

5.0 A Crash Potential #1 (Risk Category E) – Visibility

Observations:

- Sign Overload – there are many signs at and on the approaches to the intersection



Suggested Improvements:

- Consider removal of near side “Turning Vehicles Yield to Pedestrians” . As vehicles are waiting to turn left at the intersection, these near side signs are not visible to the driver.

City Response:

Remove eight near side “Turning Vehicles Yield to Pedestrians” per work order #54932.

Timeline: Completed 3/1/2019

5.1B Crash Potential #1 (Risk Category E) – Visibility

Observation:

- Sign Placement



Suggested Improvement:

- Relocate far right signs, bring down below pedestrian signal heads, raise pedestrian signal heads to maintain 7' bottom height
- Relocate far left signs, place on backside of near right signs
- No Turn on Red signs should be replaced by sign on span wire (static case sign or blank out sign)

City Response:

MMUTCD requires that the mounting height of a pedestrian signal to be between 7' and 10' (Section 4E.05). The size of "Turning Vehicles Yield to Pedestrians" would not allow this criteria to be met if signs and pedestrian signals were switched. In response to the suggested improvements the eight far side "Turning Vehicles Yield to Pedestrians" will be lowered per work order #54935

Timeline: Completed 3/1/2019

5.1C Crash Potential #1 (Risk Category E) – Visibility

Observations:

- Utility Lines are in front of signal heads



Suggested Improvements:

- Request that the utility company raise their lines on the existing poles
- If signal is rebuilt use tie-offs to float signal heads in front of the utility lines

City Response:

City staff has requested that ATT investigate a resolution to this situation.

Timeline: unknown.

5.1D Crash Potential #1 (Risk Category E) – Visibility

Observation:

- The strain pole on the SW quadrant can block view of pedestrians from EB traffic



Suggested Improvement:

- Relocate the strain pole as part of a signal modernization

City Response:

The City is not implementing any changes at this time. The existing right of way is insufficient to address this crash potential. The proposed roundabout installation will removal all traffic signal control equipment which will increase pedestrian visibility.

Timeline: 2021

5.1E Crash Potential #1 (Risk Category E) – Visibility

Observation:

- The utility pole on the NB approach blocks signs at corner



Suggested Improvement:

- Move the stop bar back and move signs onto or in front of the utility pole

City Response:

In response to the suggested improvement the city will relocate the “No Turn on Red” sign in front on utility poll per work order #54938. Stop bar will be relocated away from intersection in the spring of 2019.

Timeline: **Sign?** Pavement marking will be updated in the spring of 2019 (see attached pavement marking detail). 4/1/2019 Moved No Turn on Red signs to the span wire.

5.1F Crash Potential #1 (Risk Category E) – Visibility

Observation:

- EB traffic may miss the mid-block pedestrian crossing



Suggested Improvements:

- Move the warning sign and diagonal down arrow to near side of intersection
- Upgrade pavement markings
- Reduction of signs at main intersection

City Response:

City Staff has elected to keep current location of pedestrian warning sign as moving it to the west side of the intersection would require that sign be placed further away from the edge of the road making it less obvious. Pavement marking will be update in the spring.

Timeline: Pavement marking will be updated in the spring of 2019.

5.1G Crash Potential #1 (Risk Category E) – Visibility

Observation:

- Near and Far left turn case signs can be confusing or obstruct signal heads



Suggested Improvements:

- Use all single sided case signs, eliminating the near side arrow and only
- Re-position case signs and signal heads to provide visibility on all 4 approaches
- Add a low level signal head to far right strain pole (NW quadrant facing east)

City Response:

Blank backplates will be added to the four case signs per work order #54940. Case signs and signals are placed in accordance with the MMUTCD. Visibility obstruction is a byproduct of the horizontal and vertical curves in the area and is considered minimal and does not warrant additional of low level signal head which could be considered as unnecessary clutter. Roundabout installation will remove all traffic signal equipment visibility obstructions.

