



MANHEIM TOWNSHIP

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

TRAFFIC CALMING FOR LIVABLE
NEIGHBORHOODS

Prepared For:
Manheim Township Board of Commissioners
January 3, 2000

Prepared By:
Manheim Township Neighborhood Traffic
Management Team

Roy E. Baldwin - President, Board of Commissioners

Donald C. Smith - Board of Commissioners

James M. Martin - Manager/Secretary

Jeffrey L. Butler - Department of Planning & Zoning

Sean P. Molchany - Department of Planning & Zoning

Carl L. Neff - Department of Public Works

Philip E. Mellott - Department of Public Works

Thomas M. Smith - Department of Public Works

Thomas E. Rudzinski - Police Department

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

TRAFFIC CALMING FOR LIVABLE NEIGHBORHOODS

BACKGROUND.....	3
PURPOSE	5
WHAT ARE THE PROBLEMS?	5
SOLUTIONS.....	6
EDUCATION.....	7
ENFORCEMENT.....	7
ENGINEERING.....	7
AFFECT ON EMERGENCY VEHICLE RESPONSE TIMES	8
TRAFFIC CALMING DEVICE SELECTION/INSTALLATION PROCESS.....	9
DEFINITIONS	9
HOW LOCAL STREETS ARE SELECTED	10
<i>Initiating A Project - Community support.....</i>	<i>10</i>
<i>Ranking the Streets</i>	<i>11</i>
<i>Selecting Streets for a Project.....</i>	<i>12</i>
<i>Project Procedures for Streets.....</i>	<i>13</i>
MENU OF TRAFFIC CALMING DEVICES.....	16
NEIGHBORHOOD TRAFFIC CIRCLE	16
<i>Description:</i>	<i>16</i>
<i>Applications:.....</i>	<i>16</i>
<i>Design/Installation Issues:.....</i>	<i>16</i>
<i>Potential Impacts:.....</i>	<i>17</i>
<i>Emergency Response Issues:</i>	<i>17</i>
<i>Other/Special Considerations:.....</i>	<i>17</i>
SPEED TABLE	17
<i>Description:</i>	<i>17</i>
<i>Applications:.....</i>	<i>18</i>
<i>Design/Installation Issues:.....</i>	<i>18</i>
<i>Potential Impacts:.....</i>	<i>18</i>
<i>Emergency Response Issues:</i>	<i>18</i>
RAISED INTERSECTION	19
<i>Description:</i>	<i>19</i>
<i>Applications:.....</i>	<i>19</i>
<i>Design/Installation Issues:.....</i>	<i>19</i>
<i>Potential Impacts:.....</i>	<i>19</i>
<i>Emergency Response Issues:</i>	<i>19</i>
CHICANE.....	20
<i>Description:</i>	<i>20</i>
<i>Applications:.....</i>	<i>20</i>
<i>Design/Installation Issues:.....</i>	<i>20</i>
<i>Potential Impacts:.....</i>	<i>20</i>

<i>Emergency Response Issues:</i>	20
CHOKER	21
<i>Description:</i>	21
<i>Applications:</i>	21
<i>Design/Installation Issues:</i>	21
<i>Potential Impacts:</i>	22
<i>Emergency Response Issues:</i>	22
<i>Other/Special Considerations:</i>	22
CLOSURE	22
<i>Applications:</i>	22
<i>Descriptions:</i>	23
<i>Design/Installation Issues:</i>	23
<i>Potential Impacts:</i>	23
<i>Emergency Response Issues:</i>	24
CENTER ISLAND NARROWING	24
<i>Description:</i>	24
<i>Applications:</i>	24
<i>Potential Impacts:</i>	24
<i>Emergency Response Issues:</i>	25

BACKGROUND

Manheim Township can be characterized as having a highly mobile population and a multitude of interesting destinations. Whether it's work, shopping, or social or recreational activities, Manheim Township residents have ample access and a wide range of choices on where to go and what to do. All these activities are linked by the Township's transportation network - a series of local streets, collectors, and arterials that take us where we want to go.

