



# West Fargo Traffic Calming Study

West Fargo, North Dakota | December 2021

# Acknowledgements

A sincere thank you to the following for their involvement in guiding this Study and contributing to the pursuit of safety and traffic calming for neighborhoods throughout the City of West Fargo.

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Prepared for: City of West Fargo

RESOLUTION OF APPROVAL FOR THE WEST FARGO TRAFFIC CALMING STUDY

WHEREAS, the City of West Fargo City Commission is the duly elected governing body for West Fargo, North Dakota and is responsible for the planning and development of a safe and functional transportation system; and

WHEREAS, the Fargo-Moorhead Metropolitan Council of Governments (Metro COG), is the Metropolitan Planning Organization designated by the Governors of North Dakota and Minnesota to maintain the metropolitan area's transportation planning process in accordance with Federal regulations; and

WHEREAS, Metro COG has undertaken the task of conducting the West Fargo Traffic Calming Study which is essential to mitigate negative transportation system impacts and increase safety, livability, and quality of life in West Fargo; and

WHEREAS, the traffic calming study process was guided by the Study Review Committee and the general public; and

WHEREAS, the West Fargo Traffic Calming Study provides a vision and policy direction for traffic calming in West Fargo; and

WHEREAS, Metro COG has conducted this study in a comprehensive, coordinated, and continuing fashion that will improve the urban transportation system as well as quality of life in West Fargo; and

WHEREAS, the West Fargo Traffic Calming Study forwards goals, objectives, and policy direction of the West Fargo Comprehensive Plan, *West Fargo 2.0* and the long-range Metropolitan Transportation Plan, *Metro Grow*;

NOW, THEREFORE, be it resolved by the City Commission of the City of West Fargo, North Dakota that the City of West Fargo does hereby approve the West Fargo Traffic Calming Study and agrees to use it as a tool to implement traffic calming improvements on residential streets with a federal functional classification of local or collector.

APPROVED:

BY:   
President of the Board of City  
Commissioners

ATTEST:

  
Tina Fisk, City Administrator

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# 1 | Introduction

The West Fargo Traffic Calming Study addresses concerns received from residents of West Fargo about excessive traffic speeds on neighborhood streets. The City of West Fargo continuously improves city streets in order to address safety. This Study will help the City develop a targeted implementation strategy for traffic calming measures which, when appropriately applied can have a positive impact on travel speeds, traffic volumes, and safety of roadways in neighborhoods of West Fargo.

The purpose of this study is to provide an overview of what traffic calming is, research and understand the traffic calming issue at specific priority locations in West Fargo, identify potential traffic calming measures that can be applied to streets where frequent complaints about traffic speeds are occurring, provide public information to engage residents on existing issues and potential traffic calming interventions, provide planning-level cost estimates for traffic calming measures, identify funding sources or strategies for implementation, and summarize findings of the research, analysis, and public input to create a user-friendly report that can be utilized by West Fargo staff and residents alike.

## What is traffic calming?

Traffic calming is the implementation of physical roadway features for the purpose of slowing motor vehicle speeds and altering driver behavior. These features can be installed on a street to help reduce the speed at which vehicles travel, discourage through traffic, improve traffic safety, and improve the comfort level for non-motorized users.

## Why use traffic calming?

Traffic calming can improve the quality of life for residents on streets where traffic calming measures are applied, slowing vehicle speeds, and increasing safety for non-motorized users of the street. Although this Study was prompted by six (6) priority West Fargo locations, traffic calming interventions should be looked as a community-wide strategy to ensure that volume and speed concerns are not transferred to adjacent streets.

# Where can traffic calming measures be applied?

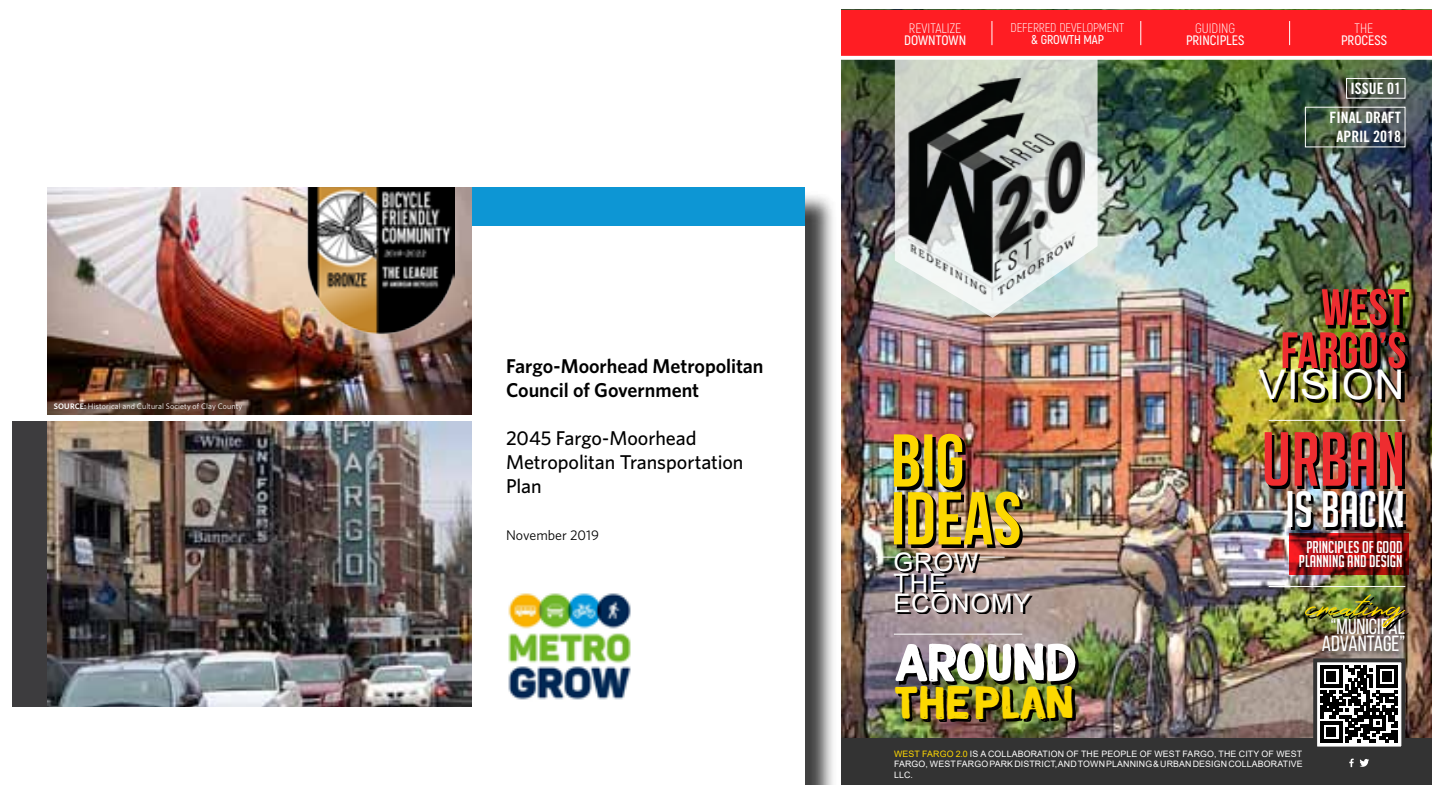
## Why is it important?

Physical traffic calming measures should only be applied to residential West Fargo roadways and those with a road classification of local or collector. It should be noted that West Fargo does not allow heavy trucks on most local and collector roadways in the City and roadways are signed as such.

Traffic calming is important, especially in residential areas of West Fargo. The City's Comprehensive Plan, *West Fargo 2.0* sets a policy direction for walkability that balances many modes of transportation in the built environment. *West Fargo 2.0* also emphasizes Metro COG's complete streets policy as a critical component toward reaching the goals and objectives of enhancing the livability and character of West Fargo:

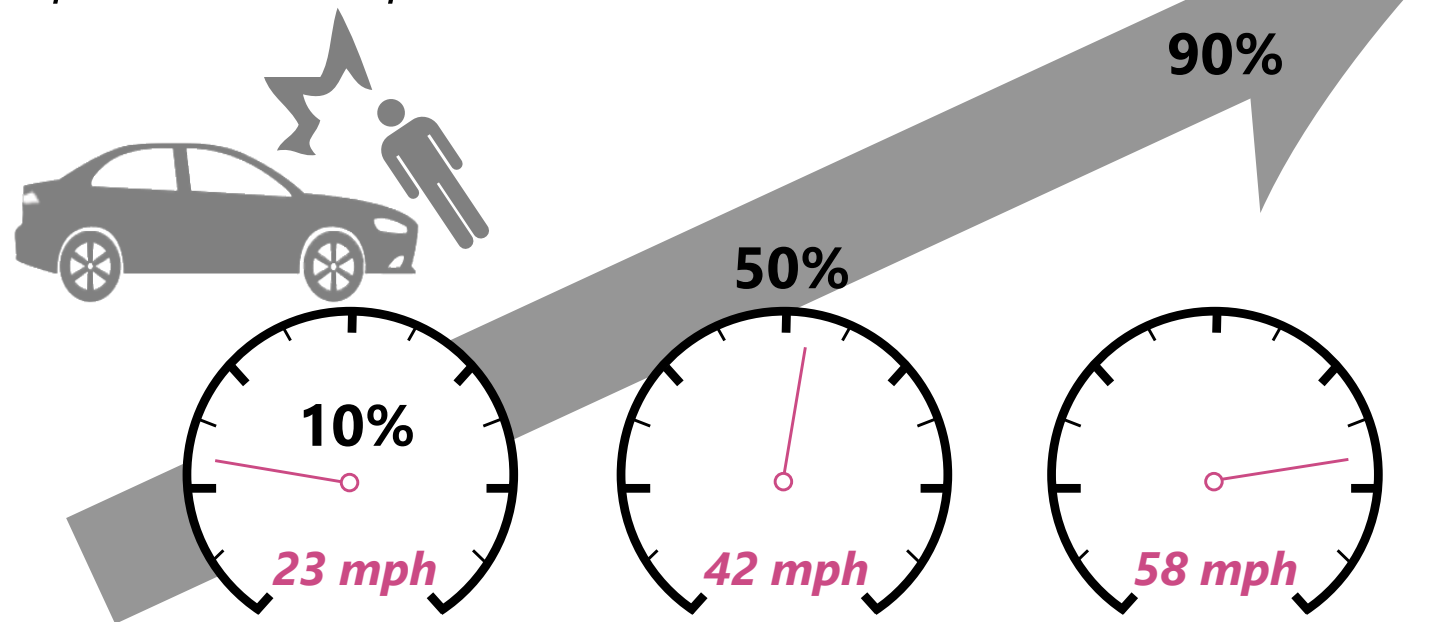
***Complete Streets is an on-going and comprehensive planning, design, construction, and operations process, with a long-range perspective, aimed at improving safety, usability, and quality of life. By embracing Complete Streets, Metro COG seeks to plan and program public rights of way that fully integrate and balance the needs of all street users, including bicyclists, pedestrians, transit users, commercial vehicles, emergency services, vehicles, and passenger vehicles. Users of all ages and abilities will be considered.***

In addition to the West Fargo Comprehensive Plan, Metro COG's Metropolitan Transportation Plan, *Metro Grow*, sets the policy direction for transportation across the Fargo-Moorhead Area (FM Area). *Metro Grow* also provides strong direction for a safer transportation system for all users and increased walking and biking as a viable mode of travel. Both of these plans have guided the City of West Fargo to pursue traffic calming as a way to forward the goals and objectives of both of these important planning documents.

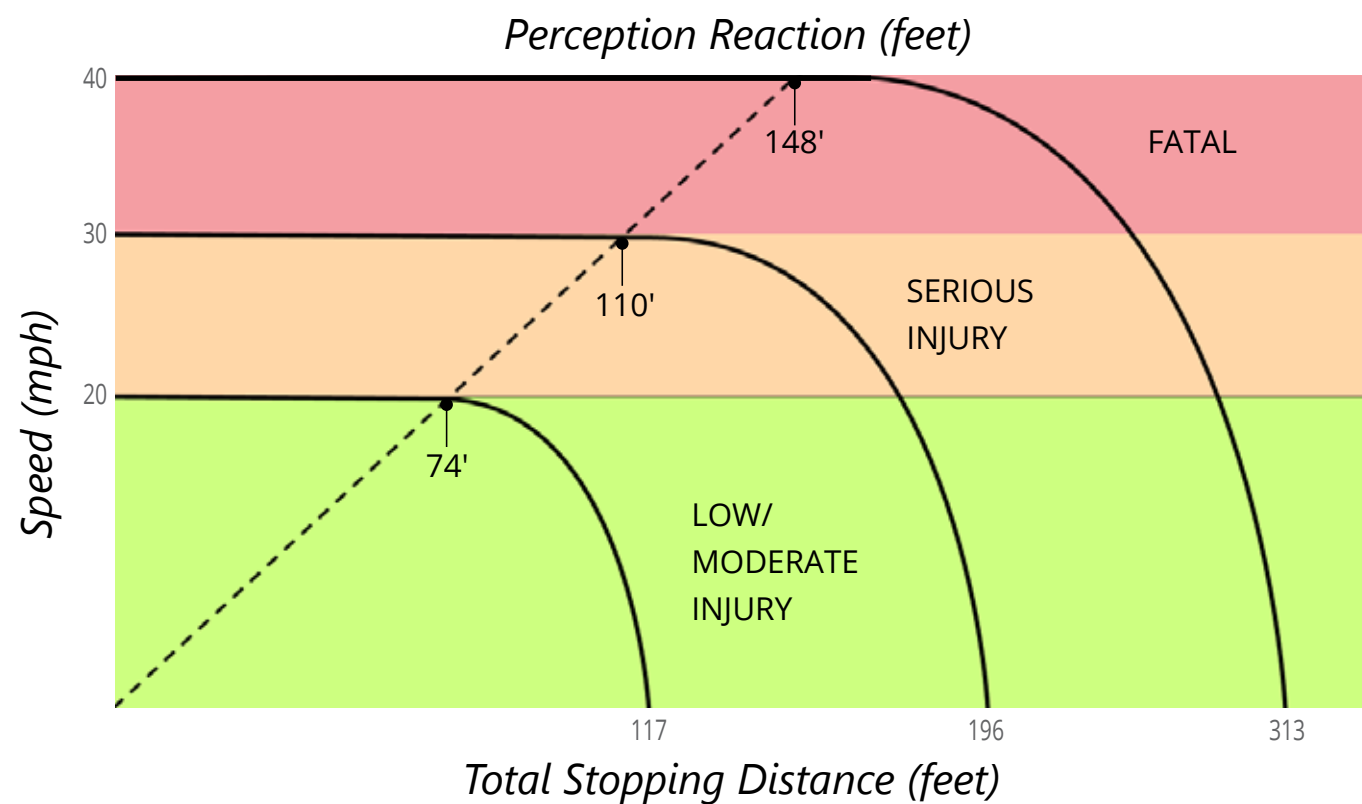


^ Figure 1 | Core transportation planning documents for the City of West Fargo

Average risk of death at impact for a pedestrian as speed increases



^ Figure 2 | Pedestrian fatalities increase exponentially as vehicle speed increases (FHWA)



^ Figure 3 | Reaction time and stopping distance increase with speed (National Complete Streets Coalition)

The figures on the left-side of this page represent how speeding vehicles create exponentially more dangerous environments for pedestrians, therefore making traffic calming an essential tool for enhancing safety, walkability, and livability of West Fargo neighborhoods.

