



Neighborhood Traffic Management Program

Objectives, Policies and Procedures on how to Increase Safety, Lower Speeds and/or Reduce Volumes

August 2019



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Mission Statement: The mission of the Neighborhood Traffic Management Program (NTMP) in the City of Rochester is to respond to requests for traffic calming in order to influence the behavior of drivers, improve the safety and quality of life in neighborhoods, and to create more quiet and livable local streets.

Goal: To closely work with neighborhood residents in order to identify various traffic concerns, conduct appropriate studies to quantify any problems, develop criteria for prioritizing projects, and implement solutions in order to rectify safety concerns and lower traffic speeds. Traffic calming will improve the safety of all road users, and create more pleasant neighborhoods for the residents of Rochester.

Objective: Under the NTMP, the Public Works Department will work with residents to assess the significance of traffic problems in their neighborhoods and determine what solutions would be appropriate to mitigate problems. Through this cooperative effort the City hopes to:

1. Improve the livability of neighborhoods by reducing the impact that traffic has on residential areas;
2. Reduce the need of traffic enforcement in residential areas;
3. Promote safe conditions for motorists, bicyclists, and pedestrians on neighborhood streets;
4. Encourage citizen involvement and effort in neighborhood traffic management activities;
5. Make efficient use of city resources by prioritizing neighborhood traffic management;
6. Effectively address the conflicting public safety interests of calming neighborhood traffic while maintaining adequate emergency response access and reasonable routing for service vehicles such as school buses;
7. Minimize the need to divert traffic to other local streets while implementing traffic calming improvements in neighborhood areas.

While neighborhood traffic concerns generally relate to speeding, pedestrian and cyclist safety, cut-through traffic, accidents, and general livability, the NTMP recognizes that each neighborhood is unique and issues vary. With that consideration, the underlying solutions of the NTMP will be classified into one or more of the following broad categories: **safety, speed, and volume**.

Traffic Calming Measures: To benefit the three broad categories of safety, speed, and volume, the NTMP involves three levels of traffic management and traffic calming measures. The use of levels allows for an intuitive calming process with visible solutions, while also allowing adaptability for specific problems. Specific examples of traffic calming devices, their uses, and averages costs can be found in the Traffic Calming Guidebook in the appendix.



Level 1 Traffic Calming (Safety): Level 1 traffic calming devices and programs are implemented to regulate, warn, inform, enforce, and educate motorists, cyclist, and pedestrians on the road. Level 1 devices are used primarily in areas that have been determined to be appropriate for traffic calming, and are a first attempt at changing driver behavior. As a trial, all eligible traffic calming locations should start with Level 1 to determine if these areas would benefit from light calming measures. Examples of Level 1 traffic calming devices include:

- | | |
|---------------------------|----------------------------|
| Radar Trailer/Radar Signs | Police Enforcement |
| Parking Modifications | Temporary Speed Bumps |
| Curb Markings | Pavement Marking |
| Signing Modifications | Traffic Signal Timing |
| Turn Restrictions | Neighborhood Traffic Watch |

Level 2 Traffic Calming (Speed): Level 2 traffic calming devices and roadway design features are used primarily to reduce traffic speeds within residential areas. Level 2 devices are implemented when Level 1 calming devices are not effectively addressing speeding issues. For example if it has been determined that the 85th percentile speed is greater than 4 mph over the posted or statutory speed limit, then Level 2 devices will be considered. Examples of Level 2 traffic calming devices include:

- | | |
|------------------------|----------------------|
| Speed Table | Raised Median Island |
| Intersection Bulb-Outs | Traffic Circle |
| Chicanes | Mid-Block Narrowing |
| Raised Crosswalks | Tree Planting |

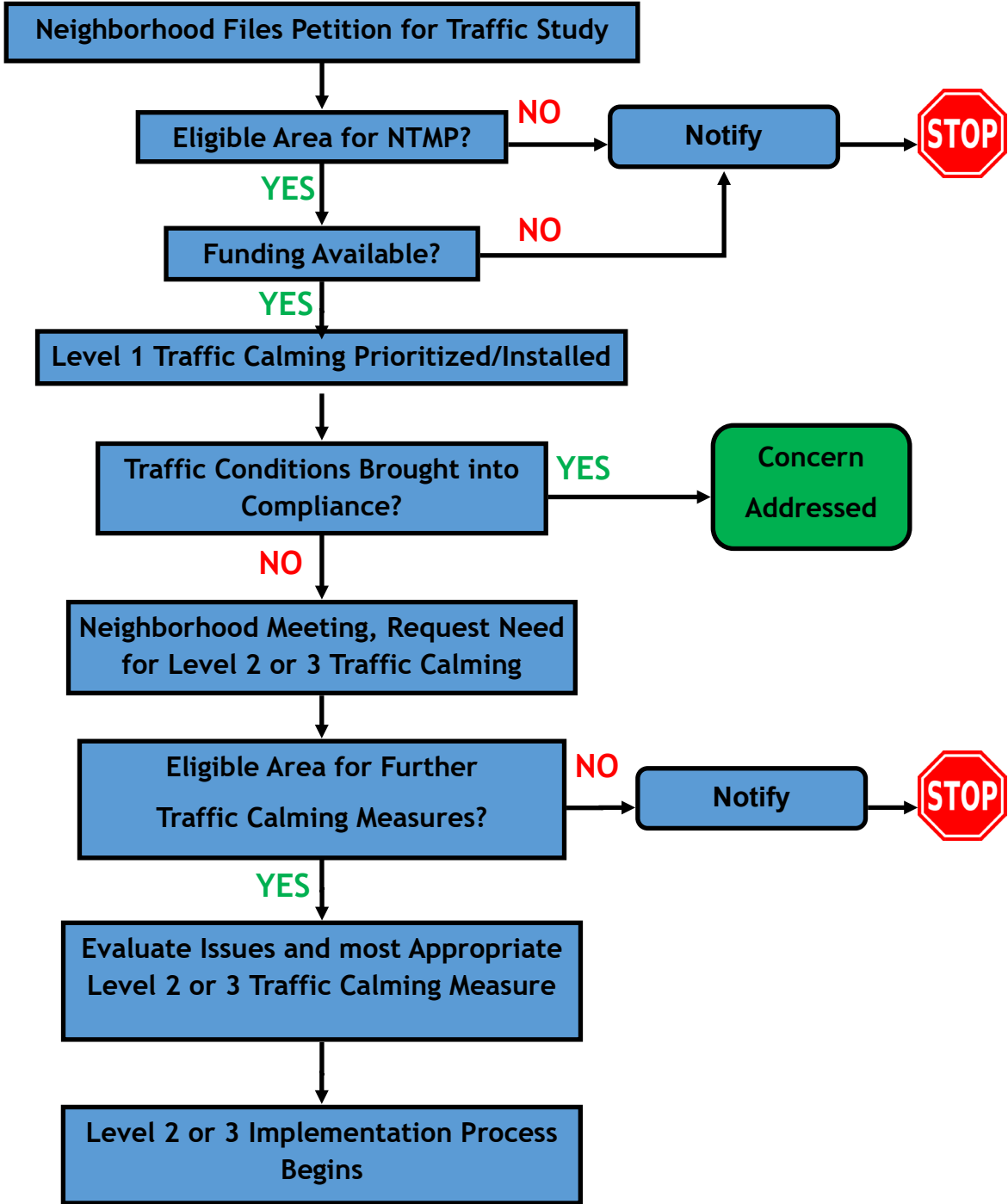
Level 3 Traffic Calming (Volume): Level 3 traffic calming devices and roadway designs are primarily implemented to discourage cut-through traffic from utilizing residential streets. Level 3 devices are used when traffic volumes in a studied area have been found to be significantly higher compared to similar streets in other areas. While Level 3 traffic calming devices are implemented to reduce the volume of cut-through traffic, attention must be paid to connectivity as accessibility should not be hindered greatly. Level 3 devices may be used by themselves to reduce volumes, or in conjunction with Level 1 and Level 2 devices. Examples of Level 3 traffic calming devices include:

