

THATCHER AVE SPEED STUDY

Introduction

Thatcher Ave was identified as an area of interest due to its imbalanced lane configuration and observed speeding during initial field assessments. The Village confirmed the location was known to have speed issues, and this was further supported upon reviewing the results of the Village-wide survey. In the corridor from Division St to Chicago Ave, 21 residents complained that drivers were speeding along Thatcher Ave.

TEG's analysis focuses on a single representative section of the corridor including one segment and its two bounding intersections. While it is likely speed conditions will apply to the areas south and north of the studied corridor, a more in-depth study of the full corridor will need to be completed at a different time or as an extension of the findings in this report. TEG is aware that the Village would like to provide bike infrastructure through the corridor in the future. TEG noted this portion of Thatcher Ave has already been identified to receive a bike lane within the Village's Comprehensive Plan approved in 2019. All recommendations will take future bike accommodations into account. Knowing this, TEG will use this study as a starting point to determine existing issues that need to be addressed in conjunction with new bike facilities that make cyclists feel safe on the road.

Existing Conditions Analysis

The existing road is designed with an imbalanced lane configuration with two southbound lanes and one northbound lane. Center striping is provided throughout the corridor with parking lanes striped along the east side of the road. The width of the road is approximately 41' with three 11' lanes and one 8' parking lane. A curb and gutter is provided along both sides of the road with lighting throughout the corridor. The east side of Thatcher is all residential and is lined with driveways, while the west side of the road is Cook County Forest Preserve. There is a railroad track running northwest to southeast crossing Thatcher Ave at the mid-point between Division St and Augusta St. The train crossing is fully equipped with flashing lights and gates for crossing vehicles. There are currently no gates for the sidewalk crossing.

The posted limit on Thatcher Ave is 25 mph and there are multiple speed limit signs posted for north and southbound traffic. This includes a driver feedback sign north and south of the study area for northbound traffic only. The speed limit of both side roads included in this analysis are also 25 mph.

At the termini intersections, Thatcher Ave maintains the same cross section with a break in the center striping to allow southbound traffic to turn left. The second southbound lane along Thatcher Ave allows drivers not turning left to go around the driver waiting to complete their left turn. TEG believes this was the intention of striping two southbound through lanes even though the directional split of traffic volumes along Thatcher Ave are close enough that an imbalanced lane configuration would not normally be considered. In this case TEG does not feel the imbalanced lanes are an issue unless they result in unsafe conditions along the segment or at either intersection.

The northern intersection with Division St is a minor stop-controlled tee-intersection with Thatcher Ave. The north leg of the intersection differs from the standard Thatcher Ave cross-section by restricting parking on the east side of the road using diagonal striping. North of the study terminus the road curves to the northeast. At the intersection, Division St has a two-lane cross section with a striped bike lane running along the outside of the travel lane north and south of the road. Parking is striped along the north side of

the road. Sidewalk is provided along the east side of Thatcher Ave from the south with a standard crosswalk striped across Division St. Sidewalk continues east along the north side of Division St, but does not continue along Thatcher Ave. There are two universities and a high school sports facility located along Division St and may serve as a trip destination for many drivers turning onto Division St.

There is potential for a high pedestrian demand in the corridor due to access for the Des Plaines River Trail requiring a theoretical cyclist to navigate the intersection between North Ave and Thatcher Ave before reaching the trail. Currently, there is no way for a cyclist to avoid this intersection without leaving River Forest and taking an indirect route to reach the trail. This indirect route is unnecessary assuming a cyclist could safely travel on Thatcher Ave. In the existing conditions with potential speeding along Thatcher Ave and no protected bike lane, most casual cyclists will feel unsafe sharing a lane with vehicles. This is the case along all roads with no striped/protected bike lanes, but especially when the route being entered is high volume (see next section) and along a curve where cyclists may be hard to see like Thatcher Ave. Making the corridor along Thatcher Ave from Chicago Ave to North Ave more cyclist friendly will promote multi-modality and address a lapse in the cycling network. TEG noted the potential for connectivity between the Des Plaines River Trail and the Illinois Prairie Path by installing bike lanes along Thatcher Ave and Madison Ave, but that goes beyond the scope of this study.