# What is NOT traffic calming?

It is important to clarify potential options that are not considered traffic calming measures. Through the public engagement efforts, several commonly requested options arose including stop sign installation requests, dynamic radar speed signs, and increased speed enforcement from police. Stop signs and other traffic control devices such as signs are traffic operations management techniques and should not be considered traffic calming measures because they are not self-enforcing. Self-enforcing measures are physical treatments that are engineered to change motorist behavior to change vehicle speed or direction of travel. Stop signs and other traffic control signs signal to motorists to change behavior and reduce speed however, enforcement is required from authorities in order to be effective rather than the motorists' voluntary behavior modification. Enforcement can and should occur at given times where speeding may be prevalent along certain corridors; however, the West Fargo Police Department has indicated that continual enforcement of problematic areas is not sustainable or efficient for Police Officers. The Police Department will continue to use a targeted enforcement approach and plans to utilize data from the traffic analysis portion of this Study to focus enforcement in areas where and at times when speeding may be more prevalent.

Temporary traffic calming devices such as signage or roadway striping may be considered in portions of West Fargo where urban development has not yet occurred and should be considered temporary solutions. Self-enforcing traffic calming measures should be considered at the time of development and/or urbanization of the roadway if temporary traffic calming devices were installed prior to urbanization.



# 2 | Study Process

## Priority Locations

## Alternate Locations

Through the Study process and West Fargo's efforts to respond to speeding on residential streets, six (6) priority and four (4) alternate locations were identified to be studied as part of this report. The Study is aimed at the identification of traffic calming problems as they exist today and to develop a toolbox that can be used to address traffic calming issues across the entire community.

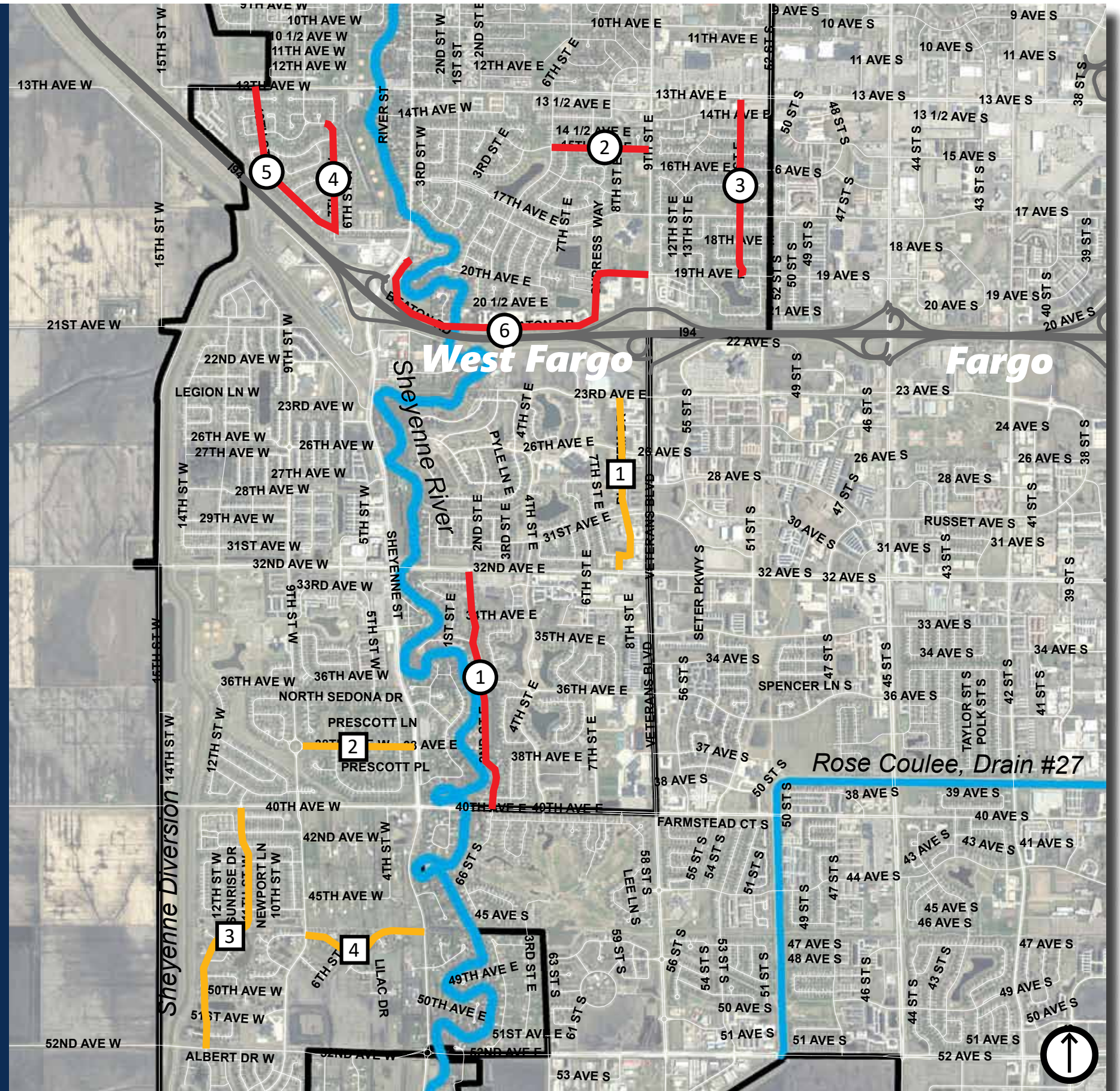
The locations listed below are based on numerous resident complaints that have been received by various City departments over the past ten (10) years including Engineering, Planning, Public Works, and Police Departments.

While the Study provides general introduction, analysis, and implementation recommendations for traffic calming across West Fargo, this effort also stems from very specific complaints at the following locations which were used to identify and understand the root of the traffic calming issue in West Fargo, engage and educate the public about traffic calming, and develop planning-level cost estimates. Through this process, the City and Metro COG developed a city-wide traffic calming toolbox and implementation strategy to address speeding and safety concerns that may arise in the future.

- ① 2<sup>nd</sup> Street East, south of 32<sup>nd</sup> Ave E
- ② 15<sup>th</sup> Avenue East, between 6<sup>th</sup> and 9<sup>th</sup> St E
- ③ 16<sup>th</sup> Street East, south of 13<sup>th</sup> Ave E
- ④ 7<sup>th</sup> Street West, between 15<sup>th</sup> and 19<sup>th</sup> Ave W
- ⑤ 10<sup>th</sup> Street West, south of 13<sup>th</sup> Ave W
- ⑥ Beaton Drive, between Sheyenne St and 9<sup>th</sup> St E

- ❑ 1 Bluestem Drive, between 23<sup>rd</sup> and 32<sup>nd</sup> Ave E
- ❑ 2 38<sup>th</sup> Avenue West, between 9<sup>th</sup> St W and Sheyenne St
- ❑ 3 11<sup>th</sup> Street West, between 40<sup>th</sup> and 52<sup>nd</sup> Ave W
- ❑ 4 47<sup>th</sup> Avenue West, between 9<sup>th</sup> St W and Sheyenne St

# Study Area Map



^ Figure 4 | Priority and Alternate Study Locations

# Public Engagement

During the West Fargo Traffic Calming Study, public engagement occurred at two (2) critical stages: (1) during the information gathering stage to understand the traffic calming issues including speeding, cut-through traffic, safety concerns, among other things and (2) during the development of the traffic calming measure toolbox to gauge the level of public support for the various infrastructure options that may be used to calm traffic in West Fargo.

# Existing Conditions

Data was collected at the six (6) priority locations to create existing conditions and to analyze whether there were components of the built environment that may be contributing to a traffic calming problem. Existing conditions information includes roadway width, driving-lane width, parking-lane width if applicable, land use and nearby destinations, and other key features including but not limited to bicycle and pedestrian infrastructure, signage, striping, boulevard trees, and driveway access. Site-specific existing conditions can be found in **Appendix A**.

In many cases, the existing conditions revealed that local and collector classified neighborhood roadways in West Fargo are built much wider than the recommended minimums for an urban neighborhood setting. With existing driving-lanes ranging anywhere from 12 to 20-feet wide, the wider driving-lanes may be contributing to excessive vehicular speeds on residential streets across West Fargo. Under-utilized parking lanes also contribute to speeding, as on-street parking lanes can make the driving lanes appear wider than they actually are, exacerbating the tendency to speed.

Access driveways from residential properties along the street may also contribute to traffic calming challenges because the spacing of said driveways contributes to on-street parking underutilization. In some cases, there is not

# Traffic Conditions

enough space to park a vehicle on-street between access driveways, again causing the driving-lanes to appear wider than they actually are.

Boulevard trees may also be a factor. Mature boulevard trees help to visually narrow a roadway which can help decrease speeds; however, a majority of neighborhoods in West Fargo have been recently developed, leaving little time for boulevard trees to mature. In some cases, in these newer developments, boulevard trees have not yet been planted, leaving open sightlines for drivers to comfortably travel at higher rates of speeds.

The existing conditions analysis also indicates that a big factor in traffic calming in West Fargo may lie in the urban design of neighborhoods and how the configuration of neighborhoods has often times created a single roadway spine of connectivity that causes speeding due to roadway circuitry. Roadway circuitry is the ratio of network to Euclidian distances (as the crow flies) and describes the directness of trips and the efficiency of the transportation network. An inefficient network can lead to speeding, as people travel round-about or indirect routes to get to most destinations. For example, a traditional grid street network is much more efficient (lower circuitry ratio) than a street network with limited connectivity or frequent curves, circles, and, or dead-ends.

The existing conditions analysis highlights certain components of the built environment that may be contributing to higher vehicular speeds on residential streets in West Fargo. Some of the obvious issues such as driving-lane width, on-street parking, boulevard trees, and access drive spacing may be proactively addressed by revising the West Fargo Development Code with traffic calming in mind.

Traffic data was collected through portable pneumatic tube counters that were strategically deployed along the six (6) priority locations. The counters were deployed for a minimum of 48 hours during weekdays to collect traffic

speed and volume. An adjustment factor was applied to the collected traffic volume based upon the time of year and day of the week in which the traffic data was collected, which provides an Annualized Average Daily Traffic (AADT) estimate which is a standard traffic volume measurement. Standard traffic speed measurements such as median speed and 85<sup>th</sup>-percentile speed were also collected.

Metro COG also used StreetLight Data to calculate cut-through traffic by percentage of volume for each of the six (6) priority locations. Streetlight Data uses Location Based Services (LBS) data sets obtained from cellular data and GPS data to calculate origin-destination and estimated traffic volumes.

The cut-through percentage was estimated by first, defining a neighborhood geometry or boundary adjacent to the street being studied and then, calculated trips with an external origin and external destination from said boundary. The cut-through percentages help identify how streets may be functioning. For example, a high percentage of cut-through traffic on a local classified roadway may indicate that the roadway is functioning more as a collector. Cut-through traffic can also exacerbate the speeding problem associated with some residential streets in West Fargo and is one of the major secondary concerns the public had in relation to traffic calming aside from speeding. The traffic data collected through this study helped to identify and validate speeding or cut-through concerns identified by the West Fargo community.

# Planning-Level Cost Estimates

General estimated costs based on national traffic calming resources were developed for each traffic calming measure and can be found in **Chapter 4**. Rather than specific numbers, a graphical scale indicates the level of investment the City of West Fargo may expect when implementing different options.

Planning-level cost estimates were developed for each traffic calming alternative scenario at the six (6) priority locations. The cost estimates include costs for implementing the recommended traffic calming measures and any incidentals that may be required. Cost estimates are only intended to be used at a planning level and should be refined with future project development. Site-specific cost estimates were developed for the six (6) priority locations based upon each location's preliminary traffic calming policy evaluation. Site-specific cost estimates may be found in **Appendix A**.

