City of Wauwatosa

Neighborhood Traffic Management Program Calming Guidelines

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1 Introduction

The City of Wauwatosa Neighborhood Traffic Management Program Calming Guidelines (NTMPCG) are designed to address traffic concerns on the City's residential streets. The City of Wauwatosa has developed the Neighborhood Traffic Management Program (NTMP) as a Traffic Calming Policy through which residents can request that the City address concerns about traffic safety in their neighborhoods. The Wauwatosa NTMP is intended to address traffic concerns on all neighborhood streets within the City.

The following traffic calming guidelines address the NTMP purpose, how to identify neighborhood traffic concerns, how traffic problem solutions are developed, how traffic calming solutions are implemented, and how the City prioritizes the implementation of recommended solutions. The Neighborhood Traffic Management Program Calming Guidelines (NTMPCG) emphasize neighborhood involvement in the identification, confirmation, and education of potential neighborhood traffic problems and solutions. The NTMPCG focuses on traffic calming as a tool that reduces the negative effects of automobile use, alters driver behavior, and improves neighborhood quality of life for residents, pedestrians, and bicyclists on neighborhood streets.

Once a traffic problem is identified and confirmed the Neighborhood Traffic Calming Guidelines uses a four-step method to direct and modify travel behavior through a neighborhood. These measures are categorized into what is commonly called the "4 E's:"

- Education
- Enforcement
- Encouragement
- Engineering

The first step involves education, which is directed at informing neighborhood residents and drivers of speed limits and pedestrian awareness. Enforcement takes another step and involves the use of police patrols to usually issue speeding tickets. Encouragement reinforces the first steps by increasing awareness using tools such as yard signs flyers, newsletters, and demonstrations. The final step, engineering, typically involves construction of traffic calming devices.

The most common solutions suggested by community residents for neighborhood traffic issues are requests for stop signs or children at play signs. Appendix A describes the purpose of stop and children at play signs and why they are inappropriate for use as traffic calming measures.

Traffic calming devices described in the Traffic Calming Tool Kit in Appendix B use physical measures to encourage people to drive more slowly. They create physical and visual cues that induce drivers to travel at slower speeds. Traffic calming measures are typically self-enforcing and do not normally require police enforcement to operate successfully.

Most motorists drive roadways based on what they feel are safe and appropriate speeds. The design of a roadway can encourage slower speeds and reduce cut-through traffic. Narrow streets, avoidance of long straight roadways and street network connectivity all contribute to calming traffic on neighborhood streets. While landscaping does not force a change in driver behavior, it can provide the visual cues that encourage people to drive more slowly. Many of these street design principles, including narrow street widths of 26 feet or less, have already been employed in the construction of Wauwatosa's neighborhood street system.

Typically, traffic-calming measures are targeted to reduce excessive travel speeds, reduce cut-through traffic, and control pedestrian/bicycle conflicts. Physical treatments such as medians, traffic circles, road narrowing, speed tables, and diverters, are used to alter behavior of drivers when they travel through a neighborhood.

1.1 Purpose

This NTMPCG report documents the policies and procedures for implementing traffic management measures on existing neighborhood streets in the City of Wauwatosa. Roadways are typically classified as arterials, collectors and neighborhood (local) streets. This program only applies to neighborhood streets directly under the City of Wauwatosa's control and does not apply to arterials or to state or county roadways as identified in Figure 1-1 below.

The City of Wauwatosa NTMPCG is consistent with the '4E' principles, initially focusing on education, which involves neighborhood action. In some cases, education will be combined with police enforcement, encouragement, and passive traffic control measures such as the use of radar trailers, signage, or turn restrictions. These are defined as Level One Options. If traffic concerns persist after Level One Options have been implemented, a neighborhood may move on to more substantial engineering measures such as speed tables, traffic circles, roadway narrowing, or other even more restrictive measures that limit neighborhood accessibility such as traffic diverters and cul-de-sacs. These are defined as Level Two Options.