A system of collector and arterial roadways serves as the backbone of the Township's roadway network. These high-capacity roads are intended to move motorists from one area of the Township to another, quickly and efficiently. As our Township grows this system of collectors and arterials grows with it. Recently, however, some of these roadways have suffered as population growth and increased mobility of residents outpaces the systems capacity to move vehicles without delay. As congestion along collectors and arterials increases, some motorists have discovered ways of bypassing the congested roadways by using neighborhood streets to get from one collector or arterial to another or as a shortcut to their destination.

The use of neighborhood streets by "cut-through" traffic has serious implications for neighborhood cohesion and livability. Increased vehicle speeds and daily traffic volumes along these streets create hazards for the residents, increase noise levels and create barriers to neighborhood interaction. The safety of those residents of the neighborhood not in vehicles, pedestrian and bicyclists, are put at increased risk.

Neighborhood traffic issues have become an increasing concern to the Township Board of Commissioners and Township staff responsible for the safe movement of people and vehicles around our Township. One of the most persistent and emotional complaints that the Township receives is speeding and increased traffic volumes on residential streets. Each year, numerous requests are received by various Township departments to study streets where residents have concerns about safety due to excessive traffic speeds and/or volumes.

Manheim Township is continually striving to strengthen and protect its neighborhoods by improving the quality of life in residential areas. The desirability of Manheim Township neighborhoods as a place to live is directly affected by local traffic conditions. Safety hazards can be

created by unnecessary through traffic in these neighborhoods or by motorists travelling at unsafe speeds on street designed primarily for local access to abutting properties.

This report presents a Neighborhood Traffic Management Program (NTMP) aimed at making existing residential streets more livable by reducing traffic speeds and volumes based on sound technical analysis and community participation. It explores the need for traffic management in our neighborhoods, establishes a Neighborhood Traffic Calming Policy and sets out guidelines for the policy implementation. This policy involves a definition of the problem, a process by which to evaluate neighborhood traffic problems, and identifies some potential strategies for managing traffic within neighborhoods.

The Institute of Transportation Engineers define traffic calming as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users".

Traffic calming goals of the Neighborhood Traffic Management Program include:

- ❖ **Increasing the quality of life for residents;**
- ❖ **Incorporating the preferences and requirements of all those using the area along the street, or at intersections;**
- ❖ **Promoting safe pedestrian and bicycle use.**
- ❖ **Creating safe and attractive streets;**
- ❖ **Helping to reduce the negative effects of motor vehicles on the environment; and**

Traffic calming objectives to meet these goals include:

- ❖ **Achieving slow speeds for motor vehicles;**
- ❖ **Reducing cut-through motor vehicle traffic.**
- ❖ **Increasing the safety and the perception of safety for non-motorized users of the streets;**
- ❖ **Reducing the need for police enforcement;**
- ❖ **Reducing frequency and severity vehicle accidents;**
- ❖ **Enhancing the street environment (i.e. streetscaping)**

PURPOSE

This report will provide a tool for Township citizens and staff to use in the implementation of the Township's Neighborhood Traffic Management Program. The report will:

- ❖ Introduce the concept of neighborhood traffic management
- ❖ Explain the idea of traffic calming,
- ❖ Define a comprehensive Policy on Neighborhood Traffic Management to guide the use of Township resources on neighborhood traffic calming projects,
- ❖ Establish a process by which the policy will be implemented, and
- ❖ Provide a list and explanation of different traffic calming devices.

WHAT ARE THE PROBLEMS?

Traffic calming measures are proposed in response to these widely-experienced problems:

Speeding - Many motorists (neighborhood residents as well as "cut throughs") drive too fast on local streets. While some speeding is by irresponsible drivers, the majority is done by normally responsible drivers who find themselves "invited" to speed by the road's design features, such as excessively wide pavement, straight sections of road and absence of vegetation. In addition to safety issues, speeding vehicles degrade the quality of the street for all other users, signaling that the street is exclusively devoted to vehicle traffic.

Cut-Through Traffic - Cut through traffic has neither its origin nor its destination within the neighborhood, but rather is passing through the neighborhood on its local streets. It is intended that through traffic use the arterial and collector streets, not neighborhood streets. This does not always happen, and cut-through trips seek out the local streets, sometimes because they are faster, and often because they are less congested and therefore seem to be faster.