The cost estimates are based on West Fargo average bid prices and were developed by identifying major pay items and estimating rough quantities for implementation. Cost estimates do not include engineering, easement or right-of-way acquisition, permitting, inspection, construction management, surveying, geotechnical investigation, environmental documentation, site remediation, escalation, operations and maintenance, or unforeseen project-specific cost items. The cost estimate includes a 25% contingency that may account for some of the aforementioned costs. Cost estimates have been rounded up to to the nearest \$5,000 and should be considered fiscal year 2021 dollars. Estimates may need to be inflated for the year in which a project is programmed.

Construction costs will vary based on project scope, site conditions and constraints, schedule, and the economic conditions at the time of construction.

# Study Review Committee

Metro COG and the project team worked with a Study Review Committee (SRC) comprised of professional staff from various City of West Fargo departments. The SRC was involved through the entire duration of the Study and oversaw the study process, provided expert and technical advice, and guided key components of the project. The project team hosted three (3) SRC meetings throughout the process, covering the following topics:

## *Meeting 1*

SRC meeting #1 was the kickoff meeting for the project and established the project process and ensured that all study participants or SRC members and the project team (Metro COG) shared a common understanding of the project goals and desired outcomes. There was a high-level overview of the six (6) priority locations including conversations about existing traffic calming issues and what complaints have been received by various departments. The meeting also introduced the methods used for traffic data collection and traffic calming resources being used to develop a traffic calming “menu”. Consensus was established from the group for the public engagement approach to gather early input from residents living in the vicinity of streets being studied as part of the project.

## *Meeting 2*

SRC meeting #2 occurred after the first round of public engagement occurred. Public feedback was discussed and themes of residents’ concerns were established. Existing conditions and existing traffic conditions including initial traffic data were summarized. The focus of the meeting was on the preliminary traffic calming options and robust discussion was had about each specific option and the feasibility of implementation for each within the City. The SRC wanted to ensure that any traffic calming option shown to the public was within the realm of possibility for the City to build, operate, and maintain. Pros and cons for each option were established. The public engagement strategy to get residents’ feedback on the options was discussed and solidified.

## *Meeting 3*

SRC meeting #3 occurred after the second round of public engagement occurred. Discussion included public feedback, traffic calming alternative matrix, site-specific alternatives, and traffic calming policy. The focus of the meeting was on the site-specific alternatives and traffic calming policy. The SRC wanted to ensure that an objective, technical evaluation process was established to identify traffic calming projects. Based upon the discussion it was determined that the six (6) priority locations provided a baseline understanding of traffic calming issues occurring throughout West Fargo and would be used to craft the traffic calming policy. With the traffic calming policy and preliminary technical evaluation criteria established, the six (6) locations would then be evaluated for a traffic calming project in an appendix, Appendix A.

### **Study Review Committee Members**

Andrew Wrucke, West Fargo Engineering

Ari Del Rosario, Metro COG

Cindy Gray, Metro COG

Dan Farnsworth, Metro COG

Denis Otterness, West Fargo Police

Luke Champa, Metro COG

Malachi Petersen, West Fargo Planning

Scott Tiffany, West Fargo Public Works

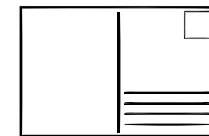
Tim Solberg, West Fargo Administration



# 3 | Community Engagement Overview

Community engagement occurred between May and August of 2021. There were **386 surveys** taken by residents. Two (2) surveys were used during the public engagement for the Study including the first survey, which was used to identify specific traffic calming concerns along the priority locations and the second survey, which was used to understand the level of support for potential traffic calming measures. Metro COG and the City of West Fargo also hosted three (3) separate pop-up meetings which were in-person events used to chat with interested residents face to face and receive feedback regarding the different traffic calming options. Over 12 people attended the pop-up events. For detailed public engagement results, see **Appendix B**.

With the continued and evolving landscape of the COVID-19 public health crisis, the project team chose to approach public engagement with a focus on virtual or online opportunities however, in-person outdoor options were also offered for those more interested in providing feedback in a traditional setting. The following outreach methods were used to engage with the West Fargo community during the project, including:



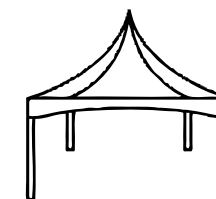
**Postcards**



**Social Media (Facebook)**



**Surveys**



**Pop-up Events**



**Emails**



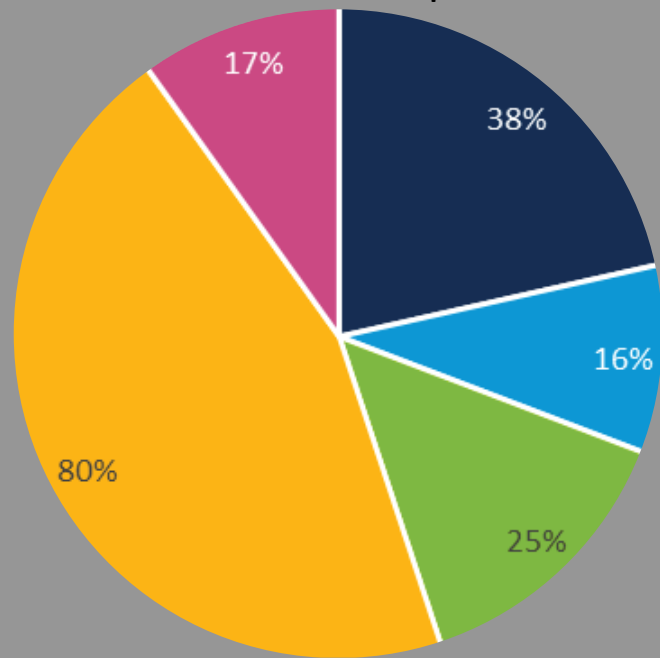
**Webpage Updates**

# Interesting Survey Results

What major concerns do you have in regards to traffic calming along the street?

201 Respondents

- Speeding
- Cut-through traffic
- Sidewalks/crosswalks
- Other
- Parking



^ Figure 5 | What major concerns do you have in regards to traffic calming along the street? (priority locations)

One of the survey questions asked respondents if they personally speed along one of the streets being studied; interestingly a vast majority of survey respondents did not admit to speeding very often. However, of the 135 respondents that admitted to driving above the speed limit at times, they believed not paying attention (31%) and street design (29%) were the top reasons causing them to speed.

Most respondents (89% of respondents) perceived more speeding between 3:00 p.m and 5:59 p.m. than any other time of day.

Respondents indicated their primary mode of travel along the priority locations is driving or riding in a vehicle with walking or running happening less and bicycling or other similar mode trips occurring least of all. Interestingly, respondents indicated feeling more safe in a vehicle, less safe walking or running, and least safe biking or other similar mode.



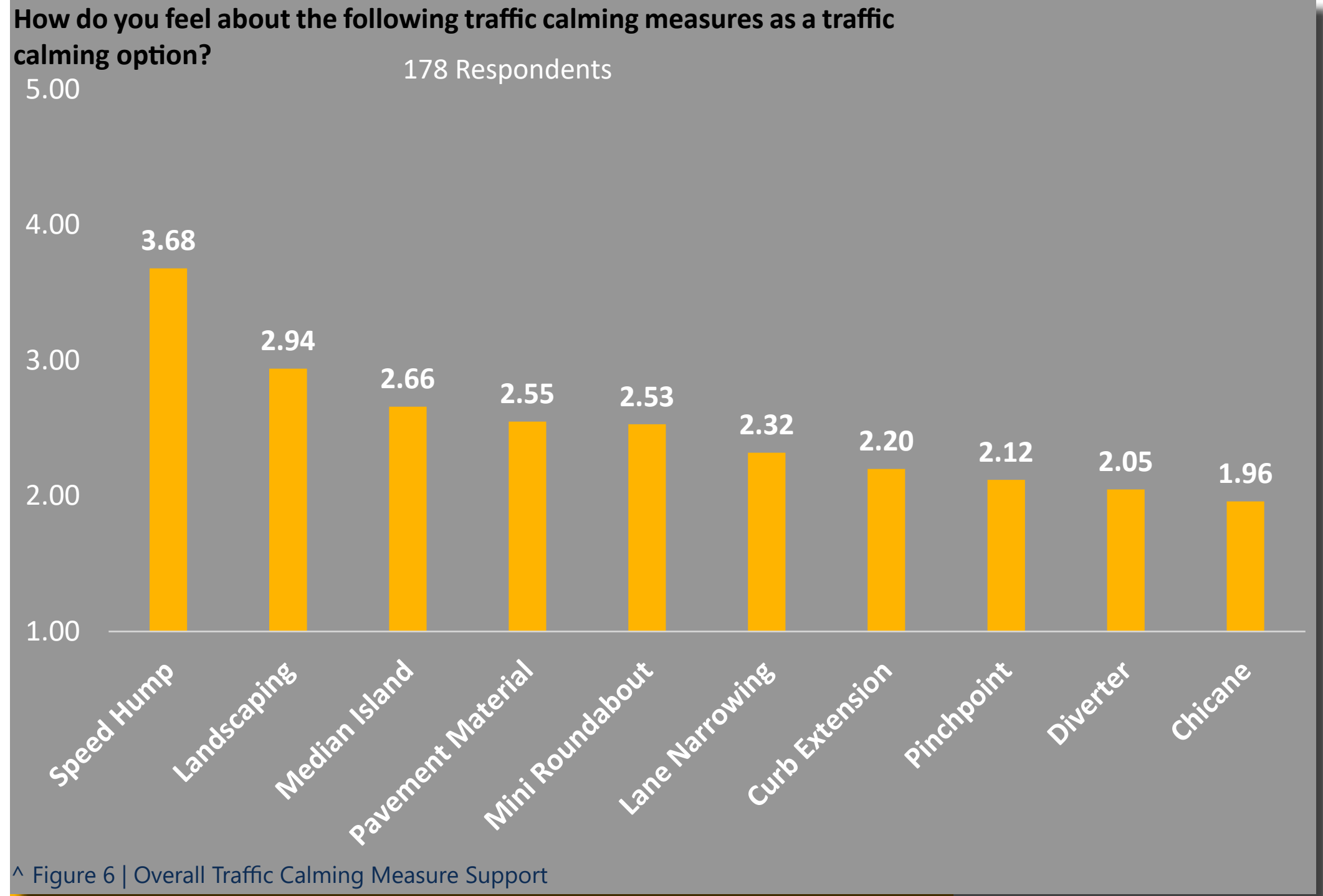
Pop-up engagement event held at Elmwood Park August 9, 2021



Pop-up engagement event held at Shadow Wood Park and Splash Pad August 10, 2021.

# Overall Traffic Calming Measure Support

The second survey included graphics and text explaining each traffic calming measure. For each traffic calming measure, community members were asked “How do you feel about [insert traffic calming measure] as a traffic calming option?” The chart on this page reflects the overall results of the online survey and the in-person survey activity from the pop-up events. Ratings are on a 1 to 5 scale, with 5 = strongly support.



^ Figure 6 | Overall Traffic Calming Measure Support

# 4 | Traffic Calming Measures

The project team developed a complete set of potential implementable traffic calming solutions based upon national literature. The primary resources to develop a comprehensive list of options included reports published by the Institute of Transportation Engineers (ITE) and the National Association of City Transportation Officials (NACTO). The project team, with major contribution from the SRC, then narrowed down the list to realistic and feasible traffic calming solutions for the City of West Fargo to implement. By focusing on budget feasibility, effectiveness, maintenance, and other criteria such as emergency services or vehicular impacts, an implementable list of traffic calming measures was derived. The team also looked for examples that have been implemented successfully in the FM Area or broader region where similar weather, roadway operations, and maintenance occurs. The list of traffic calming measures is as follows:

**Lane Narrowing**

**Curb Extension**

**Pinchpoint**

**Chicane**

**Median Island**

**Mini Roundabout**

**Speed Hump**

**Pavement Material**

**Diverter**

**Landscaping**

This section lists each traffic calming option and includes information about cost, maintenance, and effectiveness or potential speed reduction for each.

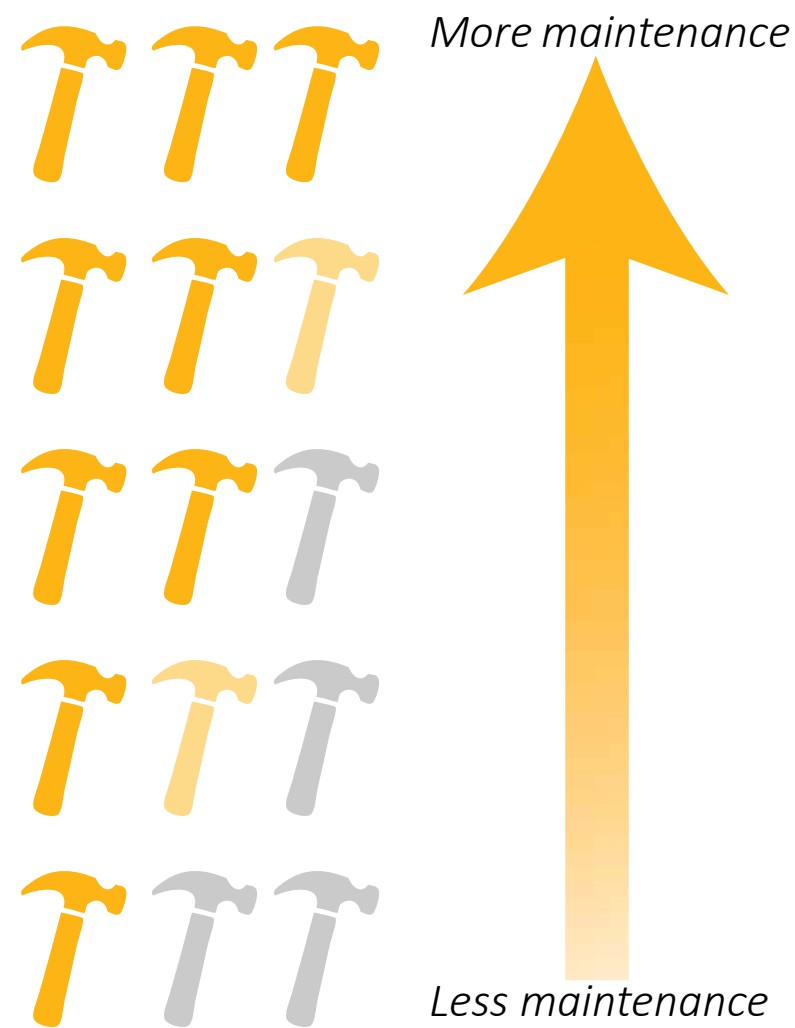
## Cost

The scale below is given for traffic calming measures to represent the estimated cost of construction based upon City of West Fargo Engineering Department estimates.