- | | |
|------------------------|-----------------------------------|
| Diverters | Median Barrier/Forced Turn Island |
| Partial Street Closure | Full Street Closure |

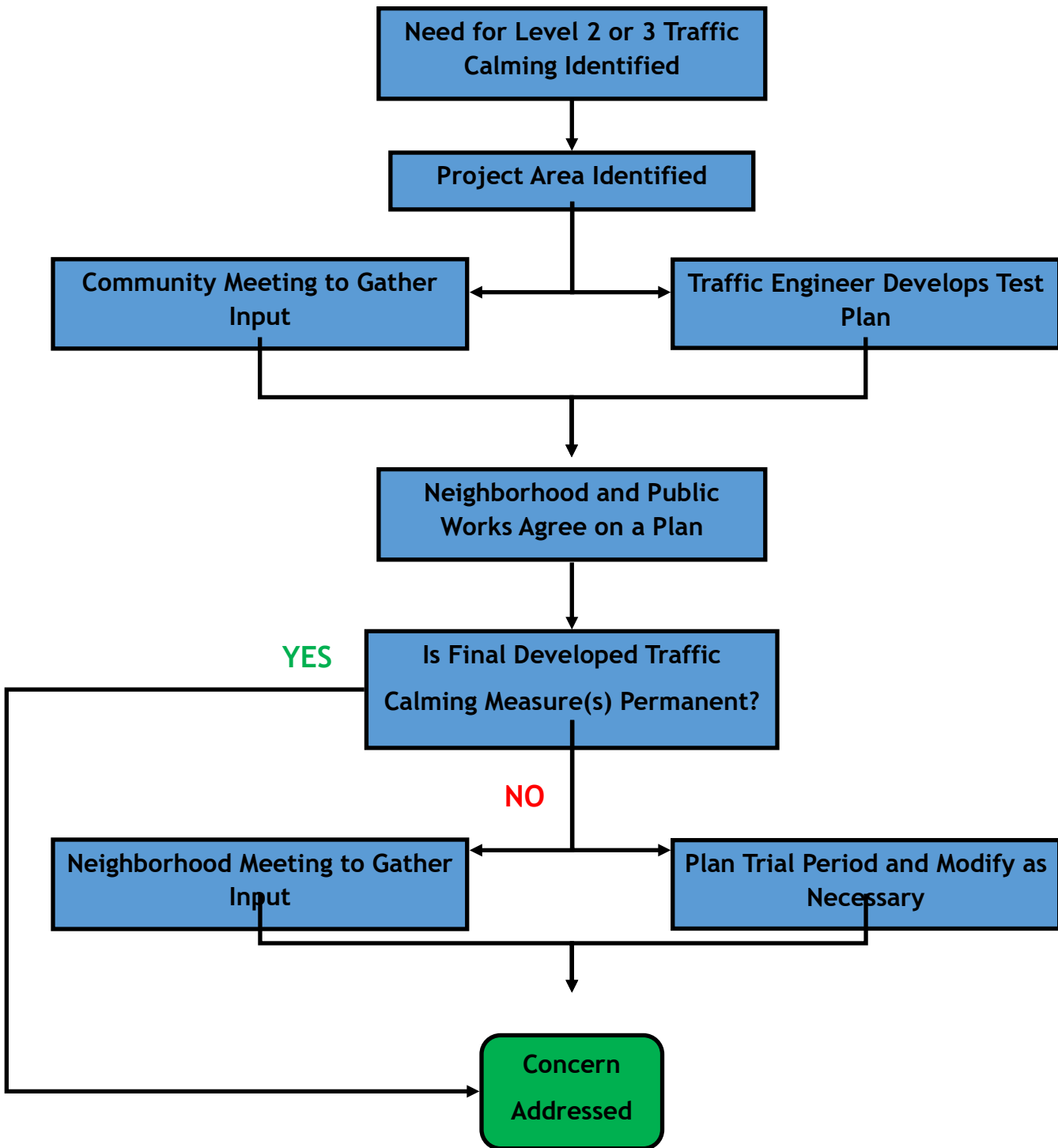


Decision Making Process

NTMP Level 1 Decision Making Process



NTMP Level 2 or 3 Decision Making Process



Traffic Calming Procedure: The traffic calming decision making process can be seen on page 5, which is initiated with Level 1 management devices. The procedure displays the roles and contact between the residents of a neighborhood and the Public Works Department. If further traffic calming has been determined necessary, the Level 2 or 3 decision making process follows and can be seen on page 6. Basic Level 1 traffic calming should be completed prior to initiating Level 2 or 3 management procedures, unless traffic engineer determines otherwise.

Level 1 Traffic Calming Procedure and Consideration for Level 2 or 3

Traffic Calming Requested – *Neighborhood*

To initiate the traffic calming process please locate the petition found in the appendix. For an area to be considered for traffic calming, the petition must be signed by the owners or residents of at least 10 different properties in the study area. Those signing the petition certify that they reside within the area impacted with problematic traffic.

Basic Study Performed – *City*

The City Traffic Engineer will complete an initial evaluation of the request to determine if area is eligible for participation in the program. Criteria for traffic calming to be considered can be seen below. Traffic studies are conducted only during summer months.

1. Streets must be primarily residential in nature:
 - 75% or more of the fronting land use along the corridor is residential or institutional in nature;
 - The street is classified as a local street or local collector street;
 - The street has no more than two through travel lanes.
2. Streets must meet the following minimum traffic conditions:
 - Volume:
 - a. On a residential local street, the location must have a minimum traffic volume of at least 500 vehicles per day.
 - b. On a residential local collector street, the location must have a minimum traffic volume of at least 900 vehicles per day.
 - In addition to the volume criteria, the location must also meet one of the following criteria:
 - c. Three or more crashes in any 12 month period within the last 3 years, not including intersections with arterial streets.
 - d. The 85th percentile speed is exceeding the speed limit.
 - e. Truck volumes exceeding 5 percent of the total traffic volume, where the truck traffic is not related to construction activity within the neighborhood.
 - f. A large portion of traffic is assumed to be cut through (i.e. non-neighborhood) traffic.



Level 1 Traffic Calming Prioritization/Implementation – *City*

If criteria from the traffic study is met, the Public Works Department will prioritize the area by assigning a score. The prioritization process can be viewed on page 10 of this document. This ensures that areas with traffic concerns are being addressed as fairly as possible. Upon being prioritized and available for traffic calming attempts, the area of concern will have Level 1 traffic calming measures implemented.

Traffic Conditions Brought into Compliance? – *Neighborhood*

After installation/implementation of Level 1 measures, contact shall be maintained between the neighborhood and the Public Works Department to discuss any changes in neighborhood traffic. If contact is not maintained then it will be assumed the concern was addressed. The Public Works Department may still perform traffic studies without request to gauge the effectiveness of the traffic calming device implemented and compare before and after traffic patterns.

Request for Level 2 or 3 Traffic Calming if Eligible – *Neighborhood*

If traffic complaints are still present a post Level 1 traffic study will be conducted. Following traffic study, if all the prior criteria are met and the 85th percentile speed is 4 miles per hour over the speed limit, then Level 2 or 3 traffic calming may be considered. Level 1 must be attempted and proven ineffective prior to Level 2 or 3 being considered.