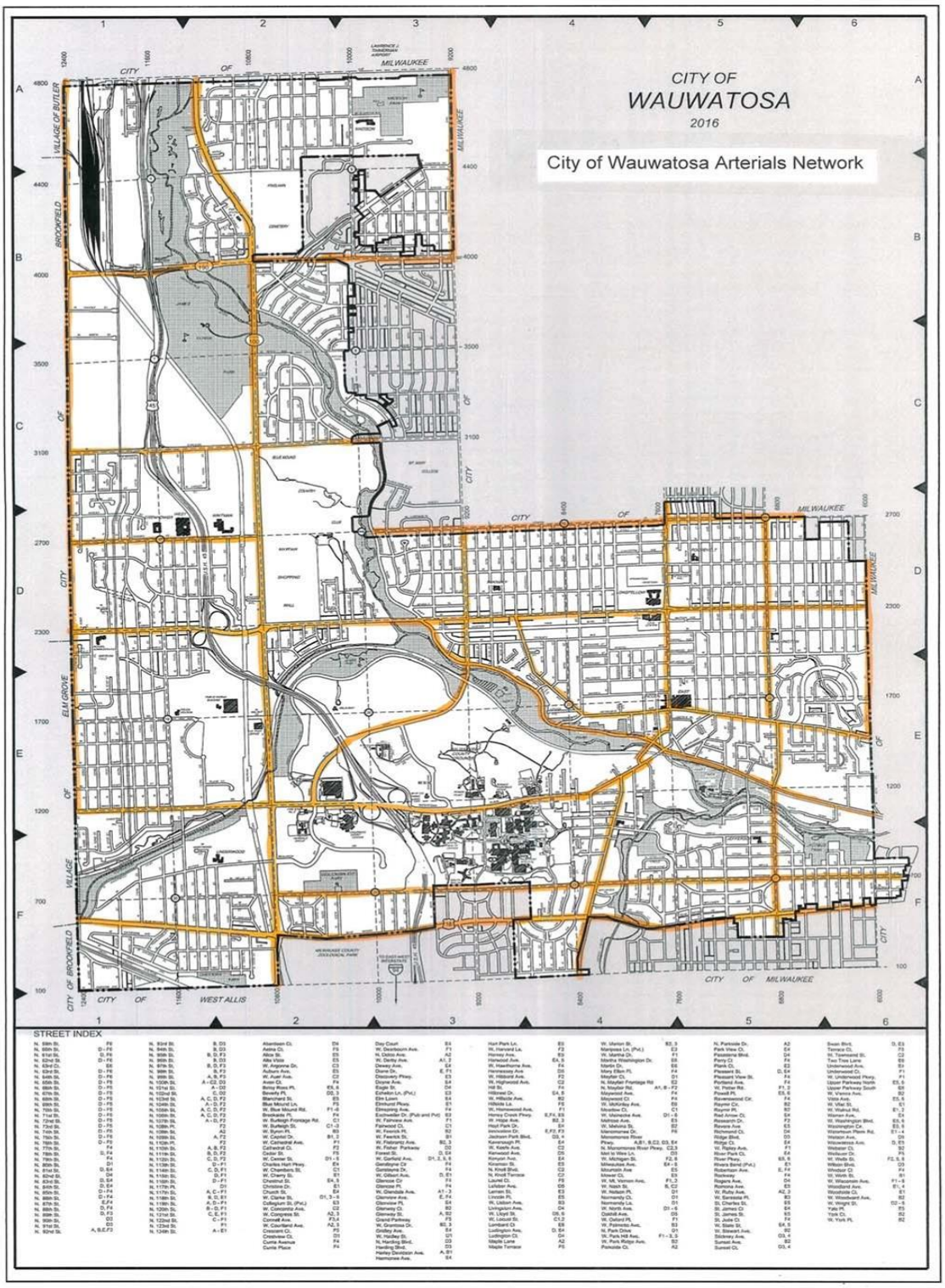
1.2 Benefits

Traffic calming measures can be used to achieve the following goals:

- Increase neighborhood safety
- Increase neighborhood aesthetics (atmosphere and landscaping) and livability
- Decrease neighborhood traffic intrusion (cut-through traffic)
- Improve traffic efficiency throughout the City
- Increase internal and external connectivity of neighborhood street networks
- Increase diversity of street use (e.g. the street is used not only for motor vehicles travel, but also for pedestrians, bicyclists, etc.)
- Increase pedestrian/bicycle use of streets and sidewalk/pathways
- Improve/enhance neighborhood identity (traffic circles, narrowing's or gateway treatments)

Figure 1-1: NTMPCG Ineligible City of Wauwatosa Arterials

Figure 1-1: NTMPCG Ineligible City of Wauwatosa Arterials



1.3 **Public Involvement**

Involvement of the community is key to a successful neighborhood traffic management program. Public input and response to the traffic calming program will indicate areas of residential traffic concerns around the City. The input and responses received from local citizens will help the City address and prioritize improvement projects. In Wauwatosa, NTMP City staff works cooperatively with neighborhood communities to help address existing and potential traffic concerns.

The public will be able to give input and responses.
Resource: Wisconsin DOT

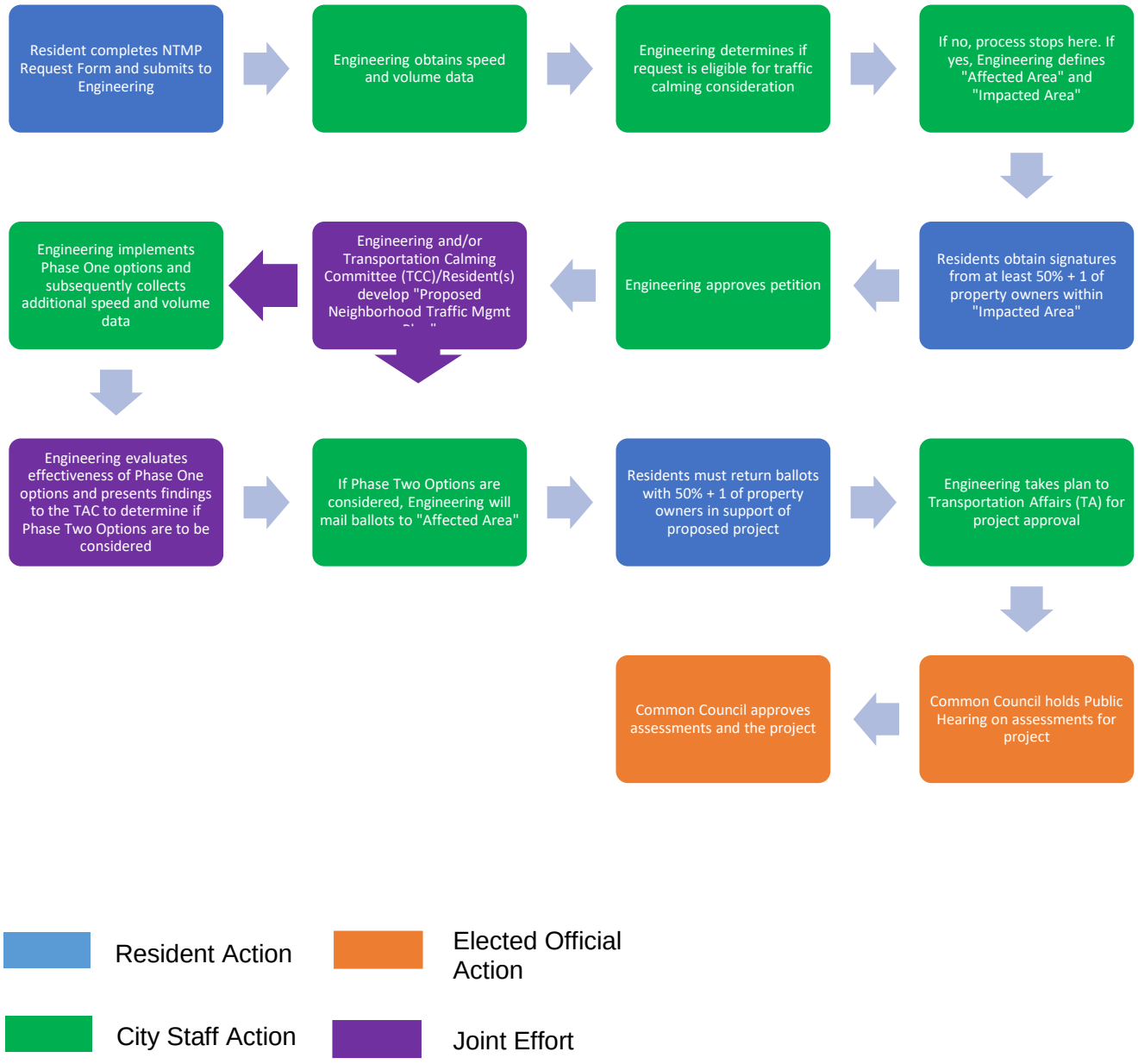
Neighborhood support is crucial to successfully implementing and sustaining traffic management strategies. Therefore, whenever practical, residents, businesses, community groups, and institutions should take the lead in initiating requests for traffic calming projects.

To keep the community involved in their requests, the City of Wauwatosa staff will work with community members and groups on how to gather data related to their traffic concern and in the development of traffic management solutions.

2 Neighborhood Traffic Calming Process

Figure 2-1 illustrates the traffic calming process described further in the following document.

