhead "butterfly" destination guide signs in the median with the sign posts located within the clear zone on WIS 441. These are currently shielded by sand barrels or guardrail.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

The proposed new design includes double barrier wall in the median. Locate the overhead destination guide sign posts within the new proposed barrier wall.

Road Safety Audit REPORT

2.9 ENVIRONMENTAL CONSTRAINTS

4 Animal crossings

Issue 10: Wildlife fencing

Description of Safety Issue:

Several struck deer were observed throughout the area. Several deer crashes have occurred in the area.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Install wildlife fencing with a height of 8 feet or greater to aid in preventing wildlife from entering the roadway.

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Location: Bridge over Little Lake Butte des Morts

2.2 DESIGN ISSUES (GENERAL)

5 Shoulders and edge treatment

Issue 11: Narrow shoulders

The Roland Kampo Bridge over Little Lake Butte des Morts has narrow shoulders. This does not provide a recovery area for an errant vehicle or for emergency purposes.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Provide shoulders for recovery area and emergency purposes when the bridge is reconstructed.

Road Safety Audit REPORT

Location: US 41 at WIS 441 Interchange

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 12: Crossover protection

Description of Safety Issue:

There is no crossover protection in the median on WIS 441 at the US 41 Interchange. Vehicles that run off the road into the median do not have guardrail or other crossover protection to prevent them from traveling into the opposite lanes.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Add guardrail, barrier wall, cable barrier, or other crossover protection in the median on WIS 441.

Road Safety Audit REPORT

Issue 13: Culvert within the clear zone

Description of Safety Issue:

There is a culvert underneath the loop ramp for US 41 southbound to WIS 441 eastbound that is within the clear zone and is not shielded. This could be a safety issue for vehicles that run off the road in this area.



Safety Risk:

Exposure: High

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Extend the culvert so the headwall is outside the clear zone, including the clear zone for the horizontal curve. If this is not possible, shield the culvert.

Road Safety Audit REPORT

Issue 14: No recovery area

Description of Safety Issue:

There is no recovery area at the bottom of the 3:1 slope on the ramp for WIS 441 westbound to US 41 northbound. This could be a safety issue for vehicles that run off the road in this area.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the road shoulder to provide appropriate slopes and recovery areas for vehicles that run off the road. If this is not possible, provide protection in the area.

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Issue 15: REMOVED

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2.2 DESIGN ISSUES (GENERAL)

5 Shoulders and edge treatment

Issue 16: Bridge north of interchange - guardrail

Description of Safety Issue:

The bridge north of the interchange has a 3:1 slope that is partially shielded by guardrail. The guardrail does not shield the entire unrecoverable area and has a straight end-treatment. The length of advancement of the guardrail is low.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Extend the guardrail to shield the entire slope and increase the length of advancement. Also change the end treatment from straight to flared.

Road Safety Audit REPORT

Issue 17: Deflection spacing behind guardrail.

Description of Safety Issue:

The deflection spacing behind guardrail on the loop ramp from southbound US 41 to eastbound WIS 441 is not sufficient. Insufficient deflection spacing does not allow adequate area between the guardrail and the hazard it is shielding to absorb an impact without reaching the hazard.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Relocate the guardrail to increase the deflection spacing between the guardrail and the hazard.

Road Safety Audit REPORT

Issue 18: Shoulder settlement

Description of Safety Issue:

The asphalt shoulder has settled away from the concrete roadway ramp in some areas. This causes a difference in elevation at the edge of travel that may be a safety concern if a vehicle overtracks into this area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Utilize a different material for the shoulder area that creates less of an elevation difference during settlement. Additionally, take this into account when selecting fill soils and compaction methods during construction.

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Issue 19: Guardrail mounting

Description of Safety Issue:

The loop ramp for southbound US 41 to eastbound WIS 441 has guardrail that is mounted higher than 24 inches. This is higher than recommended.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Adjust the guardrail to achieve a 24 inch mounting height.

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2.2 DESIGN ISSUES (GENERAL)

8 Design consistency

Issue 20: Temporary barrier wall

Description of Safety Issue:

The eastbound WIS 441 to southbound US 41 ramp has extra pavement and temporary barrier wall on the left side without a 3-beam guardrail connection.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramp to remove the extra pavement, replace the temporary barrier wall with a permanent solution and tie in any guardrail with a 3-beam connection.

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Issue 21: Vertical face curb

Description of Safety Issue:

There is vertical face curb in a high speed section on the loop ramp for southbound US 41 to eastbound WIS 441. This can create a safety issue if a vehicle traveling at high speeds strikes the curb.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramp with recoverable terrain for the shoulders within the clear zone.

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2.3 ALIGNMENT DETAILS

1 Geometry of horizontal and vertical alignment

Issue 22: Curve

Description of Safety Issue:

The southbound US 41 to westbound WIS 441 ramp is a broke-back curve. This creates additional changes in horizontal alignment that a motorist must navigate.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramp as one continuous curve throughout the ramp to simplify the geometry for the motorists.

Road Safety Audit REPORT

Issue 23: Curve on loop ramp

Description of Safety Issue:

The curve on the loop ramp for southbound US 41 to eastbound WIS 441 is a combination of curves and tangents. This creates additional changes in horizontal alignment that a motorist must navigate.

Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramp as one continuous curve throughout the ramp to simplify the geometry for the motorists.

Road Safety Audit REPORT

2.3 ALIGNMENT DETAILS

2 Visibility and sight distance

Issue 24: Horizontal and vertical sight distance

Description of Safety Issue:

The horizontal and vertical sight distances are low on the eastbound WIS 441 to southbound US 41 ramp.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Reconstruct the ramp to maximize sight distance on the ramp, and ensure that it meets the minimum sight distance criteria.

Road Safety Audit REPORT

2.5 INTERCHANGES

1 Visibility

Issue 25: Horizontal and vertical sight distance

Description of Safety Issue:

The ramp from eastbound WIS 441 to southbound US 41 has horizontal and vertical sight distance issues. Low sight distance may contribute to a vehicle not detecting a hazard in time to react and avoid a collision.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Reconstruct the ramp to maximize sight distance on the ramp, and ensure that it meets the minimum sight distance criteria.

Road Safety Audit REPORT

2.5 INTERCHANGES

2 Layout, control

Issue 26: Spacing between interchanges

Description of Safety Issue:

There is tight spacing on US 41 between the WIS 441 interchange and the interchange to the south. This may create a weaving issue for vehicles entering from WIS 441 and vehicles wishing to exit at the next exit.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: High

Suggestion:

Maximize the spacing between interchanges and analyze the weaving operations of proposed conditions.

Road Safety Audit REPORT

2.5 INTERCHANGES 3 Lanes, shoulders

Issue 27: Merge/weave issues

Description of Safety Issue:

On the loop ramp for westbound WIS 441 to southbound US 41, the traffic movement is heavy and there are merge/weave issues. This can cause operational and safety issues.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: High

Suggestion:

Reconfigure this area during reconstruction to eliminate the weave.

Road Safety Audit REPORT

Issue 28: Potential weave issue

Description of Safety Issue:

There is a potential weave issue on the southbound CD road. This can cause operational and safety issues.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: High

Suggestion:

Reconfigure this area during reconstruction to eliminate the weave.

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2.7 LIGHTING, SIGNS AND DELINEATION

1 Lighting

Issue 29: Add lighting at decision points

Description of Safety Issue:

Many ramp areas and decision points in the US 41 at WIS 441 interchange do not have lighting.

Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Light ramps, roundabouts, interchanges, and all decision points.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION 2 Signs

Issue 30: Overhead signing for auxillary lanes.

Description of Safety Issue:

The auxiliary lanes for the eastbound WIS 441 to US 41 southbound ramp do not have overhead signing.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Install overhead signing for the auxiliary lanes and ramps at the interchange to provide guidance to motorists.

Road Safety Audit REPORT

Issue 31: Overhead signs for auxillary lane

Description of Safety Issue:

There are no overhead signs for the US 41 southbound to WIS 441 westbound ramp.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Install overhead signing for the auxiliary lanes and ramps at the interchange to provide guidance to motorists.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

3 Marking and delineation

Issue 32: 45 degree striping in gore.

Description of Safety Issue:

The gore striping within the US 41 southbound to WIS 441 eastbound ramp has 45 degree striping and not chevrons, and no reflective pavement markers. This is not in accordance with current standards.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Replace the 45 degree striping with chevrons and reflective pavement markers in the gore area of the ramp.