It is unclear if sight distances are acceptable for drivers waiting to turn from Division St. The curve north of the intersection does impair vision, but it appears minor. At a design speed of 25 mph the required intersection sight distance is 280'. It appears the existing sight distance on Division St is between 300'-400' looking north which is over the minimum. Speeding southbound drivers on Thatcher Ave may result in an insufficient sight distance based on the real-world speeds.

The southern intersection between Thatcher Ave and Augusta St is also a minor stop-controlled tee-intersection entering Thatcher Ave from the east side. Thatcher Ave maintains its standard cross-section north and south of the intersection. Augusta St is a two-lane two-way street with 12' lanes, center striping, and no on-street parking permitted. Sidewalk runs along the north and south side of Augusta St and along the east side of Thatcher Ave. There is a ladder-style crosswalk striped across Augusta St. Based on roadway features Augusta St appears to be lower volume than Division St (see next section), this may be due to the presence of multiple universities along Division St drawing traffic. Drivers on southbound Thatcher Ave cannot turn left onto Augusta St due to a sign restricting the movement.

The intersection between Thatcher Ave and Augusta St does not appear to have any geometric deficiencies in the existing condition. The left turn restriction at the intersection seemed unnecessary for capacity reasons, but it may have been implemented to improve safety. TEG sees no reason to restrict left turns at Augusta St in the existing condition. If a southbound driver was taking time to make a left turn the drivers behind them would have the option to go around using the outside southbound lane. From a safety standpoint there is clear vision of oncoming traffic for a driver waiting to turn left. It is unclear why the left turn restriction was initially put in place, but TEG recommends reconsidering how necessary this turn restriction is prior to implementing any countermeasures in the area.

Volume Analysis

Knowing the volumes along all studied routes and how they interact with each other is important to understanding the operation of the corridor and focusing on potential deficiencies. Based on traffic volume counts performed in December 2022, TEG found that average daily traffic (ADT) is roughly 10,000 vehicles

along Thatcher Ave, 5,200 vehicles along Division St, and 1,500 vehicles along Augusta St. Thatcher Ave has the highest north-south ADT in the Village other than Harlem Ave. Division St represents a moderately busy collector street and Augusta St functions as a residential road. This corridor gives a good sample of intersection volumes along Thatcher Ave to determine how the road interacts with small and large side-streets.

Along Thatcher Ave the primary concern is whether existing capacity during the peak hours is adequate to process the number of vehicles travelling through the corridor and entering from both intersections. Under free flow conditions approximately 1,900 vehicles can be processed per hour per lane. Based on peak hour volumes along Thatcher Ave, the roadway would be more than adequate for the existing peak hour volumes along Thatcher Ave of approximately 1,200 total vehicles including both directions of traffic. This is reflected in the Village-wide Synchro Traffic analysis in which Thatcher has an LOS of A or better at each intersection.

Based on these values the road should not experience traffic due to reaching capacity. Any traffic delays will be a result of drivers stopping at intersections to turn or to obey traffic control. Since the road is operating under capacity in both directions there is no reason to believe a secondary southbound lane would be required except. TEG's recommendation would be to install an auxiliary lane at the intersections instead of providing a second southbound lane for the extent of the corridor. In between the intersections, this center lane could either be a striped median or a two-way left turn lane to provide driveway access.

Currently the Level of Service (LOS) on Division St is an E which is failing, but both the northbound and southbound lanes on Thatcher Ave have a LOS of A. This means minimal delays for drivers turning off Thatcher Ave and long delays for drivers waiting to turn off Division St. This may encourage drivers on Division St to find other routes out of the Village that avoid the intersection between Division St and Thatcher Ave to avoid delays. More vehicles entered Division St than exited throughout the day and at both the AM and PM peak hour times. The imbalance is roughly 400 more vehicles per day entering than exiting and may be evidence of drivers attempting to avoid the delays while exiting using Division St.