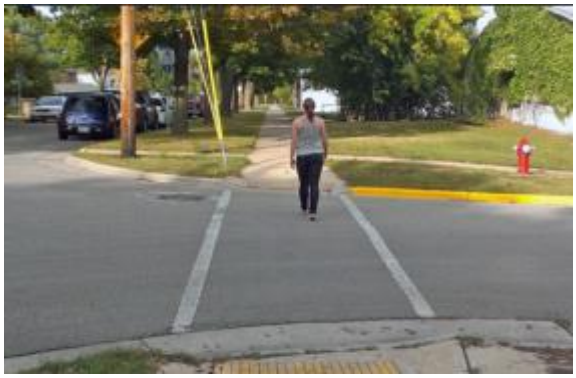
Figure 2-1: Neighborhood Traffic Management Program Process



2.1 Identification of Traffic Concern and Eligibility

Identifying and eligibility determination of neighborhood traffic concerns is a five-step process that involves:

1. Resident completes NTMP Request Form and submits to Engineering;
2. Engineering collects basic speed and volume data;
3. Engineering determines if concern is eligible for traffic calming process;
4. If eligible, Engineering determines “Affected Areas” and “Impacted Areas”
5. Residents obtain signatures from at least 50% plus 1 of property owners within "Impacted Area” and submits to Engineering.



One concern is pedestrian safety.
Resource: City of Wauwatosa Bicycle and Pedestrian Facility Plan

2.1.1 Resident Completes NTMP Request Form and Submits to Engineering

The process starts when a resident or community group submits an NTMP Request Form, which can be found on the City website, to Engineering. A copy of the NTMP Request form, and accompanying Traffic Study petition form, is included in Appendix C. City staff will determine if the street or intersection of concern is applicable for consideration by the Neighborhood Traffic Calming Guidelines. To be eligible for the program, the street must:

* Be a residential neighborhood or collector street under the City of Wauwatosa’s jurisdiction
* Have traffic volumes greater than 300 vehicles per day
* Have a posted speed limit of 30 mph or less
* Be at least 500 feet in length
* Not be cul-de-saced

Note: The City may choose to provide education and enforcement components of traffic calming on streets that are less than 500 feet in length or are cul-de-saced. Streets and roadways servicing emergency response vehicles such as fire trucks may have limits to the implementation of certain traffic calming measures. Additional City coordination will be needed for addressing traffic calming on these roadway segments.

2.1.2 Engineering Collects Basic Speed and Volume Data

Once the NTMP Request Form has been reviewed by staff, the next step in the Neighborhood Traffic Management Program Calming Guidelines involves collecting related traffic data to confirm the existence and magnitude of the traffic concern.

Engineering will obtain site data including traffic volumes and speeds.

2.1.3 Engineering determines if concern is eligible for traffic calming process

After Engineering determines project eligibility if there are numerous eligible projects in the queue, then the Traffic Calming Committee (TCC) will meet to review data collected to determine prioritization within the traffic calming program. Prioritizing factors include:

1. First come, first served;
2. Consideration as to whether the district recently had traffic calming measures as a way to ensure equality among districts; and
3. The need of traffic calming in the requested area.

Based on the data collected, priority in the program may be determined by the TCC based on specific, definable criteria related to:

* **Traffic Speeds**

  As motor vehicle speed increases, noise increases and pedestrian and bicycle safety decrease. Some of the most dangerous traffic safety situations involve infrequent vehicles traveling substantially above the speed limit.

* **Daily Traffic Volume Levels**

  As motor vehicle volume increases, noise increases, and pedestrian and bicycle access decrease. The local function and feel of a street also diminishes. From studies measuring resident opinions, the ideal traffic volume on a local neighborhood street is less than 300 vehicles per day (vpd), and residents generally are able to accept volumes up to 800 vpd.

Table 2-1: Neighborhood Street Traffic Calming Thresholds

The table below summarizes the traffic concern characteristic thresholds required for a neighborhood street to be considered for traffic calming considerations. One or more of the three thresholds should be met to proceed with traffic calming measures.

Traffic Criteria	Minimum Threshold
* 85th Percentile Speed	Greater than 5 mph over the posted speed limit
* Significant Speeding	10% of traffic at or greater than 10 mph over the posted speed
* Daily Traffic Volume	Exceeds 800 vpd on neighborhood streets or 1,500 vpd residential collectors

If the results of the study conclude that the criteria for traffic calming have not been met, Engineering will conclude that the concern is not eligible for the traffic calming program at this time. The concern cannot be brought back to the City for three years unless something significantly changes existing conditions.

If Engineering reviews the data and verifies that one or more of the thresholds have been met, they will determine the “Affected Areas” and “Impacted Areas” as described below.

2.1.4 City Determines "Affected Areas" and "Impacted Areas"

After the City receives a traffic concern and determines it is eligible for the NTMP, Engineering will define an "Affected Area" and an "Impacted Area." An "Affected Area" includes all property directly affected by the traffic issue. An "Impacted Area" includes any property that would be impacted by any proposed traffic management solution.

The size and extent of the impacted area will take into consideration the type of traffic management project being proposed, the type of properties in the vicinity, and the characteristics of the street network surrounding the proposed project site(s).

These areas may include:

- All properties abutting the proposed street segment to be modified.
- All properties on adjacent street(s) with ingress/egress only possible via the modified street segment.
- All properties on adjacent street(s) that have alternative points of ingress/egress but will be otherwise affected by the modified street segment.

Spot-specific concerns will generally relate to a particular intersection or street segment, whereas neighborhood-wide concerns will generally relate to conditions or behaviors affecting the neighborhood street network. The City may elect to treat some spot-specific concerns as neighborhood-wide concerns if it decides that they could be better addressed in the context of the street network system. At the City's discretion, the potentially affected area for a spot-specific concern may be extended to the entire street block. The potentially affected area for a neighborhood-wide concern should generally be a distinct area that is bounded or bisected by major roadways or geographic features. If the traffic concern influence area (but not the specific street being considered) may impact a larger neighborhood area the City will inform residents of the larger neighborhood area of the perceived problem and potential traffic calming alternatives under consideration.

2.1.5 Residents obtain signatures from at least 50% plus 1 of property owners within "Impacted Area" and submit to Engineering.

Engineering will provide a map or description of the impacted area indicating individual properties in the area to the requester. Requesters must obtain signatures from at least 50% plus 1 of the property owners within the impacted area to move forward with the request for a neighborhood traffic management effort (the petition can be found in Appendix C).

2.1.6 Development of "Proposed Neighborhood Traffic Management Plan"

Engineering will work with the applicant or the neighborhood to develop a traffic management plan. If the neighborhood is involved, City staff, in coordination with the local Alderperson(s) will arrange a meeting with the resident, community group, or neighborhood that identified the traffic concern or is affected/impacted but the measures. At the meeting, City Staff will help the neighbors develop a "Proposed Neighborhood Traffic Management Plan.

