



MEMORANDUM

TO: Nicholas Hutchinson, Engineering
FROM: Cyrus Naheedy, Transportation
DATE: September 16, 2022
SUBJECT: Speed Limit Change on Packard Road, from Buhr Park/Easy Street to US-23/City Limits

Summary

This memorandum has been prepared to provide background and support for lowering the speed limit on Packard Road, between Buhr Park/Easy Street and US-23/City limits. The current speed limit for this corridor is 40 mph. Staff propose that the speed limit be lowered to 35 mph, consistent with the section of Packard immediately west of here.

Background

In May 2021, City Council passed Resolution R-21-0754 to install the 2021 Healthy Streets project. Like its predecessor project in 2020, 2021 Healthy Streets was designed in response in the COVID-19 pandemic, while also advancing goals from the Ann Arbor Moving Together Toward Vision Zero Comprehensive Transportation Plan (**Moving Together**) and the A2Zero Carbon Neutrality plan. Moving Together sets forth a list of strategies for improving the safety of Ann Arbor's streets. Through the Healthy Streets project, staff deployed one such strategy: focusing transportation investments on corridors and intersections with the most serious crashes. Staff are now proposing another Moving Together strategy: addressing the dangerous behavior of speeding.

As part of 2021 Healthy Streets, Packard Road was restriped to narrow vehicle lanes to standard urban design widths (10' for vehicle travel lanes), re-allocating the extra road space to add curbside bicycle lanes. This section of Packard Road is identified as a Tier 2 Focus corridor in Moving Together (p. 32-33), and "reducing vehicular speeds throughout Ann Arbor is likely the most effective, singular approach to improving safety on Ann Arbor's streets (p. 37)." By evaluating speed limits before and after a street is redesigned, the two approaches to reducing vehicular speeds can reinforce each other and further impact driver behavioral changes.

The policies outlined in Moving Together are reinforced at the state and federal levels, though there is some divergence regarding strategies. The U.S. Department of Transportation (**USDOT**) has recently outlined a National Roadway Safety Strategy, adopting a Safe System approach to addressing roadway safety. The strategy involves addressing and mitigating the risks of the transportation system by "building and reinforcing multiple layers of protection to both prevent crashes from happening in the first place and minimize the harm caused to those involved when crashes do occur." One of the objectives of the USDOT

strategy is Safer Speeds, which includes encouraging local jurisdictions to set context-appropriate speed limits and designing roadways that help to “self-enforce” speed limits. By comparison, the Michigan Department of Transportation’s (MDOT) Toward Zero Deaths safety campaign focuses on other unsafe driver behaviors rather than speeding. MDOT also does not explicitly discuss lowering vehicle speeds as a goal of engineering countermeasures, as they are limited by the Michigan Vehicle Code (MVC) which hews closer to previously established guidance for setting speed limits.

Analysis

Staff performed speed limit analyses of the corridor using several methodologies. Historically, traffic engineering guidance has used the 85th percentile of observed vehicle speeds as the starting point to set speed limits on a given corridor. Several methodologies referenced below do so as well, though more recent research has recommended incorporating other factors. These factors include lower percentile speeds (typically 50th percentile) for urban areas, surrounding land use context and crash/injury rates. Other methodologies focus primarily on the levels of activity and conflict on the corridor.

While the design change implemented on Packard Road is relatively less conspicuous than other reconfigurations deployed or under consideration throughout the City, data collected as part of 2021 Healthy Streets has shown promising changes in driver behavior. The 85th percentile of vehicle speed dropped from 47 mph to 42 mph, while the 50th percentile of vehicle speeds decreased from 42 mph to 36 mph.

To provide an initial baseline speed limit, staff referenced the most established methodology of those used in this report: **USLimits2**. USLimits2 comes from the Federal Highway Administration (FHWA), and the methodology was developed based on research through National Cooperative Highway Research Program 3-67. For USLimits2, a non-exhaustive list of input variables includes the following:

- Traffic information, including: traffic volume, 85th and 50th percentile speeds, parking usage, and bicyclist/pedestrian activity
- Crash data, including: total crashes and total fatal/injury crashes
- Roadway information, including: route type, section length, existing speed limit, number of lanes, driveways and signals

After completing an analysis using the USLimits2 web-based tool, the recommended speed limit based on USLimits2 analysis is 35 mph.

Next, staff referenced *Research Report 966* from the *National Cooperative Highway Research Program: Posted Speed Limit Setting Procedure and Tool (NCHRP SLS)*. NCHRP SLS is intended to focus on streets within more developed areas, compared to USLimits2 guidance that also includes highways. For NCHRP SLS, a non-exhaustive list of input variables includes the following:

- Traffic information, including: traffic volume, 85th and 50th percentile speeds, parking usage, and bicyclist/pedestrian activity, presence of sidewalk/sidewalk buffer
- Crash data, including: total crashes and total fatal/injury crashes
- Roadway information, including: surrounding land use/type, section length, existing speed limit, number of lanes, driveways and signals

After completing an analysis using the NCHRP SLS Excel-based tool, the recommended speed limit based on NCHRPC SLS analysis is 35 mph.

Another recent methodology staff referenced for setting speed limits comes from the National Association of City Transportation Officials (**NACTO**). As indicated in the document's title, *City Limits: Setting Safe Speed Limits on Urban Streets (City Limits)* places a greater emphasis on the urban context of a street than traditional methods. In *City Limits*, NACTO provides several approaches to urban speed limit setting at various scales, from individual corridors up to citywide strategies.