Road Safety Audit REPORT

Issue 33: Contrast markings on concrete pavement

Description of Safety Issue:

There are currently white pavement markings for the edge lines and lane lines that do not have contrast markings on areas of concrete pavement. This can cause low visibility of the striping over time.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install contrast pavement markings for the lane lines and edge lines wherever there is concrete pavement.

Road Safety Audit REPORT

Issue 34: RPM's

Description of Safety Issue:

There are no reflective pavement markers in several areas, on the ramps and on mainline WIS 441. Reflective pavement markers help to delineate the roadway for motorists at night and in inclement weather.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install reflective pavement markers on the mainline and ramps for WIS 441.

Road Safety Audit REPORT

Issue 35: Delineators on ramps

Description of Safety Issue:

There are no delineators on some of the US 41 at WIS 441 interchange ramps. Delineators are typically placed along the outside of a curve on the ramp to help delineate the roadway.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install delineators on the curves on the ramps for the interchange.

Road Safety Audit REPORT

Location: Racine Rd Interchange

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 36: Gore area

Description of Safety Issue:

The area behind the gore between the mainline and the Racine Road ramp slopes to one side. If a vehicle were to enter this area it may overturn.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the merge area to include flat recoverable terrain behind the gore.

Road Safety Audit REPORT

Issue 37: Posts and poles in clear zone

Description of Safety Issue:

There are sign uprights in the median islands on the Racine Road connector that are within the clear zone.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Sign uprights are recommended to be located outside the clear zone. If this is not possible, they should be shielded appropriately.

Road Safety Audit REPORT

Issue 38: End treatment on guardrail

Description of Safety Issue:

There are bridge piers in the median at the overpass in the Racine Road interchange. There is no end treatment on the guardrail around the bridge piers in the median; the guardrail is wrapped around the pier. Guardrail is not designed to absorb an impact from a vehicle head-on.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Revise the guardrail around the bridge piers to add the appropriate end treatment on both approaches for the guardrail.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

4 Roadway layout

Issue 39: Lane drop

Description of Safety Issue:

The westbound on-ramp has a lane drop within the curve. Navigating a curve and a lane drop in the same area can be difficult for motorists to navigate.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: High

Suggestion:

Relocate the lane drop to occur before or after the curve in the ramp.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

5 Shoulders and edge treatment

Issue 40: Asphalt shoulder

Description of Safety Issue:

The asphalt shoulder has settled away from the roadway on Racine Road. This causes a difference in elevation at the edge of travel that may be a safety concern if a vehicle overtracks into this area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Utilize a different material for the shoulder area that creates less of an elevation difference during settlement.

Road Safety Audit REPORT

Issue 41: Shielding on the eastbound WIS 441 off ramp

Description of Safety Issue:

The front slope on the right side of the eastbound WIS 441 off ramp is unrecoverable and is not shielded. This may be a safety issue if an errant vehicle runs off the road in this area.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Reconstruct the shoulder area to remove the slope that is considered to be unrecoverable. If this is not possible, shield the potential hazard.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

8 Design consistency

Issue 42: 4 inch high curb face

Description of Safety Issue:

The curb at Racine road and 9th street intersection does not meet minimum height requirements. The curb is less than 6 inches in height. A shorter curb does not shield roadside objects as well.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

During reconstruction, ensure curb heights in the urban area are 6 inches in height at a minimum. Also, consider this issue when resurfacing the roadway.

Road Safety Audit REPORT

2.3 ALIGNMENT DETAILS

2 Visibility and sight distance

Issue 43: Sight distance

Description of Safety Issue:

The vegetation lines near the proposed roundabout are close to the roadway and reduce sight distance. The vegetation obstructs the view around the corner of the roadway and any pedestrians in the area.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Trim back vegetation on the shoulder of the roadway to maintain proper sight distance at the intersection. Ensure this is maintained regularly.

Road Safety Audit REPORT

2.4 INTERSECTIONS

Issue 44: Sight distance to railroad crossing

Description of Safety Issue:

The sight distance to the railroad crossing is low for the eastbound WIS 441 off ramp to Racine Road. This condition will not be improved with the new construction. The railroad crossing has passive control, so vehicles must see the crossing to stop for an oncoming train.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Install advance warning signs with beacons on the ramp to alert motorists when the crossing has been activated. Also install gates at the railroad crossing.

Road Safety Audit REPORT

Issue 45: Overtracking observed

Description of Safety Issue:

We observed evidence of overtracking on both the southwest and northwest corners of the intersection of Racine Road with WIS 441. Heavy vehicles are running off the roadway in this area.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Increase the radius returns to accommodate the truck traffic in this area.

Road Safety Audit REPORT

2.5 INTERCHANGES

3 Lanes, shoulders

Issue 46: Lane length deficient

Description of Safety Issue:

At the intersection of Racine Road and 9th Street, the northbound left turn lane does not have sufficient queue length and deceleration length. Also, the eastbound left turn lane queue was observed to overflow into the through lane.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Lengthen the northbound and eastbound left turn lanes to accommodate the queues and deceleration lengths.

Road Safety Audit REPORT

2.5 INTERCHANGES

5 Pedestrians, bicyclists

Issue 47: Bicycle safety through roundabout

Description of Safety Issue:

Bicyclists traveling on Racine Road need to be accommodated through the roundabout area. Bicyclists traveling on the roadway through a roundabout is a safety issue.

Safety Risk:

Exposure: High

Probability: High

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Transition from on-street bicycle lanes to a multi-use trail with a 4 foot offset through the proposed roundabout.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

2 Pedestrians

Issue 48: Crosswalk fading

Description of Safety Issue:

The crosswalk striping at Racine Road and 9th street has faded. The crosswalks designates the area for the pedestrians to cross for both the pedestrians and motorists.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Refresh the striping at the intersection to increase visibility of the pavement markings during the reconstruction project.

Road Safety Audit REPORT

Issue 49: Sidewalks and pedestrian ramps

Description of Safety Issue:

Racine Road is missing sidewalks and pedestrian ramps. This area is not ADA compliant. Not having pedestrian facilities causes the pedestrians to walk on the shoulder of the roadway exposing them to safety issues. The land uses in this area are pedestrian and bicycle generators and attractors.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install a sidewalk for pedestrians on the east side of Racine Road. Install a multi-use path for pedestrians and bicyclists on the west side of Racine Road.

Road Safety Audit REPORT

Issue 50: Pedestrian ramps

Description of Safety Issue:

The pedestrian ramp at Racine Road and 12th Street is aligned diagonally. The slope on this ramp is greater than 8%. There are no crosswalks at this intersection. There is a tripping hazard. There is no pedestrian ramp on the north side.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the sidewalk ramps to be directional, have detectable domes, and in accordance with current ADA standards. Add standard 12 inch (6 - 10 ft wide) crosswalk pavement markings at the intersection.

Road Safety Audit REPORT

Issue 51: Pedestrian ramps, push buttons

Description of Safety Issue:

Pedestrian ramps and signals at the intersection of Racine Road with 9th Street are not present on all of the corners.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Recommend 2 separate ramps that are ADA compliant, 2 separate pedestrian push buttons that are ADA accessible, and 2 separate countdown pedestrian signals with countdown pedestrian signing on each corner of the intersection.

Road Safety Audit REPORT

Issue 52: Lighting not facing the road

Description of Safety Issue:

The lighting on the southeast corner of Racine Road and 9th Street has rotated.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Rotate the luminaire to face the roadway to ensure the intersection is properly lit.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

1 Lighting

Issue 53: Roundabout lighting

Description of Safety Issue:

The roundabout on Racine Road will require lane changing and decision-making from the motorist to navigate through.

Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Adequate visibility through the roundabout is important. Ensure lighting is installed in the proposed roundabout area.

Road Safety Audit REPORT

Issue 54: Poles close to back of curb

Description of Safety Issue:

There are several poles near the intersection of Racine Road and 9th Street that are close to the back of curb. This is considered to be within the clear zone area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the poles away from the roadway to remove the potential hazard.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION 2 Signs

Issue 55: Lane assignment signs

Description of Safety Issue:

The Racine Road interchange requires lane changing and decision-making for the motorist to navigate through.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Install lane assignment signs in advance of the current signalized intersection or approaching the proposed roundabout to guide motorists into the proper lanes.

Road Safety Audit REPORT

Issue 56: Arrow signs instead of chevron signs

Description of Safety Issue:

The Racine Road ramp curve has a single W1-6 arrow sign and no W1-8 chevron signs.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install W1-8 chevron signs along the curve in the ramp instead of the single W1-6 arrow sign to provide enhanced delineation in the curve.

