

CTH JJ Proposed Speed Limit
 0.1 miles east of Lightning Drive to 0.2 miles east of French Road



DISCLAIMER: This map is not guaranteed to be accurate, correct, current, or complete and the conclusions drawn are the responsibility of the user.

ENGINEERING AND TRAFFIC SPEED STUDY CTH JJ

Lightning Drive to CTH N
Outagamie County

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Prepared for Outagamie County Highway Department
OMNNI Project No. E2211A15

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CONTENTS

EXECUTIVE SUMMARY 1
INTRODUCTION..... 2
EXISTING CONDITIONS..... 3
TRAFFIC DATA 6
TRAFFIC CRASH DATA..... 8
ENGINEERING ANALYSIS 10

APPENDICES

- APPENDIX A – GIS MAPPING
- APPENDIX B – TRAFFIC VOLUME AND SPEED DATA SUMMARY
- APPENDIX C – CRASH DATA

EXECUTIVE SUMMARY

Currently on CTH JJ, north of the City of Appleton, Outagamie County, Wisconsin, there is a 55 mph speed zone that extends from approximately 600 feet east of Lightning Drive to CTH N/Freedom Road and further east. Residents and local officials have raised questions regarding whether the existing 55 mph speed zone starting near Lightning Drive and extending east to CTH N/Freedom Road should be revised. OMNNI Associates, Inc. (OMNNI) was retained by the Outagamie County Highway Department to conduct an Engineering and Traffic Speed Study to determine the reasonable and prudent speed limit along CTH JJ from Lightning Drive to CTH N/Freedom Road. The purpose of the study is to determine if the existing 55 mph speed limit from Lightning Drive to CTH N/Freedom Road should be lowered.

Geometric information, existing roadway characteristics, traffic volumes and speed data were collected for the study. The annual average daily traffic for this segment of CTH JJ ranged from approximately 4,300 vehicles per day (vpd) east of Holland Road to 6,600 vpd west of French Road. Traffic data was collected at three locations within the study limits in July 2016.

After reviewing the existing roadway characteristics and traffic data, we recommend that the speed limit along CTH JJ between Lightning Drive and French Road be lowered to 45 mph and that the speed limit along CTH JJ between French Road and CTH N/Freedom Road remain at 55 mph.

INTRODUCTION

OMNNI Associates, Inc. (OMNNI) was retained by the Outagamie County Highway Department to conduct an Engineering and Traffic Speed Study to determine the reasonable and prudent speed limit on CTH JJ between Lightning Drive and CTH N/Freedom Road, located in the City of Appleton, Town of Grand Chute, and Town of Vandebroek, Outagamie County, Wisconsin.

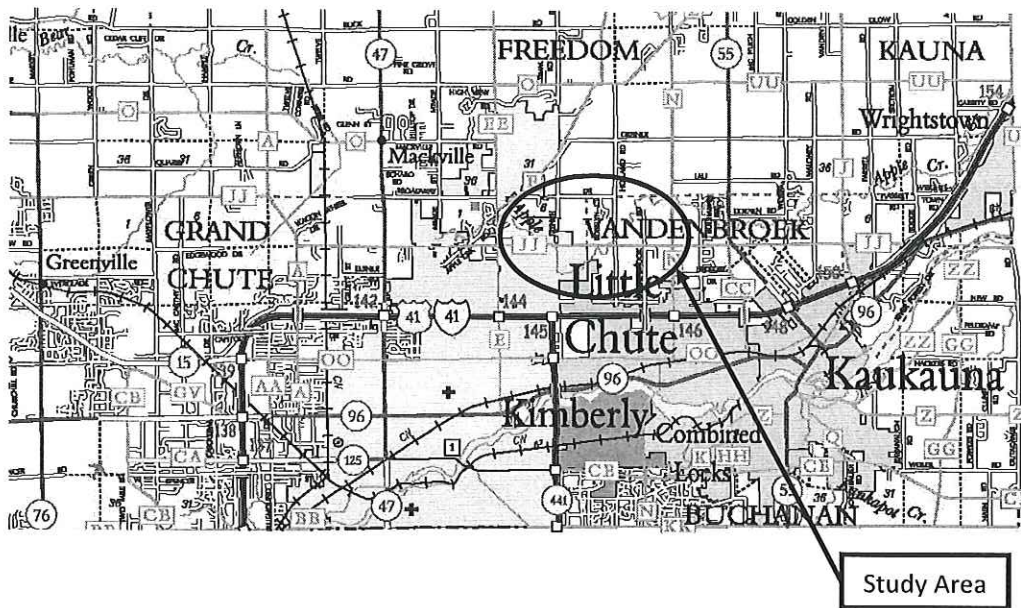
The purpose of this speed study is to determine if the existing 55 mph speed limit located east of Lightning Drive should be revised. This report documents the data, procedures, findings and recommendations of the traffic speed study. This study was completed under the guidance of the *Wisconsin Transportation Bulletin 21 – Setting Speed Limits on Local Roads* and the *Wisconsin Statewide Speed Management Guidelines – June 2009*.