Safety - Excessive traffic speeds are a threat to neighborhood safety, causing residents to retreat into or behind their homes, essentially abandoning the street to vehicles and whoever else wants to claim it. Reducing traffic speeds and volumes through traffic calming measures are ways for residents to start to reclaim their streets for their own needs.

Aesthetics - Wide expanses of pavement devoted solely to the moving of traffic appear to have taken over much of our neighborhoods in the name of "traffic service". Traffic calming provides the opportunity to use streets not only for moving cars but also as an aesthetically pleasing focal point for the community.

SOLUTIONS

Why Calm Traffic?

Traffic calming devices are simple street design features that cause motorists to drive with more care, to drive more slowly or perhaps via another route. The great majority of traffic calming devices make slight alterations to the street's geometry, reducing its real or perceived width, or causing the driver to negotiate curvature or pavement texture. These modifications, almost always made within the public right-of-way, are usually accompanied by extensive landscaping, and serve as neighborhood landmarks as well as traffic calming devices.

Borrowing heavily from European and Australian experience, many cities throughout the United States have installed traffic calming devices over the past decade. Originally seen as devices to "retrofit" existing streets, traffic calming is now also seen as a part of original street design in new communities.

Traffic calming measures, while simple in concept, are a complete change in direction from conventional traffic planning of the past three decades. In conventional traffic planning, moving the most possible traffic at the highest affordable speed is the highest priority, and almost no neighborhood values are allowed to interfere. Traffic calming gives a new balance between meeting the needs of motorists and important neighborhood values, such as safety, walking and bicycling.

The Neighborhood Traffic Management Program employs three kinds of traffic calming solutions:

- Education

- Enforcement
- Engineering

All three approaches are considered when designing a traffic calming project. The Manheim Township Neighborhood Traffic Management Team will work closely with all interested citizens to select the solutions that best serve the many uses of the neighborhood and the local street system.

EDUCATION

Education alerts people to ways they can help ease traffic problems - for example, by reducing their speed or travelling by other forms of transportation. The Township will continue to develop a variety of educational materials and activities that can be targeted to both the specific project area and the general public. Two examples are a Neighborhood Speed Watch Program and "Slow Down" banners.

ENFORCEMENT

Enforcement enlists the help of the Manheim Township Police Department's Patrol Division to focus enforcement efforts on the project street and increase community awareness of speeding problems. Patrol officers use two tools: appropriate enforcement and the use of awareness techniques.

ENGINEERING

Engineering tools include a variety of traffic calming devices that can reduce speed, decrease traffic volumes, and/or improve safety. In deciding which traffic calming device will work best for a specific street, a number of considerations must be weighed. Devices can have both benefits and disadvantages. For example, a device that effectively slows traffic may also have some impact on emergency vehicle response time. Some tradeoffs may have to be made.

- ❖ Some devices may be generally appropriate for local streets, but cannot be used on particular streets because of traffic or physical conditions.
- ❖ Specific neighborhood characteristics must be taken into account. Residents may want to consider how traffic calming devices might affect visual aesthetics, parking needs, or other issues important to the neighborhood.

Although there is a seemingly endless variety of traffic calming devices, they all derive from some combination of a few basic principles:

Narrowing the street reduces the speed that most drivers find reasonable and comfortable (the "design" speed). Narrowing is done through reducing the pavement width, adding parking to the

street, or adding a median. At intersections, narrowing is complemented by tight corner radii. The perception of narrowing, which can be as effective as actual narrowing, is gained with street trees along the curb, an overhead tree canopy or buildings brought close to the street.

Deflecting the vehicle path causes the driver to slow and devote more attention to the task of driving. Deflection is done through curving the travel path of the automobile. Deflection usually eliminates long, straight street views, thereby reducing their design speed.

Sharing the pavement with other vehicles is a powerful way to slow traffic and raise the attention level of drivers. Long a feature of traditional local streets, shared-use can be re-introduced into other streets by selective short sections of narrow pavements, either at mid-block locations or near intersections. On-street parking can also compel shared use of the street.

Diverting the driver's route makes vehicular access more difficult, and encourages the driver to use another route. Diagonal street closures, one-way streets, median closings and turning movement restrictions are primary examples of diversion. Closing the entire street is typically not an acceptable traffic calming solution.