Road Safety Audit REPORT

Issue 57: Street name signage

Description of Safety Issue:

The street name signs at Racine Road and 9th Street are not readily visible. Adequate visibility of the street name signs helps to guide motorists approaching the intersection and allow for advance lane change maneuvers.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install overhead internally illuminated street name signs at the signalized intersections.

Road Safety Audit REPORT

B Street Crossings

B.6 Access Management

Issue 58: Absence of left turn lanes for driveway access

Description of Safety Issue:

There are driveway accesses to the Citgo gas station and other businesses onto Racine Road that do not have left turn lanes. Vehicles were observed decelerating and stopping in the left through lane to turn into these driveways.



Safety Risk:

Exposure: High

Probability: High

Consequence: Medium

Resulting Road Safety Risk: High

Suggestion:

Extend the raised median from the proposed roundabout at WIS 441 south to 9th Street and restrict left turn access to the driveways. These businesses have accesses in the rear via 9th Street.

Road Safety Audit REPORT

Issue 59: Large trucks using driveway to cut through.

Description of Safety Issue:

Large trucks are using the driveway at Bubba's Pub to cut through and avoid the intersection of Racine Road and 9th Street.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Reduce the width of the driveways into Bubba's Pub and increase the corner radius at the intersection of Racine Road and 9th Street to accommodate heavy vehicles.

Road Safety Audit REPORT

Issue 60: Sharp transition from driveway to Racine Road

Description of Safety Issue:

The corners of the driveways from the Auto Exchange and the Citgo gas station onto Racine Road do not have a radius. Overtracking onto the shoulder was visible in these areas.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Recommend reconstructing driveways to provide radial returns.

Road Safety Audit REPORT

B Street Crossings

B.9 Signals

Issue 61: Signal head backplates

Description of Safety Issue:

The signals on Racine Road have standard backplates.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install reflective backplates to improve visibility of the signal heads.

Road Safety Audit REPORT

Issue 62: REMOVED

Road Safety Audit REPORT

Location: Midway Rd Interchange

2.1 GENERAL TOPICS

4 Utility accommodations

Issue 63: Overhead power lines

Description of Safety Issue:

There are overhead power lines near the railroad crossing at Midway Road. These may cause OSHA clearance issues during construction.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Maintain clearance for the overhead lines during the design process.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 64: Bridge piers in median

Description of Safety Issue:

There are bridge piers in the median that are within the clear zone. The bridge piers may be a hazard to motorists that run off the road into the median area. The bridge piers are not shielded.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Install guardrail protection for the bridge piers within the median.

Road Safety Audit REPORT

Issue 65: Headwalls in clear zone

Description of Safety Issue:

Near the St. Johns cemetery on Racine Road, south of the T-intersection with Midway Road, there are headwalls and a ditch within the clear zone. These present roadside hazards for a vehicle that runs off the road. They are not shielded.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Consider extending the headwalls outside of the clear zone. Consider closing the ditch and converting to a closed drainage system. If these modifications are not possible, at a minimum the ditch and headwalls should be shielded.

Road Safety Audit REPORT

Issue 66: Mitered end section in clear zone

Description of Safety Issue:

On WIS 441 westbound, west of the Midway Road interchange there are unshielded mitered end sections and steep back slopes within the clear zone.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Remove the potential hazards from the clear zone through reconstruction. If this is not possible, shield the mitered end sections and steep back slopes.

Road Safety Audit REPORT

Issue 67: Steep front and back slopes

Description of Safety Issue:

The Midway Road westbound on-ramp has a front slope of 40% and a back slope of 60% on the right side. These steeper slopes are not considered to be recoverable and are not shielded.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Reconstruct the shoulder to remove the steep slopes. If this is not possible, shield the area.

Road Safety Audit REPORT

Issue 68: Steep front slope and narrow shoulder

Description of Safety Issue:

The front slope on the south side on the overpass at Midway Road is 42% and unshielded, and the front slope on the north side is greater than 50% and unshielded. The shoulder on both sides of the bridge is narrow.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Increase the shoulder width on the bridge and shield the steep front slopes on both sides of the overpass at Midway Road.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

5 Shoulders and edge treatment

Issue 69: Steep embankment slopes

Description of Safety Issue:

There is no guardrail or fencing at the top of bridge abutment slopes on the Midway Road overpass. A barrier would provide protection for maintenance working in the area and prevent pedestrians on Midway Road from accessing the WIS 441 median area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Install guardrail or fencing at the top of the bridge abutment slope on the Midway Road overpass.

Road Safety Audit REPORT

Issue 70: Steep slope on shoulder

Description of Safety Issue:

The slope on the shoulder on the south side just past the overpass for Midway Road is 38%. The area is not shielded. This slope is considered to be unrecoverable. This can be a safety issue if a vehicle runs off the road in this area.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Shield the slope with guardrail or other appropriate protection.

Road Safety Audit REPORT

2.3 ALIGNMENT DETAILS

1 Geometry of horizontal and vertical alignment

Issue 71: Alignment of off-ramp

Description of Safety Issue:

The eastbound WIS 441 Midway Road exit ramp alignment encourages a high speed exit because it aligns with the mainline.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Realign the exit ramp at a more severe angle to encourage vehicles to slow down when exiting the highway.

Road Safety Audit REPORT

2.4 INTERSECTIONS

2 Layout, including the appropriateness of type

Issue 72: Overtracking

Description of Safety Issue:

There is evidence of overtracking on the corner at the intersection of Midway Road and Earl Street. There is heavy truck traffic in this area and the radii are not sufficient to accommodate the vehicular movements.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Recommend increasing the radius for all corners at this interchange to accommodate the heavy vehicle traffic in this area.

Road Safety Audit REPORT

Issue 73: Roundabout and railroad crossing

Description of Safety Issue:

The new roundabout is planned close to a railroad crossing. This could cause queuing issues across the railroad tracks.

Safety Risk:

Exposure: Medium

Probability: Low

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Recommend gates, flashing warning beacons, and "Do Not Stop On Tracks" signing. The traffic in this area is not anticipated to be high enough to cause queuing issues with a roundabout.

Road Safety Audit REPORT

Issue 74: Absence of left and right turn auxillary lanes

Description of Safety Issue:

There is not a northbound right turn lane or a southbound left turn lane at the T-intersection of Midway Road and Racine Road. Auxiliary lanes remove turning vehicles from the through lanes and provide an area for deceleration and queuing.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Install a northbound right turn land and a southbound left turn lane at the intersection..

Road Safety Audit REPORT

Issue 75: Guardrail and other hazards

Description of Safety Issue:

On the west side of the T-intersection of Racine Road and Midway Road, there is guardrail shielding a slope and old signal equipment.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Regrade the west side of the intersection to remove the slope, remove the old signal equipment and any other hazards and remove the guardrail.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

2 Pedestrians

Issue 76: Absence of pedestrian features

Description of Safety Issue:

There are no sidewalks, ramps, and other pedestrian features at the intersection of Midway Road and WIS 441. This area is not ADA compliant. Not having pedestrian facilities causes the pedestrians to walk on the shoulder of the roadway exposing them to safety issues.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant crosswalks and ramps for pedestrians in this area.

Road Safety Audit REPORT

Issue 77: No sidewalks, ramps

Description of Safety Issue:

There are no sidewalks and sidewalk ramps at the intersection of Midway Road and Racine Road. This area is not ADA compliant. Not having pedestrian facilities causes the pedestrians to walk on the shoulder of the roadway exposing them to safety issues.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant crosswalks and ramps for pedestrians in this area.

Road Safety Audit REPORT

Issue 78: Sidewalk across railroad tracks

Description of Safety Issue:

Sidewalk is planned across the railroad tracks. This could cause potential ADA issues.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant ramps for pedestrians in this area; give special consideration to the sidewalk in this area during design and construction.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

3 Bicyclists

Issue 79: No bike lanes

Description of Safety Issue:

There are no bicycle lanes on Midway Road. Bicyclists in this area must travel in the roadway or on the shoulder in this area.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Install 5 foot bicycle lanes on Midway Road to accommodate bicycles.

Road Safety Audit REPORT

Issue 80: Trailblazer signs

Description of Safety Issue:

Trailblazer signs are located directly at the intersection. This does not provide advance notice to the motorist approaching the intersection and allow time to make a lane change prior to reaching the intersection.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Relocate the trailblazer signs in advance of the intersection and new proposed roundabout.

