

MEMO

TO: Chairperson Davis and Committee Members
FROM: Andrew M. Beyer, P.E., Director of Public Works/City Engineer
DATE: July 23, 2024
RE: Public Safety & Welfare Committee Meeting of August 7, 2024

Agenda Item: Review and take possible action: Speed Study for Carriage Hill Drive

Background:

In response to public comments and as directed by the Public Safety & Welfare Committee, further vehicle speed data was collected in May and June of 2024 and a speed study was performed on Carriage Hill Drive between West Main Street and Endeavour Drive. The purpose of the study was to determine what speeds drivers are driving on the roadway segment as per public comment received by the Committee. Data was first collected on December 27, 2023, and then collected on May 29, 2024, as well as June 23, 2024. These additional speed studies were conducted to collect data during peak traffic hours which captured traffic activity during high school release times and park events at Brandt Quirk Park. It was determined by the Engineering Division that peak hours occurred during school release and park events. Data collection followed guidance set forth in the Wisconsin Department of Transportation (WisDOT) Statewide Speed Management Guidelines. The instrument used to collect speed data was a Laser Tech (LTI) TruSpeed S LiDAR speed detector, which was provided by the City of Watertown Police Department.

On May 29, 2024, data was collected from Country Lane near the intersection with Carriage Hill Drive. School released at 2:00 PM. 214 spot speeds were measured over a total time of one hour, exceeding the requirements set forth in the Statewide Speed Management Guidelines. This number also surpasses the requirement of 30 samples for statistical significance as required by the Central Limit Theorem. The summary of collected data from May 29, 2024, is shown below in Table 1A:

Table 1A: Summary of Collected Data

Time	Direction of Travel	Average Speed	50 th Percentile	85 th Percentile	Pace Speed Range
1:30 PM-2:30 PM	North Bound	27.7	27.1	30.9	24 to 33
1:30 PM-2:30 PM	South Bound	30.7	30.1	32.9	26 to 35

It can be noted from the Pace Speed Range in Table 1A that the lower limit is around the posted speed limit of 25 miles per hour.

On June 23, 2024, data was collected from Country Lane near the intersection with Carriage Hill Drive. A large softball tournament was in progress with games at 7:00 AM and 8:30 AM. 109 spot speeds were measured over a total time of one hour, exceeding the requirements set forth in the Statewide Speed Management Guidelines. This number also surpasses the requirement of 30 samples for statistical significance as required by the Central Limit Theorem. The summary of collected data from June 23, 2024, is shown below in Table 1B:

Table 1B: Summary of Collected Data

Time	Direction of Travel	Average Speed	50 th Percentile	85 th Percentile	Pace Speed Range
7:30 AM-9:00 AM	North Bound	27.6	26.6	29.9	24 to 33
7:30 AM-9:00 AM	South Bound	30.5	29.3	34.0	25 to 34

It can be noted from the Pace Speed Range in Table 1B that the lower limit is around the posted speed limit of 25 miles per hour.

Current land use in the surrounding area is institutional, recreational, and single family residential. Notably the Watertown High School property is east of Carriage Hill Drive, Brandt-Quirk Park is north and west of Carriage Hill Drive, and single-family residential subdivisions are west of Carriage Hill Drive.

The 5-year crash data along the roadway segment is shown below in Table 2:

Table 2: 5 Year Crash Data (Community Maps – Traffic Safety for Wisconsin)

Year	Total Number of Incidents	Speed Related Incidents	Incidents Involving Injury
2019	2	-	-
2020	1	1	1
2021	1	1	-
2022	2	-	-
2023	-	-	-
Total	6	2	1

Carriage Hill Drive is classified as a minor arterial roadway. Pavement width generally measures 35' and includes a 4' wide striped shared bike lane. A 2.5' wide concrete curb and gutter is installed adjacent to both sides of the pavement edge. Per City code, parking on both sides of Carriage Hill Drive is prohibited between Oak Street and Endeavor Drive from 7:30 am to 4:00 pm Monday through Friday. A concrete shared-use path was constructed roughly 36' to the east of the eastern back of curb.

Per the WisDOT Statewide Speed Management Guidelines, speed limits should be within 5 mph of the 85th percentile speed. It can be seen in Table 1A and Table 1B that the speed limit of 25 mph is exceeded by at least 5 mph in all 85th percentiles. This percentile corresponds to what is referred to as the "reasonable and proper" speed, as per the average driver's perception of roadway conditions. According to the Statewide Speed Management Guidelines, "Implementing speed limits on roadways aims to strike a balance between safety and mobility for the traveling public." The guidelines also mention the correlation between speed variance and crash rate, reinforcing the need for an accurate speed limit. In addition, the WisDOT Statewide Speed Management Guidelines state driving at the 85th percentile speed results in the least likelihood of a crash.

There are many secondary roadway attributes relevant to the study area. Secondary roadway attributes on Carriage Hill Drive include large volumes of regional traffic, driveways, intersections, on-street parking, pedestrian and bicycle activity, level of law enforcement, and divergence between functional classification and practical function. Due to the existence of secondary roadway attributes, it may be advisable to use the measures outlined in the Statewide Speed Management Guidelines: "When the analyst concludes and documents that significant secondary roadway attributes like these exist, the factors may call for a proposed speed limit that is significantly lower (greater than 5 mph) than the 85th percentile speed. The 50th percentile operating speed rounded to the nearest five-mile per hour increment may be a suitable alternate recommendation."

According to the Statewide Speed Management Guidelines: "It should also be noted that setting a regulatory speed limit based on secondary roadway attributes versus observed speeds may have negative effects including:

- Higher financial cost due to the need for increased enforcement to ensure driver compliance.
- Potential for increased crashes due to larger variability in vehicle speeds.
- Mistrust of highway and enforcement officials and potential disregard for other speed limits, because motorists do not readily perceive the need for lower speeds."

From the data collected and analysis conducted, the Engineering Division presents the following options from least expensive to most expensive. It should be noted that the below measures need to be designed and/or funded prior to implementation.

- Maintain the speed limit at 25 mph (based on secondary roadway attributes)
- Raise the speed limit to 30 mph (based on 85th percentile from study)
- Implement “Your Speed” signs on both north and south bound lanes
- Implement one or more traffic calming measures to reduce speeds
 - Add additional trees on both sides of the street in the terrace area
 - Reduce traffic lane widths and increase shared bike lanes via pavement marking (mini- road diet).
 - Add centerline double yellow striping
 - Strategically placed bumpouts
 - Narrow (chicane) the pavements at the intersection of Country Lane and Carriage Hill Drive (see attached Exhibit 1)
 - Implement one-sided dedicated parking with lateral lane shift
 - Reduce overall pavement width to minimize traffic lane widths (Road diet) – long term plan. This would result in a wider terrace area
- Increased enforcement

ATTACHMENTS:

- Exhibit 1, Chicane (Narrow)