Level 2 or 3 Traffic Calming Procedure

Need for Level 2 or 3 Traffic Calming Identified – *Neighborhood*

Initial Level 1 traffic calming options have been implemented and found to be ineffective and area qualifies for Level 2 or 3 traffic calming. Under certain conditions the traffic engineer can determine if area is severe enough for immediate Level 2 or 3 devices prior to Level 1.

Project Area Identified – *City*

Specific problem area identified for Level 2 or 3 traffic calming project. Project areas may include an entire street in question, intersections, smaller sections of roads, etc.

Community Meeting to Gather Input/Traffic Engineer Develops Plan – *Neighborhood/City*

Meetings are ideal so the residents of a neighborhood and the Public Works Departments can work together to find the best suited plan for traffic calming. These public meetings will be held in the community in order to discuss the problems and potential solutions. Based on comments and concerns received from the community meetings, the traffic engineer will develop suitable solutions for traffic calming in the area.



Neighborhood and Public Works Agree on a Plan – Neighborhood/City

When a traffic calming solution is presented, the neighborhood should be in agreement on the calming device and its location as these are typically expensive and permanent.

Traffic Calming Plan Approved and Prioritized – Neighborhood/City

Once the traffic calming plan is agreed upon, it will be placed onto a list for traffic calming devices requested and be sent to the City Council for review. Based on available resources, the City anticipates that it will be able to implement only a limited number of neighborhood traffic management projects each year. Therefore, the area is prioritized again from the post Level 1 traffic study data to determine the order of work. However, as with most decisions involving public infrastructure improvements the final approval of any traffic calming project will lie with the City Council.



Traffic Calming Project Prioritization

All requests for traffic calming that have had a traffic study resulting in the 85th percentile speed over the speed limit will be prioritized. For Level 2 and 3, based on available resources the City anticipates that it will be able to implement only a limited number of neighborhood traffic management projects each year. The prioritization system is used to ensure that projects are being scored by fact and not opinion. The use of a project prioritization system provides an even playing field and transparency to residents throughout the NTMP process.

Project prioritization will be based on a point system to develop a numerical score for each candidate area being considered for traffic calming measures. The prioritization criteria being studied include: speed, volume, schools, proximity to pedestrian generators, collisions, and designation as a current or future bicycle route. Areas that score more points will be prioritized higher than areas with fewer points. Low ranking areas on the prioritization list are eligible for 10 years. Areas that do not move up the prioritization list after 10 years will be removed and petition process and traffic study will have to be redone if traffic is still believed to be a concern.

The prioritization point system is as follows: (100 points possible.)









1. **Speed** (40 points maximum): 5 points are assigned for every mile per hour (mph) the 85th percentile speed is above the speed limit on the street. The 85th percentile speed identifies the travel speed where 85% of the vehicles surveyed are traveling at or below that speed. The 85th percentile speed is commonly used as a benchmark when posting speed limits.
2. **Volume** (30 points maximum):
 - a. 1 point is assigned on residential local streets for every 100 vehicles per day using the street.
 - b. 1 point is assigned on residential local collector streets for every 150 vehicles per day using the street.
3. **Schools** (10 points maximum): 5 points are given if a school is within $\frac{1}{2}$ mile radius of the subject area; 10 points are given if a school is within $\frac{1}{4}$ mile radius of the subject area.
4. **Pedestrian Generators** (5 points maximum): 5 points are assigned if facilities such as libraries, parks, trails, hospitals, transit routes/bus stops, or playgrounds are located within $\frac{1}{4}$ miles radius of the subject area.
5. **Collisions** (10 points maximum): 2.5 points are assigned for each recorded crash within the subject area, not including intersections with arterial streets. 5 points given if the collision is an incapacitating injury or fatal injury crash. Crash data being considered is for the 3 calendar years prior to the year the petition was submitted.
6. **Bicycle Routes** (5 points maximum): 5 points given if area is designated as a current or future bicycle route, according to the current version of the City's Bicycle Master Plan.

There may be existing conditions, other than what is included on the project ranking system, that warrant the need or not for traffic calming. Establishing the ranking for these traffic calming projects will require the use of engineering judgment and is up to the city traffic engineer's discretion.



Possible Effects of Traffic Calming Devices

Traffic calming devices can potentially have negative impacts on neighborhoods. These possible traffic calming side effects should be taken into consideration.

WHAT MAY BE AFFECTED	POTENTIAL EFFECT
 Emergency Vehicles	Increased response time
 Adjacent Neighborhoods	Increased traffic volume and speed
 Utility Vehicles (i.e. sanitation vehicles)	Increased route time
 Other Roadway Users (i.e. bicyclists, joggers, pedestrians, etc.)	Increased likelihood of an unintended negative impact in attempting to negotiate or circumvent the traffic calming device
 Residents Immediately Adjacent to the Traffic Calming Devices	Increased noise level from vehicles braking and going over and around the traffic calming device(s)
 On-Street Vehicle Parking	Loss of on-street parking immediately around traffic calming device(s)
 Neighborhood Aesthetics	Traffic calming device may detract visually
 Future Maintenance Cost	Increased landscaping and street rehabilitation costs (e.g. pavement, pavement markings, or sign maintenance)

Budgeting and Final Implementation: Once the traffic calming project is approved, specifications and final cost estimates will be prepared by the Public Works Department. The cost of traffic calming will be borne by the city from the NTMP budget.

Project Implementation: After City Council determines approves the traffic calming project for construction, the construction of the project(s) will be scheduled as soon as practical/prioritized. Due to cost and resources only a limited amount of projects can be initiated each year.

Evaluation Phase: Communication between the neighborhood residents and the Public Works Department shall be maintained following construction. If communication is not maintained it will be assumed that the concern was addressed. The Public Works Department may still perform traffic studies in the area after completion of any traffic calming project to determine effectiveness of work and gauge any change in traffic patterns.

Maintenance of Traffic Calming Devices: If the traffic calming device allows for the installation of landscaping as a final part of the construction project, maintenance of the landscaping will become the responsibility of the benefited neighborhood. If the neighborhood does not agree to maintain the landscaping, or if the neighborhood fails to fulfill the responsibility, the landscaping creates obstructions for pedestrians or motorist, becomes unsightly, or is otherwise potentially hazardous, it will be removed and or replaced by the city with low or no-maintenance items.

Summary: The Neighborhood Traffic Management Program is a program that allows for clear and open lines of communication with the Public Works Departments and residents of a neighborhood. By using the system of levels, a visible identifiable solution to traffic concerns can be implemented, as well as being a process that is simple to follow and understand. If initial basic calming measures are found ineffective, more involved solutions may be implemented. The first step of any traffic calming process is to acquire 10 signatures from adjacent residents on the petition found in the appendix and submit to:

City of Rochester Public Works Department
201 4th Street SE, Room 108
Rochester, MN 55904

Questions can call: 507-328-2400



Appendix

- City of Rochester Neighborhood Traffic Management Program
- City of Rochester Neighborhood Traffic Management Program (NTMP) Application/Petition
- Petition/Evaluation for Comprehensive Level 2 or 3 Traffic Calming
- Traffic Calming Guidebook



City of Rochester Neighborhood Traffic Management Program (NTMP) Application/Petition

We the undersigned residents submit this Application due to our concerns about traffic along _____ between _____ and _____ during the following times (select the worst time of day and if weekdays/weekends).