Road Safety Audit REPORT

Issue 81: Speed limit sign location

Description of Safety Issue:

There is a 55 mph speed limit sign posted on the westbound WIS 441 on-ramp at Midway Road. This is the speed limit of the mainline WIS 441, not the ramp.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the speed limit sign onto the mainline of WIS 441 and out of the ramp area.

Road Safety Audit REPORT

Issue 82: No object markers

Description of Safety Issue:

The arrow sign at the T-intersection of Midway Road with Racine Road does not have adjacent object markers.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install three object markers (9 button signs) near the arrow sign. This will enhance the visibility of the end of the road to approaching motorists.

Road Safety Audit REPORT

Issue 83: Multi sign posts

Description of Safety Issue:

Multiple signs are mounted on the same post. This can cause an overload of information to the motorist or convey confusing or conflicting messages. The sign panels for Speed Limit 35 mph and County AP are on the same post.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Relocate signs to individual posts for each separate message.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

3 Marking and delineation

Issue 84: Contrast pavement markings and RPM's

Description of Safety Issue:

There are no contrast pavement markings or reflective pavement markers at Midway Road and WIS 441. There are currently white pavement markings for the edge lines and lane lines that do not have contrast markings on areas of concrete pavement. This can cause low visibility of the striping over time. Reflective pavement markers help to delineate the roadway for motorists at night and in inclement weather.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install contrast pavement markings for the lane lines and edge lines wherever there is concrete pavement.
Install reflective pavement markers on Midway Road.

Road Safety Audit REPORT

Issue 85: Delineation of median nose

Description of Safety Issue:

There are no delineators on the median noses.



Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Delineate the median noses. Delineation on the median noses calls attention to the obstacle in the roadway to help prevent motorists from striking it.

Road Safety Audit REPORT

Issue 86: Pavement arrow markings

Description of Safety Issue:

The lanes on Midway Road approaching the T-intersection with Racine Road do not have pavement arrows, messages, solid lane lines, or a stop bar. These pavement markings convey the message to the motorist that they are approaching an intersection and they are in a turn only lane.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install pavement arrows, messages, solid lane lines, and a stop bar on Midway Road approaching the intersection.

Road Safety Audit REPORT

A Streets

A.2 Quality, Conditions, and Obstructions

Issue 87: Old signal foundations and equipment

Description of Safety Issue:

At the T-intersection between Midway Road and Racine Road, there are old signal foundations and equipment on the roadside which could pose a potential hazard.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Remove all unused signal equipment throughout the area of the intersection. This will remove any potential safety hazard from these obstacles.

Road Safety Audit REPORT

B Street Crossings

B.1 Presence, Design, and Placement

Issue 88: No radial returns

Description of Safety Issue:

There are no radial returns in the driveway access to RR Donnelley across from Earl Street.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install radial returns at this driveway for heavy vehicle access.

Road Safety Audit REPORT

Location: Appleton Rd Interchange

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 89: Bridge support piers

Description of Safety Issue:

There are bridge support piers in the median within the clear zone that are unshielded. The bridge piers may be a hazard to motorists that run off the road into the median area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Install guardrail protection for the bridge piers within the median.

Road Safety Audit REPORT

Issue 90: Front slope issues

Description of Safety Issue:

There are unshielded unrecoverable front slopes on Appleton Road, south of WIS 441. This is a safety issue for vehicles that run off the road in this area.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Reconstruct the shoulder to remove the front slopes that are considered to be unrecoverable. If this is not possible, shield the area with guardrail or other protection.

Road Safety Audit REPORT

Issue 91: Guardrail

Description of Safety Issue:

There is no guardrail or fencing at the top of bridge abutment slopes on the Appleton Road overpass. A barrier would provide protection for maintenance working in the area and prevent pedestrians on Appleton Road from accessing the WIS 441 median area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Medium

Suggestion:

Install guardrail or fencing at the top of the bridge abutment slope on the Appleton Road overpass.

Road Safety Audit REPORT

Issue 92: Light poles within clear zone

Description of Safety Issue:

South of intersection of Appleton Road with Midway Road, there are wooden light poles within the clear zone. These present a hazard for vehicles that run off the road in this area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the wooden light poles outside the clear zone, or replace them with aluminum poles with a transformer base.

Road Safety Audit REPORT

Issue 93: Steep slopes

Description of Safety Issue:

The front slope on the right side of westbound WIS 441 west of Appleton Road is 43%. Also, the slope into the ditch in the median is steep. These slopes are considered to be unrecoverable.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Reconstruct the shoulder and median area to remove the slopes that are considered to be unrecoverable. If this is not possible, shield the potential hazards.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

4 Roadway layout

Issue 94: Acceleration taper

Description of Safety Issue:

There is an acceleration taper for right turns from the WIS 441 off-ramp. This creates a larger conflict area for right turning vehicles at the intersection. It also causes motorists to look at a more severe angle for a gap in traffic.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Remove the acceleration taper and have right turning vehicles enter the intersection at the stop bar.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

5 Shoulders and edge treatment

Issue 95: Rumble strips

Description of Safety Issue:

The loop ramp for southbound US 41 to eastbound WIS 441 does not have any rumble strips on the shoulder. These call attention to the driver that they have left the travel lanes.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install rumble strips in the shoulder for the loop ramp.

Road Safety Audit REPORT

2.4 INTERSECTIONS

2 Layout, including the appropriateness of type

Issue 96: No southbound right turn lane into strip mall

Description of Safety Issue:

There is no southbound right turn lane into the strip mall at Drum Corps Drive. This strip mall appears to be a high traffic generator.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Evaluate the criteria for installing a southbound right turn lane into the strip mall.

Road Safety Audit REPORT

Issue 97: Traffic separator

Description of Safety Issue:

There is no traffic separator for the southbound left turn lane at the intersection of Appleton Road and Valley Road and the transition into the center two-way left turn lane is not in accordance with current standards. A separator serves as crossover protection for vehicles and can also provide refuge for pedestrians crossing the roadway.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Recommend providing a traffic separator for the southbound left turn lane and modifying the transition into the center two-way left turn lane to comply with current standards.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

2 Pedestrians

Issue 98: Detectable warning devices

Description of Safety Issue:

There are no detectable domes in the sidewalk ramps at the intersection of Appleton Road with Valley Road. These provide detection to the visually impaired that they are entering the roadway.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install detectable domes on the sidewalk ramps in the area to accommodate the visually impaired.

Road Safety Audit REPORT

Issue 99: Cross slope on sidewalk

Description of Safety Issue:

The cross slope on the sidewalk at the NE corner of Midway Road and Appleton Road is 5%. This is not in compliance with ADA guidelines which allows a maximum cross slope of 2%.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the sidewalk so the cross slope is 2% or less.

Road Safety Audit REPORT

Issue 100: Drop off hazard

Description of Safety Issue:

There is an unshielded drop off hazard at the NW corner of Midway Road and Appleton Road.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Installing handrail at the back of the sidewalk for protection.

Road Safety Audit REPORT

Issue 101: Missing section of sidewalk

Description of Safety Issue:

On Appleton Road between Valley Road and the WIS 441 ramps, there is a missing section of sidewalk. This is not in compliance with current ADA guidelines.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant sidewalk in this area for pedestrians.

Road Safety Audit REPORT

Issue 102: No countdown signs

Description of Safety Issue:

The countdown pedestrian signal across the west side of the eastbound WIS 441 WB ramps on Appleton Road has no countdown signs. The instructions for using the pedestrian signal do not match the pedestrian signal in use at this location.



Safety Risk:

Exposure: Very Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Wherever pedestrian countdown signals are installed, ensure the appropriate corresponding signing is also installed.

Road Safety Audit REPORT

Issue 103: No sidewalks or ramps north of Drum Corps drive

Description of Safety Issue:

There are no sidewalks or pedestrian ramps north of Drum Corps Drive on the east side of Appleton Road.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant sidewalks, crosswalks and ramps for pedestrians in this area.

Road Safety Audit REPORT

Issue 104: Pedestrian features

Description of Safety Issue:

There are no pedestrian features at the intersection of Appleton Road with the WIS 441 eastbound ramps. There are no sidewalks or ramps on the east side.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Install ADA compliant crosswalks and ramps for pedestrians in this area. Provide pedestrian facilities in the proposed condition.

Road Safety Audit REPORT

Issue 105: Pedestrian ramps

Description of Safety Issue:

The pedestrian ramps on all of the corners of the intersection of Appleton Road with Valley Road are diagonal. This directs pedestrians using the ramps into the center of the intersection.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install directional ADA compliant ramps for pedestrians in this area to direct them in the direction of the crosswalk.