The opposite pattern was observed at the intersection between Thatcher Ave and Augusta St where approximately 50% more drivers (300) exited Augusta St than drivers who turned from Thatcher Ave. The pattern is consistent throughout the day. TEG noted that most drivers at the intersection (~70%) turn right to go north on Thatcher Ave. Using the same roads the return trip would involve a left turn back onto Augusta St which is illegal at the intersection. This makes a return trip reversing the route originally taken impossible for 70% of drivers who are turning right off Augusta St. This may help to explain why so many drivers turned left at Division St. In a way this causes Division St and Augusta St to operate as a couplet where drivers turning right to leave Augusta St end up returning by turning left onto Division St to avoid the turn restriction at Augusta St. The result of this configuration is more traffic exiting Augusta St onto Thatcher Ave and more traffic reentering the Village by taking Thatcher Ave south and turning left onto Division St.

The LOS on Augusta St at the intersection is a C which is acceptable. Total traffic at the intersection is significantly less than at Division St and TEG expects that most drivers at Augusta St will wait in a short queue before turning onto Thatcher Ave. Knowing that traffic during the peak hour periods is roughly ~120 westbound vehicles it is unlikely that drivers experience pressure to turn quickly while waiting at the

intersection with Thatcher Ave. In most cases drivers waiting at the intersection will be in a queue of at most one to three vehicles.

Speed Analysis

TEG conducted a speed study along the segment of Thatcher Ave between Division St and Augusta St over a 24-hour period to determine the presence and extent of any existing speed issue in the area. When analyzing speed data, it is commonplace to look at the 85th percentile speeds as a representative sample of the speed that most drivers feel comfortable traveling at through the corridor. Typically, the speed limit and the 85th percentile speed are within a few miles per hour of each other. Along Thatcher Ave this is not the case. The 85th percentile speed was 41 mph – along a road posted with a speed limit of 25 mph. This is a significant speed differential that may result in drivers on Thatcher Ave feeling unsafe when attempting to follow the speed limit (other drivers honking or riding too closely).

Looking closer at the 85th percentile speeds broken down by lane TEG noticed that northbound drivers 85th percentile was 38 mph, the southbound inside lane 85th percentile was 42 mph, and the southbound outside lane 85th percentile was 44 mph. This could be indicative that the unbalanced lane configuration makes southbound drivers feel they can drive faster without feeling unsafe. This is expected because southbound drivers on the outside leg can speed without worrying about other drivers stopping to turn left. This explains the higher 85th percentile speed in the outside lane compared to the inside. Other factors for northbound traffic such as striped parking lanes making the lane appear narrower and multiple entering driveways likely work as a minor form of traffic calming reducing speeds for northbound traffic.

Compiling the 85th percentile for all lanes and breaking the data down by hour revealed that drivers were traveling anywhere between 9-21 mph over the speed limit in any given hour without exception. This is clearly a roadway with severe speed issues.

TEG noted that the Village does not currently have a road with a speed posted above 25 mph to cross the Village north-south other than Harlem Ave (30 mph). This may leave drivers looking for an efficient route to traverse north-south across the Village without going to the opposite end of the Village to use Harlem Ave. In its current state Thatcher Ave fills this niche operating as a perimeter road allowing drivers to use a route with minimal stops to get north-south efficiently. While filling its role as a perimeter road there are some design aspects of Thatcher Ave that may mislead drivers into thinking the road has a speed limit between 35-40 mph. These features include:

- Multiple southbound lanes
 - More than one lane per direction is not typical on low-speed roads.
- Road width
 - Similar to having multiple lanes per direction having a wide road-way signals to drivers it is a more major street and typically has higher speeds.
- Turning restrictions
 - Generally low-speed residential roads do not restrict turns onto other residential roads like at the intersection with Augusta St.
- Lack of pedestrian and cycling facilities
 - While there is a sidewalk along the east side of Thatcher Ave it is not continuous up to North Ave and there is no matching sidewalk along the west side of the road.
 - There are currently no bike facilities along Thatcher Ave.

- This might give drivers the impression that pedestrians/cyclists are not expected along the road.

These issues become worse if drivers are not paying attention to the posted limits or miss seeing a sign. Due to the severity of speeding, TEG feels that changes to the entire corridor may be warranted to correct the issue. These changes would include:

- reducing southbound traffic to one through-lane as a form of natural traffic calming
- Installing the bike lane along Thatcher Ave as described in the 2019 Comprehensive Plan
- Periodic raised intersections
 - This improvement would be most beneficial at entrances to the Village to address traffic along Thatcher Ave and drivers entering the Village from the west with the same improvement.