- Morning from 6am to 9am Mid-day from 9am to 3pm
- Late Afternoon from 3pm to 6pm Evening from 6pm to 10pm
- Late night from 10pm to 6am Weekdays Weekends

We believe the following factors / conditions may also contribute to a potentially unsafe condition along this segment of road:

- Young children present Near school Near school crossing
- Near playground Steep hill Sharp curve in road
- Limited sight distance Numerous cars parked on the street
- Other (describe):

Please describe the nature of the neighborhood problem you are concerned with. You may attach additional sheets if necessary. *(Please print or type additional description sheets.)*

Please list possible solutions to the problem you would like the City of Rochester to consider:

(Traffic calming examples are listed on page 4, while their description and benefits are listed in the Traffic Calming Guidebook in the appendix.)

The following person is the Point of Contact for this Application:

(Point of contact is responsible for distributing information to petition signers and to help arrange time and place for any community meetings.)

Name (print): _____

Name (signature): _____ Date: _____

Address: _____

Phone Number: _____

E-Mail Address: _____



Your request will be processed in the order in which it is received. An initial evaluation of the site will be conducted and a priority assigned to the location. A letter, phone call, or email will be sent to the Point of Contact indicating the evaluation findings, priority assigned to the application, and future actions to be taken. Please allow time for the response, and it is usually not possible to conduct the evaluation during the winter months. Petition must be signed by at least 10 different residents in the study area. Those signing the petition certify that they reside in the impacted area and agree with the concerns described.

The Point of Contact will be responsible for distributing this information to the signers of the petition, and to arrange times and places for any community meetings that may result should the installation of Level 2/3 traffic calming devices become an option.

	Printed Name	Signature	Address	Phone or Email
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

RETURN THE COMPLETED PETITION TO

City Traffic Engineer
 Rochester Public Works Department
 201 4th St SE, Room 108
 Rochester, MN 55904



Petition/Evaluation for Comprehensive Level 2 or 3 Traffic Calming

This form is designed to help you evaluate your street, and to indicate if you support the City investigating potential traffic calming devices on your street. Citizen approval is important as these projects are permanent. The information you provide is also helpful so that the City can understand and define a specific problem. Please answer the questions below and send this sheet and petition to the address provided, or simply discuss during community meeting.

Name of Observer: _____

Are you in favor of the City investigating potential comprehensive (Level 2 or 3) traffic calming devices?

Yes

No

Address: _____

Age:

18-40

41-64

65+

Are you a (Check all that apply)

Pedestrian

Bicyclist

Motorist

On a scale of 1 to 5, please indicate the number that best describes conditions in your neighborhood (1 = Not a Problem; 5 = Serious Problem):

Children Present: _____

Pedestrian Safety: _____

Careless drivers: _____

Speeding Cars: _____

Cut-Through Traffic: _____

Parking: _____

Traffic Noise: _____

Street Width: _____



Frequently Asked Questions

Why can't stop signs be installed?

Stop signs are a frequently requested measure by citizen to control speeds on residential streets. Stop signs are traffic control devices and not traffic calming measures as they are intended to control the flow of traffic at an intersection and assign right-of-way. With the introduction of a stop sign, speeds may actually increase. Speed reductions are observed only in the immediate vicinity of the intersection, and motorists often increase their speeds between stop signs to make up for lost time. Areas where stops signs are not necessary for traffic control are more likely to be ignored by motorists, and with poor compliance leads to more safety issues. Noise is increased in the vicinity of the intersection as well because of accelerating vehicles. Due to these concerns, stop signs are not used as a tool for speed control and will only be installed if intersection meets MUTCD warrants (Regulatory Signs, Sign R1-1).

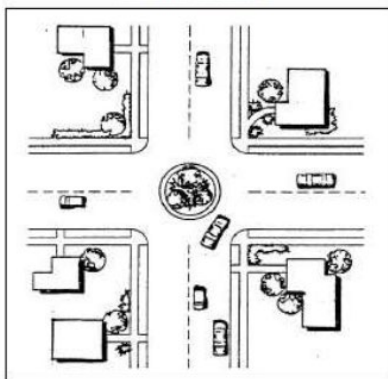
Can we reduce the speed limit to slow speeding?

No. The City of Rochester has set the posted speed limit with good reasons in mind including road characteristics, traffic mix, collision history, and road function. Reducing the speed limit and posting signs is not very effective at reducing speeds either. If it was effective, there would be more speed limit signs and speeding problems would be gone.

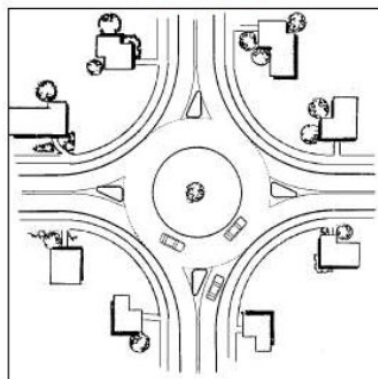
Are traffic circles and roundabouts the same thing?

No. Roundabouts, like stop signs, are traffic control devices and not traffic calming measures. While they can slow traffic, they are intended to continue the flow of traffic at an intersection of higher volume roadways. Roundabouts often take the role of traffic signals. Traffic circles however are small raised islands located in the center of an intersection. Often used in residential areas, they are an effective device to prevent drivers from speeding through intersections by impeding the straight-through movement.

Traffic Circle



Roundabout





Neighborhood Traffic Management Program

Objectives, Policies and Procedures on how to Increase Safety, Lower Speeds and/or Reduce Volumes

August 2019



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Introduction

The purpose of this guidebook is to assist neighborhood residents and community leaders increase their knowledge about various ways of calming traffic. There are many different ways in which traffic can be calmed, and the devices can range from subtle to fairly aggressive. Each device has appropriate applications, advantages, disadvantages, and cost and limitations associated with it. This guidebook will outline where, when, why, and how each traffic calming devices should be used.

Since traffic calming devices vary, it is important to first identify the problem. With the problem identified the proper traffic calming device may be selected to counteract the issue. Some traffic calming devices address speed reduction while others may be more suited to reducing traffic volume, so the appropriate device should be selected.

This Traffic Calming Guidebook should be used in conjunction with the Neighborhood Traffic Management Program Handbook. Following the process laid out there, and the use of this Guidebook, the appropriate traffic calming device(s) can be explained, compared, and selected.

Level 1 Traffic Calming (Safety)

Level 1 traffic calming devices and programs are implemented to regulate, warn, inform, enforce, and educate motorists, cyclist, and pedestrians on the road. Level 1 devices are used primarily in areas that have been determined to be appropriate for traffic calming, need an initial traffic calming trial, or have not been found excessive or very serious. Intended to primarily address safety concerns, Level 1 devices can be implemented quickly and relatively inexpensively. These devices are the least intrusive, can be permanent or temporary, and can overall create behavioral changes resulting in a higher quality of life in the neighborhood.



Speed Monitoring Trailer

Description: This calming attempt involves the placement of speed display trailers on designated streets. The portable radar speed trailer is capable of measuring vehicles speed and displaying the speed of the driver.

Potential Advantages:

- Effective for temporary speed reduction;
- Educates drivers on what their speed is;
- Good public relations tool.

Potential Disadvantages:

- May not change long-term habits;
- Effects speed only in the area of the trailer;
- Requires periodic enforcement to maintain beneficial effect.

Cost: Low to moderate cost due to purchase price and staffing requirements.

Where to Apply: Any local/residential street where speeding has been a problem.



Alternative: Permanent Driver Feedback Speed Limit Sign

Description: Driver feedback speed limit signs show the posted speed as well as the speed at which the coming traffic is traveling. This reminds motorists of their speed and these signs help educate residents with what the general speed of traffic is in their neighborhood.