Road Safety Audit REPORT

Issue 106: Pedestrian ramps, crosswalk

Description of Safety Issue:

The pedestrian ramps are diagonal at Appleton Road and Tuckaway lane. Also, there is no crosswalk at this intersection.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install a crosswalk and directional ADA compliant ramps for pedestrians in this area to direct them in the direction of the crosswalk.

Road Safety Audit REPORT

Issue 107: Sidewalk

Description of Safety Issue:

There is no sidewalk on the east side under the WIS 441 overpass.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant sidewalk for pedestrians in this area.

Road Safety Audit REPORT

Issue 108: Sidewalk ramps

Description of Safety Issue:

The sidewalk ramps at the intersection of Appleton Road with the WIS 441 westbound ramps are not ADA compliant.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramps to be directional and install detectable domes to accommodate the visually impaired, in accordance with current ADA standards.

Road Safety Audit REPORT

Issue 109: Sidewalk ramps

Description of Safety Issue:

The sidewalk ramp on the south side near the Goodwill Community Center driveway at Appleton and Tuckaway lane is not ADA compliant.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramp to be directional and install detectable domes to accommodate the visually impaired, in accordance with current ADA standards.

Road Safety Audit REPORT

Issue 110: Sidewalk ramps and crosswalks

Description of Safety Issue:

The sidewalk ramps at Drum Corps near the strip mall are diagonal and there are no crosswalks.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramps to be directional and install a crosswalk.

Road Safety Audit REPORT

Issue 111: Sidewalks, ramps and crosswalks

Description of Safety Issue:

The sidewalk on the northwest corner of the intersection of Midway Road with Appleton Road is not ADA compliant and the ramp is diagonal. There is only one crosswalk at the intersection which is on the north side. The sidewalks and ramps are only on the northwest and northeast corners of the intersection.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the ramps to be directional, have detectable domes, and in accordance with current ADA standards. Add countdown pedestrian features across all approaches and crosswalks.

Road Safety Audit REPORT

Issue 112: Crosswalk markings

Description of Safety Issue:

The proposed roundabout will have a right turn slip lane for vehicles to bypass the roundabout. Pedestrians must cross these lanes to continue traveling on Appleton Road.

Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Ensure crosswalks with yield bars are marked across the right slip lanes for pedestrians crossing at the proposed roundabouts.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

3 Bicyclists

Issue 113: Bicycle path worn

Description of Safety Issue:

There are no bicycle lanes on Appleton Road. There is a bicycle path in the grass on the east side with bicycle track marks.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Install 5 foot bicycle lanes on Appleton Road to accommodate bicycles.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

8 Public transport

Issue 114: Bus shelter

Description of Safety Issue:

The bus shelter at Appleton Road and Tuckaway Lane is not ADA accessible.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Modify the bus shelter to be ADA compliant.

Road Safety Audit REPORT

Issue 115: Bus shelter/bench not ADA compliant

Description of Safety Issue:

The bus shelter and bench at the SE corner of the intersection of Appleton Road with Valley Road are not ADA compliant.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Modify the bus shelter and bench area to be ADA compliant.

Road Safety Audit REPORT

Issue 116: Bus stops not ADA compliant

Description of Safety Issue:

The bus stops on both sides of Appleton Road are not ADA compliant.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Construct boarding and alighting areas for all bus stops on Appleton Road.

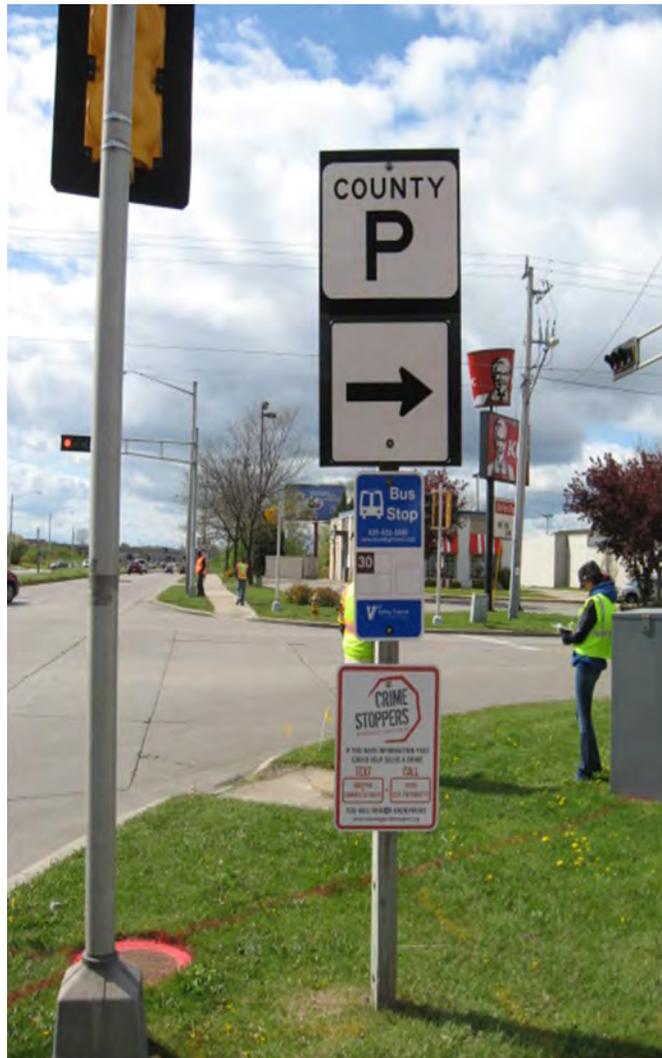
Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION 2 Signs

Issue 117: Trailblazer location

Description of Safety Issue:

The trailblazers at Midway Road and Appleton Road are located right at the intersection. This does not provide advance notice to the motorist approaching the intersection and allow time to make a lane change prior to reaching the intersection.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Relocate the trailblazer signs in advance of the intersection.

Road Safety Audit REPORT

Issue 118: Speed limit sign location

Description of Safety Issue:

There is a 65 mph sign posted on the eastbound on-ramp. This is the speed limit of the mainline WIS 441, not the ramp.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the speed limit sign onto the mainline of WIS 441 and out of the ramp area.

Road Safety Audit REPORT

Issue 119: Speed limit sign location

Description of Safety Issue:

The westbound on-ramp has a 55 mph sign posted on the ramp. This is the speed limit of the mainline WIS 441, not the ramp.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the speed limit sign onto the mainline of WIS 441 and out of the ramp area.

Road Safety Audit REPORT

Issue 120: Street name signs

Description of Safety Issue:

The street name signs at Midway Road and Appleton Road are not readily visible. Adequate visibility of the street name signs helps to guide motorists approaching the intersection and allow for advance lane change maneuvers.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install overhead internally illuminated street name signs at the signalized intersections.

Road Safety Audit REPORT

Issue 121: Street name signs visibility

Description of Safety Issue:

The street name signs at the intersection of Appleton Road and Valley Road are not readily visible. Adequate visibility of the street name signs helps to guide motorists approaching the intersection and allow for advance lane change maneuvers.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install overhead internally illuminated street name signs at the signalized intersections.

Road Safety Audit REPORT

Issue 122: Overuse of "Do Not Enter" signs

Description of Safety Issue:

There is an overuse of the "Do Not Enter" signs at Midway Road and Appleton Road. This clutters the roadway and may cause an issue with information overload to the motorist.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Install "Do Not Enter" signs only where necessary and in accordance with current standards, and remove any duplicate or unnecessary signs.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

3 Marking and delineation

Issue 123: Pavement arrows and delineators

Description of Safety Issue:

There are no pavement arrows in the left turn lanes at Drum Corps Drive. Also, there are no delineators on the median noses. There was evidence of vehicles striking the median.



Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install left turn arrow pavement markings in the left turn lanes and delineate the median noses. Delineation on the median noses calls attention to the obstacle in the roadway to help prevent motorists from striking it.

Road Safety Audit REPORT

Issue 124: Contrast markings and RPM's

Description of Safety Issue:

There are currently white pavement markings for the edge lines and lane lines that do not have contrast markings on areas of concrete pavement. This can cause low visibility of the striping over time. There are no reflective pavement markers on Appleton Road. Reflective pavement markers help to delineate the roadway for motorists at night and in inclement weather.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install contrast pavement markings for the lane lines and edge lines wherever there is concrete pavement.
Install reflective pavement markers on Appleton Road.