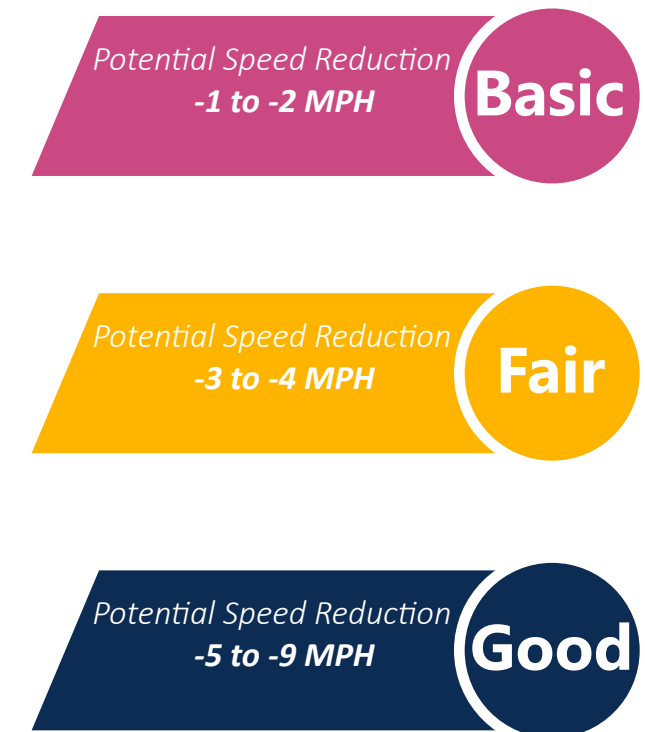
## Maintenance

The scale below is given for traffic calming measures to represent the long-term operations and maintenance effort based upon City of West Fargo Streets Department estimates.



## Effectiveness

The following ribbons indicate speed reduction potential of each traffic calming measure that may be expected after implementation and is based upon FHWA and ITE literature and research on traffic calming effectiveness.

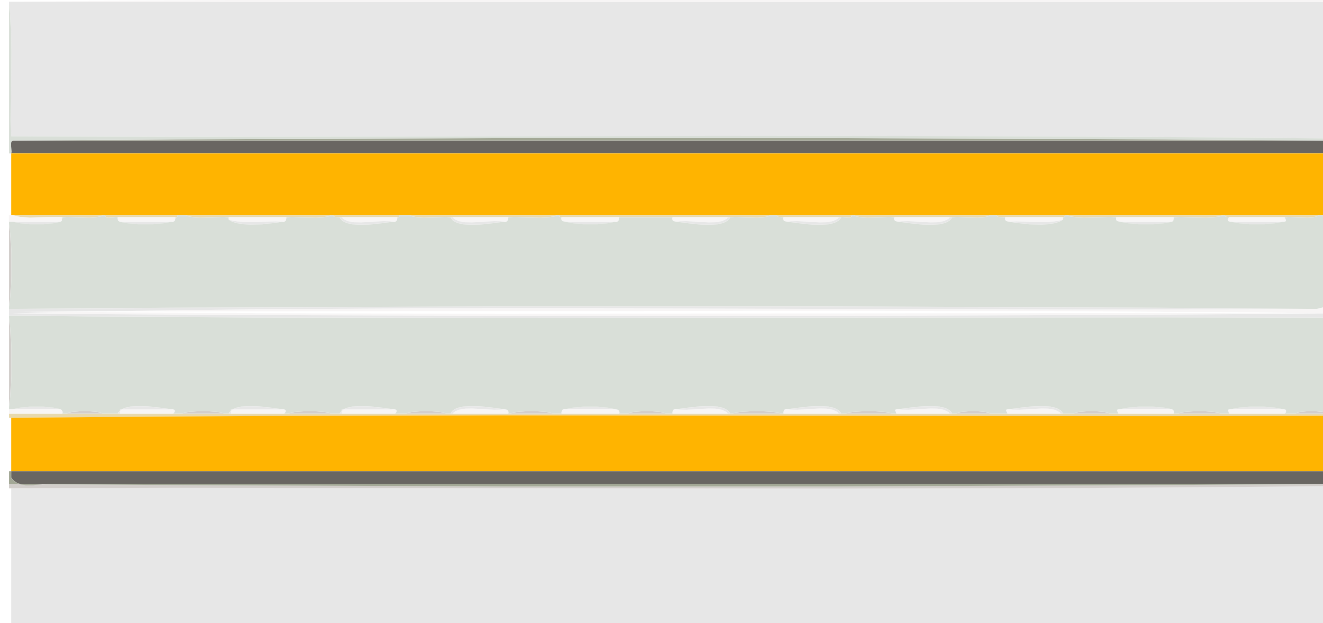


# Lane Narrowing

(Road Diet, On-Street Parking, Pavement Striping)

Potential Speed Reduction  
-1 to -2 MPH

**Basic**



^ Figure 7 | Plan View Graphic, Lane Narrowing (NACTO)

## Description

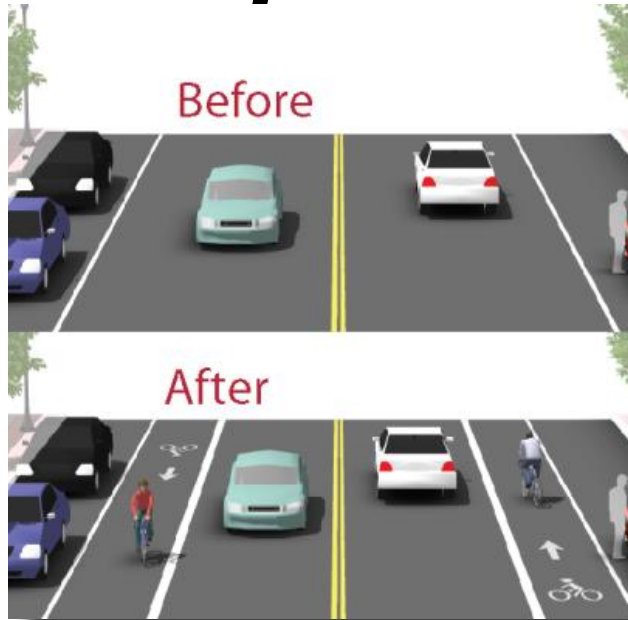
Narrow lanes are well known to reduce speed and keep drivers more alert on the street. Lane narrowing, also known as a road diet, can be achieved through pavement striping or reduction of pavement however, due to the estimated cost of reducing pavement, that option for lane narrowing is much less likely to be implemented in West Fargo. Reduced travel lane widths allow for other roadway features that may add to livability including extended curbs, bike lanes, or on-street parking.

## Cost & Maintenance



Dependent on roadway length. Costs increase exponentially if pavement reduction is pursued which moves or adds curb and gutter.

## Examples



Braintree, MA neighborhood traffic calming visualization.



Roland, IA shoulder markings used to narrow travel lanes.

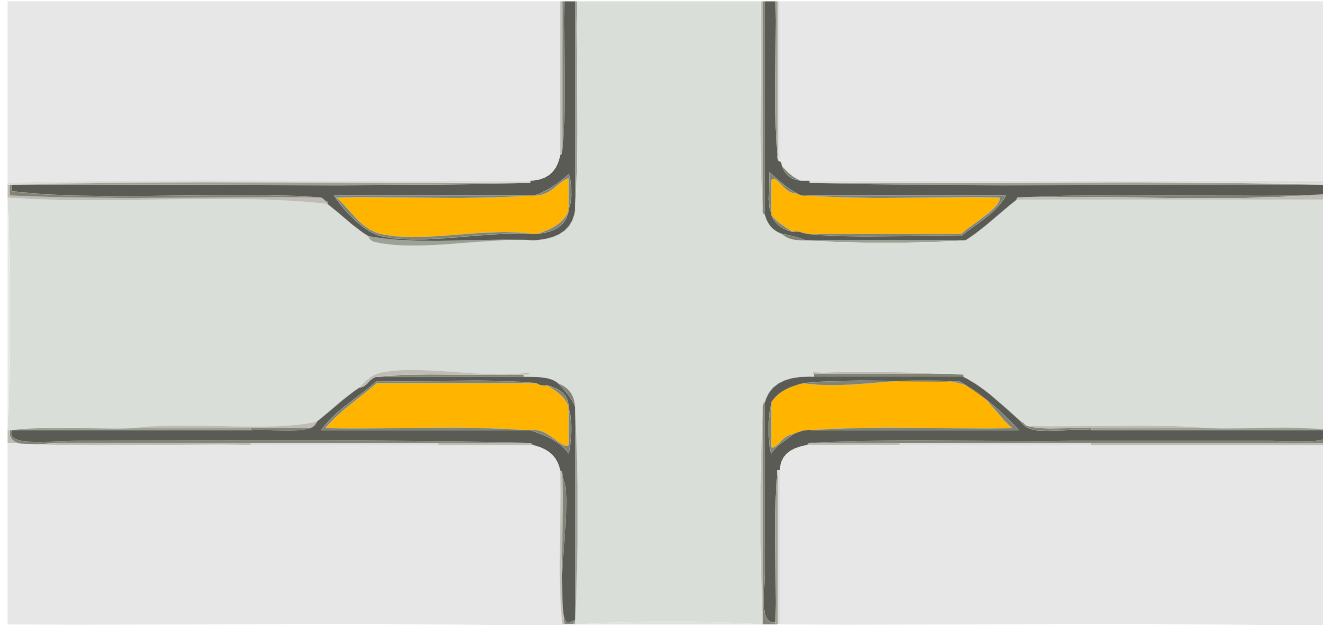
| Pros  | Cons   |
|---|--|
| + May allow for bike lanes, additional parking, or other roadway features that enhance livability | - May not be effective if lanes are not significantly narrowed |
| + Low cost solution   |  |

# Curb Extension

(Corner Extension, Corner Radii, Bulb-Out)

Potential Speed Reduction  
-3 to -4 MPH

**Fair**



^ Figure 8 | Plan View Graphic, Curb Extensions (NACTO)

## Description

Extensions of the sidewalk and curb can narrow the street at strategic intersections. Curb extensions can improve safety by slowing vehicle turning speeds, reducing pedestrian crossing distances, and increasing pedestrian visibility. Curb extensions can increase the livability of neighborhoods by enhancing pedestrian friendliness and safety. Historically, West Fargo has used curb extensions to delineate on-street parking or to improve pedestrian safety at high pedestrian traffic locations.

## Cost & Maintenance



Dependent on length and width of extension. Winter maintenance is the biggest concern with curb extensions.