Wisconsin State Statutes establish speed limits for roadways based on the type of roadway. The state statutes also give local and state governments the authority to change the speed limit of a roadway, but within a certain constraint. Since this route is a County Trunk Highway, the State statute lists the speed limit at 55 mph. The local governing authority can lower the speed limit by 10 mph or less. However, if the highway is located within an “outlying area” or a “semiurban area” as defined by Wisconsin State Statutes, the fixed speed limit is 35 mph with local government able to raise the speed limit to 55 mph or less and to lower the speed limit by 10 mph or less. Even if a proposed change is within the allowable constraints, all speed limit revisions shall be based on an engineering and traffic speed study.

EXISTING CONDITIONS

CTH JJ (Edgewood Drive) is an east-west major collector highway within the developing area of the City of Appleton and Town of Grand Chute and also within the rural area of the Town of Vandebroek. CTH JJ is an alternate east-west route to IH 41 between CTH A and CTH J. Traffic counts conducted by the OMNNI Associates in July 2016 show the average annual daily traffic (AADT) volume on CTH JJ to be approximately 6600 vehicles per day west of French Road and 4400 vehicles per day east of Holland Road.

The study length is approximately 2.75 miles long. See below for an overview of the study area.



CTH JJ has a 2-lane rural cross section with wide paved shoulders through the project limits. Spot curb and gutter exists along the south side east of Lightning Drive and along the north and south side of the road east of Holland Road. The existing pavement on CTH JJ is in good condition.

The existing horizontal alignment is straight throughout the study limits. Within the study limits, the existing vertical alignment is flat and appears to meet standards for a 55 mph posted speed.

Left turn lanes and right turn lanes exist at the intersections of Lightning Drive while rural bypass lanes and right turn lanes exist at the intersections of Mary Martin Drive, Cherryvale Avenue and Edgewood Trail. Right turn lanes are provided at Providence Avenue and CTH N/Freedom Road. Holland Road, French Road, Vandebroek Road, and Farmview Road have right turn tapers but no marked bypass lanes.

Stopping sight distances for intersecting roadways along CTH JJ appear adequate. No sidewalks exist along CTH JJ within the study limits.

Land use along the study corridor is generally residential or agricultural/undeveloped, with commercial pockets near the intersections of CTH E/Ballard Road and CTH N/Freedom Road, and institutional for Appleton North High School near Lightning Drive.

Existing Speed Limits

The existing speed limits located near and within the study length are as follows:

- 35 mph from Ballard Road to approximately 600' east of Lightning Drive
- 55 mph from Lightning Drive east to CTH N/Freedom Road

School speed limits also exist near and within the study corridor. A 25 mph school speed limit is posted for Appleton North High School, with the zone starting approximately 400 feet west of CTH E/Ballard Road and extending past the primary school grounds to a point approximately 400 feet east of Lightning Drive.