Road Safety Audit REPORT

Issue 125: Median islands

Description of Safety Issue:

There is no delineation on the median island noses on Appleton Road, south of WIS 441.



Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Delineate the median noses. Delineation on the median noses calls attention to the obstacle in the roadway to help prevent motorists from striking it.

Road Safety Audit REPORT

Issue 126: Missing stop bar

Description of Safety Issue:

There is no stop bar on Tuckaway lane at Appleton Road. Stop bars designate where a vehicle on the side street should stop before entering into the intersection.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Add a stop bar.

Road Safety Audit REPORT

Issue 127: No arrows in left/right turn lanes

Description of Safety Issue:

There are no arrow pavement markings in the existing left and right turn lanes near the proposed roundabout. Pavement arrows convey to the motorist the lane designation of left and right turn lanes approaching the intersection.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install arrow pavement markings in the proposed turn lanes in this area to guide motorists into the correct lane approaching the proposed roundabout.

Road Safety Audit REPORT

Issue 128: No pavement arrow markings

Description of Safety Issue:

The northbound and southbound left turn lanes at the intersection of Appleton Road with Midway Road do not have left turn arrow pavement markings.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install left turn arrow pavement markings in the northbound and southbound left turn lanes to designate the lane use on these approaches.

Road Safety Audit REPORT

Issue 129: No delineators

Description of Safety Issue:

There is no delineation around the noses of the median separator at the intersection of Appleton Road with Midway Road.



Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install delineation on the median noses. This calls attention to the obstacle in the roadway to help prevent motorists from striking it.

Road Safety Audit REPORT

Issue 130: Pavement arrow markings, delineation

Description of Safety Issue:

The northbound left turn lane on Appleton Road, north of WIS 441, does not have left turn arrow pavement markings. The median nose is not delineated.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install left turn arrow pavement markings in the northbound left turn lane to designate the lane use. Install delineation on the median noses. This calls attention to the obstacle in the roadway to help prevent motorists from striking it.

Road Safety Audit REPORT

Issue 131: Pavement marking visibility

Description of Safety Issue:

The WIS 441 mainline has standard pavement markings for the edge lines. Many of the crashes in the area occurred during weather events.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Install wet weather pavement markings for better visibility during weather events.

Road Safety Audit REPORT

Issue 132: Staggered stop bar

Description of Safety Issue:

There is staggered stop bar on the eastbound approach at the intersection of Midway Road and Appleton Road.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Remove the staggered stop bar and install one stop bar for all lanes closer to the intersection, for improved sight distance at the intersection for all movements on this approach.

Road Safety Audit REPORT

Issue 133: Stop bar and signal heads

Description of Safety Issue:

The stop bars and signal heads are set back from the intersection of Midway Road and Appleton Road.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Relocate the stop bars and corresponding near side signal heads closer to the intersection for improved sight distance at the intersection.

Road Safety Audit REPORT

Issue 134: Stop bars and delineation

Description of Safety Issue:

The stop bars and median noses at the intersection of Appleton Road and Valley Road are set back from the intersection. The median noses are not delineated



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Relocate the median noses and stop bars closer to the intersection for improved sight distance. Add delineation to the median noses.

Road Safety Audit REPORT

A Streets

A.2 Quality, Conditions, and Obstructions

Issue 135: Median curb damaged

Description of Safety Issue:

The curb in the median is damaged on Appleton Road.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Replace the median on Appleton Road during the proposed reconstruction.

Road Safety Audit REPORT

B Street Crossings

B.1 Presence, Design, and Placement

Issue 136: Pedestrian crossing

Description of Safety Issue:

There are no pedestrian features or crosswalks across the north and west sides of the intersection of Appleton Road at Valley Road.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Add pedestrian features, crosswalks, and ramps across the north and west sides of the intersection to accommodate pedestrians in this area.

Road Safety Audit REPORT

B Street Crossings

B.2 Quality, Conditions, and Obstructions

Issue 137: Separator in poor condition

Description of Safety Issue:

The median separator on Appleton Road between Drum Corps Drive and Midway Road is in poor condition.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Replace the separator on Appleton Road with the proposed reconstruction project.

Road Safety Audit REPORT

Issue 138: Joint damage, cracking, spalling

Description of Safety Issue:

There is joint damage, cracks, and spalling in the pavement on Appleton Road.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Resurface Appleton Road during the WIS 441 reconstruction project.

Road Safety Audit REPORT

B Street Crossings

B.6 Access Management

Issue 139: Cross slope on driveway

Description of Safety Issue:

The cross slope of the sidewalk on the southern driveway to the Citgo gas station on Appleton Road is 4%. This is not in compliance with ADA guidelines which allows a maximum cross slope of 2%.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the sidewalk across the driveway to be in compliance with ADA guidelines.

Road Safety Audit REPORT

Issue 140: Multiple driveways

Description of Safety Issue:

Several driveways closely spaced to a signalized intersection. Burger King has cross access at Drum Corps Drive and also has a driveway access to the south on Appleton Road. The Citgo gas station has two driveways onto Appleton Road; the south driveway is close to an intersection.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Close the driveway into Burger King to the south of Drum Corps Drive. Close the south Citgo driveway close to the intersection. This will eliminate several conflict points.

Road Safety Audit REPORT

B Street Crossings B.9 Signals

Issue 141: Signal head backplates

Description of Safety Issue:

The signals at the intersection of Appleton Road and Midway Road have standard backplates.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install reflective backplates at the intersection to improve visibility of the signal heads.

Road Safety Audit REPORT

Issue 142: Signal pole

Description of Safety Issue:

There is a signal pole near the back of the curb in the northeast corner of Appleton Road with Midway Road within the clear zone.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the signal pole away from the back of the curb outside of the clear zone.

Road Safety Audit REPORT

Issue 143: Sight of pedestrian signal

Description of Safety Issue:

The pedestrian signal on the northeast corner of Appleton Road at Valley Road is poorly visible.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the pedestrian signal on the corner to be more visible to pedestrians attempting to cross into the crosswalk.

Road Safety Audit REPORT

Location: Oneida St Interchange

2.2 DESIGN ISSUES (GENERAL)

2 Typical cross sections and recovery zones

Issue 144: Bridge columns within clear zone

Description of Safety Issue:

The columns under the overpass on Oneida Street, south of WIS 441 are within the clear zone and unshielded. The bridge piers may be a hazard to motorists that run off the road into the median area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Install guardrail protection for the bridge piers within the median.

Road Safety Audit REPORT

Issue 145: Power poles within clear zone

Description of Safety Issue:

There are power poles with lighting within the clear zone on the west side of Oneida Street. These create a hazard to motorists that run off the road in this area



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

To remove the hazard, relocate the power poles outside of the clear zone on Oneida Street.

Road Safety Audit REPORT

Issue 146: Steep, unshielded front slope

Description of Safety Issue:

The front slope on the south side on the Oneida Street overpass before and after the bridge is 45% and unshielded. This is considered to be unrecoverable and may be a safety issue if an errant vehicle runs off the road in this area.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Shield the steep front slopes before and after the bridge.

Road Safety Audit REPORT

2.2 DESIGN ISSUES (GENERAL)

8 Design consistency

Issue 147: Curb height

Description of Safety Issue:

The curb is less than 6 inches in height. A shorter curb does not shield the roadside as well.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

During reconstruction, ensure curb heights in the urban area are 6 inches in height at a minimum. Also, consider this issue when resurfacing the roadway.

Road Safety Audit REPORT

2.4 INTERSECTIONS

2 Layout, including the appropriateness of type

Issue 148: Low radius returns

Description of Safety Issue:

We observed evidence of overtracking at the intersection of Oneida Street with Midway Road. The radius returns at the intersection are too low. Heavy vehicles are running off the roadway in this area.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Increase the radius returns to accommodate the truck traffic in this area.

Road Safety Audit REPORT

Issue 149: Abrupt transition

Description of Safety Issue:

There is an abrupt transition to the auxiliary lanes in the westbound off-ramp of WIS 441 to Oneida Street. The ramp transitions from a single lane into three lanes abruptly without developing the lanes per standards. This area may be subject to rear end collisions due to the geometry.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Widen the ramp to properly develop the lanes in accordance with current standards.

Road Safety Audit REPORT

Issue 150: Deceleration on raised concrete gore area

Description of Safety Issue:

Vehicles are driving over the raised concrete gore area on Oneida Street while decelerating to turn left into Meadow Grove Blvd.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install a southbound left turn lane with appropriate queue and deceleration length into Meadow Grove Boulevard.