## Examples



Yellow-painted curb extension narrows the roadway along 30<sup>th</sup> Ave E in West Fargo, ND



Curb extension narrows crossing of 1<sup>st</sup> St E near South Elementary School in West Fargo, ND

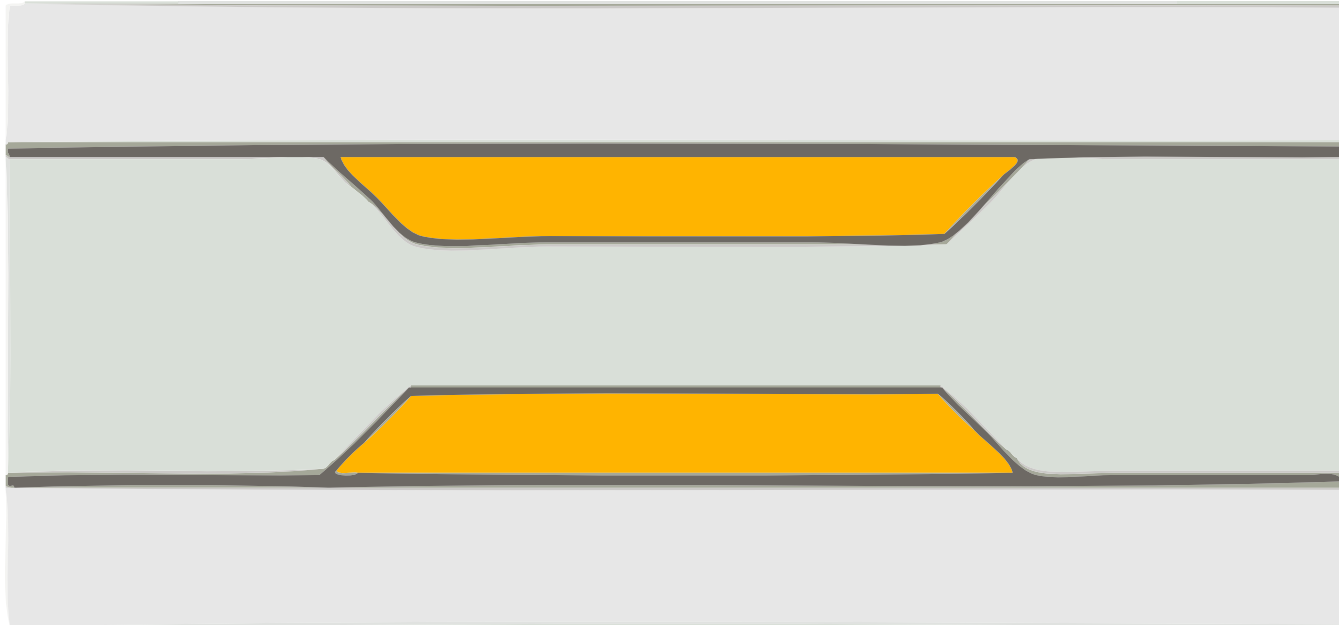
| Pros  | Cons  |
|---|---|
| + Slows vehicular turning and through movements | - Buses and heavy trucks including some emergency vehicles may have difficulty making turns |
| + Improves pedestrian visibility and safety     | - Realigned drainage may increase costs and maintenance                                     |
|   | - Snow removal impacts  |

# Pinchpoint

(Choker)

Potential Speed Reduction  
-3 to -4 MPH

**Fair**



^ Figure 9 | Plan View Graphic, Pinchpoint (NACTO)

## Description

Pinchpoints narrow the roadway at a strategic mid-block point which helps lower vehicular speeds. The pinchpoint can narrow travel lanes at strategic locations and provides a visual constriction of the roadway to influence driver behavior. A more dramatic example, the one-lane choker, can force two-way traffic to take turns entering through the pinchpoint, reducing vehicular speeds and keeping drivers alert.

## Cost & Maintenance

\$\$\$      TTT

Dependent on roadway length. Costs increase exponentially if pavement reduction is pursued which moves or adds curb and gutter.

## Examples



Choker narrows the roadway in St. Louis Park, MN



Traffic island narrows a roadway in Toronto, ON

| Pros                                   | Cons   |
|--|--|
| + Slows traffic at mid-block locations | - May require on-street parking removal                            |
| + Keeps drivers alert                  | - Uncomfortable for bicyclists whom may be sharing the travel lane |
|  | - Snow removal impacts   |

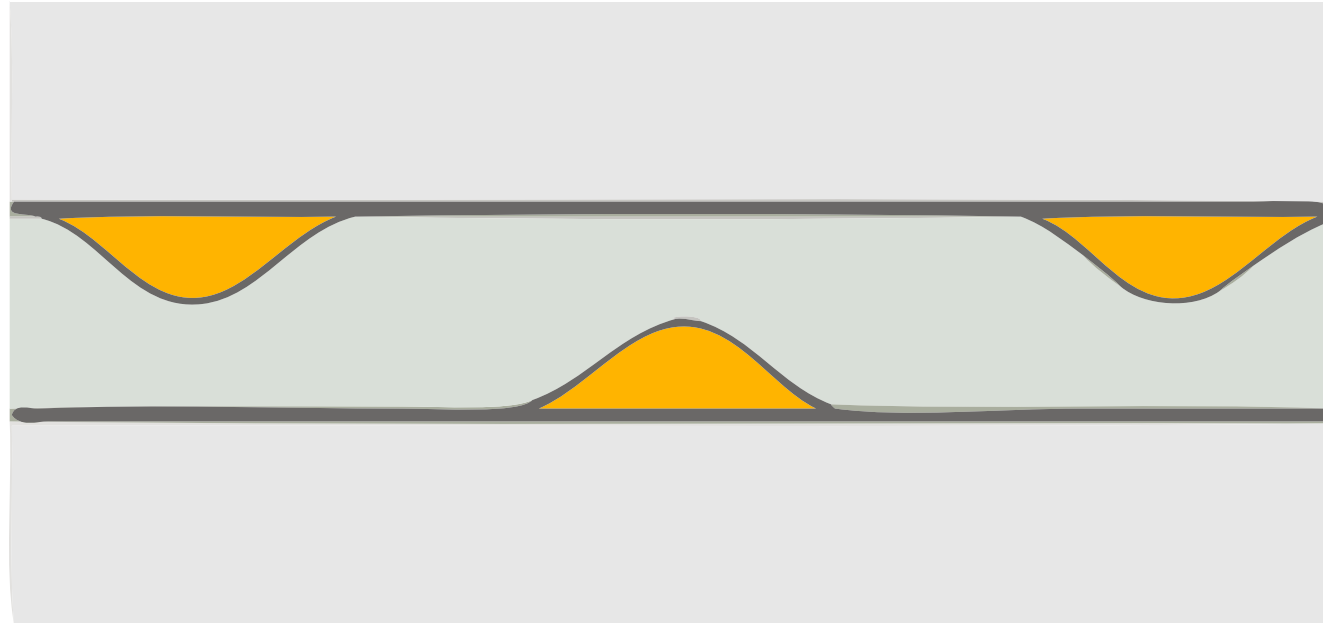


# Chicane

(Lane Shift, Lateral Shift, Realigned Intersection)

Potential Speed Reduction  
-6 to -9 MPH

**Good**



^ Figure 10 | Plan View Graphic, Chicane (NACTO)

## Description

Chicanes slow vehicular traffic by alternating curves or lane shifts, creating an S-shaped travel path. Chicanes are strategically created by placing parking, curb extensions, or edge islands along the roadway to force motorists to steer back and forth. This method can greatly impact driver behavior through visual and physical roadway design cues, causing vehicular traffic to slow down.

## Cost & Maintenance



Dependent on length and width of chicane. Winter maintenance, drainage, and street-sweeping are the biggest concerns with chicanes.

## Examples



Chicane with added landscaping in Seattle, WA



Chicane shifts traffic on a one-way street in Toronto, ON

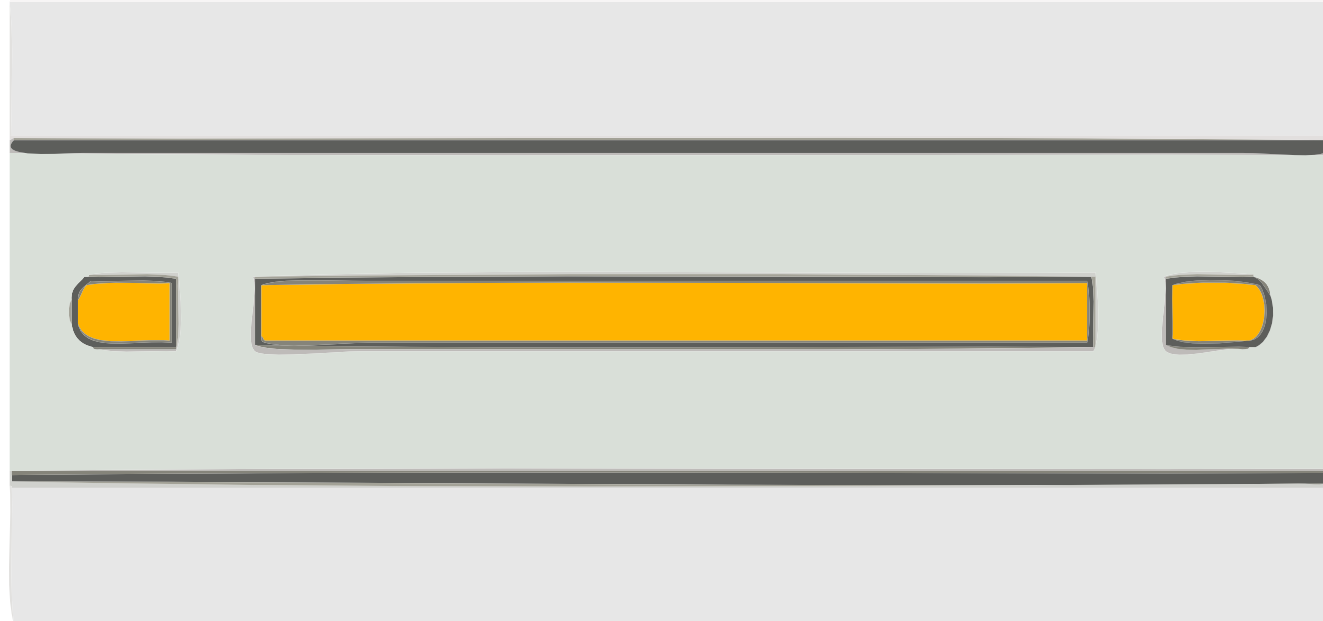
| Pros  | Cons   |
|---|--|
| + Significantly slows vehicular traffic         | - Buses and heavy trucks including some emergency vehicles may have difficulty moving through chicanes |
| + Typically does not require utility relocation | - Realigned drainage may increase costs and maintenance  |
|   | - Snow removal impacts   |
|   | - Street-sweeping impacts  |

# Median Island

(Median, Refuge Island, Median Island Intersection, Median Island Midblock)

Potential Speed Reduction  
-3 to -6 MPH

**Fair**



^ Figure 11 | Plan View Graphic, Median Island (NACTO)

## Description

Raised median islands in the center of the roadway can slow vehicular traffic by narrowing travel lanes and creating a visual constriction of the roadway. Medians, when designed properly can also be used as a pedestrian refuge, increasing pedestrian safety at strategic crossing locations. Historically, West Fargo has implemented medians on busier roadways across the City to increase safety and aesthetics.

## Cost & Maintenance



Dependent on roadway length. Costs increase exponentially if pavement reduction is pursued which moves or adds curb and gutter.

## Examples



Median island on 13<sup>th</sup> Ave W in West Fargo, ND



Median refuge island on 18<sup>th</sup> Ave W in Fargo, ND

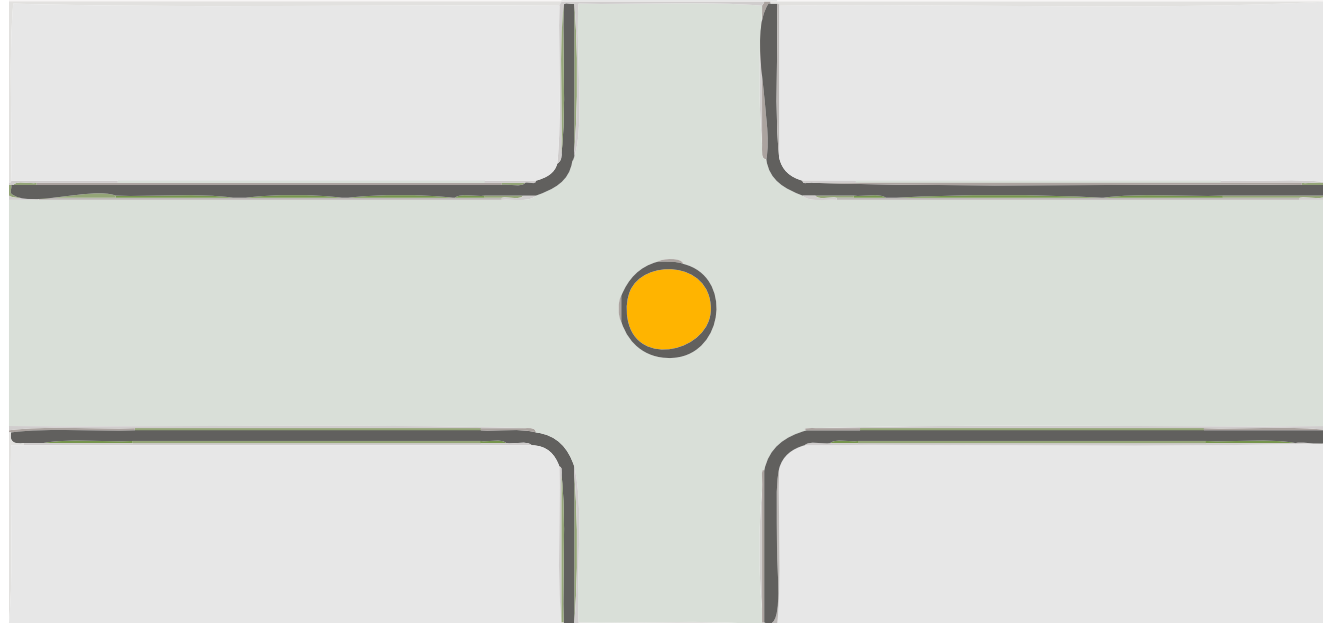
| Pros   | Cons   |
|--|--|
| + Slows traffic by narrowing travel lanes                      | - May restrict turning access into or out of driveways |
| + Can shorten pedestrian crossing distances and enhance safety | - May require removal of on-street parking             |

# Mini Roundabout

(Traffic Circle)

Potential Speed Reduction  
-4 MPH

**Fair**



^ Figure 12 | Plan View Graphic, Mini Roundabout (NACTO)

## Description

Roundabouts can help slow and organize vehicular traffic at intersections. Roundabouts keep drivers alert, requiring vehicles to move with caution and yield to other vehicles. West Fargo has implemented roundabouts across the City however, admits the design and implementation of mini roundabouts has not been a straightforward success.

## Cost & Maintenance



Depends upon the design and dimensions of the roundabout which may impact right-of-way (ROW) acquisition.