Municipality Boundaries

The City of Appleton and the Town of Grand Chute cross or parallel different segments of the study corridor. Review of the Outagamie County GIS mapping shows the corporate limits of the City of Appleton generally as follows:

- CTH E/Ballard Road to Lightning Drive on both sides of highway
- Lightning Drive to approximately 250 feet east of Cherryvale Avenue on south side of highway
- Approximately 2500 feet west of French Road to 1300 feet east of French road on north side of highway
- The remainder of the study corridor until the Town of Vandebroek is in the Town of Grand Chute

The Town of Vandebroek limits begin approximately 2700 feet east of French Road and continue east along both sides of the highway through the project limits. See Appendix A for GIS mapping.

Existing conditions can best be understood through the following site photos:



CTH JJ Facing West
Looking at Lightning Dr
Existing Speed Limit = 35 mph



CTH JJ Facing West
Near Holland Road
Existing Speed Limit = 55 mph

TRAFFIC DATA

The annual average daily traffic for this segment of CTH JJ was approximately 6600 vehicles per day west of French Road and 4400 vehicles per day east of Holland Road based upon traffic counts conducted by the OMNNI Associates in July 2016.

Traffic speed data was collected by OMNNI Associates from July 18, 2016 to July 25, 2016 using pneumatic road tube data collectors. Three data recorders were placed on CTH JJ for the study at locations that were determined to be indicative of typical motorist behavior for a section of the project corridor. Traffic volume, vehicle classification and vehicle speeds were all collected at each location.

The first data collector was located approximately 2300 feet (0.44 miles) west of the intersection of CTH JJ/French Road. The second data collector was located approximately 400 feet (0.08 miles) east of the intersection of CTH JJ/French Road. The third data collector was located approximately 1400 feet (0.27 miles) east of Holland Road. Please refer to Appendix B for the traffic volume and speed data.

As part of the speed study, several data items were analyzed. These included the following:

- Average speed
- 85th percentile speed
 - The 85th percentile speed is where 85% of free-flowing traffic travels at or below that speed. It represents the speed that is perceived to be reasonable by the majority of motorists.
- 10 mph pace speed
 - The 10 mph pace is the ten mile per hour range of speeds containing the greatest number of observed speeds.
- Amount of traffic exceeding the posted speed limit
- Secondary roadway attributes
 - This includes factors such as the number of driveways, truck volume, sight distance, on-street parking, pedestrian and bicycle activities and level of law enforcement.

Traffic Data

| | Counter #1 | | Counter #2 | | Counter #3 | |
|-----------------------------------|---------------------------|-----------|-------------------------|-----------|-----------------------------|-----------|
| | ~ 2300' west of French Rd | | ~400' east of French Rd | | ~1400 ft east of Holland Rd | |
| | Eastbound | Westbound | Eastbound | Westbound | Eastbound | Westbound |
| Posted Speed Limit | 55 mph | | 55 mph | | 55 mph | |
| % Traffic Exceeds Speed Limit | 7.6% | 1.9% | 23.8% | 50.4% | 36.4% | 55.5% |
| Average Speed | 49 mph | 46 mph | 51 mph | 55 mph | 53 mph | 56 mph |
| 85 th Percentile Speed | 54 mph | 51 mph | 57 mph | 61 mph | 58 mph | 61 mph |
| 10 mph pace | 45-54 mph | 42-51 mph | 48-57 mph | 51-60 mph | 50-59 mph | 52-61 mph |
| % Traffic in 10 mph pace | 71.8% | 72.2% | 62.0% | 59.5% | 71.7% | 68.0% |

Secondary Roadway Characteristics:

| | |
|-------------------------------|--|
| Number of Driveways | 32 |
| Number of Intersections | 9 |
| Truck Volume | 5.6% West of French Road 11.4% East of French Road 13.8% East of Holland Road (per OMNNI traffic counts 7/2016) |
| Parking | No on-street parking |
| Pedestrian/Bicycle Activities | Minimal |