Potential Advantages:

- Constant reminder to motorists what their speed is in relation to speed limit;
- Educational tool for motorists and residents.

Potential Disadvantages:

- May not slow traffic down long-term after the novelty wears off;
- Not everyone will see permanent signs as a positive influence in their neighborhood.

Cost: Estimated cost of \$2,000 to \$8,000 per sign.

Where to Apply: Any local/residential street where persistent speeding is a problem.



Police Enforcement

Description: Increased enforcement of speed limits on residential streets to reduce traffic speed and increase safety.

Potential Advantages:

- Visible enforcement could reduce speed by increasing driver awareness about speeding on residential streets;
- Can target specific times;
- Targets violators without affecting normal traffic;
- Can be implemented in almost any location at short notice.

Potential Disadvantages:

- May not change long term habits;
- Enforcement limited by police availability and other policing duties;
- The portion of the fines the city receives does not cover the cost of enforcement as enforcement is an expensive tool;
- Temporary measure.
- Special Considerations:
- Often helpful in school zones;
- May be used during “learning period” when new devices or restrictions are first implemented.

Cost: Moderate cost primarily due to the staffing requirements.

Where to Apply: Anywhere that speeding or traffic safety is a concern.



Pavement Markings

Description: Stop bars, yield bars, turn arrows, delineators, lane marking, crosswalks, etc. Used to delineate and to inform motorists, bicyclists, and pedestrians about important information necessary to travel safely upon the City's streets.

Potential Advantages:

- Quick application;
- Relatively easy to install;
- Effective way of increasing awareness and safety to road users.

Potential Disadvantages:

- Not visible when snow covered;
- Less visible at night/in rain if not reflective;
- Maintenance cost.

Cost: Low to moderate.

Where to apply: Anywhere safety is a concern or pavement isn't marked.



Restricted Movement Signing

Description: Signs that would prohibit certain types of movements at an intersection. This is used in special circumstances to increase traffic safety and decrease volume.

Potential Advantages:

- Redirects traffic onto main streets;
- Reduces the volume of traffic in area of concern;
- Addresses rush hour issues.

Potential Disadvantages:

- No significant effect on vehicle speeds;
- Can increase congestion in directed area;
- May increase trip length for some drivers.

Cost: Low

Where to Apply: Areas impacted with rush-hour traffic, or where safety is a concern.



Level 2 Traffic Calming (Reduce Speed): Level 2 traffic calming devices and roadway design features are used primarily to reduce traffic speeds within residential areas. Level 2 devices are implemented when Level 1 calming devices are not effectively addressing speeding issues, or if it has been determined that the 85th percentile speed is greater than 34 mph. Some possible Level 2 traffic calming devices include:

Speed Bump

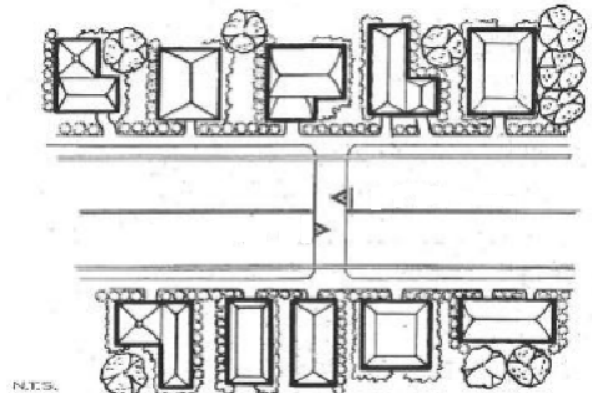
Description: Rounded raised areas of pavement typically placed in a series. Effective at lowering speeds on local streets. Appropriate for mid-block placement, but not intersections.

Potential Advantages:

- Very effective at slowing traffic;
- Self-enforcing;
- May reduce volumes by discouraging non-resident traffic

Potential Disadvantages:

- Impacts the ease of emergency vehicle access;
- Can disrupt street drainage paths;
- May increase traffic noise in vicinity of speed hump;
- Depending on size and height can interfere with snow removal.



Cost: Ranges between \$2,500 to \$8,000 depending on material and size.

Where to Apply: Areas with speeding issues.



Raised Crosswalks

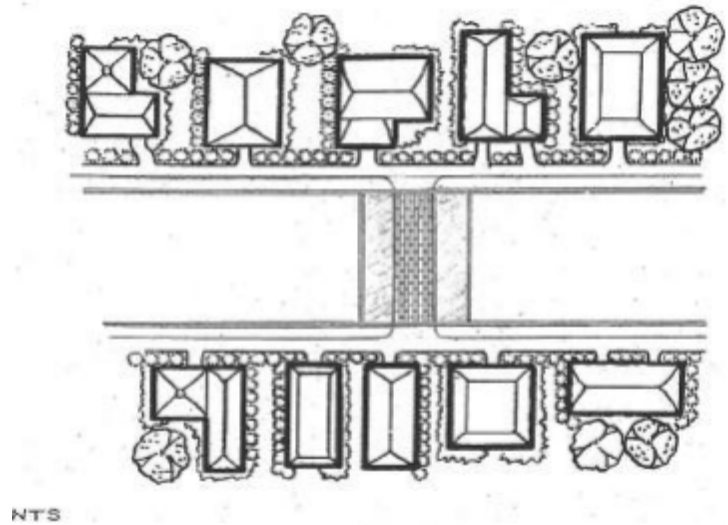
Description: Similar to speed bump but typically has a flat section in the middle and is used as a pedestrian crosswalk.

Potential Advantages:

- Can be very effective at slowing traffic down on residential streets;
- Self-enforcing;
- Requires minimal maintenance;
- May reduce volumes by discouraging non-resident traffic;
- Minimal impact on snow removal.

Potential Disadvantages:

- May slow emergency response times;
- May increase speed of traffic between tables;
- May disrupt drainage paths;
- Increases traffic noise in vicinity of hump.



Cost: Ranges between \$2,500 and \$8,000.

Where to Apply: Areas where speeding or pedestrian safety is an issue.



Raised Intersection

Description: Flat raised areas covering entire intersections, with ramps on all approaches. Sometimes referred to as raised junctions, or intersection humps, they are essentially speed tables stretched across an intersection and are effective at reducing speed.

Potential Advantages:

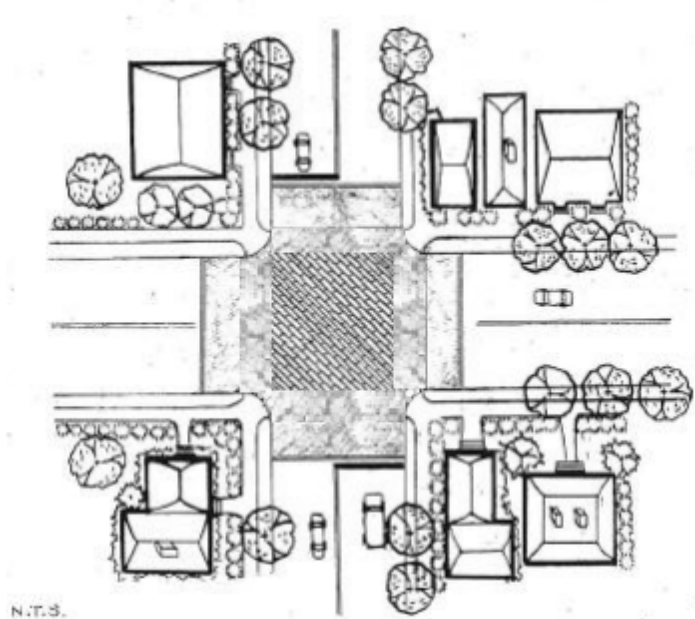
- Effective at slowing traffic down through residential streets and intersections;
- Self-enforcing;
- Minimal maintenance required;
- Improves safety for both pedestrians and vehicles;
- May discourage non-resident traffic.