## Examples



Mini roundabout on 19<sup>th</sup> Ave W in West Fargo, ND



Mini roundabout in Athens, OH

| Pros                                       | Cons  |
|--|---|
| + Slows vehicular traffic at intersections | - Buses and heavy trucks including some emergency vehicles may have difficulty moving through roundabouts |
| + Can reduce crash severity                | - Uncomfortable for bicyclists whom may be sharing the travel lane  |

# Speed Hump

(Speed Cushion, Speed Table, Raised Intersection, Raised Crosswalk)

Potential Speed Reduction  
-6 to -8 MPH

**Good**



^ Figure 13 | Plan View Graphic, Speed Hump (NACTO)

## Description

Speed humps, speed cushions, or speed tables use a vertical offset to slow vehicles at strategic locations. Raised intersections are similar to speed tables however, the entire intersection is raised. By forcing part or all of a vehicle's wheelbase upward, drivers must slow down in order to travel over speed humps comfortably. West Fargo has recently implemented more speed humps on lower traffic volume streets or other strategic parts of the City to slow down traffic and increase safety.

## Cost & Maintenance



Dependent on design and pavement material choice.

## Examples



Raised crosswalk on 19<sup>th</sup> Ave W in West Fargo, ND



Speed bump on Golf Course Road in Fargo, ND

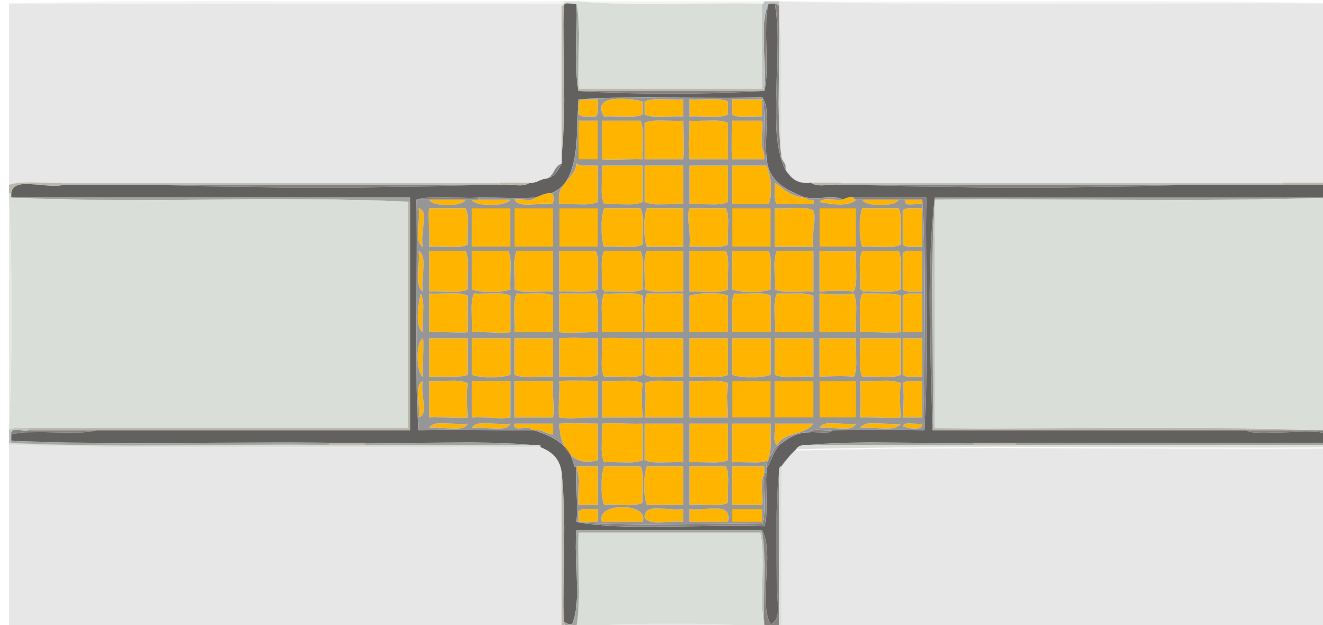
| Pros  | Cons  |
|---|---|
| + Forces a significant speed reduction      | - Speeds may increase after or between speed humps  |
| + Can be an effective yet low-cost solution | - Speed humps force emergency vehicles to slow down |

# Pavement Material

(Pavement Markings)

Potential Speed Reduction  
-1 to -2 MPH

**Basic**



^ Figure 14 | Plan View Graphic, Pavement Material (NACTO)

## Description

Pavement appearance can be uniquely altered through treatments that add visual interest, such as colored or pattern-stamped asphalt, concrete, or brickwork. Pavement material is typically used to alert drivers, particularly at strategic crossings or intersections. Aside from the visual appearance, certain pavement textures may also physically vibrate vehicles, causing drivers to feel and hear the difference in driving surface which can slow travel speed and increase awareness on the roadway.

## Cost & Maintenance



Depends upon the quantity and type of paving material or if paired with a raised intersection.

## Examples



Raised, stamped, and stained intersection near Freedom Elementary in West Fargo, ND

Intersection pavement material in downtown Fargo, ND

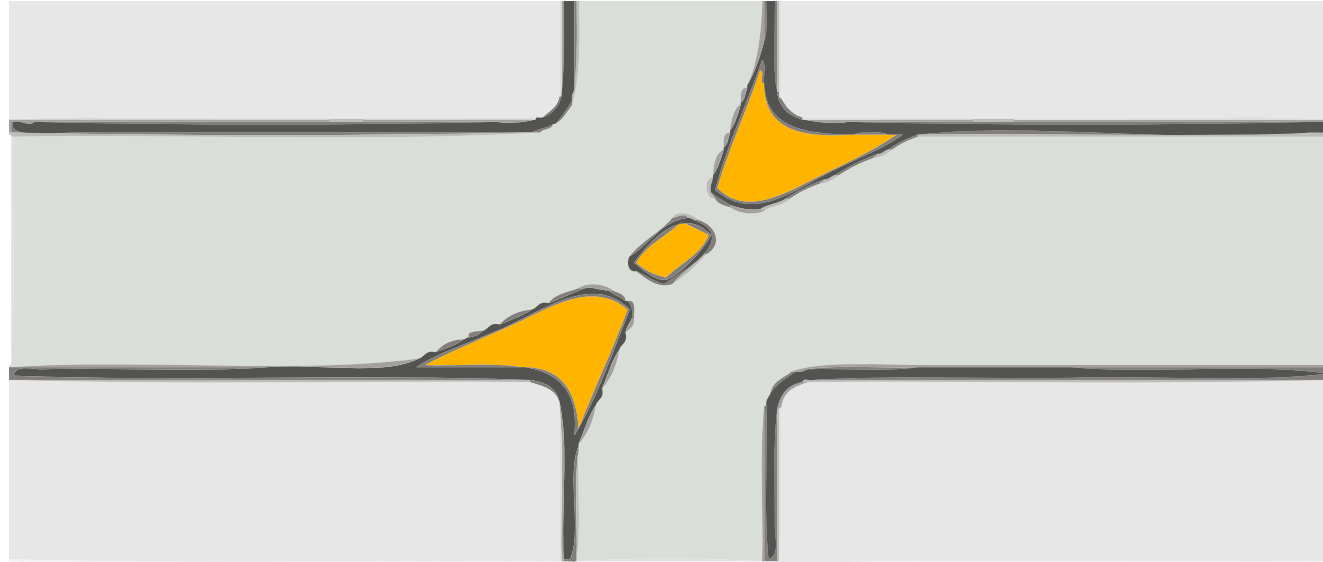
| <b>Pros</b>                                  | <b>Cons</b>   |
|--|---|
| + Can be low-cost depending on material used | - Minimal speed reduction   |
| + No impact on drainage or access            | - Pavement may require more long-term maintenance especially if brickwork is used |

# Diverter

(Closure, Partial Closure, Diagonal Diverter, Median Barrier, Forced Turn Island, Forced Turn Island, Bicycle Boulevard, Semi-Diverter)

Potential Speed Reduction  
NA  
Traffic is Diverted

**Fair**



^ Figure 15 | Plan View Graphic, Diverter (NACTO)

## Description

Diverter and other traffic volume management strategies restrict movement along a roadway while maintaining access for bicyclists and pedestrians. Diverter move traffic to other parallel streets. West Fargo has not utilized diverters in the past and given the non-traditional development patterns of the project study area, the only feasible locations for application are in older West Fargo neighborhoods, where a traditional development pattern with gridded street network exists.

## Cost & Maintenance



Costs increase with more complex designs and full closures.

## Examples



Diverter in residential area of Minneapolis, MN



Bicycle boulevard diverts vehicular traffic in Rochester, NY

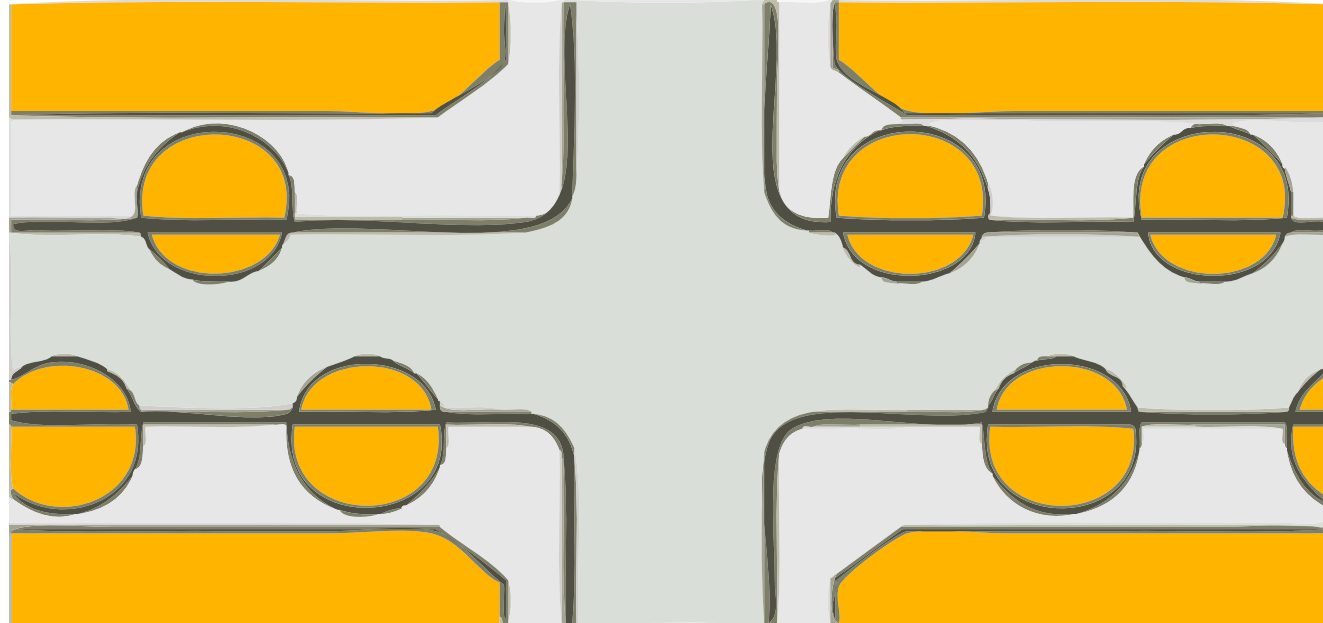
| Pros  | Cons                                      |
|---|---|
| + Reduces traffic volumes and speeds along the corridor | - May increase traffic on nearby streets  |
| + Improves pedestrian and bicycle safety                | - May impact ease of access to properties |

# Landscaping

(Building Lines, Street Trees)

Potential Speed Reduction  
NA  
Depends on Context

**Basic**



^ Figure 16 | Plan View Graphic, Landscaping (NACTO)

## Description

A denser built environment with street trees or no significant building setbacks can narrow a driver's visual field. This can help keep drivers more alert and aware of neighborhood surroundings and can create a visual constriction of the roadway to influence driver behavior.

## Cost & Maintenance



Depends upon landscaping size and quantity. Operations and maintenance efforts may increase in some areas and decrease in others.

## Examples



Very mature street trees providing canopy coverage of 4<sup>th</sup> St N in Fargo, ND

Large street trees maturing in the Charleswood neighborhood of West Fargo, ND

| Pros  | Cons   |
|---|--|
| + Does not alter roadway use of space or access | - May not be as effective unless tree coverage is significant or building setbacks are reduced to zero |
| + Increases roadway aesthetics and livability   | - May take decades for boulevard trees to fully mature   |

# Local Traffic Calming Examples

The study team, with help from the SRC, identified numerous local examples of existing traffic calming infrastructure that has been implemented in West Fargo and Fargo. Although the effectiveness of local traffic calming infrastructure was not studied through this report, there is precedent that traffic calming infrastructure can be implemented successfully and maintained through the oftentimes harsh climate and weather events experienced in this region.