TRAFFIC CRASH DATA

Traffic crash data was obtained from the WisTransPortal Database along the study area of CTH JJ from Lightning Drive to CTH N from January 2011 through December 2015. Crashes located north and south of the subject intersections remained in the data, if they were deemed to be intersection related. Within the study area, there were forty crashes during the 5 year time period studied. Below is a tabulation of crash types:

| | |
|--------------------------------|----|
| Angle | 15 |
| Traffic Sign | 6 |
| Sideswipe Same Direction | 5 |
| Ditch | 2 |
| Other non-collision | 3 |
| Rear-End | 5 |
| Head-on | 1 |
| Sideswipe – Opposite Direction | 1 |
| Culvert | 1 |
| Overtaken Vehicle | 1 |
| Total | 40 |

Below is a tabulation of the crash locations with relation to intersections:

| | |
|--------------------------------|----|
| Lightning Drive | 1 |
| Providence Ave | 1 |
| French Road | 11 |
| Cherryvale | 2 |
| Edgewood Trail | 1 |
| Holland Rd | 7 |
| Vandenbroek Rd | 3 |
| CTH N | 13 |
| Various Locations along CTH JJ | 1 |
| Total | 40 |

Below is a tabulation of the crash severity:

| | |
|--------------------|----|
| Property Damage | 27 |
| Possible | 4 |
| Non-incapacitating | 7 |
| Incapacitating | 2 |
| Fatal | 0 |
| Total | 40 |

The crash rate for CTH JJ from Lightning to CTH N is 181.14 crashes per 100 million vehicle miles traveled (MVM). The Statewide Average Crash Rate for Rural County Trunk Highways = 99.80 crashes per 100 MVM (2014) and the Statewide Average Crash Rate for Urban Streets (includes rural city streets) = 332.33 crashes per 100 MVM (2014).

ENGINEERING ANALYSIS

After reviewing the traffic and site data, it is recommended to analyze this project as two segments:

- Segment 1 – Lightning Drive to French Road
- Segment 2 – French Road to CTH N/Freedom Road.

Prevailing Speed

The prevailing speed, the speed at which most drivers choose to drive, is a major consideration in setting speed limits. Typically, a proposed speed limit should be set within 5 mph of the 85th percentile speed. However, the median speed, 10 mph pace speeds and roadway characteristics should also be considered when determining a speed recommendation.

Segment 1 – Lightning Drive to French Road

A review of the traffic data indicates that the 85th percentile speeds for traffic west of French Road (Site #1) were 54 mph eastbound and 51 mph westbound. The traffic data also indicates that the majority of motorists are driving at or below the posted speed limit between Lightning Drive and French Road. The 10 mph pace for traffic in this segment is 45-54 mph for eastbound traffic and 42-51 mph for westbound traffic.

Segment 2 – French Road to CTH N/Freedom Road

A review of the traffic data indicates that there is a significant amount of traffic that travels above the posted speed limit between French Road to CTH N. The 85th percentile speeds for traffic east of French Road (Site #2) were 57 mph eastbound and 61 mph westbound. The 85th percentile speeds for traffic east of Holland Road (Site #3) were 58 mph eastbound and 61 mph westbound. The traffic data for this project indicates that a majority of motorists are driving higher than the posted speed limit between French Road and CTH N. The 10 mph pace for traffic in this segment ranged from 48-57 mph for eastbound traffic to 52-61 mph for westbound traffic.

Crash Data

Another item to consider when determining speed zones is safety. The existing crash rate for the entire project limits of the speed study is higher than the statewide crash rate for rural county trunk highways but lower than the statewide crash rate for urban streets. As the area is a transitioning area, it is reasonable that the crash rate would be between the two different crash rate types.

Segment 1 – Lightning Drive to French Road

The crash data discussed earlier in the report was further analyzed for the two segments of the project. Segment 1, including crashes at the intersection of French Road, had 14 crashes over 5 years. The crash rate for CTH JJ from Lightning thru French Road is 154.97 crashes per 100 million vehicle miles traveled (MVM).