Potential Disadvantages:

- May slow emergency response time;
- Disrupts drainage paths;
- Compared to speed bumps/tables raised intersections are more expensive.

Cost: Ranges from \$15,000 to \$60,000+.

Where to Apply: Intersections with safety or speeding concerns.



Median Island

Description: Raised islands are located along the street centerline and narrow the travel lanes at that location.

Potential Advantages:

- Effective at slowing traffic down through residential streets and intersections;
- Self-enforcing;
- Minimal maintenance required;
- Improves safety for both pedestrians and vehicles;
- Effective at bends in a road to keep vehicles from cutting corners and staying within travel lane.

Potential Disadvantages:

- Potential legal issues associated with blocking a public street (e.g., business or emergency access);
- May impact access to properties adjacent to islands;
- No significant impact on vehicle speeds beyond island.

Cost: Ranges from \$1,000 to \$10,000+.

Where to Apply: Roads with speeding concerns.



Neighborhood Entry Island/Gateway

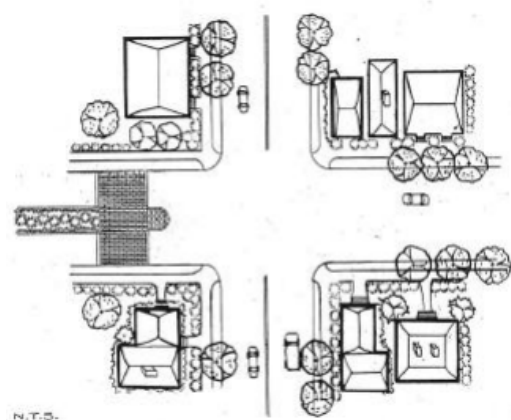
Description: Entry Island/Gateway are raised sections used at entrances to residential neighborhoods to define the transition from a major collector/arterial street to a local neighborhood street. They are intended to reduce vehicle speed and interrupt sight distance down the center of the roadway.

Potential Advantages:

- Notifies motorists of a change in roadway character;
- Helps identify neighborhood;
- Can discourage truck or through traffic entry;
- Reduces speed;
- Creates an opportunity to provide landscaping and aesthetic improvements

Potential Disadvantages:

- Needs maintenance or irrigation if landscaped;
- May remove some parking;
- May impact snow removal;
- Landscaping has the possibility of restricting sight distance.



Cost: Can vary widely depending on width, length, landscaping, material, etc. Range from \$5,000-\$20,000+.

Where to Apply: Residential areas neighboring streets with heavy flow.



Chicanes

Description: A series of alternating curves or lane shifts that force a motorist to steer back and forth instead of traveling in a straight path. Typically done with curb extensions, chicanes are effective at reducing speeds in residential areas.

Potential Advantages:

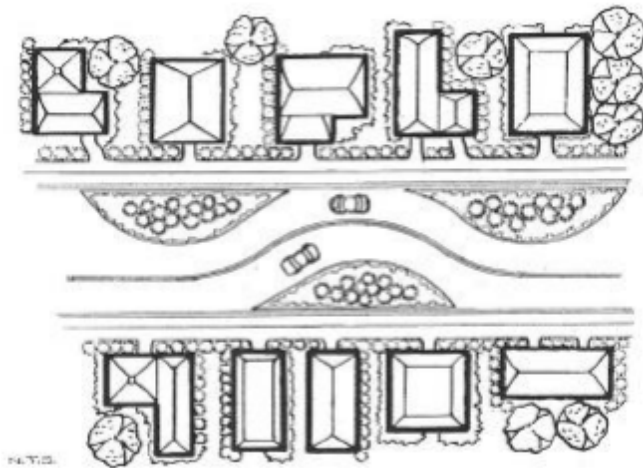
- Interferes with straight line travel;
- Provides opportunity for landscaping;
- No effect on emergency access;
- Reduces speed.

Potential Disadvantages:

- May require the removal of on-street parking;
- Not a preferred crosswalk location;
- May interfere with snow removal;
- May reduce cyclist comfort;
- Larger vehicles may experience challenges or passenger discomfort when negotiating.

Cost: Ranges between \$8,000 and \$25,000+.

Where to Apply: Straight roads with speeding concerns.



Chokers

Description: Raised islands/curb on one or both sides of the roadway creating a narrower roadway. Used mid-block, chokers encourage lower travel speeds by reducing motorist margin of error and can also be landscaped.

Potential Advantages:

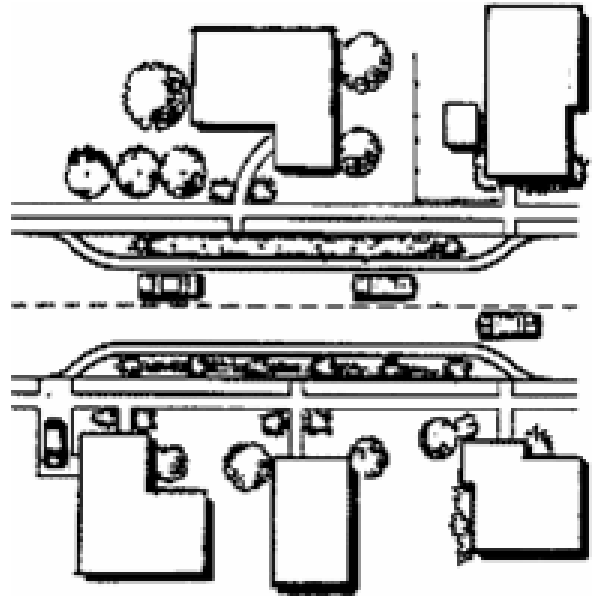
- Reduces vehicle speed;
- Reduces crossing distance for pedestrians;
- Provides opportunity for landscaping.

Potential Disadvantages:

- May create problems with maintenance and snow removal;
- May require removal of parking;
- May reduce cyclist comfort.

Cost: Ranging from \$10,000 to \$20,000+. Depends on length, width, landscaping, etc.

Where to Apply: Straight roads with speeding concerns.



Intersection Bump-Outs

Description: Intersection bump-outs, also known as curb extensions or neckdowns, are similar to chokers but instead of mid-block, are at an intersection. They are achieved by extending curb corners towards the center of the roadway and reduce the crossing distance for pedestrians and may slow motorists.

Potential Advantages:

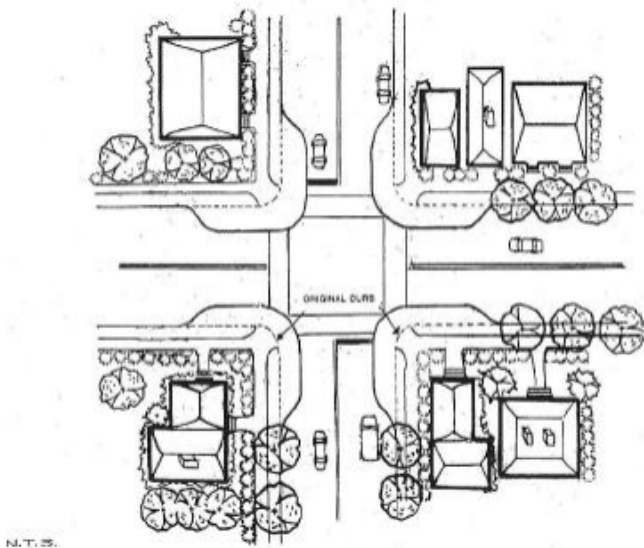
- Slows traffic by funneling it through a narrower street opening;
- Reduces the crossing distance for pedestrians and makes pedestrians more visible to oncoming traffic;
- Prevent illegal parking close to an intersection;
- Can improve neighborhood appearance with landscaping and/or textured treatments.

