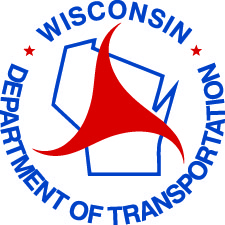
**C:\Users\Mark\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.MSO\1D2E1142.png**

**Intersection Control Evaluation Worksheet**

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| --- | --- | --- |
| **Prepared By** | Becky Reese | **Date** |
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|  |  |  |

Revised: March 31, 2014



**NOTE:** Attach Items in BLUE as appendices

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| --- | --- | --- | --- | --- | --- |
| **Intersection:** | Main Street and Merrill Avenue | **Design Project ID:** | 4110-30-00 | **Project Description:** | Main St, City of Fond du Lac |

| **Factor** | **Existing Traffic Control** Existing Signalized Intersection | **Alternative 1** Alternative Signalized Geometry |
| --- | --- | --- |
| **Safety** |  |  |
| Crash diagram trends | Seventeen total crashes occurred during the five year study period (2009-2013). Of the 17 crashes, the most abundant crash type was rear-end crashes (5). The second most prevalent crash types were side-swipe crashes (3) and fixed object crashes (3). A total of 3 out of the 17 crashes resulted in injury, all type C. The injury crash rate was 0.11 per MEV. Most crashes were low speed with minor property damage. Possible geometric layout may be cause of some crashes. No other major trends observed. More information can be found on each of the crashes that occurred in the intersection in Attachment A. | |
| Percent and type of crashes expected to be reduced by alternative | A reduction in crashes is not expected from this alternative. | A reduction in Hit Object crashes would be expected from this alternative as well as angle crashes. |
| Access near the intersection and side road traffic impacts | On-street parking is located on both Main St and Merrill Ave. Several access points are in close proximity to the intersection as well. The near side driveway on SB Main St is approximately 100' north of the intersection. The far side driveway on SB Main St is approximately 50' south of the intersection. | |
| Additional considerations | Sign and signal placement will be looked at further to enhance safety. Lighting may be a factor as well. | |
| **Operational Analysis** |  |  |
| Discuss the Warrant Analysis  (Attach AWSC/Signal warrants) | No signal warrant analysis conducted due to existing signalized intersection. | No signal warrant analysis conducted due to existing signalized intersection. |
| LOS, delay, v/c ratio and 95th percentile queues for each movement. (Attach traffic count, forecast and analysis inputs/outputs) | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **AM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | |  | - | - | - | LT | TH | RT | LT | TH | - | - | TH | RT | | **# of Lanes** | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | | **LOS** |  |  |  | B | B | B | B | B |  |  | B | B | | **Delay (s)** |  |  |  | 10.9 | 11.4 | 15.3 | 12.4 | 11.8 |  |  | 11.7 | 11.4 | | **v/c Ratio** |  |  |  | 0.015 | 0.086 | 0.430 | 0.008 | 0.272 |  |  | 0.265 | 0.217 | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** | B | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **PM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | LT | TH | RT | LT | TH | - | - | TH | RT | | **# of Lanes** | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | | **LOS** |  |  |  | B | B | B | B | B |  |  | B | B | | **Delay (s)** |  |  |  | 10.4 | 10.9 | 16.4 | 15.8 | 16.6 |  |  | 14.5 | 12.2 | | **v/c Ratio** |  |  |  | 0.023 | 0.094 | 0.536 | 0.035 | 0.569 |  |  | 0.449 | 0.234 | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** | B | | | | | | | | | | | |   **Notes:** | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **AM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | LT | TH | RT | LT | TH | - | - | TH | RT | | **# of Lanes** | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | | **LOS** |  |  |  | B | B | B | B | B |  |  | B | B | | **Delay (s)** |  |  |  | 10.9 | 11.5 | 16.2 | 12.7 | 12.1 |  |  | 12 | 11.6 | | **v/c Ratio** |  |  |  | 0.016 | 0.097 | 0.482 | 0.008 | 0.298 |  |  | 0.289 | 0.236 | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** | B | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **PM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | LT | TH | RT | LT | TH | - | - | TH | RT | | **# of Lanes** | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | | **LOS** |  |  |  | B | B | B | B | B |  |  | B | B | | **Delay (s)** |  |  |  | 11.0 | 11.6 | 19.3 | 15.6 | 16.4 |  |  | 14.2 | 11.7 | | **v/c Ratio** |  |  |  | 0.026 | 0.108 | 0.623 | 0.038 | 0.597 |  |  | 0.469 | 0.244 | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** | B | | | | | | | | | | | |   **Notes:** |
| Queue impact on adjacent driveways | There is no queue impact on adjacent driveways. | There is no queue impact on adjacent driveways. |
| Capacity to accommodate diverted freeway traffic for routes parallel to freeway | N/A | N/A |
| Impacts of railroad crossings within 1000 feet | N/A | N/A |
| Preliminary Layout of existing and proposed traffic control | See Appendix | See Appendix |
| Additional considerations (Indicate if roundabout is expected to be a spiral design) |  | |
| **Right-of-Way Impacts** |  |  |
| Amount of acreage impacted (# of relocations, access restrictions) | N/A | N/A |
| Anticipated right-of-way and real estate costs (Attach cost estimate tables) | N/A | N/A |
| Additional considerations |  | |
| **Costs** |  |  |
| Discuss estimated costs (Attach itemized cost estimate tables) | N/A |  |
| Operations and Maintenance Costs |  |  |
| Additional considerations | USH 45 (Main St) within the project limits is a Connecting Highway. CSD is anticipated. | |
| **Practical Feasibility** |  |  |
| Concerns alternative may present | N/A |  |
| Major impacts on businesses, parking availability, real estate and utilities | N/A |  |
| Frequency of use as an alternate route | N/A | |
| Additional considerations |  | |
| **Pedestrians and Bicycles** |  |  |
| Describe the need for pedestrian and bicycle facilities | N/A |  |
| Identify nearby pedestrian generators, bike routes, transit stops and if the intersection is on a Safe Route to School (part of existing conditions exhibit) | N/A | N/A |
| State if and what facilities are proposed, within, the project limits (part of preliminary layout of proposed alternatives) | N/A | N/A |
| Additional considerations | Trans 75 applies. | |
| **OSOW Freight Network** |  |  |
| Identify nearby OSOW generators | STH 23 with USH 151: Longer OSOW loads have difficulties making the WB 23 to SB 151 turning movement at the interchange. OSOW generally need to back up several times to make turn. There is a high wind industry volume here. | |
| If either intersecting road is on the freight network, is a significant diversion route or near a freight origin or destination discuss the following:   * The geometric features and other design considerations to account for the OSOW vehicle path (e.g. grading, medians, islands). * Vertical and horizontal clearance to account for the OSOW vehicle path (e.g. monotubes, signing) | N/A |  |
| Additional considerations |  | |
| **Environmental Impacts** |  |  |
| Type (i.e. historical, archeological, wetlands or hazardous material) and amount of environmental acreage impacts | N/A | N/A |
| Additional considerations |  | |