## *Median Island*



13<sup>th</sup> Ave W in West Fargo, ND



18<sup>th</sup> Ave W in Fargo, ND

## *Curb Extensions*



30<sup>th</sup> Ave E in West Fargo, ND



1<sup>st</sup> St E near South Elementary School in West Fargo, ND

## *Mini Roundabout*



19<sup>th</sup> Ave W in West Fargo, ND



## ***Speed Hump***



19<sup>th</sup> Ave W in West Fargo, ND



Golf Course Road in Fargo, ND

## ***Pavement Material***



Freedom Elementary in West Fargo, ND



Downtown Fargo, ND

## ***Landscaping***



4<sup>th</sup> St N in Fargo, ND



Charleswood neighborhood of West Fargo, ND

# Evaluation Matrix - Traffic Calming Measures

| Traffic Calming Measure | Estimated Cost | Maintenance | Potential Speed Reduction | Public Support Score | Technical Support Score <sup>1</sup> | Access Friendly | Parking Friendly | Neighborhood Enhancement <sup>2</sup> |
|-------------------------|----------------|-------------|---------------------------|----------------------|--------------------------------------|-----------------|------------------|---------------------------------------|
| Lane Narrowing          | \$\$\$         | ↑↑↑         | -1 to -2 MPH              | 2.32                 | 4.00                                 | ✓               | ✓                | ✗                                     |
| Curb Extension          | \$\$\$         | ↑↑↑         | -3 to -4 MPH              | 2.20                 | 4.17                                 | ✓               | ✗                | ✓                                     |
| Pinchpoint              | \$\$\$         | ↑↑↑         | -3 to -4 MPH              | 2.12                 | 3.50                                 | ✗ <sup>3</sup>  | ✗                | ✓                                     |
| Chicane                 | \$\$\$         | ↑↑↑         | -6 to -9 MPH              | 1.96                 | 2.67                                 | ✗ <sup>3</sup>  | ✗                | ✓                                     |
| Median Island           | \$\$\$         | ↑↑↑         | -3 to -6 MPH              | 2.66                 | 4.00                                 | ✗               | ✗                | ✓                                     |
| Mini Roundabout         | \$\$\$         | ↑↑↑         | -4 MPH                    | 2.53                 | 3.17                                 | ✓               | ✓                | ✓                                     |
| Speed Hump              | \$\$\$         | ↑↑↑         | -6 to -8 MPH              | 3.68                 | 3.33                                 | ✗ <sup>3</sup>  | ✗ <sup>3</sup>   | ✗                                     |
| Pavement Material       | \$\$\$         | ↑↑↑         | -1 to -2 MPH              | 2.55                 | 3.50                                 | ✓               | ✓                | ✓                                     |
| Diverter                | \$\$\$         | ↑↑↑         | NA                        | 2.05                 | 2.33                                 | ✗               | ✓                | ✓                                     |
| Landscaping             | \$\$\$         | ↑↑↑         | NA                        | 2.94                 | 4.67                                 | ✓               | ✓                | ✓                                     |

The alternative evaluation matrix may be used by the City of West Fargo during future traffic calming project development to weigh different options side-by-side based upon the existing conditions and various factors of the street being evaluated.

<sup>1</sup>Similar to the public support score, the technical support score is derived from SRC-specific survey responses regarding support of the traffic calming options.

<sup>2</sup>Neighborhood enhancement options are those which may enhance the character of West Fargo by adding greenspace or other elements of detailed aesthetic. These measures may also be considered a neighborhood enhancement project that may be programmed outside of a traffic calming specific project.

<sup>3</sup>Pinchpoints, chicanes, and speed humps may be harder to fit in certain areas with access driveways on both sides of the street. Speed humps also may not impact on-street parking depending on the design.

# 5 | Traffic Calming Recommendations

## Step 1 | Traffic Calming Policy

### Highest Priority

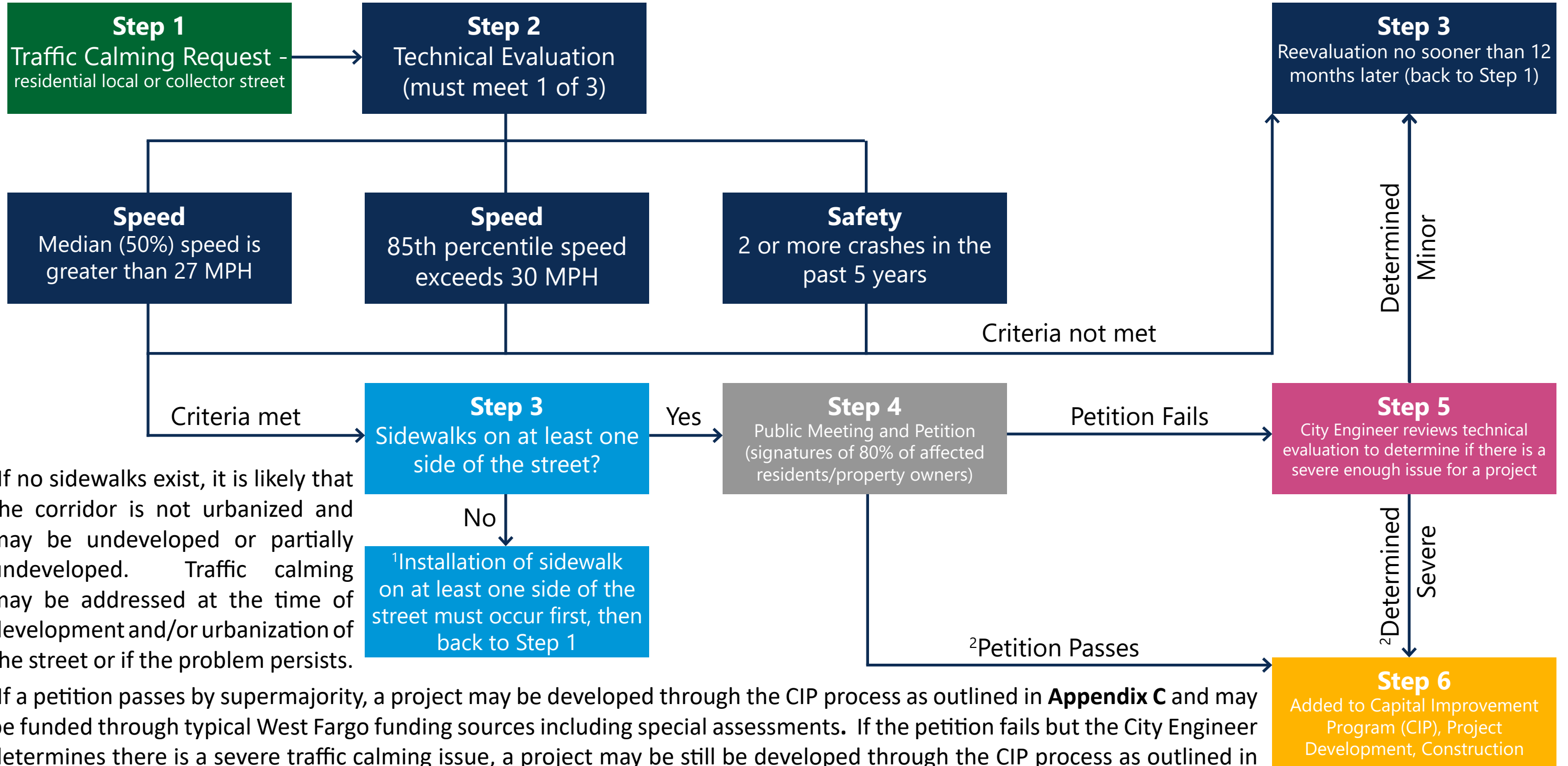
Chapter 5 provides community-wide prioritized recommendations for the City of West Fargo to address traffic calming concerns. The recommendations are based upon analysis of the root issues identified at the six (6) priority locations defined in Chapter 2 of this report. The recommendations found in this Chapter (Chapter 5) should be considered the priority recommendations to address traffic calming issues across the City of West Fargo.

This Study lays out a preliminary traffic calming policy flow-chart that establishes objective technical criteria that would warrant a traffic calming project. Traffic calming projects should only be considered on roadways with a federal functional classification of local or collector.

The City of West Fargo should *develop* and *adopt* a Traffic Calming Policy based upon objective technical criteria. The policy should only be a few pages long and clearly describe the process and technical evaluation criteria that all traffic calming project requests will go through in West Fargo.

# Draft Traffic Calming Policy Flowchart

One of the highest priority recommendations of the West Fargo Traffic Calming Study is for the City Commission to establish and approve a traffic calming warrant policy. The warrant policy will be used by Engineering Department staff to evaluate whether requests for traffic calming are warranted based upon technical criteria. The traffic calming policy will provide transparent and clear guidance to the public, and help ensure objectivity when programming traffic calming projects. The City Engineer will conduct the review of all traffic calming requests. The flowchart below, details the request



<sup>1</sup>If no sidewalks exist, it is likely that the corridor is not urbanized and may be undeveloped or partially undeveloped. Traffic calming may be addressed at the time of development and/or urbanization of the street or if the problem persists.

<sup>2</sup>If a petition passes by supermajority, a project may be developed through the CIP process as outlined in **Appendix C** and may be funded through typical West Fargo funding sources including special assessments. If the petition fails but the City Engineer determines there is a severe traffic calming issue, a project may be still be developed through the CIP process as outlined in **Appendix C** however, special assessments may not be used to fund the project and alternate sources will be pursued.

## Step 2 | Priority Locations

The evaluation of the six (6) priority locations against the preliminary traffic calming policy indicates that the following locations meet the criteria to be eligible for a traffic calming project. See **Appendix A** for site-specific evaluation and prioritization details. Locations below are listed in order of priority based upon technical evaluation and should be considered for project programming through the Traffic Calming Policy process:

**1<sup>st</sup> | 16<sup>th</sup> St E, south of 13<sup>th</sup> Ave E**

**2<sup>nd</sup> | 15<sup>th</sup> Ave E, between 6<sup>th</sup> and 9<sup>th</sup> St E**

**3<sup>rd</sup> | Beaton Dr, between Sheyenne St and 9<sup>th</sup> St E**

**4<sup>th</sup> | 10<sup>th</sup> St W, south of 13<sup>th</sup> Ave W**

**5<sup>th</sup> | 7<sup>th</sup> St W, between 15<sup>th</sup> and 19<sup>th</sup> Ave W**

**6<sup>th</sup> | 2<sup>nd</sup> St E, between 32<sup>nd</sup> and 40<sup>th</sup> Ave E**

See **Appendix A** for site-specific existing conditions, traffic conditions, planning-level cost estimates, and preliminary technical evaluation matrix.

## Step 3 | Alternate Locations

The City should collect existing conditions and traffic data at the four (4) alternative locations identified in this Study. These locations should be next on the list for formal traffic calming policy evaluation based upon complaints received by City departments over the last several years.

# Step 4 | Development Code

This Study also identifies areas within the City's development code that should be revised to proactively address root traffic calming issues caused by development across the City including the following:

## **Boulevard Trees | Chapter 4, Title IV, Section 4-449-A**

West Fargo should consider strengthening the boulevard tree standard to require minimum spacing of boulevard trees by classification of the roadway and timing of boulevard tree planting after development. Clarification for the responsibility of boulevard tree planting on double-fronting lots should also be considered.

Based on the existing conditions analysis of priority corridors, consistency of boulevard tree planting could also be improved in West Fargo. One way to accomplish this would be to make the planting boulevard trees the sole responsibility of the City, funded through an adjustment to forestry department fees. An alternative could be more strict enforcement of landscaping standards to ensure consistent planting and establishment of boulevard trees.

## **Driveway Spacing | Title II, Chapter 2, Section 2-0119**

The City should consider increased driveway spacing in certain contexts where on-street parking may also be present. Factors to consider when determining proper driveway spacing should include land use such as whether or not twin homes or town homes abut the street and if parking will be allowed on both sides. Existing conditions analysis of priority corridors indicates that on-street parking is underutilized under certain conditions, effectively creating wider travel-lanes that contribute to higher vehicular speeds. Driveway spacing can negatively impact on-street parking utilization and boulevard tree spacing.

## **On-Street Parking | Title IV, Chapter 4, Section 4-434.4**

West Fargo should consider establishing more robust on-street parking

regulations on local and collector roadways. Encouraging on-street parking in applicable areas where utilization may be high, can visually narrow the roadway, making higher vehicular speeds less comfortable for drivers and provides a buffer between traveling vehicles on the street and pedestrians along the sidewalk.

**Road/Lane Width | Title IV, Chapter 4, Section 4-0406.3**

West Fargo may consider revising ordinance language in regards to local and collector street widths to have a maximum width or not to exceed width (rather than a minimum width) based upon the number of travel- and on-street parking lanes. An 11-foot maximum travel lane and 8-foot maximum parking lane is encouraged however, different standards could be modified within reason based upon land use. Narrowing roadway pavement is one of the most effective ways to proactively discourage speeding, enhance safety, and is much more financially sustainable in the long-term task of roadway operations and maintenance.