The Plan will include:

- Evaluation of problems and needs
- Identified goals and objectives
- Suggested Phase One non-construction solutions (education, encouragement, enforcement, and passive traffic control devices), a work plan for implementation, and a plan for post evaluation to determine if the non-construction solutions have been effective.
- Suggested Phase Two traffic calming measures, including general estimated costs and an assessment plan to inform residents of the potential costs associated with the solutions.
- All City departments will have an opportunity to participate in plan preparation.

Neighborhood meetings can be used to address local concerns. Source: www.wisn.com

3 Alternative Solutions

3.1 Neighborhood Meeting / Workshops

City staff and the local alderperson should coordinate to establish a date and location for a neighborhood meeting. The City should notify residents in the project area through mail of the meeting. Residents should also encourage their neighbors to attend.

3.1.1 Develop a Proposed Neighborhood Traffic Management Plan

At the meeting, City Staff will help the neighbors develop a "Proposed Neighborhood Traffic Management Plan." The Plan will include:

- Evaluation of Problems and needs
- Identify goals and objectives
- Suggested Phase One non-construction solutions (education, encouragement, enforcement, and passive traffic control devices), a work plan for implementation, and a plan for post evaluation to determine if the non-construction solution have been effective
- Suggested Phase Two traffic calming measures, including general estimated costs and an assessment plan so people will know what it will cost

The City will help participants understand the full range of possible measures, their likely effectiveness, and their costs. Participants articulate their goals for the neighborhood and discuss how NTMPCG tools might help them realize those goals. Concepts or alternatives that should be considered at the workshop are described in the following resources:

- ITE Traffic Calming State of the Practice: http://www.ite.org/traffic/tcstate.asp
- TrafficCalming.org, http://www.trafficcalming.org

Appendix B of this report also lists typical traffic calming measures, their appropriate application, and their expected effectiveness.

At the workshop, the participants may create a project committee of 3 to 10 residents that work with the City to develop a specific NTMPCG project proposal. The goals, available NTMPCG tools, and committee charter become the NTMP project action plan. Appendix D contains a draft Proposed Neighborhood Traffic Management Plan form.

3.1.2 **Plan Assessment**

The City reviews and refines the specific project proposal. Bicyclist, pedestrian, emergency vehicle, and maintenance needs may influence the placement and design of specific measures. In addition, the project must be feasible and consistent with safety and engineering principles and judgment.

Street closure used as a traffic calming measure
Resource: ITE Traffic Calming

If the size of the project area has changed since the application, the City adjusts the project area and may require that the resident obtain additional signatories to represent 50% plus 1 of the residents in the larger study area. The City may also adjust the project area if it determines that the proposed measures are likely to cause substantial or undesirable traffic diversions.

3.2 **Initial Traffic Management Phase One Solutions**

Generally, it is desirable to address traffic problems with the least restrictive measures possible and move to more costly geometric solutions only after other measures have proven ineffective. Therefore, City staff may choose to implement fairly low cost, undisruptive initial traffic management solutions before proceeding into more formative calming measures. These solutions fall into four categories: education, enforcement, encouragement, and engineering. The categories are explained below.

3.2.1 **Education/Encouragement**

The neighborhood can be educated concerning the traffic management problem. This education can include the use of:

* Radar speed trailer
* Brochures/pamphlets describing the problem, including suggestions for what the neighborhood residents can do to improve the situation
* Lawn signs, provided by neighborhood volunteers

3.2.2 **Enforcement**

If police resources are available, regular and random patrol and enforcement activities can address speeding and other traffic control concerns.

3.2.3 **Engineering**

The City may choose to install enhanced signing or pavement markings to address concerns. Initial cost and any on-going maintenance costs of these Phase One measures may need to be paid for by the residents. Examples of these measures can include:

* Roadway narrowing through pavement marking of medians or bike lanes
* Increased visibility of pedestrian crossing pavement markings
* Additional pedestrian crossing signs
* Appropriate speed limit signs

3.3 **Phase Two Solutions**

Design, construction, and any future maintenance of Phase Two solutions are paid 100% by the residents.

After a predetermined time period, Engineering will evaluate the effectiveness of the non-construction elements of the Phase One plan. The results of this study will be presented to the local alderpersons to the Transportation Affairs Committee. If the Phase One efforts are not satisfactory, Phase Two traffic calming techniques will be considered as outlined in the Proposed Neighborhood Traffic Management Plan.

In according with the City of Wauwatosa Traffic Calming Countermeasure Guidelines, Engineering and the Transportation Affairs Committee will consider Phase Two engineering solutions such as bump outs, chokers, traffic circles, chicanes, speed tables, diverters, closings, etc. Engineering will analyze the options and make a recommendation for the appropriate engineering countermeasures. Engineering will take into consideration such items as snow removal, street sweeping, and the impact to ambulances, fire, and police when determining these solutions. Solutions in the Traffic Calming Toolkit are discussed in Appendix B.

Design, construction, and any future maintenance of Phase Two solutions are paid 100% by the residents.

Payments will be made via special assessments which will follow the City's public hearing process. Residents in the affected area must achieve a 50% + 1 positive vote of the parcels in the affected area. There is one vote per property. The ballot and voting process is described in Section 4.0Once the project cost is determined and the affected property owner assessment is approved by the Common Council, Engineering will finalized construction plans and project specifications, and solicit bids from contractors to construct the traffic calming devices.

3.4 **Temporary Measures (Street Continuity Disruptions Only)**

In general, temporary traffic calming devices should be avoided. A number of agencies have adopted a policy of installing temporary traffic calming devices to test their effectiveness and the public's acceptance. There are a number of advantages and disadvantages to installing temporary traffic calming devices. Advantages include the cost and the opportunity to field test devices without committing to permanent installations. The disadvantages, however, often outweigh the advantages. Temporary devices such as traffic circles or curb extensions are generally not as effective as permanent installations as they do not have the same level of

visual break created by landscaping. In addition, the installations are usually unattractive and reduce the acceptance and support by the general public or neighborhood residents. Most temporary installations also become attractions for road litter adding to the aesthetic problem. If, for example, a City has never installed traffic circles and the citizens are not familiar with circles, temporary installation using bumper blocks or barrels will be their first, and possibly only, exposure to a circle. It becomes difficult for them to imagine that such a device placed on a permanent basis could enhance their neighborhood. In general, programs and plans should be well thought out and the use of temporary installations avoided unless absolutely necessary. If temporary devices are used, care should be taken to address the issues of aesthetics and effectiveness.

For proposals that involve street continuity disruptions (diverters, cul-de-sacs, etc.), the City should implement trial temporary traffic calming measures that simulate the proposal that is being proposed by the neighborhood. The trial measures should be implemented during the non-winter months for the duration of at least four months. Examples of trial implementations include:

* Using concrete barriers or barricades for diverters.
* Using barrels for cul-de-sacs.
* Using barrels or delineators for turn restrictions.