Road Safety Audit REPORT

Issue 151: Transition to two way left turn lanes

Description of Safety Issue:

The southbound left turn lane at the Roeland Avenue/Valley Road intersection does not have adequate deceleration length and the transition to the center two-way left turn lane is not per current standards. Inadequate turn lane lengths can cause deceleration and/or overflow in the through lane which can increase the occurrence of rear end collisions.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Lengthen the southbound left turn lane and revise the transition to the center two-way left turn lane per current standards.

Road Safety Audit REPORT

Issue 152: Transition from bike lane to multi-use trail

Description of Safety Issue:

Bicyclists traveling on Oneida Street need to be accommodated through the roundabout area. Bicyclists traveling on the roadway through a roundabout is a safety issue.

Safety Risk:

Exposure: High

Probability: High

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Transition from on-street bicycle lanes to a multi-use trail with a 4 foot offset through the proposed roundabout.

Road Safety Audit REPORT

Issue 153: Yield bars at crosswalks

Description of Safety Issue:

Pedestrians traveling on Oneida Street will have to cross a roundabout in the proposed condition. Roundabouts can be a safety concern for pedestrians due to the continuous flow of traffic from multiple directions.

Safety Risk:

Exposure: High

Probability: Medium

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Install yield bars in advance of crosswalks on the approached to the proposed roundabout. This will designate where a vehicle should yield to pedestrians attempting to cross the roadway in this area.

Road Safety Audit REPORT

2.5 INTERCHANGES

5 Pedestrians, bicyclists

Issue 154: Absence of bicycle facilities

Description of Safety Issue:

No bicycle facilities are provided on Oneida Street.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Low

Suggestion:

Install 5 foot bicycle lanes adjacent to the travel lanes for bicyclists in the area. This will remove the bicycles from the travel lanes and/or the pedestrian paths.

Road Safety Audit REPORT

Issue 155: Bicycle safety through roundabout

Description of Safety Issue:

Bicyclists traveling on Oneida Street need to be accommodated through the roundabout area. Bicyclists traveling on the roadway through a roundabout is a safety issue.

Safety Risk:

Exposure: High

Probability: High

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Transition from on-street bicycle lanes to a multi-use trail with a 4 foot offset through the proposed roundabout.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

2 Pedestrians

Issue 156: High cross slopes

Description of Safety Issue:

The existing cross slope on the sidewalk in the southwest corner of the intersection of Oneida Street at Midway Road is greater than 2%. This is not in compliance with ADA guidelines.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Reconstruct the sidewalk so the cross slope is 2% or less.

Road Safety Audit REPORT

Issue 157: Absence of detectable warning devices

Description of Safety Issue:

There are no detectable domes on the pedestrian ramps at the cross streets. These provide detection to the visually impaired that they are entering the roadway.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install detectable domes on the sidewalk ramps in the area to accommodate the visually impaired.

Road Safety Audit REPORT

Issue 158: Absence of pedestrian facilities

Description of Safety Issue:

The pedestrian ramps and signals in the NE, SE, and SW corners of the intersection of Oneida Street with the WIS 441 ramps are not ADA compliant. The push buttons are located away from the ramps.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant crosswalks and ramps for pedestrians in this area.

Road Safety Audit REPORT

Issue 159: Absence of pedestrian ramps

Description of Safety Issue:

The intersection of Oneida Street with WIS 441 south of the overpass does not have pedestrian ramps.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant crosswalks and ramps for pedestrians in this area.

Road Safety Audit REPORT

Issue 160: Countdown pedestrian signals

Description of Safety Issue:

The pedestrian signals at the Roeland Avenue/Valley Road intersection currently do not have filled hands. Filled symbols are more visible to the road users than unfilled symbols.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install countdown pedestrian signals and signs on all corners of the intersection. These have been found to increase safety for pedestrians.

Road Safety Audit REPORT

Issue 161: Diagonal ramp, pedestrian detector on signal pole

Description of Safety Issue:

There is a diagonal ramp and pedestrian detector on the signal pole on the SE corner of the intersection with Roeland Avenue/Valley Road.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install two separate directional ramps and two separate stand alone pedestrian poles for the detectors.

Road Safety Audit REPORT

Issue 162: Narrow sidewalk

Description of Safety Issue:

There is a 5 foot sidewalk at the back of curb on Oneida Street, north of WIS 441, which is not ADA compliant. Sidewalk located directly at the back of the curb should be a minimum of 6 feet wide.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Widen the sidewalk in this area to a minimum of 6 feet to be ADA compliant.

Road Safety Audit REPORT

Issue 163: No pedestrian signals

Description of Safety Issue:

There are no pedestrian signals on Oneida Street, north of WIS 441. The pedestrian ramp at the NE corner is broken/cracked up.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

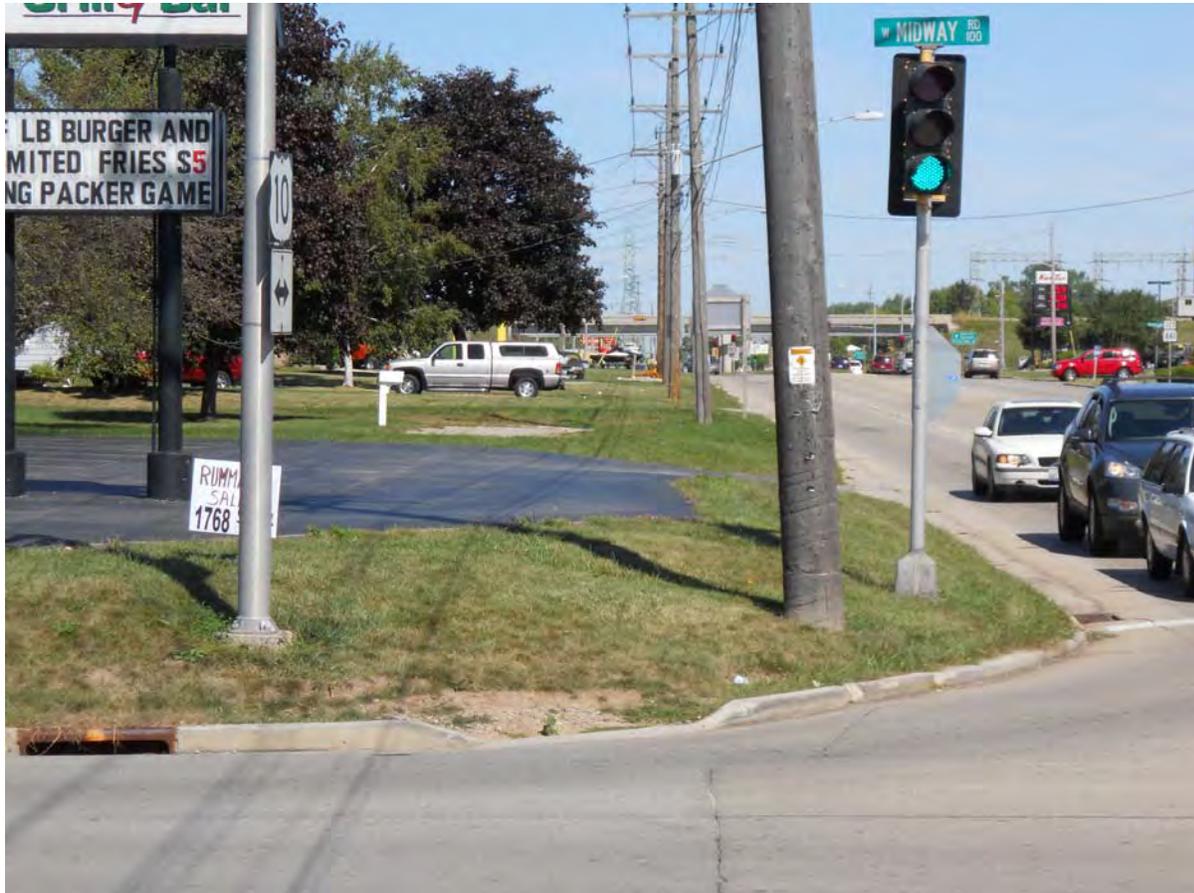
Install ADA compliant crosswalks and ramps for pedestrians in this area. Provide pedestrian facilities in the proposed condition.

Road Safety Audit REPORT

Issue 164: No sidewalks or ramps

Description of Safety Issue:

There are no sidewalks and pedestrian ramps in the northwest corner of the intersection of Oneida Street at Midway Road.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Install ADA compliant crosswalks and ramps for pedestrians in this area.