Timeline: Work is complete. 2/20/19

5.1H Crash Potential #1 (Risk Category E) – Visibility

Observation:

- General visibility of signal heads



Suggested Improvements:

- Add tethers and backplates to the signal heads

City Response:

The City of Battle Creek will add tethers and backplates as per work order #55185

Timeline: Spring 2019 / As weather permits.
Completed 4/3/2019

5.2A Crash Potential #2 (Risk Category E) – Signal Timing

Observations:

- There is a short cycle length of 60 seconds throughout the day leading to long queues during peak hours
- Pedestrians using the west leg conflict with SB right turns causing only 2-3 vehicles to get through on green



Suggested Improvement:

- Revisit city's modeling to make sure that pedestrians are accurately represented in the models
- Increase the cycle length
- Add a leading pedestrian interval to get peds started while traffic is held under all redphase

City Response:

The City of Battle Creek's engineering staff revisited the model and determined that a longer cycle length and leading pedestrian interval would lower the overall level of service from a B/C to a C/D. This was to be acceptable and new control equipment will need to be installed to accomplish this improvements.

Timeline: Summer of 2019

5.2B Crash Potential #2 (Risk Category E) – Signal Timing

Observations:

- Pedestrian crossing times may be too short based on latest standards
- Pedestrian pushbuttons only turn on walk for one leg at a time



Suggested Improvement:

- Re-evaluate the pedestrian crossing times using the MDOT clearance interval spreadsheet
- Consider putting pedestrians on recall during peak periods, need to push the button the rest of the day
- Program the signal to turn on the parallel walk leg when a pushbutton is pressed

City Response:

The Pedestrian timing will be adjusted as suggested by MDOT during the controller upgrade and leading pedestrian interval programming. The pedestrian recall is not being pursued due to a fear of pedestrian during non-peak times failing to use the push buttons. This may be revisited in the future if detailed pedestrian counts are taken. Similarly the parallel walk activation is not being pursued due to the possibility of delayed pedestrian crossings a situation that will be addressed with the leading pedestrian interval.

Timeline: Spring 2019

5.3A Crash Potential #3 (Risk Category D) – Non-Compliance

Observation:

- Vehicles turning on red



Suggested Improvement:

- Improve visibility
 - Align signs with drivers vision
 - Relocate signs to spans
 - Blank out signs
 - Reduce sign clutter
- More enforcement

City Response:

With the addition of tethers the “No Turn on Red” signs that are currently located on the strain poles will be relocated to the span per Work order #55186. Report was also shared with the Battle Creek Police Department for enforcement consideration.

Timeline: Spring 2019 / As weather permits
Completed 4/3/2019

5.3B Crash Potential #3 (Risk Category D) – Non-Compliance

Observation:

- Red light running



Suggested Improvement:

- Update signal clearance intervals
- Add backplates to improve signal head visibility
- Increase cycle length

City Response:

Signal control will be upgraded to allow a leading pedestrian interval and longer cycle length and clearance intervals per Work order #55187. Backplates will be installed per work order #55185.

Timeline: Spring 2019

5.3 C Crash Potential #3 (Risk Category D) – Non-Compliance

Observation:

- Pedestrians not pushing the pushbuttons



Suggested Improvement:

- Modify signal controller to turn on parallel ped signal with activation
- Turn on pedestrian recall for peak pedestrian periods
- Perform maintenance on SE corner pushbutton mounted to strain pole, not always working

City Response:

Signal control will be upgraded to allow a leading pedestrian interval and longer cycle length and clearance intervals per Work order #55187. Pedestrian observation will be made to determine if parallel pedestrian signal activation is needed. Detailed pedestrian counts were requested as part of the 2019 Multi-modal counts which may help with determining if pedestrian peak recall is needed.

Timeline: Spring 2019

5.4 A Crash Potential #4 (Risk Category D) – Driver expectation

Observation #1:

- Pedestrians crossing at unmarked crosswalks away from intersection



Suggested Improvements:

- Issue a TCO and install signs to prohibit crossing at Emmett Loop intersection
- Add fences to discourage crossing
- Restrict employee use of loading zone doors

City Response:

No Action. It was determined that compliance and enforcement of the recommended TCO unlikely and a fence installation could create more of a hazard. Staff will continue to work with Bronson to encourage staff to only use legal crosswalks.

Timeline: NA

5.4B Crash Potential #4 (Risk Category D) – Driver expectation

Observation:

- Bus stops near the intersection



Suggested Improvements:

- Review need for bus stop sign since the transit route map does not show the south leg as a stop

City Response:

Three bus stops were evaluated with Battle Creek Transit leadership. Work order #54663 was issued to relocate the stop located at 285 North Ave and Work order #54664 was issued to relocate the stop located at 300 North Avenue further away from the intersection. Work order #55126 was issued to remove the stop located at Emmett St W and College St.