Changing the pavement surface demands attention from drivers, and reduces the comfortable driving speed (the "design" speed).

Standard traffic control devices slow traffic through regulation. Stop signs, four-way stop signs, turn-movement prohibitions, traffic signals and posted speed limits are the devices most frequently used to calm traffic. Intensified enforcement of traffic regulations can calm traffic, generally by reminding drivers of posted speed limits and by enforcing the observance of stop signs.

AFFECT ON EMERGENCY VEHICLE RESPONSE TIMES

Any device that might be an effective method of calming traffic generally has a negative impact on several classes of emergency vehicles. This is especially true for fire apparatus and ambulances. Manheim Township, as well as its residents and businesses, place a very high priority on minimizing emergency response times. The installation of most physical traffic calming tools can lengthen emergency response times.

Because of the weight of fire apparatus and the delicate instruments and patients within ambulances, these vehicles must almost come to a complete stop when they encounter a bump, dip

or sharp curve. While these maneuvers will cause moderate discomfort and delay for normal passenger vehicles, they cause a much greater problem for emergency response vehicles.

The increasing sizes of emergency apparatus can affect the selection and design of traffic calming devices. These vehicles must be able to maneuver through areas in which traffic calming measures have been implemented.

Due to the potential affect on emergency vehicles, all projects that involve the installation of engineering tools to calm traffic will necessitate a review of emergency service providers as part of the process.

TRAFFIC CALMING DEVICE SELECTION/INSTALLATION PROCESS

DEFINITIONS

Accident History - accident history relates to the number of correctable accidents that have been recorded during the past three years. Potential safety problems can be identified by analyzing prior accident data.

Immediate Affected Area - the immediate affected area includes those streets that are experiencing traffic related problems and would most likely have a reduction in traffic speeds and/or volumes after the installation of any traffic control/diverter devices.

Local Street - local streets are those streets that are not designated as arterial or collector streets in the Manheim Township Subdivision and Land Development Ordinance.

Primary Affected Area - the primary affected area includes those streets that might experience increased traffic speeds and/or volumes after installation of any traffic control/diverter devices in the immediate affected area.

Secondary Affected Area - the secondary affected area includes those streets that are indirectly affected by the installation of traffic control/diverter devices in the immediate affected area. Examples of this type would include a nearby street where the traffic patterns of residents are altered because of a traffic device even though their street is not directly affected.

Study Area - the study area is defined as the "immediate affected" and "primary affected" areas.

Traffic "Control" Devices - traffic control devices include signs, markings, traffic circles, lane narrowings, curb extensions, and other physical devices within public right-of-way that affect the operation of vehicles but do not restrict access to a street.

Traffic "Diverter" Devices - traffic diverter devices include restrictive medians, street closures, one-way operation, and other devices within the public right-of-way that restrict access to a street.

Traffic Volume - traffic volume refers to the number of vehicles passing a given point during a specified period of time. Daily (24-hour) traffic volume counts are utilized for Neighborhood Traffic Management Program analyses.

Traffic Speed - traffic speed refers to the rate of vehicle movement. The Neighborhood Traffic Management Program utilizes the 85th percentile speed, i.e. 85 percent of the vehicles sampled are at or below a particular speed.

HOW LOCAL STREETS ARE SELECTED

The Manheim Township Public Works Department can undertake a limited number of traffic calming projects for local streets each year. With the advice of Citizens and the Neighborhood Traffic Management Team, the following process for deciding which streets are selected for a project.

INITIATING A PROJECT - COMMUNITY SUPPORT

No project will be considered without support from the citizens in the affected area. Responsibility for completion of this phase of the process rests with the community.

Local street projects are initiated when citizens or neighborhood associations ask for help with traffic problems on their street. Citizens or neighborhood associations must complete and submit a Neighborhood Action Request Form (Appendix A) to the Manheim Township Public Works Department or Manheim Township Police Department. The form requests a written description of the location of concern and requires signature from twenty-five (25%) percent of the residences and businesses, per block, of the affected area.

RANKING THE STREETS

Each project area will be evaluated based on technical traffic data. The Neighborhood Traffic Management Team collects and analyzes traffic volume counts, speed surveys and accident reports on all requested street segments. Each segment is assigned a numerical score, based on the two phase scoring procedure shown below.