These improvements should effectively change the character of the road, which should in effect reduce driver speed. Due to the severity of the existing speed issue more countermeasures may be required in the future, but the current recommendations will change so much about the operation of the road that a reevaluation will be required before suggesting additional future countermeasures.

Crash Analysis

TEG analyzed crash data within the Village over a six-year period from 2016-2021 for Thatcher Ave from Division St to Augusta St

Higher speed crashes tend to result in more severe injuries, so addressing the speed will be key for improving safety in the corridor. Within the study area there has been two A-injuries and one cyclist crash. The studied segment has the highest crash rate along Thatcher Ave while the two studied intersection are the 4th and 6th highest scoring intersections along Thatcher Ave. TEG believes this is a good representative area for study including a segment, an all-way stop, and a minor leg stop.

Thatcher @ Division St: 18 Crashes 1 A-injury, 1 B-injury, 1 C-injury

4 Fixed Object

4 Turning Left: 1 B-injury

3 Rear End: 1 C-injury

3 Other Object

1 Head On: 1 A-injury

1 Angle

1 Turning Right

This intersection has seen several severe injuries and has had three crashes per year on average. No individual crash type stood out as a recurring crash pattern. Seeing a moderate crash rate coupled with a high injury rate where no one crash type stands out is more common at locations with existing speed issues. Since drivers are using the road at faster speeds than what was designed for, this has a significant impact on the curves, sight distances, and stopping distances. There is a higher likelihood of error or a driver losing control resulting in a variety of crash types with more injuries. This explanation makes sense

for the eight lane departure crashes (fixed object, other object, and head on) and accounts for the A-injury crash. Decreasing speeds along the road makes it less likely that drivers will lose control of their vehicle resulting in fewer lane departure crashes. The four crashes involving southbound left turning drivers and the two angle/turning right crashes are also less likely when oncoming traffic is slower. Slower oncoming vehicles gives waiting drivers more time to judge their turn. If a driver expects oncoming traffic to be moving at 25 mph this could also result in crashes when oncoming traffic is traveling over 60% faster than expected through the corridor.

Two of the three rear end crashes occurred between southbound drivers. In theory, if southbound traffic on Thatcher Ave was reduced to one lane of traffic the number of rear end crashes between drivers slowing down to turn right and drivers going straight would likely increase. TEG's goal at the intersection and through the corridor is safety. A reduction in perpendicular crashes and crash severity would provide significant safety improvements even if there was a moderate increase in the comparatively much less dangerous rear end crash type.

The lack of angle crashes suggests that sight distance is adequate at the intersection or drivers have adapted their driving to avoid turning southbound from Division St. This may explain why 70% of drivers on Division St turn right – it is unclear if the directional split is due to more drivers needing to go north to North Ave or if drivers who would want to turn southbound have changed their route to avoid turning left across Thatcher Ave.

Thatcher Ave @ Augusta St: 5 Crashes 2 B-injuries

2 Rear End

2 Angle: 1 B-injury

1 Pedalcyclist: 1 B-injury

While there is only about one crash per year at this intersection, there has been a high rate of injuries with 40% of the crashes that did occur resulting in B-injuries. Since this intersection has considerably lower volume than Division St it is expected that crash rates would also be lower. Despite this, seeing two angle crashes and a cyclist crash indicates the intersection may not be operating safely.

Due to only five total crashes occurring at the intersection, it is hard to establish a crash pattern. At this point, TEG feels that lower speeds in the corridor would have resulted in fewer injuries and may have resulted in several of the crashes not occurring at all. If traffic calming along the road is effective, TEG expects crash and injury rates to go down naturally at the intersection. The location should be reevaluated in the future to verify this is the case. Less than one crash per year would not generally warrant crash specific countermeasures. Unless one crash type becomes dominant, injuries remain common, or crash rates go up, TEG does not believe any crash specific countermeasures should be implemented at this intersection.