Trial installations help neighbors understand the potential effectiveness of the measures and their effect on traffic patterns. Cost of trial installations may be borne by the residents.

4 Recommendations

4.1 Neighborhood Informational Meeting

Depending on the participation levels at the neighborhood workshop, neighbors or City staff may feel it is necessary to hold a neighborhood informational meeting to display the project plans and answer questions regarding the proposal. If this is necessary, it should be held prior to the balloting process described in section 4.2 below.

4.2 Balloting

If the project is feasible and meets criteria, the City mails one ballot to each parcel in the project area. A sample ballot is included in Appendix E. Each household, business, and nonresident property owner in the project study area receives one vote per parcel.

4.3 Decision

To pass the balloting, ballots must be returned to the City within four weeks of the mailing and at least 50% + 1 of the parcels must return a ballot marked in favor of the project. If the project passes, it moves to the implementation stage.

If the project does not pass, the process stops. At the City's discretion, the project committee may revise the proposed project for a second balloting without restarting the process. To avoid creating a nuisance to the neighborhood, if the revised project does not pass the second balloting, the NTMPCG program will not consider the issue again for a period of at least three years unless conditions substantial change.

4.4 Implementation Schedule

Depending on City staffing constraints to process numerous traffic calming requests the City may not be able to implement all of the traffic calming projects in a single fiscal year. The projects that have been identified through the NTMPCG process for implementation may be ranked by priority as described in Section 5.0 of these guidelines. Should the City not be able to implement all of the traffic calming projects in a single fiscal year the project will automatically go to the top of the City priority list for the following year.

5 Priority Ranking Process

5.1 Scoring

Because of limited resources, the City may not be able to implement all traffic calming project proposed by the NTMP. The NTMP scoring system allows the City to prioritize traffic calming projects based on the following neighborhood street and land use characteristics. These characteristics include the initial set of traffic calming guideline thresholds plus additional land use and City planning related considerations

* Traffic speeds
* Daily traffic volumes levels
*
* Motor vehicle crashes
* Proximity to schools and parks
* Critical locations
* Pending Road Construction
* Relationship to neighborhood and City plans

5.1.1 85th Percentile Motor Vehicle Speed

The point value for this criterion is equal to the 85th percentile motor vehicle speed (in miles per hour) measured on the subject street, minus 25.

5.1.2 Significant Motor Vehicle Speed

The point value for this criterion is the percentage of traffic that is traveling at least 10 mph above the speed limit.

5.1.3 Average Daily Traffic Vehicle Volume

The point value for this criterion is equal to the average daily traffic vehicle volume (in vpd) divided by 1,000, and rounded to the nearest whole number. If possible, the motor vehicle volume should be measured over a 48-hour period.

5.1.4 Crash History

The point value for this criteria is the number of crashes that have occurred at this location over the last three years excluding non-correctable crashes such as those involving deer, snow/ice pavement conditions, driver health related seizures, or motorists operating a vehicle under the influence.

5.1.5 Distance from Park or School

Motor vehicle noise can have an adverse impact on parks and schools. In addition, these facilities typically attract pedestrians and bicyclists, especially children. Bicycle and pedestrian volumes (or demand) are typically the highest on streets adjacent to these facilities and decrease as the distance from the facility increases.[1]

The point value for this criterion is equal to one one-hundredth of the difference of 1,000 and the linear street or sidewalk walking distance between the subject street and the nearest park or school. The minimum point value is 0. Other pedestrian-oriented facilities (such as the library or pool) may also be considered for this criterion. For example, if the problem area on the subject street is 400 feet away from a park, the point value associated to this distance will be (1,000-400) x 0.01 = 6.

5.1.6 Critical Location

Certain intersections or street segments have the potential for acute conflict between motorized and non-motorized traffic. These “critical locations” may include:

* Multiuse trail crossings.
* Intersections where the minor street is marked as a bicycle route.
* Intersections staffed by a school crossing guard.
* Streets or intersections with high bicycle or pedestrian volumes.
* Streets or intersections with high (unmet) bicycle or pedestrian demand.
* Streets or intersections within a school zone.

A project that improves conditions for bicyclists or pedestrians at a critical location may receive up to 10 points for this criterion, depending on the extent of both the need and the improvement.

5.1.7 Pending Road Construction

Traffic calming measures can be easily implemented at little additional cost when roadway plans are prepared for reconstruction. When residential streets are planned for reconstruction, the City may seek to capitalize on this opportunity and encourage the implementation of traffic calming measures as part of the reconstruction project. To acknowledge this criteria and opportunity, up to 10 points is awarded to the scoring.

5.1.8 Neighborhood and City Planning

Neighborhood-wide projects typically require extra effort and produce more comprehensive traffic management solutions. To acknowledge this effort, the City may award 5 points to a neighborhood-wide project for this criterion. This is a subjective measure.

The score for a neighborhood-wide project is the average of scores for individual project elements rounded up to the next whole number. The addition of 5 points reduces the penalty incurred by individual project elements that score lower than the overall project average but as a

[1] Current pedestrian and bicycle volumes can be a poor indicator of actual pedestrian and bicycle travel demand if roadway and traffic conditions discourage these modes.

Scoring Priority Calculation system provide a positive synergistic enhancement to calming the neighborhood street network problem.

Table 5-1 summarizes the scoring criteria, which are explained in the following subsections. The proposed project's score is the sum of the point values for each of the criteria. Projects with a score of 15.0 or more are eligible for physical traffic calming measures.

Table 5-1: Project Prioritization Scoring Criteria

Criterion	Point Formula
85th Percentile vehicle speed	85th Percentile motor vehicle speed (in mph) - 25
Excessive motor vehicle speed	Percent of traffic traveling at least 10 mph over speed limit
Motor vehicle volume	Average daily motor vehicle volume (in vpd) / 1000
Distance from school or park	(1,000 - linear distance to nearest school or park in ft)/100
Critical location	Up to 10 points
Crash history	Number of crashes in last 3 years
Pending road construction	Up to 10 points
Neighborhood planning	5 points

This score is used to prioritize the projects under implementation consideration. The project is placed on the NTMPCG project list, and its score is compared to other projects that have been proposed but not yet implemented. If the project receives a high score that places it near the top of proposed projects, the process continues. City

Unimplemented projects remain on the NTMPCG list for three years. Every three years, the advocate is notified and may submit a new application to keep the project on the list for an additional three years.

5.2 Formal Review

Engineering reviews the project and makes a recommendation to the City Council. This review includes the project score, the project action plan, the proposed measures, the results of any temporary installations (if applicable), and the results of the balloting.

The Council will make the final determination on whether or not to implement the project.