To determine the speed limit for a given corridor, *City Limits* considers two primary factors: *Activity Level* (how active a street currently is or is expected to be) and *Conflict Density* (how frequently potential conflicts arise on a given street). Staff's determination is that Packard Road would be classified as Low activity, and as having conflict density as either Moderate or Low. According to the matrix outlined on p. 63 of *City Limits*, the two potential recommended speed limit possibilities are:

- Low Activity Level, Low Conflict Density: 35 mph
- Low Activity Level, Moderate Conflict Density: 25 mph

After completing an analysis using the *City Limits* methodology, the recommended speed limit is 35 mph. Further discussion regarding the potential 25 mph speed limit can be found towards the end of this memo.

Lastly, City staff from the Engineering Design Unit analyzed Packard Road to determine if there are any sight distance issues along the corridor, and what design speed(s) would be recommended on Packard Road if issues exist. Engineering staff surveyed the street and created a topographic profile of Packard Road. In each direction of travel, the topography of Packard Road was analyzed to determine if there was sufficient sight distance available to a driver to perform avoidance maneuver E (speed/path/direction change on Urban Road), for a 24-inch object at a design speed of 35 mph. Staff found through this analysis that sufficient sight distance exists along the corridor, with the following exceptions due to vertical crests:

- Eastbound travel:
 - Between Chesterfield Drive and Springbrook Avenue, for ~475 feet.
 - Between Brandywine Drive and Turnberry Lane, for ~575 feet.
- Westbound travel:
 - Between Platt Road and Springbrook Avenue, for ~550 feet.
 - Between Burton Road and Turnberry Lane, for ~575 feet.

After completing the sight distance analysis, the recommended speed limit is 35 mph. Staff also recommend advisory signage at the locations above, where sight distance is more obscured.

As the geometric analysis and USLimits2, NCHRP SLS, and *City Limits* methodologies analysis each recommend a speed limit lower than the current posted speed limit of 40 mph, staff referenced the MVC to confirm state regulations involving this potential change. MVC is the state legislation which regulates the setting of speed limits, including what constraints and allowances apply to a local agency – in this case, the City of Ann Arbor – and its ability to set speed limits. MVC, section 257.628, paragraph (5) states:

A speed limit established under this section shall be determined by an engineering and safety study and by the eighty-fifth percentile speed of free-flowing traffic under ideal conditions of a section of highway rounded to the nearest multiple of 5 miles per hour.

A speed limit established under this act shall not be posted at less than the fiftieth percentile speed of free-flowing traffic under optimal conditions on the fastest portion of the highway segment for which the speed limit is being posted.

As previously outlined, USLimits2, NCHRP SLS and City Limits each recommended a posted speed limit of 35 mph. Data collected as part of the 2021 Healthy Streets project indicated that the 50th percentile speed for Packard Road is 36 mph, or 35 mph when rounded to the nearest 5 mph (as stated in the MVC). According to MVC, this is the minimum posted speed limit allowable for Packard Road.

While City Limits could also be interpreted to recommend a lower speed limit of 25 mph (if Packard Road is assumed to have a Moderate conflict density), staff do not recommend this speed limit change given the language of MVC regarding minimum speed limits. Additionally, as the City streets connecting to this section of Packard Road are both 35 mph (Packard Road east of Buhr Park, Eisenhower Parkway east of Packard Road intersection), staff recommend 35 mph as the more appropriate speed limit.

In consideration of the above analysis using various methodologies for setting speed limits, staff recommends setting a speed limit of 35 mph.

Next Steps

Signage

The existing speed limit signage along this corridor will need to be updated from 40 mph to 35 mph. Existing signage includes 5 signs in the eastbound direction, and 4 in the westbound direction. While this is generally consistent with placement and spacing elsewhere throughout the City, staff recommends installing additional speed limit signage once the speed limit is changed to provide drivers with additional conspicuity to the lowered speed limits. Staff recommends that additional speed limit signs are installed to bring the total up to 7-8 signs in each direction. This would ensure that signs can be placed approximately every ¼ mile throughout the corridor and after major intersections (Turnberry Lane, Fernwood Avenue, Platt Road).

Where sight distance drops, staff recommend installing sign assemblies indicating the vertical crest conditions (sign W7-6, "Hill Blocks View") and advisory speed (sign plaque W13-1P, "30 mph). Advisory signs should be placed in the following locations:

- For eastbound travel:
 - West of Brandywine Drive
 - West of Chesterfield Drive
- For westbound travel:
 - East of Burton Road (near US-23)
 - East of Platt Road

As is commonly done when traffic conditions change, staff will add orange conspicuity flags to signage to raise awareness of the new speed limits to all street users.

Pavement Markings

To further reinforce the new speed limit to drivers, staff recommend installing pavement marking legends (reading “35 MPH”) at the following locations:

- For eastbound travel:
 - At Eisenhower intersection
 - West of Platt Road
- For westbound travel:
 - East of Burton Road (near US-23)
 - East of Platt Road

Communication

Staff will communicate the speed limit change to Transportation Commission and Ward 3 City Council members as an informational item. Staff will also coordinate with the City Communications office to determine what other methods could be used to communicate the change.

Staff plans to monitor the corridor once all elements are installed to determine what, if any, changes may be required.

Attachments

- USLimits2 Analysis
- NCHRP SLS Analysis
- Sight Distance Analysis

References

- [MDOT Towards Zero Deaths Safety Campaign](#)
- [USDOT National Roadway Safety Strategy](#)
- [NACTO City Limits](#)

cc: R Hess
C Redinger
L Liu
S Flowers