Qualification Scoring

Criteria	Points	Basis For Point Assignment
VOLUME		AVERAGE DAILY TRAFFIC VOLUMES (1 POINT ASSIGNED FOR EVERY 100 VEHICLES)
SPEED (AT THE TIME OF THE REQUEST)		TRAFFIC SPEEDS MORE THAN 5 MPH ABOVE THE POSTED LIMITED (5 POINTS ASSIGNED FOR EVERY MPH)
ACCIDENT HISTORY		AVERAGE NUMBER OF RECORDED CORRECTABLE ACCIDENTS WITHIN THE PAST THREE YEARS.
TOTAL POINTS POSSIBLE		

In order to continue to be considered as a Neighborhood Traffic Management Program project, the Team must determine that a need exists. Street segments with a Qualification Score under ____ are not considered for a project. If a need cannot be shown, the contact person listed on the Neighborhood Action Request Form will be notified. Segments with a score of ____ or more advance to the Selection Scoring procedure.

Selection Scoring

Criteria	Points	Basis For Point Assignment
SPEED	0 TO 50	PERCENTAGE OF VEHICLES TRAVELLING 10 MPH OVER THE POSTED SPEED (1 POINT ASSIGNED FOR EVERY 1 PERCENTAGE)
VOLUME	0 TO 5	AVERAGE DAILY TRAFFIC VOLUMES (1 POINT ASSIGNED FOR EVERY 1,000 CARS OVER 5,000 VEHICLES PER DAY)
ELEMENTARY SCHOOLS	0 TO 10	5 POINTS ASSIGNED FOR EACH SCHOOL ZONE ON THE PROJECT STREET
PEDESTRIAN GENERATORS	0 TO 15	5 POINTS ASSIGNED FOR EACH PUBLIC FACILITY (SUCH AS PARKS, COMMUNITY CENTERS AND HIGH SCHOOLS) THAT GENERATES A SIGNIFICANT NUMBER OF PEDESTRIANS ON THE STREET
PEDESTRIAN ROUTES	0 OR 5	5 POINTS ASSIGNED IF THE STREET IS DESIGNATED A PEDESTRIAN ROUTE
BICYCLE ROUTES	0 OR 5	5 POINTS ASSIGNED IF THE STREET IS DESIGNATED A BICYCLE ROUTE
TRANSIT STREETS	0 OR 5	5 POINTS ASSIGNED IF THE STREET IS A DESIGNATED MASS TRANSIT ROUTE
PEDESTRIAN FACILITIES	0 OR 5	5 POINTS ASSIGNED IF THERE IS NO CONTINUOUS SIDEWALK ON AT LEAST ONE SIDE OF THE STREET
TOTAL POINTS POSSIBLE	100	

The Qualification and Selection scores for each street segment are added together. All Streets are then compared with each other. Those with the most points are ranked the highest.

SELECTING STREETS FOR A PROJECT

Traffic calming projects are selected from the segments with the highest rankings. In identifying projects, other considerations include the project size and complexity, compatibility with other transportation projects, and budget availability. The Neighborhood Traffic Management Team then proposes the project to the neighborhood.

PROJECT PROCEDURES FOR STREETS

All traffic calming projects provide for and encourage citizen involvement. The Neighborhood Traffic Management Team maintains a close dialogue with neighborhood residents and works with them to develop an acceptable traffic calming plan. A project can be undertaken only if it has the support of residents.

The steps below outline the procedures followed for each traffic calming project.

Survey to Proceed

The Neighborhood Traffic Management Team sends a brochure to all households and businesses within a defined Study Area to provide background information about the proposed project. The Study Area depends on the specific project, but generally includes all properties on the project street, on the cross streets, and on the parallel local street(s).

For people who occupy a household or business in the Immediate Affected Area, a survey is enclosed with the brochure (Appendix B). As residents of the street, these people are most familiar with the problems and issues and will be most affected by any measures that are implemented. The survey asks their opinions about traffic conditions on the street, and whether they would like a project to proceed.

Each household and business is entitled to one response. Nonresident property owners are not included in the survey. The project can go forward only if at least eighty (80%) percent of the surveys are returned and if a majority of the respondents would consider the use of traffic calming options to address traffic issues.