6 Costs and Implementation

6.1 Phase One Project Costs

The City may choose to fund some Phase One project costs after taking into consideration the availability of funds, whether or not the improvement is recommended by an approved City plan, and/or staff recommends.

If the City decides not to fund Phase One improvements and the residents wish to proceed with funding the approved improvements, 50% + 1 of the parcels must vote in favor of the project.

6.2 Phase Two Project Costs

Costs of Phase Two improvements must be paid by the residents. 100% of the design, construction, and future ongoing maintenance of Phase Two improvements are paid for by the property owners. Project costs shall include all construction costs, plus 12.5% engineering costs.

6.3 Implementation

City staff directs implementation of the permanent measures approved by the Council.

Many traffic management measures include landscaping. The City may add trees as part of the project. Other vegetation may be included if a volunteer or organization commits to its maintenance.

6.4 City Implements Project

Affected area property owner assessments will be used to construct the recommended traffic calming project. After Common Council approval of the property assessments, the City will install the project, either using City forces or by enlisting the services of consultants and contractors.

6.5 Traffic Calming Device Construction Costs

Appendix F lists the cost estimates of selected typical calming devices. Depending on the neighborhood street length or study impact area street network several devices may need to be constructed as a part of a system of calming devices increasing the total cost to effectively calm traffic.

6.6 Maintenance and Costs

If the City funds Phase One improvements, the City will be responsible for future maintenance. If residents fund any improvements, the ongoing maintenance will be assessed to the residents.

The City Department of Public Works performs the maintenance of the traffic management measures, and the City Parks, Recreation and Forestry Department maintains any trees in the right-of-way. If other landscaping is not maintained by the volunteers, it will be removed at the discretion of the City.

6.7 Evaluation

The City collects traffic data one year after implementation. The data may include motor vehicle speeds, motor vehicle volumes, crash rates, and pedestrian and bicycle usage. This data can then be used to determine the ‘success’ of the project and in the implementation of future traffic calming projects.

Appendix A

Inappropriate Traffic Calming Solutions

The most common request by residents of a community to reduce speeding, and cut-through traffic in residential neighborhoods is to install ‘Stop’ or ‘Children at Play’ signs on their neighborhood streets.

Stop Signs

Because a stop sign causes a substantial inconvenience it should only be used where warranted. A stop sign is a valuable and effective traffic control device when used under appropriate conditions. They are meant to help drivers and pedestrians at an intersection decide who has right-of-way. National studies have shown:

1. that crashes can increase at intersections where stop signs are installed even though they are not warranted.

2. that speeds can actually increase between stop signs by 3 to 5 mph, particularly when they are used inappropriately.

3. compliance at inappropriate stop sign locations is poor, resulting in a false sense of security and accidents involving motorists and pedestrians expecting cross traffic to stop.

4. the proliferation of stop signs at inappropriate locations creates a lack of respect for stop signs that are warranted.

Stop signs can be used for two-way or four-way stop conditions. According to the Manual of Uniform Traffic Control Devices stop signs are used for:

Two-Way Stop Signs

* Where a local street enters a through street: or

* Where a safe approach speed is less than 10 mph due to permanent visibility conditions – such as buildings, trees, shrubs or terrain: or

* Where crash history indicates three or more reported crashes in a 12-month period, and the crashes could have been avoided by the use of a stop sign; or

* Where circumstances and crash history indicate that observing the normal right-of-way rule could still be hazardous, resulting in crashes.

Four-Way Stop Signs

* Where traffic signals are needed; four-way or all-way stops may be used as an interim measure; or

* On local streets, where there has been an average of five or more reported crashes per year and these crashes would likely have been prevented by an all-way stop; or

* Where the number of vehicles entering an intersection averages at least 500 vehicles per hour for any eight hours of the day, and the combined vehicular and pedestrian volumes on the minor street averages at least 200 per hour for the same eight hours.

Children at Play Signs

Signs are used to guide and direct motorists. Unnecessary signs can confuse, distract and irritate motorists. Studies have shown that Children at Play signs normally have no effect on driver behavior. The MUTCD discourages the use Children at Play Signs. The Children at Play sign is unclear and unnecessary. It suggests to a driver that:

* If no such sign is present on another street, children will not be playing there, therefore it is OK to speed or be less careful.

* Other drivers might wonder what time of day will children be present or are they always present?

* When no children are seen by a driver in many cases they will assume the sign is not pertinent anymore.

* It gives parents and children a false sense of safety.

* It can give children the impression that it's OK to play in the street.

Almost all neighborhood streets have children, which would require signs to be placed on all streets adding to sign proliferation problems if implemented.

Specific warning signs are recommended in the MUTCD for school zones and pedestrian crossing locations where they clearly serve a purpose

Appendix B

Traffic Calming Tool Kit

B.01 Traffic Calming and Traffic Management

There are two basic elements involved in Neighborhood Traffic Calming Guidelines. They are classified as traffic calming and traffic management. Both elements use physical devices to change driver behavior. Traffic calming measures affect driver characteristics by slowing traffic speeds and/or discouraging through traffic from using neighborhood streets. In comparison, traffic management measures change street system use patterns by diverting traffic to arterial streets and balance neighborhood street system use.

Many neighborhood residents consider traffic calming to involve the installation of stop signs or 'Children at Play' signs. Studies have shown that, in most cases, these devices actually have no effect or in some cases can increase traffic speeds within neighborhoods and provide a false sense of safety.

Traffic calming measures are physical devices that change driver behavior. Traffic calming measures can be used to mitigate traffic safety problems or reduce speeding and cut-through traffic problems. For this report, traffic calming measures are organized into the following categories:

Traffic Calming Measures

1. Vertical deflection speed control devices
2. Horizontal deflection speed control devices
3. Gateways and intersection treatments
4. Reduced corner radii

Traffic management measures physically alter accessibility so that existing traffic patterns are required to change. These measures are quite extreme because they change route patterns, may increase emergency vehicle response times, affect local municipal service routes and potentially increase traffic volumes on adjacent neighborhood streets. The following are examples of traffic management measures:

Traffic Management Measures

1. Intersection turn restrictions
2. Intersection traffic diverters
3. Partial street closures
4. Full street closures

These measures should be implemented only as a last resort. If they are implemented, residents on all affected neighborhood streets should be part of the decision process.

B.02 Traffic Calming Measures

Speed Tables have a flat top and can also serve as a pedestrian crosswalk connection to parks or schools located in residential neighborhoods.

Example of speed tables are found on Menomonee River Parkway from State Street to Mayfair Road. Speed tables are designed to be uncomfortable to drive over if the speed limit is exceeded.