**Road Network Circuity | Title IV, Chapter 4, Section 4-04**

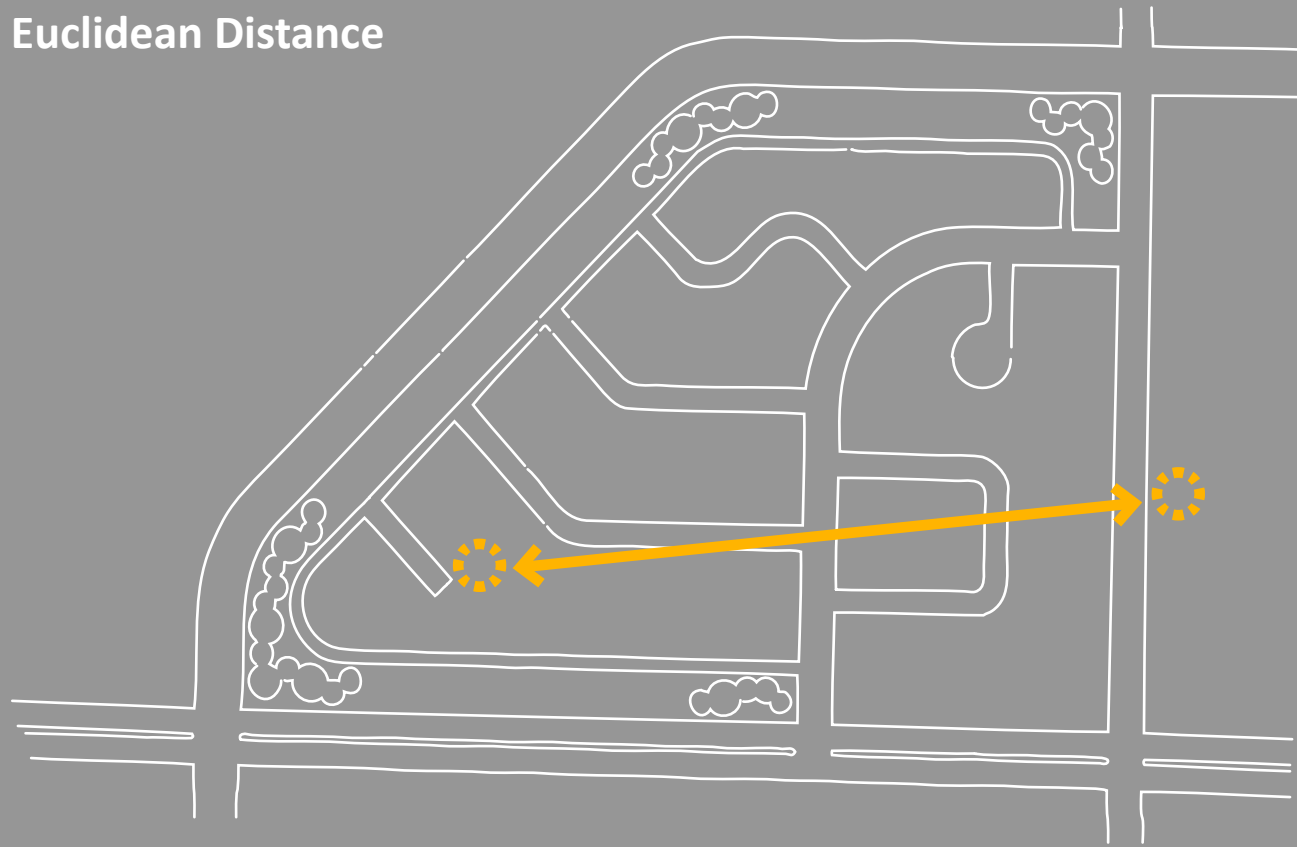
The City should add language regarding roadway network circuity or network efficiency to the Subdivision Regulations. Even as a simple concept, encouraging network efficiency will help improve traffic operations and safety on City of West Fargo streets, proactively calming traffic by increasing directness of vehicular travel.

See below regarding how Road Network Circuity can be calculated. The figure on the following page shows the basic concept of network circuity and how connectivity increases directness of vehicular travel.

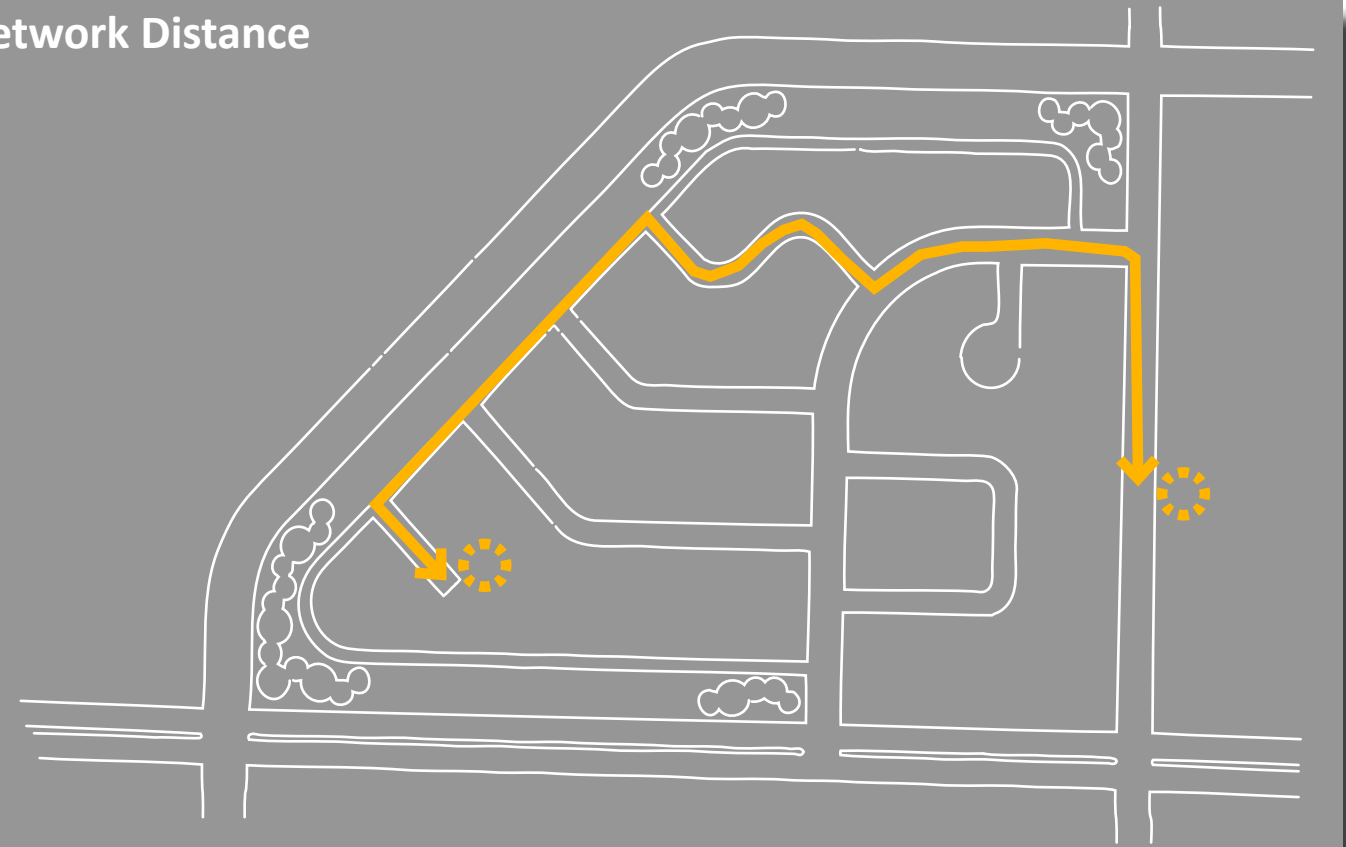
$$\text{Road Network Circuity Ratio} = \frac{\text{Network Distance}}{\text{Euclidian Distance}}$$

The lower the calculated ratio, the higher the connectivity and directness of travel.

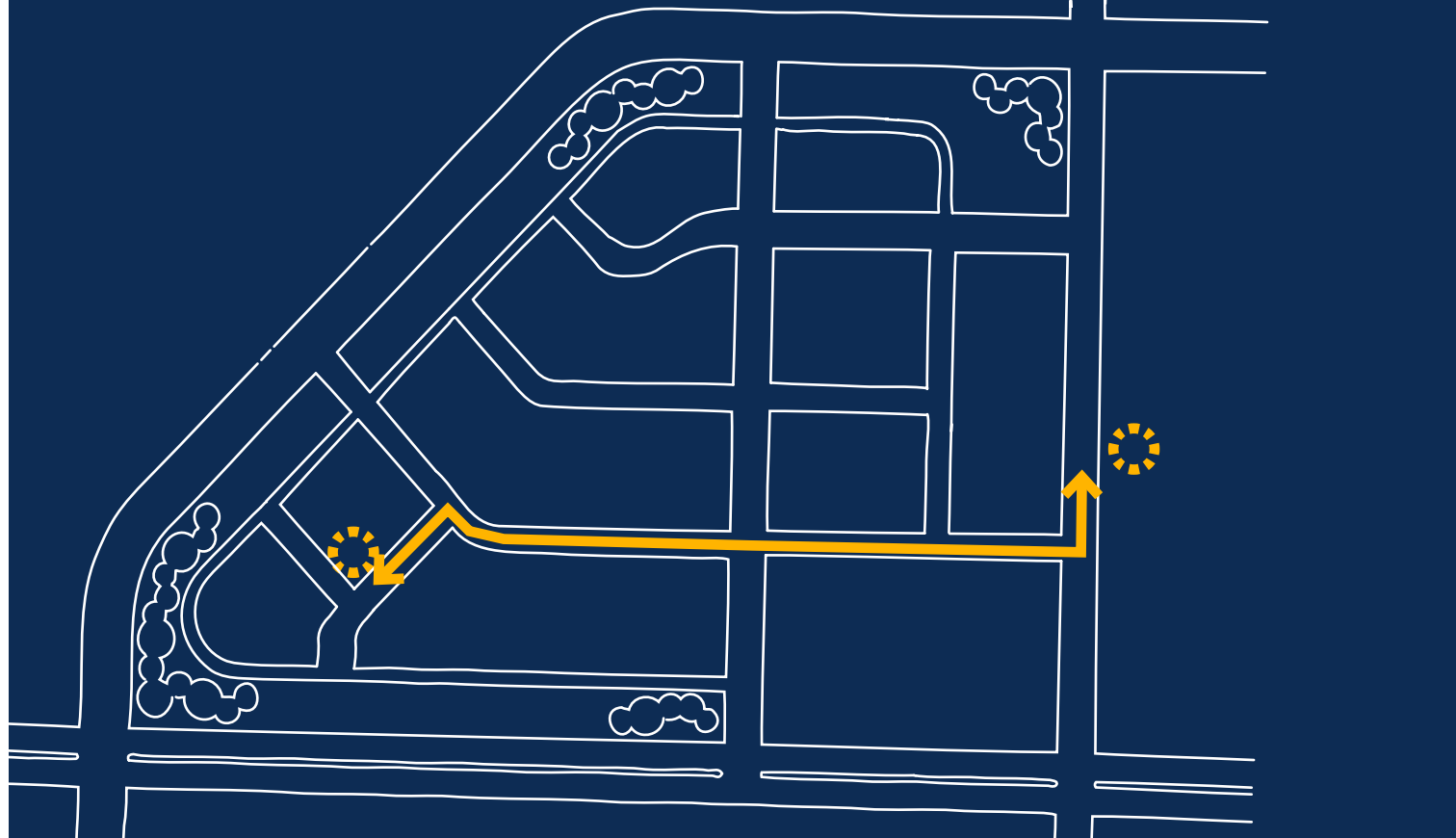
Euclidean Distance



Network Distance



Network Distance with higher connectivity (lower circuitry ratio)



< ^ Figure 17 | Road Network Circuitry Concept



## Step 5 | Refinement

West Fargo should refine and update the Traffic Calming Policy and this Study to reflect what is working and what is not. For example, if every project evaluated through the Traffic Calming Policy meets the criteria, the City may want to adjust the technical evaluation criteria to weed out roadways with less of a traffic calming problem. This will help ensure that major traffic calming issues are being programmed and that budget is being prioritized for locations with the worst problems. The Traffic Calming Study itself may also need updating to reflect best practices, effectiveness, and/or public support for various traffic calming measures identified within.

## Step 6 | Traffic Calming Program

The City should have in place a clear and transparent Traffic Calming Program that residents, City staff, and policy-makers can easily understand. The Traffic Calming Program is the City's Traffic Calming Policy in action and will ultimately help meet the goals and objectives of West Fargo's Comprehensive Plan, *West Fargo 2.0* and to uphold the City's reputation as a wonderful place to live.

# 6 | Traffic Calming Program Funding

## Highway Safety Improvement Program (HSIP)

The traffic calming program should be funded by the typical funding sources West Fargo uses to pay for capital improvements. Funding sources may include:

### **Capital Sales Tax**

### **Utility Fees**

### **Outside Funds**

- Local & State Agencies - Cost Shares
- State and Federal Grants

### **Special Assessments**

### **General and/or other Bonds**

### **Other City Funds**

- Special use funds (TIF, Economic Development)

The North Dakota Department of Transportation (NDDOT) Highway Safety Improvement Program (HSIP) provides discretionary or competitive federal funding for projects to achieve significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related safety improvements which would include traffic calming measures. If there are high instances of crashes at a given location being evaluated through the Traffic Calming Policy, a traffic calming project or portions thereof, may be eligible for HSIP funds. HSIP program funds can provide up to 90% federal cost participation for eligible projects and should be pursued for applicable traffic calming projects in West Fargo to help offset the costs associated with implementing traffic calming.

# 7 | Resources



U.S. Department  
of Transportation  
Federal Highway  
Administration



In the West Fargo Traffic Calming Study, there are numerous references to national standards for traffic calming and roadway design engineering from the following sources:

-Federal Highway Administration (FHWA) Office of Safety. Traffic Calming ePrimer. Available: [https://safety.fhwa.dot.gov/speedmgt/traffic\\_calm.cfm](https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm) Accessed June 2021. Last Modified: February 15, 2017.

-Institute of Transportation Engineers (ITE). Traffic Calming Measures Guide. Available: <https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/> Accessed June 2021. Last Modified:

-National Association of City Transportation Officials (NACTO). Urban Street Design Guide. <https://nacto.org/publication/urban-street-design-guide/design-controls/design-speed/speed-reduction-mechanisms/> Accessed June 2021. Last Modified: September, 2013.

-Federal Highway Administration (FHWA). Manual on Uniform Traffic Control Devices (MUTCD). Available: <https://mutcd.fhwa.dot.gov/> Accessed June 2021. Last Modified: June 21, 2021.

## West Fargo Traffic Calming Program Contact

Dustin Scott, PE

City Engineer



Contact Form (link)



(701) 515-5000