Timeline: Completed 2/20/19

5.5 Crash Potential #5 (Risk Category C) – Geometrics

Observation:

- The north and east legs have horizontal curves approaching the intersection, inhibiting sight distance to the signal
- The east leg also has a vertical grade change



Suggested Improvement:

- Realign east leg of the intersection to smooth out the curves
- Consider high friction pavement on east leg
- Review clearance intervals with respect to grades
- Add low level signal head in northwest quadrant facing east

City Response:

Suggested improvements will be considered if it is determined that a roundabout installation is not feasible which could incorporate alignment changes, high friction pavement and the elimination of all traffic signal equipment.

Timeline: NA

5.6 A Crash Potential #6 (Risk Category B) - ADA Ramps and Sidewalks

Observation:

- Some ramps and pushbutton locations are not ADA compliant, relating to ramp slopes and provision of landings adjacent to pushbuttons.

Suggested Improvement:

- Upgrade ramps to comply with grading requirements
- Relocate pushbuttons to meet ADA and MDOT guidelines

City Response:

No Action. Ramp and push button relocation to current guidelines will be considered if roundabout solution is considered not feasible which would not require any pedestrian push button equipment.

Timeline: NA

5.6B Crash Potential #6 (Risk Category B) – ADA Ramps and Sidewalks

Observation:

- Strain pole located in the middle of the sidewalk



Suggested Improvement:

- Obtain an easement to provide full width sidewalk around the pole or relocate pole as part of a signal modernization

City Response:

Easement and relocation of strain pole will be considered if roundabout solution is considered not feasible which would remove all existing traffic signal control equipment.

Timeline: NA

5.6C Crash Potential #6 (Risk Category B) – ADA Ramps and Sidewalks

Observation:

- Sidewalk abruptly ends along south side of Emmett at West Street



Suggested Improvement:

- Provide a pedestrian crossing of Emmett at West Street

City Response:

No action. Cost of extending the sidewalk to the Linear Park would require retaining wall to be constructed. Sidewalk serves as a collector for Bronson's Employee parking lot which makes removal not practical. Bronson indicated that some fence may be installed around the existing parking lot. If this is the case the City/Bronson may consider improvements to this section of sidewalk to better serve the new demands.

Timeline: NA

5.6D Crash Potential #6 (Risk Category B) – ADA Ramps and Sidewalks

Observation:

- On the north leg, east side of road there is a guy wire missing a protective guard



Suggested Improvement:

- Add guy guards

City Response:

City staff contacted Comcast to repair infrastructure in the area and add guy guard.

Timeline: completed

5.7A Crash Potential #7 (Risk Category B) – Pavement Markings

Observation:

- Pavement marking lacking retroreflectivity



Suggested Improvements:

- Upgrade all markings with new thermoplastic
- Recess the special markings
- If a financial issue, prioritize crosswalks, stop bars and then long lines
- If choosing to use waterborne applications, apply twice per year
- Maintain markings using in-kind materials (don't mix materials)

City Response:

Pavement marking will be upgraded per attached pavement marking detail.

Timeline: Spring 2019

5.7B Crash Potential #7 (Risk Category B) – Pavement Markings

Observation:

- The crosswalks are high emphasis but just the minimum width



Suggested Improvements:

- To provide greater emphasis, widen markings to a minimum 8' as shown below

City Response:

Pavement marking will be upgraded per attached pavement marking detail.

Timeline: Spring 2019

5.7C Crash Potential #7 (Risk Category B) – Pavement Markings

Observation:

- Non-standard left turn markings were noted in the field

Suggested Improvements:

- Review pavement marking standards for left turn lanes
- Shouldn't need markings or signs for continuous left turn lanes

City Response:

Pavement marking will be upgraded per attached pavement marking detail.