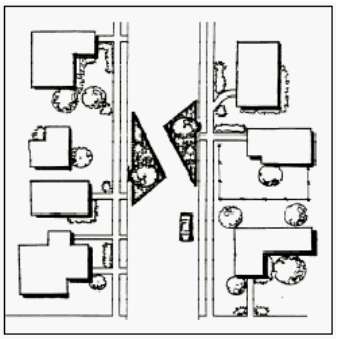
There are some considerations with speed tables and other vertical control devices. Generally, to be effective they must be installed as a series or system with specifics spacing requirements of not more than 300 feet apart.

Speed tables should not be used on sharp grades or curves. Grades should generally be less than 6%. Curves should have a radius greater than 400 feet with an angle of 60 degrees or less. Extra consideration should be given to street drainage, emergency vehicles, snow plowing and street sweeping equipment limitations. Also speed tables should be properly designed with tight profile tolerances to provide the correct ‘ride’ and not create undue driver discomfort. ITE has a new publication on the design of speed humps.

B.03 Horizontal Deflection Speed Control

A horizontal deflection speed control device causes drivers to slow down by requiring them to drive around a roadway obstruction.

Single-lane Slow Points sometimes called a 'choker', is a narrowing of the pavement that reduces the street width to one lane. This is typically accomplished by realigning the edge of pavement or adding landscape areas along the edge of the street they effectively create pinch points along the street. Slow points can be installed at midblock locations or used at intersections creating a gateway effect for an entering street.



Slow points require opposing motorists to yield to each other as they approach the slow point. In order to function effectively, the width of the traveled way cannot be wide enough for two cars to pass, generally 16 feet or less.

A Chicane horizontally diverts traffic through alternating roadside islands from the left to the right. A similar application to a chicane is an angled two-lane slow point. Chicanes can be subtle or quite restrictive depending on the design and angles (tapers) used. Shifting a travel lane will decrease speeds if the taper is not so gradual that motorists can comfortably maintain their speed. For traffic calming, the taper lengths may be as little as half of those typically used in a standard design.

Example of chicane
Resource: ITE Procedures and Warrants

Similar to a chicane, traffic can also be horizontally diverted by shifting parking from one side to the other when there is only roadway width for parking on one side of a street or by building landscaped islands in the center of a street, which also serve as a roadway narrowing.

There are several considerations for chicanes and slow points. They should be used only on low-volume, low-speed residential streets. Emergency response providers and sanitation collectors should be consulted before setting the widths. Chicanes and slow points may reduce the availability of on-street parking.

If landscape islands are installed they must be maintained by the residents. Good visibility should be maintained by planting only low shrubs or trees with high canopies. Also, design efforts should be made to ensure bicycle safety and mobility are not diminished.

Roadway narrowings reduce the width of the traveled way and, by doing so; increase the driver's desire to travel at a slower speed.

Bulb-outs create a roadway narrowing at a street intersection. In many ways, they are a gateway or threshold treatment. Bulb-outs often are coupled with a median island to further reduce the available width of the traveled way. One advantage of placing bulb-outs near intersections is that they reduce the crossing distance for pedestrians. Also, they prevent on-street parking near the intersection, which can increase the intersection sight distance if appropriate landscaping is used.

Two-Lane Slow Points are similar to the single-lane slow point where the street is narrowed yet two lanes are maintained. It differs from the angled two-lane slow point in that there is no horizontal deflection introduced into the travel lane alignment. Sometimes a median is used to further constrict the traveled way. If the travel lane widths are unchanged at the location of the slow point, it will have a minimal effect on speed.

There are several considerations with road narrowing measures. If a parking lane is provided, and there are periods of the day when there are few parked cars, the visual effect of roadway narrowing will be minimized. For this reason, it is desirable to have several bulb-outs into the parking lane to physically reduce roadway width during times when there are no parked cars. As with the other traffic calming measures, road narrowings must consider roadway drainage, bicycle, bus, emergency service and truck design vehicles.

Neighborhood Traffic Circles are circles placed directly in the center of an intersection. Traffic circles typically do not have stop sign controls. A neighborhood traffic circle differs from a modern roundabout in that its main purpose is not to keep traffic moving but to slow traffic. (Note: Roundabouts are an effective intersection treatment for collectors and arterials, but not for residential streets.) Much like horizontal deflection speed control devices, Neighborhood traffic circles reduce vehicle speeds by forcing motorists to maneuver around them. Drivers desiring to make a left turn are directed to go on the far side of the circle (3/4 of the way around the circle) prior to making the turn. Signs should be installed directing motorists to proceed around the right side of the circle before making a right turn off of the circle. Neighborhood traffic circles are commonly landscaped with bushes, flowers, or grass, most often at locations where neighbors have agreed to maintain the plants. In locations where landscaping is not feasible, traffic circles can be enhanced through special pavement materials.

B.04 Gateways/Intersection Treatments

A gateway is a geometric change in the roadway that signals a change in environment from a higher speed arterial or collector street to a lower speed residential area. Gateways often place a high emphasis on aesthetics and are frequently used in addition to distinctive signing to identify neighborhoods. Gateways may be a combination of roadway narrowings, bulb-outs, medians, signing, archways, roundabouts, or other treatments. Gateways should send a clear message to drivers that their environment has changed. Many gateway and intersection treatments have been discussed in the preceding paragraphs such as, raised pedestrian crossings, narrowings, and bulb-outs positioned at intersections. Gateway treatments can also include the use of traffic circles, distinctive arches or public art at street entrances to neighborhoods.

Center Island Narrowing, also called a *Gateway*
Resource: ITE Toolbox of Traffic Calming Measures

B.05 Traffic Management Measures

As mentioned previously, traffic management measures physically alter the street so that traffic patterns cannot remain the same. They tend to have much more pronounced traffic effects, both positive and negative. Careful planning with all potentially affected neighborhoods should take place before implementing a measure that will alter traffic patterns.

Traffic Diverters are islands built at an intersection that prevents certain through and/or turning movements. Diverters are a very severe traffic management measure because they change traffic patterns and the transportation system by restricting movements. Traffic diverters greatly affect people living in the neighborhood and should be considered only when less restrictive measures are not appropriate.

There are several types of diverters: diagonal, forced turn, and star. A diagonal diverter breaks up cut-through movements and forces right or left turns in certain directions. A forced turn diverter mandates a certain traffic movement, typically through the placement of channelization or roadway closures. The most frequent applications of this are right-in/right-out islands and left-turn in only islands. A star diverter is a star placed in the center of the intersection that forces right turns from every approach.

Right-in/Right-out Diverter
Source: Dan Burden

Left-in Only Diverter
Source: ITE Pedestrian Council

There are many implications that should be considered before constructing any type of diverter. Less restrictive measures should be considered first. Neighborhood traffic patterns must be evaluated to see how the diverter will affect other adjacent streets, and a diverter should have very strong neighborhood support before it is implemented. Diverters should be designed to allow full movements by bicycles and pedestrians. Finally, diverters disrupt the transportation system, which may affect emergency response times to portions of the neighborhood. For this reason, emergency response providers must be involved in the design process.