The intersection of CTH JJ and French Road experienced 11 crashes over the 5 years of the study period.

Segment 2 –French Road to CTH N/Freedom Road

Segment 2, not including crashes at the intersection of French Road, had 26 crashes over 5 years. The crash rate for CTH JJ from French Road to CTH N is 161.89 crashes per 100 million vehicle miles traveled (MVM).

The intersection of CTH JJ and CTH N experienced 13 crashes over the 5 years of the study period.

State Statute Classification

In addition, the classification of the surrounding area should also be considered when determining speed zones. The corporate limits are necessary for classification of an “outlying district” and “semiurban district” in order to determine the fixed speed limits per the Wisconsin State Statutes.

Per State Statute 346.57 (1)(ar), an “outlying district” is defined as “the territory contiguous to and including any highway within the corporate limits of a city or village where on each side of the highway within any 1,000 feet along such highway the buildings in use for business, industrial or residential purposes fronting thereon average more than 200 feet apart.” This statute would apply to the portions of CTH JJ that are within the City of Appleton. State Statute 346.57(4) would allow the fixed speed limit to be 35 mph for an outlying district.

A “semiurban district” is defined as “the territory contiguous to and including any highway where on either side of the highway within any 1,000 feet along such highway the buildings in use for business, industrial or residential purposes fronting thereon average not more than 200 feet apart or where the buildings in use for such purposes fronting on both sides of the highway considered collectively average not more than 200 feet apart. This statute would apply to the portions of CTH JJ that are within the Town of Grand Chute and the Town of Vandebroek. State Statute 346.57(4) would allow the fixed speed limit to be 35 mph for a semiurban district.

Segment 1 – Lightning Drive to French Road

Since the area between Lightning Drive and French Road is located within the City of Appleton, the area along CTH JJ could be considered an “outlying district”. As such, the Wisconsin State Statutes list the speed limit as 35 mph with the option for the local government authority to raise the speed limit to 55 mph or less or lower the speed limit by 10 mph or less.

Segment 2 –French Road to CTH N/Freedom Road

A review of the building frontage along CTH JJ within the Town of Grand Chute and Town of Vandebroek shows one pocket of roadside development that would meet the definition of semiurban district. The residential section near Holland Road meets this definition and is approximately 0.34 miles in length. Typically, speed zones should be at least 0.3 miles in length. However, setting the speed limit solely on the definition of a semiurban district at this location is

not recommended. Other factors such as 85th percentile speed, crash history and prevailing speed should also be considered.

Recommendations

Segment 1 – Lightning Drive to French Road

As this segment is within the City of Appleton, it can be considered an outlying district with a fixed speed limit of 35 mph. The 85th percentile speeds indicate that traffic is traveling less than the posted 55 mph speed limit with an average speed ranging from 46 mph to 49 mph and an 85th percentile speed of 54 mph for eastbound and 51 mph for westbound. Based on the Wisconsin Statewide Speed Management Guidelines, a posted speed should be within 5 mph of the 85th percentile speed. In addition, it should be noted that the intersection of CTH JJ and French Road has experienced eleven crashes over the last five years. It is recommended that the speed limit from Lightning Drive to French Road be lowered to 45 mph.

Segment 2 – French Road to CTH N/Freedom Road

Since the majority of this segment does not meet the definition of an outlying district or semiurban district, the fixed speed limit according to the Wisconsin State Statutes is 55 mph. The 85th percentile speeds indicate that traffic is traveling more than the posted 55 mph speed limit with an average speed ranging from 51 mph to 56 mph and an 85th percentile speed of 57 mph for eastbound and 61 mph for westbound. Based on the Wisconsin Statewide Speed Management Guidelines, a posted speed should be within 5 mph of the 85th percentile speed. It is recommended that the speed limit from French Road to CTH N/Freedom Road remain at 55 mph.