Timeline: Spring 2019

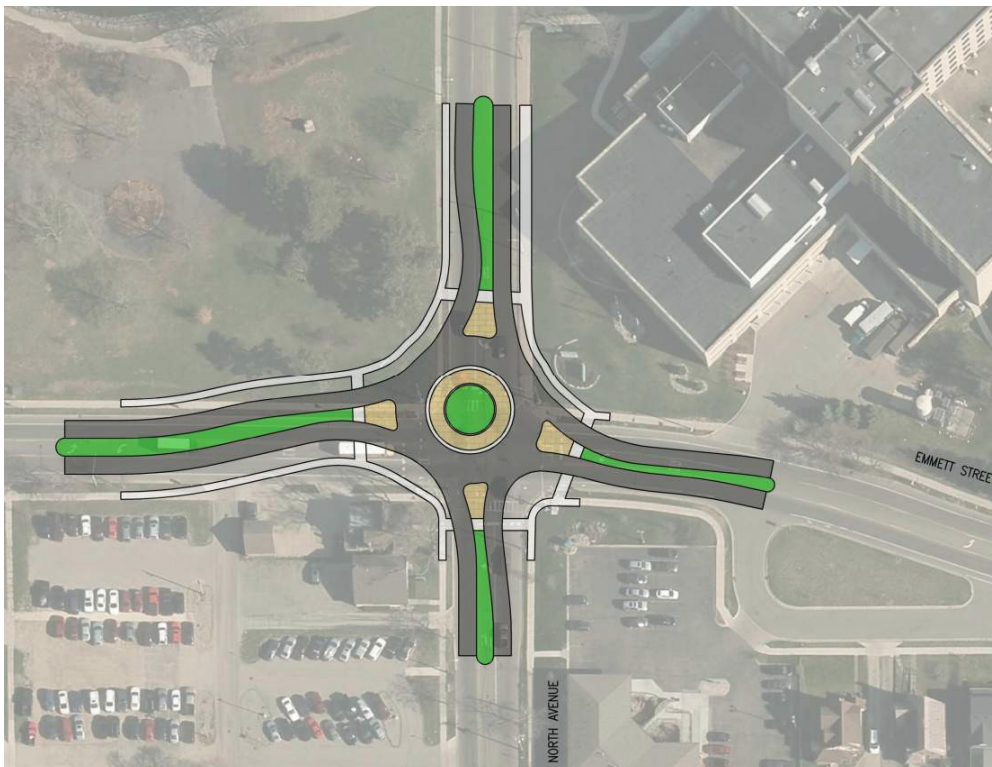
5.8 Other Items Considered

There were some other items discussed following the field reviews, which did not neatly fit into any of the seven highlighted crash potentials. These items are summarized below:

Long Term Recommendation - Roundabout

Observation:

- Many pedestrians are crossing at all legs of the intersection
- Traffic volumes are relatively even on all approaches
- Right of way on 3 out of 4 quadrants are owned by stake holders (Bronson Battle Creek Hospital -SE and NE, City of Battle Creek NW)



Suggested Improvement:

- Construct a single lane modern roundabout in place of the signalized intersection
 - According to MDOT's crash reduction factors a roundabout provides a 78% reduction in fatal and injury crashes and a 57% reduction in minor crashes.
- Include splitter islands wide enough to shelter pedestrians

City Response:

City staff have begun to reach out to neighboring agencies that have had success with roundabout installation. Site visit is scheduled with Washtenaw County Road Commission to discuss design elements, public relations strategies and cost. Staff has also began grant funding research and has conclude that project would be eligible for the Michigan Department of Transportation (MDOT) Congestion Air Quality Mitigation grants as well as MDOT Safety Program grants as early as fiscal year 2021.

Timeline: 2021

Bus Shelter

Observations:

- Many pedestrians are crossing at all legs of the intersection



Suggested Improvements:

- Consider the addition of a shelter in shuttle lot to promote use
- Encourage car-pooling to reduce parking demand of offsite lots

City Response:

Suggested was shared with Bronson Leadership as part of the Road Safety Audit wrap up meeting.

Timeline: NA

Tunnel

Observations:

- Many pedestrians are crossing at all legs of the intersection



Suggested Improvement:

- A pedestrian tunnel above ground or underground would limit exposure of pedestrians to vehicle traffic

City Response:

Anticipated cost and level of use does not make this a viable option. Additionally the soil conditions in the area and elevated ground water could make this solution not feasible.

Timeline: NA

6.4 Parking Garage

Observations:

- Many pedestrians are crossing at all legs of the intersection



Suggested Improvement:

- A parking garage would provide additional parking spaces adjacent to the hospital and limit exposure of pedestrians to vehicle traffic

City Response:

Anticipated cost and level of use does not make this a viable option. Additionally the soil conditions in the area and elevated ground water could make this solution not feasible.

Timeline: NA