Road Safety Audit REPORT

Issue 165: Tripping hazards

Description of Safety Issue:

The sidewalk on the east side of Oneida Street south of WIS 441 has tripping hazards. The sidewalk on the west side of Oneida Street north of WIS 441 has tripping hazards. This is not ADA compliant.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Repair the sidewalk to be ADA compliant.

Road Safety Audit REPORT

Issue 166: Utility pole next to sidewalk ramp

Description of Safety Issue:

The utility pole next to the sidewalk ramp at the southwest corner of Roeland Avenue/Valley Road intersection has no protection. This can be a hazard to a vehicle that runs off the road in this area.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: High

Resulting Road Safety Risk: Medium

Suggestion:

Relocate the utility pole away from the intersection to remove the potential safety issue.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

2 Pedestrians

Issue 167: No pedestrian signals or crosswalks

Description of Safety Issue:

There are no pedestrian signals or crosswalks at the northwest corner of Oneida Street at Midway Road.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Add pedestrian signals and crosswalks to this corner to accommodate pedestrians in the area.

Road Safety Audit REPORT

2.6 SPECIAL ROAD USERS

8 Public transport

Issue 168: Bus stops not ADA compliant

Description of Safety Issue:

The bus stops on Oneida Street are not ADA compliant.



Safety Risk:

Exposure: Medium

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Low

Suggestion:

Construct boarding and alighting areas for all bus stops on Oneida Street.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

1 Lighting

Issue 169: Glare from luminaires

Description of Safety Issue:

The current non-cutoff (drop-lens) luminaires on Oneida Street can produce glare.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Replace the existing luminaires with cutoff luminaires.

Road Safety Audit REPORT

Issue 170: Lighting levels low

Description of Safety Issue:

The illumination levels are low in this area. Luminaires are currently located on joint-use poles at inconsistent spacing.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Relocate the luminaires to separate poles to achieve maximum desired illumination of the roadway.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

2 Signs

Issue 171: Railroad crossing warning sign

Description of Safety Issue:

The railroad crossing warning supports for the railroad tracks are within the clear zone. This could be a hazard for vehicles that run off the road in this area.



Safety Risk:

Exposure: High

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Reconstruct the crossing area to remove the supports from the clear zone. If this is not possible, utilize frangible equipment for the application or shield the support posts for protection.

Road Safety Audit REPORT

Issue 172: Sign reflectivity

Description of Safety Issue:

The sign panels on several of the signs on Racine Road have faded. This causes a loss in visibility of the sign messages to the motorist, especially at night.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Replace the current faded signs with new signs that are more visible at night.

Road Safety Audit REPORT

Issue 173: Tilted signs

Description of Safety Issue:

Several of the signs on Racine road are tilted in one direction, typically back or upward. This reduces the visibility of the sign and the reflectivity of the sign panel to the motorist at night.

Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Modify the sign posts to be vertical.

Road Safety Audit REPORT

Issue 174: Sign in wrong location

Description of Safety Issue:

There is a two-way left turn lane sign in the wrong location. The sign is also in poor condition.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Replace and relocate the current with a new sign further north on Oneida Street near the current two-way left turn lane.

Road Safety Audit REPORT

Issue 175: Multiple sign panels on one post

Description of Safety Issue:

There are back to back sign panels of different sizes on the same post. Different types of signs are on the same post. This can obscure the shapes of the signs which are important to convey the message to motorists.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Relocate signs to individual posts for each separate message.

Road Safety Audit REPORT

Issue 176: Street name signs

Description of Safety Issue:

The street name signs are not readily visible at the major intersections. Adequate visibility of the street name signs helps to guide motorists approaching the intersection and allow for advance lane change maneuvers.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install overhead internally illuminated street name signs at the signalized intersections.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

3 Marking and delineation

Issue 177: Pavement markings in right turn lanes

Description of Safety Issue:

There are no right turn arrow pavement markings in the right turn lanes on Oneida Street. When the proposed roundabouts are constructed, motorists will require guidance on lanes uses.



Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install right turn arrow pavement markings in the right turn slip lanes through the proposed roundabouts.

Road Safety Audit REPORT

2.7 LIGHTING, SIGNS AND DELINEATION

3 Marking and delineation

Issue 178: Long taper

Description of Safety Issue:

The southbound right turn lane on Oneida Street, north of WIS 441 has a long taper with no striping. This area of pavement can be confusing to motorists as to the location of each lane.



Safety Risk:

Exposure: Low

Probability: Medium

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install skip striping along the taper area to help define lanes.

Road Safety Audit REPORT

Issue 179: Stop bar not perpendicular

Description of Safety Issue:

The stop bar on the northbound approach at the intersection of Oneida Street and Midway Road is not perpendicular to the approach.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Restripe the stop bar to be perpendicular to the approach.

Road Safety Audit REPORT

Issue 180: Striping transition

Description of Safety Issue:

The current striping transition from the two-way left turn lane to the left turn lane on Oneida Street is not in accordance with current standards.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Restripe the transition between the center two-way left turn lane to the left turn lane to be in accordance with current standards.

Road Safety Audit REPORT

B Street Crossings

B.1 Presence, Design, and Placement

Issue 181: Drainage inlet within return

Description of Safety Issue:

On the northeast corner of the intersection of Oneida Street and Midway Road, there is a drainage inlet within the return. Vehicles were observed driving around to avoid the inlet.



Safety Risk:

Exposure: Low

Probability: Very Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Relocate the inlet and establish a gutter pan outside of the return and away from the wheel path.

Road Safety Audit REPORT

Issue 182: Evidence of overtracking

Description of Safety Issue:

There is evidence of overtracking at the driveways and at Oneida Street and Meadow Grove Boulevard.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Increase the radius at the driveways and Meadow Grove Boulevard to accommodate the heavy vehicle traffic in the area.

Road Safety Audit REPORT

Issue 183: No returns

Description of Safety Issue:

The intersection of Oneida Street at Primrose Lane has no returns.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Add radial returns at this intersection.

Road Safety Audit REPORT

Issue 184: Overtracking

Description of Safety Issue:

There is evidence of overtracking at the Roeland Avenue/Valley Road intersection.

Safety Risk:

Exposure: Low

Probability: Low

Consequence: Very Low

Resulting Road Safety Risk: Very Low

Suggestion:

Increase the returns to accommodate the heavy vehicle traffic in the area.

Road Safety Audit REPORT

B Street Crossings

B.6 Access Management

Issue 185: Conflict points

Description of Safety Issue:

The roadway has unrestricted access with a center two-way left turn lane. There are many conflict points due to multiple driveways and side streets.



Safety Risk:

Exposure: High

Probability: High

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Install a raised median in the center two-way left turn lane on Oneida Street, but maintain access into Fox Valley Estates on Primrose Lane. This will eliminate many conflict points and has been shown to reduce crashes.

Road Safety Audit REPORT

Issue 186: Access into Kwik Trip gas station

Description of Safety Issue:

Vehicles were observed driving over the raised concrete gore area to turn left into Meadow Grove Road/Kwik Trip gas station.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Install a left turn lane with adequate queue length and deceleration length into Meadow Grove Road/Kwik Trip gas station.

Road Safety Audit REPORT

Issue 187: Conflicting left turn movement

Description of Safety Issue:

The roadway has unrestricted access with a center two-way left turn lane. There are many conflict points due to multiple driveways and side streets.



Safety Risk:

Exposure: High

Probability: High

Consequence: High

Resulting Road Safety Risk: High

Suggestion:

Install a raised median on Oneida Street between WIS 441 and Valley Road and restrict left turn access to the substation.

Road Safety Audit REPORT

Issue 188: Driveway close to intersection

Description of Safety Issue:

The north driveway to the substation near the intersection of Oneida Street with Valley Road/ Roeland Avenue is close to the intersection. The substation has two driveways onto Oneida Street.



Safety Risk:

Exposure: Medium

Probability: Medium

Consequence: Medium

Resulting Road Safety Risk: Medium

Suggestion:

Close the north driveway to the substation. This driveway is close to the intersection and the turning movements can interfere with the operations of the signalized intersection.

Road Safety Audit REPORT

B Street Crossings

B.9 Signals

Issue 189: Signal head backplates

Description of Safety Issue:

The signals at the intersection of Oneida Street and Midway Road have standard backplates.



Safety Risk:

Exposure: Low

Probability: Low

Consequence: Low

Resulting Road Safety Risk: Low

Suggestion:

Install reflective backplates at the intersection to improve visibility of the signal heads.