Partial Street Closures use a semi-diverter to physically prevent vehicles from entering a street at an intersection. A partial street closure could involve closing one direction of a two-way street. As mentioned, partial street closures at the entrance to a neighborhood must consider the traffic flow pattern of the surrounding streets, as these streets will probably experience increased traffic volumes. Partial street closure design should incorporate full (two-way) access for bicyclists and pedestrians. A partial street closure provides better emergency access than a full closure.

B.06 Comparison of Devices

As mentioned, various treatments accomplish different objectives. Table B.06.1 illustrates the likely effects from the application of different treatments. The table is derived from the City of Las Vegas Neighborhood Traffic Management Program Manual.

Table B.06.1 Effects of Traffic Calming Applications

Traffic Calming Treatment	Vehicle Volume	Vehicle Speed	Noise	Vehicle Conflicts	Traffic Diverted to Other Residential Streets	Ped/Bike Safety	Emergency Vehicle Access	***3.1.1.1.1 Recommended For***
Chicanes/Slow Points	↓	↓	↓	↓	↑	↓	↓	Residential Streets
Narrowings	↓	↓	↓	↑	↓	↑	↓	Residential/Collector Streets
Crossing Islands								Collector Streets
Bulb-outs		↓		↑[2]	↑	↓	↓	Residential / Collector Streets
Diverters	↓	↓	↓	↓	↑	↑	↓	Residential Streets
Gateways/Thresholds	↓	↓		↓		↑	↓	Residential / Collector Streets
Partial Turn Diverters/				↓	↑	↑	↓	Residential/Arterial Streets
Speed Tables	↓	↓	↑		↑	↑	↓	Residential Streets
Neighborhood Traffic Circle		↓	↓	↓		↑[3]	↓	Residential/Collector Streets

Table B.06.2 illustrates the effectiveness of several traffic calming measures in reducing traffic volumes. Table B.06.3 illustrates the effectiveness of several traffic calming measures in reducing traffic speeds. Table B.06.4 illustrates the effectiveness of several traffic calming measures in reducing traffic crashes.

[2] Vehicle conflicts may increase for turning movements of large trucks.
[3] Ped safety may decrease if motorists are swerving around circles instead of slowing down.

Table B.06.2 Average Volume Reduction

Calming/Control Measure	Percent Change
22-ft table	-12
Neighborhood traffic circles	-5
Narrowings	-10
One-lane slow points	-20

Source: Victoria Transport Policy Institute TDM Encyclopedia, May 27, 2003, www.vtpi.org.

Table B.06.3 85th Percentile Speed Reduction

Calming/Control Measure	Percent Change
22-ft table	-18
Raised intersections	-1
Neighborhood traffic circles	-11

Source: Victoria Transport Policy Institute TDM Encyclopedia, May 27, 2003, www.vtpi.org.

Table B.06.4 Safety

Calming Measure	Before	After	% Change
22 ft. tables	6.7	3.7	-45%
Traffic circles	2.2	0.6	-73%
All Measures	2.6	1.3	-50

Appendix C

Neighborhood Traffic Management Program

Application Forms

CITY OF WAUWATOSA
NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM
APPLICATION FORM

To request NTMP assistance from the City of Wauwatosa for traffic safety concerns on local residential streets, please complete this application and the neighborhood petition form and return them to:

City of Wauwatosa
Attn: William Wehrley
City Engineer
Engineering Services Division
7725 W. North Avenue
Wauwatosa, WI 53213
wwehrley@wauwatosa.net (Scan and email)

Date: _____ Aldermanic District Name or #: _____

Street Name(s), Including Block Number(s): _____

_____

Contract Name: _____

Mailing Address: _____ Zip Code: _____

Contact's Phone: _____ Contact's Email: _____

Reason(s) for Request (e.g. cut-through traffic, speeding, difficult to cross street, frequent crashes):

_____

_____

_____

_____

School(s) on the street? If so, please list: _____

_____

Park/community facility on the street? If so, please list: _____

_____

Any additional information you want to provide? _____

_____

CITY OF WAUWATOSA
NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM (NTMP)
REQUEST FOR TRAFFIC STUDY PETITION

We the undersigned residents, are requesting the City of Wauwatosa conduct a traffic study on _____

Insert Street Name and Block Number

and/or at the intersection of _____ and _____
Insert Street Name Insert Street Name

We the undersigned, understand that this petition is to initiate the City's neighborhood traffic management program to discuss a potential traffic management plan. This petition is *not* intended to authorize the approval or construction of any traffic calming treatments or other changes to the street. Data will be evaluated and the results will be discussed at a future Transportation Affairs Committee meeting to determine if a significant safety problem(s) exists and if the street/intersection should be considered for traffic calming improvements.

This petition should only be utilized after the City has determined your area is eligible for traffic calming and you have been given the "Impacted Area" for signature purposes. Please collect signatures from at least 50% +1 of the homes within the "Impacted Area". Please print as many sheets as needed and note the number of pages at the bottom. Please write legibly.

NAME (PRINTED)	STREET ADDRESS	EMAIL	SIGNATURE

Appendix D

Proposed Neighborhood Traffic Management Plan

City of Wauwatosa
Neighborhood Traffic Calming Committee Charter

Committee Name: _____

Neighborhood Area Represents: _____

Date: _____

Committee Goals:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Anticipated Activities to be Conducted by the Committee:

_____

_____

_____

_____

_____

_____

_____

_____

Appendix E

Neighborhood Traffic Management Program Ballot

City of Wauwatosa

Neighborhood Traffic Calming Program

CONFIDENTIAL BALLOT

Family or Business Name _____

Check One: Owner ___ Renter ___

Address _____

Phone Number _____

Email (optional) _____

Date _____

Individual ballots will remain confidential. Results of the ballots will be made public.

Description of measure being proposed (Drawing attached)

_____

_____

_____

Estimated cost per parcel for the improvement $_____

_____**We oppose the proposed traffic calming measure and/or do not want to pay for it.**

_____**We support the proposed traffic calming measure and are willing to pay for it.**

Signature:_____ **Date:**_____

Comments:

_____

_____

Return by _____**to:** City of Wauwatosa
Attn: William Wehrley, City Engineer
Engineering Services Division
7725 W. North Avenue
Wauwatosa, WI 53213

Appendix F

Typical Neighborhood Traffic Calming Device Construction Cost Estimates

Typical Traffic Calming Device Construction Costs Estimates

Device	Typical Cost
Speed Tables	$6,000 to $10,000
Traffic Circles	20,000 to $30,000
Gateway Treatments	$5,000 to $20,000
Bulbouts	$25,000
Diagonal Diverters	$100,000 and up
Full Closures	$120,000 and up

Appendix G

Photographs of Traffic Calming Devices