Potential Disadvantages:

- May be difficult to accommodate full bicycle lanes;
- May necessitate the removal of parking;
- Will likely need drainage modifications;
- Can impede truck movements.

Cost: \$1,500 to \$20,000 depending on length and width of barriers.

Where to Apply: Intersections with speeding or pedestrian safety concerns.



Traffic Circle or Roundabouts

Description: Traffic circles are raised islands located in the center of an unsignalized intersection. They interrupt straight-through movement and require drivers to slow speeds to comfortably maneuver around them. Roundabouts in a residential setting are more of a traffic control device than a calming device but can work to slow traffic in the same way at higher volume intersections.

Potential Advantages:

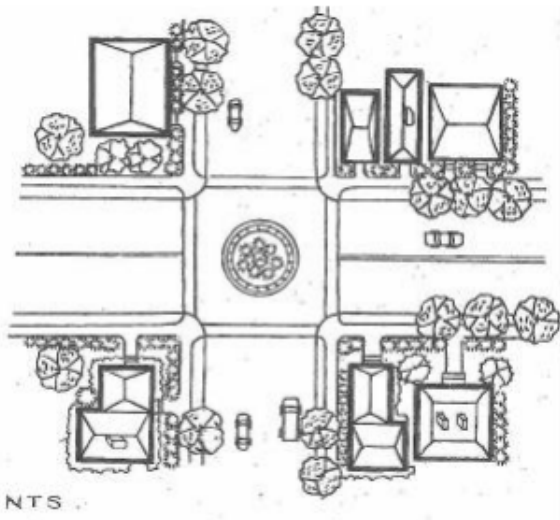
- Slows traffic as it navigates around circle;
- Breaks up straight-through movement on streets;
- Opportunity for landscaping in the intersection enhancing neighborhood appearance;
- Reduces the number of potential conflict points at an intersection which can result in fewer accidents.

Potential Disadvantages:

- Increases emergency response times;
- May impede left turns made by large vehicles;
- Maintenance costs;
- May require driver education, similar to roundabouts;
- Can make snow removal more difficult.

Cost: Ranges from \$10,000 to \$25,000+.

Where to Apply: Intersections with speeding concerns.



Tree Planting

Description: Traffic calming can be sometimes as simple as planting roadside trees. The purpose of planting trees in front of homes on a residential or collector street is to give the impression of a narrower street and thus to slow traffic. Streets with a virtual canopy formed by trees have much more residential appearance/feeling. This theory of course becomes more effective as trees become fully mature.

Trees act as a buffer zone between motorists and residents and also provide a visual barrier between the two. Trees have no impact on the volume of traffic (besides maybe tall/larger trucks) but may have a minor impact on speed. To be effective, trees must be planted consistently along street frontages/boulevards. This may be seen merely as a “beautification project” rather than a traffic control project. However, while trees definitely do improve the aesthetics of roadways they also contribute to traffic calming.



Potential Advantages:

- Helps a neighborhoods aesthetic/landscaping;
- Is an option if other traffic management devices are not acceptable to emergency response services;
- Does not restrict the availability of on-street parking;
- Possible for residents to implement this themselves;
- May slow traffic down with the impression of a narrower street.

Potential Disadvantages:

- Effects not immediate as trees need to mature;
- Not a direct calming device;
- Not all motorists will feel the need to slow down from “smaller feeling” streets.

Cost: ~\$200-\$400 per tree

Where to Apply: Newer neighborhoods without tree cover, neighborhoods without much landscaping, or as an add-on to other traffic calming measures for additional benefits and landscaping.



Level 3 Traffic Calming (Reduce Volume): Level 3 traffic calming devices and roadway designs are primarily implemented to discourage cut-through traffic from utilizing residential streets. Level 3 devices are used when traffic volumes in a studied area have been found to be significantly higher compared to similar streets in other areas. While Level 3 traffic calming devices are implemented to reduce the volume of cut-through traffic, attention must be paid to connectivity. When planning measures to reduce volumes, the connectivity and accessibility to city streets should not be hindered greatly. Level 3 devices may be used by themselves to reduce volumes, or in conjunction with Level 1 and Level 2 devices. Possible Level 3 traffic calming devices include:

Diagonal Diverter

Description: Barriers placed diagonally across an intersection blocking through movement to create two unconnected intersections.

Potential Advantages:

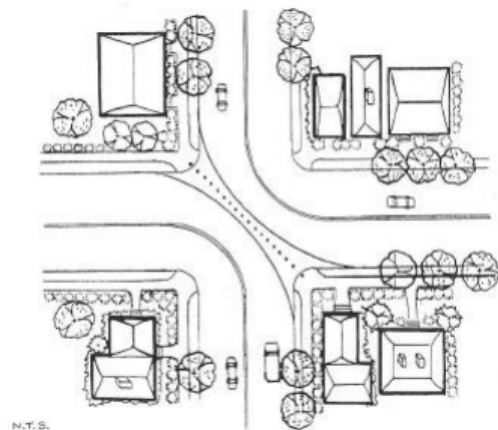
- Reduces volume;
- Reduces crash potential by eliminating conflict points of traffic movements;
- If landscaped, can enhance visual environment;
- May reduce speeds as well.

Potential Disadvantages:

- May just redirect traffic to other local streets;
- May inconvenience local residents in accessing their homes;
- May impact emergency response time;
- Permanently in effect even if cut-through problem exists only at certain times of day.

Cost: Typical cost of \$6,000 for diverter with limited drainage modifications; can vary up to \$30,000 depending on intersection width, drainage requirements, and landscaping.

Where to Apply: Intersections/streets that have cut-through volume issues.



Median Barrier/Forced Turn Island

Description: Median barriers are raised islands along the centerline of a street and continue through an intersection to block left-turn movements. Similarly, forced turn islands are raised islands that forces a right turn. Median barriers should extend beyond intersection to discourage improper/illegal turn movements.

Potential Advantages:

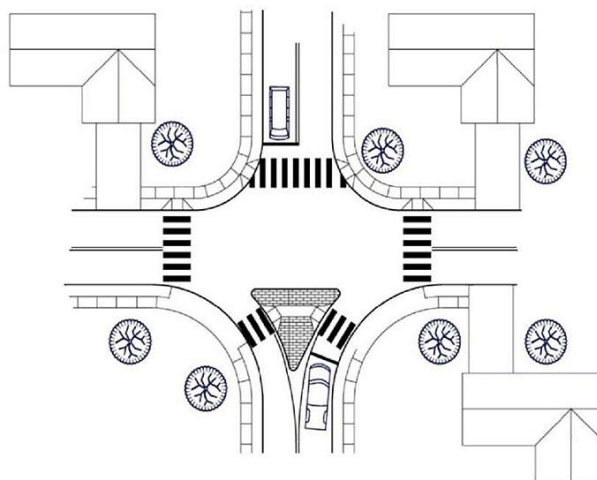
- Restricts access to minor roads or local streets and/or narrows land widths.
- Barriers are made passable for pedestrians and bicyclists;
- Self-enforcing;
- May reduce speeds as well.

Potential Disadvantages:

- May direct traffic volumes to other parallel and/or crossing streets;
- May require removal or shortening of on-street parking zones on approaches/departures;
- Restricts emergency vehicle access;
- May impact/inconvenience properties adjacent to intersection.