Thatcher Ave: From Division St to Augusta St: 6 Crash 1 A-injury, 1 B-injury, 1 C-injury

2 Fixed Object: 1 A-injury

3 Rear End: 1 B-injury

1 Other Object: 1 C-injury

The six crashes did not exhibit any patterns but did display a high rate of injuries, similar to the intersections. 50% of all crashes resulted in injuries with the most severe injury being an A-injury fixed object crash. Three of the six crashes involved a driver hitting a non-moving object due to lane departure. Generally, these types of crashes are exacerbated by higher speeds. The same can be said for the three northbound rear end crashes. TEG assumes these are vehicles stopping for a train or drivers turning into driveways since no other stop points are present. In these situations, both drivers going the speed limit would give the rear driver enough time to react to the lead driver braking.

Recommendations/Conclusion

There are severe speed issues throughout the study area; and it is likely these speed conditions extend beyond the studied location. Verification of these issues would need to be part of a more focused corridor study. The crash patterns in the area are also indicative of speeding. An 85th percentile speed of 41 mph on a 25 mph speed demonstrates a serious discrepancy between posted limit and the speed most drivers travel along the road at. To bring speeds in line with the existing speed limit, TEG believes changes would need to be made throughout the corridor not just the study area.

TEG noted that the road had the character of a higher speed road than the 25 mph posted speed. When this is the case and when the 85th percentile of drivers is significantly above the posted speed limit, it is important to consider if a speed limit adjustment is appropriate. Without studying the full corridor TEG would not make a specific recommendation for a new limit, but adjusting the limit up by even five miles per hour gives drivers the ability to go fast compared to other Village roads without going 40 mph in a residential area. Regardless of speed limit changes. TEG would recommend some traffic calming to bring speeds in line with what is safe for the roadway. TEG would strongly advise considering the Village's future goals for the Thatcher Ave corridor before making any changes. Since drivers have been driving 40 mph though the area for a while and are used to these speeds; reducing the speed in the corridor may have unintended consequences for the rest of the road network.

If the Village would like to follow through with traffic calming along the road TEG would advise using a variety of countermeasures and spacing countermeasures out through the corridor. Since this study found speed issues in the segment between Division St and Augusta St, these speed issues cannot necessarily be applied to the entire corridor without further study. These recommendations are given under the assumption that speed continues to be an issue south of the study area to Chicago Ave where the dual southbound lanes end. Similarly, TEG assumes speeds remain consistent to North Ave, since no major changes in roadway cross-section are present north of the Division St intersection. Past these intersections the road cross section changes and it is unclear if speeding would continue.

TEG recommends making the following changes to the corridor bounded by the signalized intersections of North Ave and Chicago Ave:

- Consider removing the second southbound lane or repurposing the lane for southbound left turns into driveways.
 - This lane is not needed for capacity reasons and if an auxiliary lane is necessary at an intersection it should not also be used as a through-lane (See Appendix C.03: Alternative Volumes & Level of Service – AM and Appendix C.04: Alternative Volumes & Level of Service – PM).
 - Having dual southbound lanes gives the impression the road is higher speed than what is posted.
 - If maintaining the secondary lane it should be changed from a through lane to a shared left turn lane for residents turning left into driveways along Thatcher Ave.
- Install bike facilities along the road
 - Following the 2019 Comprehensive Plan, TEG suggests providing bike facilities to promote connectivity to the Des Plaines River Trail to the north.
 - The existing condition with drivers traveling 40 mph is unsafe for a cyclist to try and share the lane.
- Install raised intersection(s) at the Chicago Ave (signalized) intersection and The Division St (minor-stop) intersection.
 - Since the road is posted 25 mph the slowdowns caused by raised intersections would be minimal (the raised intersection can be designed based on a desired speed).
 - Since it is a physical installation, drivers risk damaging their vehicle if they continue to speed at the current rates.
 - Evenly spacing the raised intersections helps to prevent drivers from immediately speeding up after passing the countermeasure.
 - Raised intersection planned at Division St benefits cyclists entering Thatcher Ave from the bike lane.
 - Raised intersection planned at Chicago Ave slows drivers on Thatcher Ave and drivers heading eastbound into the Village.

From a geometric and operational standpoint, the existing issues seem to be caused by the severe speeding in the corridor. TEG feels that resolving speed issues would mitigate the high rate of injury for crashes in the corridor. Slowing traffic down will have impacts to the road network and TEG believes a more in-depth corridor study would be beneficial to help ensure changes along the corridor do not result in unforeseen consequences for other nearby roads.