| **Factor** | **Alternative 2** Roundabout | **Alternative 3** |
| --- | --- | --- |
| **Safety** |  |  |
| Crash diagram trends | Seventeen total crashes occurred during the five year study period (2009-2013). Of the 17 crashes, the most abundant crash type was rear-end crashes (5). The second most prevalent crash types were side-swipe crashes (3) and fixed object crashes (3). A total of 3 out of the 17 crashes resulted in injury, all type C. The injury crash rate was 0.11 per MEV. Most crashes were low speed with minor property damage. Possible geometric layout may be cause of some crashes. No other major trends observed. More information can be found on each of the crashes that occurred in the intersection in Attachment A. | |
| Percent and type of crashes expected to be reduced by alternative | Angle collisions would be eliminated with a roundabout design. Additionally, the severity of property damage would decrease as the speed in roundabouts would be less. |  |
| Access near the intersection and side road traffic impacts | On-street parking is located on both Main St and Merrill Ave. Several access points are in close proximity to the intersection as well. The near side driveway on SB Main St is approximately 100' north of the intersection. The far side driveway on SB Main St is approximately 50' south of the intersection. | |
| Additional considerations |  | |
| **Operational Analysis** |  |  |
| Discuss the Warrant Analysis  (Attach AWSC/Signal warrants) | No signal warrant analysis conducted due to existing signalized intersection |  |
| LOS, delay, v/c ratio and 95th percentile queues for each movement. (include traffic count, forecast and analysis inputs/outputs) | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **AM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | - | - | - | - | - | - | - | - | - | | **# of Lanes** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | **LOS** |  |  |  |  |  |  |  |  |  |  |  |  | | **Delay (s)** |  |  |  |  |  |  |  |  |  |  |  |  | | **v/c Ratio** |  |  |  | 0.24 | 0.27 |  |  | 0.24 |  |  | 0.43 |  | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** | A | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **PM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | - | - | - | - | - | - | - | - | - | | **# of Lanes** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | **LOS** |  |  |  |  |  |  |  |  |  |  |  |  | | **Delay (s)** |  |  |  |  |  |  |  |  |  |  |  |  | | **v/c Ratio** |  |  |  | 0.40 | 0.45 |  |  | 0.49 |  |  | 0.61 |  | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** | B | | | | | | | | | | | |   **Notes:** | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **AM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | - | - | - | - | - | - | - | - | - | | **# of Lanes** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | **LOS** |  |  |  |  |  |  |  |  |  |  |  |  | | **Delay (s)** |  |  |  |  |  |  |  |  |  |  |  |  | | **v/c Ratio** |  |  |  |  |  |  |  |  |  |  |  |  | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** |  | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **PM PEAK** | **EB** | | | **WB** | | | **NB** | | | **SB** | | | | - | - | - | - | - | - | - | - | - | - | - | - | | **# of Lanes** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | **LOS** |  |  |  |  |  |  |  |  |  |  |  |  | | **Delay (s)** |  |  |  |  |  |  |  |  |  |  |  |  | | **v/c Ratio** |  |  |  |  |  |  |  |  |  |  |  |  | | **Queue (ft)** |  |  |  |  |  |  |  |  |  |  |  |  | | **Int. LOS** |  | | | | | | | | | | | |   **Notes:** |
| Queue impact on adjacent driveways |  |  |
| Capacity to accommodate 5-20% of diverted freeway traffic for routes parallel to freeway |  |  |
| Document railroad crossings within 1000 feet of the intersection. | N/A |  |
| Preliminary Layout of existing and proposed traffic control | See Appendix | See Appendix |
| Additional considerations  (Indicate if roundabout is expected to be a spiral design) |  | |
| **Right-of-Way Impacts** |  |  |
| Amount of acreage impacted (# of relocations, access restrictions) |  |  |
| Anticipated right-of-way and real estate costs (Attach cost estimate tables) |  |  |
| Additional Considerations |  | |
| **Costs** |  |  |
| Discuss estimated costs (Attach itemized cost estimate tables) |  |  |
| Operations and Maintenance Costs |  |  |
| Additional considerations |  | |
| **Practical Feasibility** |  |  |
| Concerns alternative may present |  |  |
| Major impacts on businesses, parking availability, real estate and utilities |  |  |
| Frequency of use as an alternate route |  | |
| Additional considerations |  | |
| **Pedestrians and Bicycles** |  |  |
| Describe the need for pedestrian and bicycle facilities |  |  |
| Identify nearby pedestrian generators, bike routes, transit stops and if the intersection is on a Safe Route to School (part of existing conditions exhibit) |  |  |
| State if and what facilities are proposed, within, the project limits (part of preliminary layout of proposed alternatives) |  |  |
| Additional considerations |  | |
| **OSOW Vehicle Routes** |  |  |
| Identify nearby OSOW generators |  | |
| If either intersecting road is on the freight network, is a significant diversion route or near a freight origin or destination discuss the following:   * The geometric features and other design considerations to account for the OSOW vehicle path (e.g. grading, medians, islands). * Vertical and horizontal clearance to account for the OSOW vehicle path (e.g. monotubes, signing) |  |  |
| Additional considerations |  | |
| **Environmental Impacts** |  |  |
| Type (i.e. historical, archeological, wetlands or hazardous material) and amount of environmental acreage impacts |  |  |
| Additional considerations |  | |
| **Recommendation** | | |
|  | | |