Cost: Between \$1,500 and \$20,000, depending on length and width of barriers.

Where to Apply: Areas that has volume of traffic back up when attempting left turns.



Entrance Barrier/Half Closure

Description: Physical barrier that restricts turns into or from a street. Barrier creates a one-way street for a short distance on an otherwise two-way street.

Potential Advantages:

- Restricts movements into (or exit from) a street;
- Reduces volume;
- May reduce speed;
- Half closures permit emergency vehicles to go around them if needed;
- Provides landscaping opportunity.

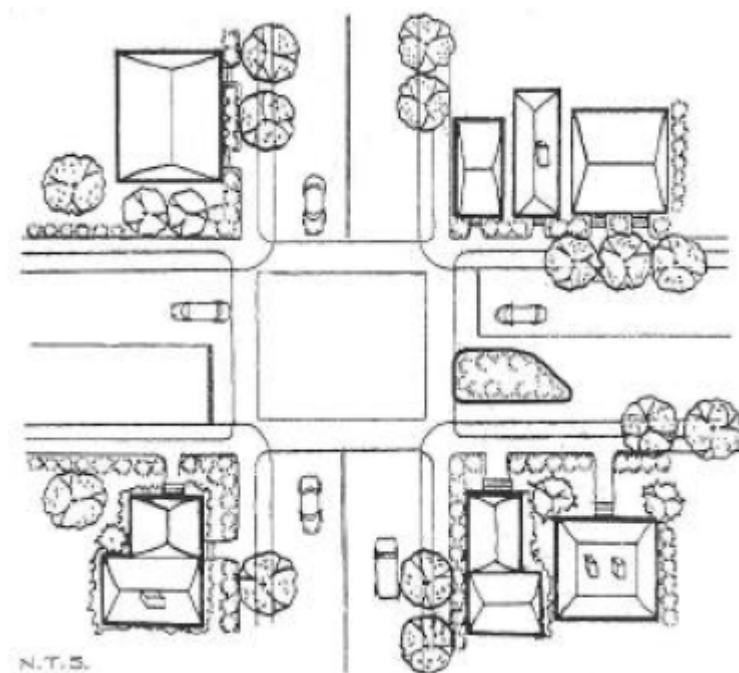


Potential Disadvantages:

- May redirect traffic to other local streets;
- May increase trip length for some drivers;
- Permanently in effect even if cut-through problem exists only at certain times of day
- May impact emergency response time;
- Depending on design, could be easily violated.

Cost: \$3,000 for simple closures, to \$40,000 for complex closures with drainage modifications.

Where to Apply: Roads with heavy cut-through traffic and alternate routes.



Full Closure

Description: Full street closures are barriers placed across a local street to completely close the street to vehicular traffic, usually only leaving the sidewalks open. Full street closures are generally used for locations with extreme traffic volume problems where other measures have proven unsuccessful in reducing traffic volumes.

Potential Advantages:

Cut off traffic volumes while maintaining pedestrian and bicycle access;

Self-enforcing;

If landscaped, can enhance visual environment.

Potential Disadvantages:

Redirects traffic to other local streets;

May increase trip length for some drivers;

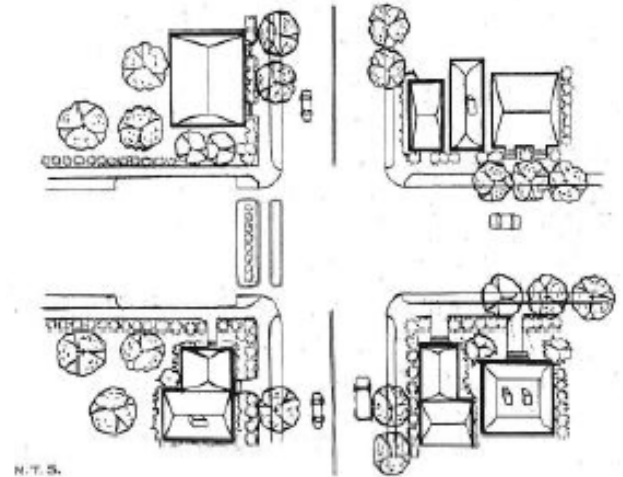
Increases emergency response times;

Most intrusive;

Reduces connectivity.

Cost: <\$10,000 for simple closures, to \$100,000+ for complex closures with drainage modifications.

Where to Apply: Residential roads with high cut-through volumes that have been unsuccessfully calmed by other measures.



Traffic Calming Measures Summary

Level 1 – Basic Additions/Efforts

Traffic Calming Measure	Typical Cost for Implementation (can be multiple categories)	Comments
Speed Trailer/Sign	Low: <\$6,000	Good public relations tool, effective at reminding drivers of speeds and easy to install.
Police Enforcement	Low: <\$6,000	Good driver education and visual enforcement of speed.
Pavement Markings	Low: <\$6,000	Additional markings/more narrow lanes can reduce speed and increase safety.
Restricted Movement Signs	Low: <\$6,000	Can lower traffic volumes impacted by rush-hour traffic.

Level 2 – Vertical Deflections

Traffic Calming Measure	Typical Cost for Implementation (can be multiple categories)	Comments
Speed Hump	Low: <\$6,000	Self-enforcing effective way of reducing traffic speeds.
Speed Table/Raised Crosswalk	Medium (\$6,000-15,000)	Usually larger than speed hump and require more material. Effective at reducing speeds and increasing pedestrian safety.
Raised Intersection	Medium (\$6,000-15,000)	Slows intersection traffic.

Level 2 – Horizontal Deflection

Traffic Calming Measure	Typical Cost for Implementation (can be multiple categories)	Comments
Neighborhood Entry Island/Gateway	Medium (\$6,000-15,000) High >\$15,000	Wide range of typical cost, helps identify neighborhoods and can lower speeds and volumes.
Median Island	Low Medium High	Effective at keeping traffic from cutting corners. Narrows lanes and can slow drivers.
Chicanes	Medium (\$6,000-15,000) High >\$15,000	Interferes with straight line travel and helps reduce traffic speeds.
Chokers	Medium (\$6,000-15,000) High >\$15,000	Wide range of cost, narrows road forcing drivers to slow speeds.
Intersection Bulb-Outs	Low: <\$6,000 Medium (\$6,000-15,000) High >\$15,000	Areas of expanded curbing that narrow lanes, slow traffic, and reduces the crossing distance for pedestrians.
Traffic Circles	Medium (\$6,000-15,000) High >\$15,000	Breaks up straight-through movement on streets slowing traffic.
Tree Planting	Low: <\$6,000	Gives impression of a narrower street to slow traffic. Can be used in conjunction with other traffic calming devices.

Level 3 – Routing Restrictions

Traffic Calming Measure	Typical Cost for Implementation (can be multiple categories)	Comments
Diagonal Diverter	Medium (\$6,000-15,000) High >\$15,000	Reduces volume and crash potential, but can be inconvenient and have varying cost.
Median Barrier/Forced Turn Island	Low: <\$6,000 Medium (\$6,000-15,000) High >\$15,000	Keeps traffic flowing and reduces cut-through movements.
Entrance Barrier/Half Closure	Low: <\$6,000 Medium (\$6,000-15,000) High >\$15,000	Can turn a two way street into a one way street, reducing traffic volume. Can vary in price and be easily violated depending on design.
Full Closure	Medium (\$6,000-15,000) High >\$15,000	Cuts off through traffic all together, but can be expensive and inconvenient. Used if other measures are unsuccessful.



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