Plan Development

The Neighborhood Traffic Management Team works with interested residents to develop a traffic calming plan. Everyone in the Study Area is invited to participate in this process. The following public meetings are held to exchange information and ideas:

- An initial meeting is held to report on the survey results, identify the issues, and discuss possible solutions. A "working group" may be formed at this meeting, consisting of people who want to take a more active role in developing the project.

- The Neighborhood Traffic Management Team collects and analyzes data about the traffic issues that have been identified and develops possible traffic calming alternatives from the suggestion received and present them at a third public meeting for review and comment. If multiple alternatives are presented, meeting participants give the Team ideas about solutions they would like to see pursued.

- The Neighborhood Traffic Management Team refines the traffic calming alternatives and present them at a third public meeting. Meeting participants identify the alternative they prefer.

Petition-to-Test

A test of the traffic calming plan is usually not required. A temporary test is conducted, however, if the plan includes traffic diversion devices. Testing is required to ensure that an unacceptable amount of traffic is not shifting onto other local streets instead of onto arterial or collector streets.

The petition-to-test is circulated to all households and businesses within the Primary Affected Area of the Study Area. Each household and business is entitled to one response. Nonresident property owners are not included in the petition-to-test process. However, the Neighborhood Traffic Management Team notifies them of the proposed test and informs them of the procedures that will be followed in approving a permanent project.

The majority of the households and businesses must sign the petition in order for the test to proceed. If the required signatures are not obtained, the plan is modified or the project is discontinued. If the petition is successful, the test is installed for at least three months.

Project Ballot

An open house is held to present the proposed permanent traffic calming plan. Everyone in the Study Area is notified of the open house. In addition, households and businesses that are within the Secondary Affected Area receive a ballot asking them to support the project. For projects that do not include diversion, this includes all properties on the project street; on cross streets up to the next parallel street (or up to 200 feet from the project street); and on any other street that must use the

project street as its primary access (for example, a dead-end street off the project street). Both residents and nonresident property owners are included in this ballot.

For diversion projects, ballots that are given to those mentioned above, plus properties on any other streets that were affected during the test. This will be determined by the Neighborhood Traffic Management Team and the project working group.

Eighty (80%) percent of those receiving ballots must be in favor of the project for it to proceed to Township Board of Commissioners for action.

Board of Commissioner Action

If ballot approval is obtained above, the Neighborhood Traffic Management Team prepares a report and recommendations for Township Board of Commissioner action. The public is notified of the opportunity to attend the Board of Commissioners meeting and comment on the proposal.

Implementation

If the project is approved by the Township Board of Commissioners, the Township designs and constructs the traffic calming devices. Education and enforcement tools are also implemented.

Project Evaluation

Six months after construction is complete, the Neighborhood Traffic Management Team evaluates the effects of the project (for example, traffic speeds and traffic diversion onto other local streets). If any unacceptable impacts are identified, corrective measures are taken.

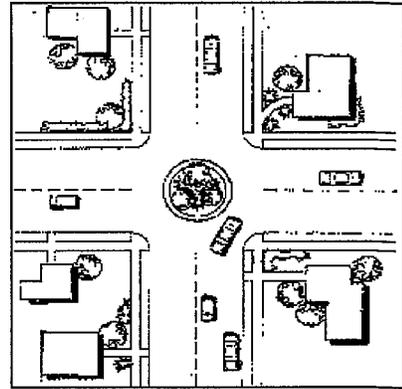
MENU OF TRAFFIC CALMING DEVICES

This section summarizes some commonly used traffic calming strategies and devices, indicating generally suitable applications, design and installation issues, and potential impacts, including impacts on emergency response. Traffic calming projects often involve a combination of these measures.

NEIGHBORHOOD TRAFFIC CIRCLE

DESCRIPTION:

- * raised islands, placed in intersections, around which traffic circulates
- * motorists yield to motorists already in the intersection
- * require drivers to slow to a speed that allows them to comfortably maneuver around them
- * sometimes called intersection islands
- * different from roundabouts



APPLICATIONS:

- * intersections of local streets
- * one lane each direction entering intersection
- * not typically used at intersections with high volume of large trucks and buses turning left

DESIGN/INSTALLATION ISSUES:

- * typically circular in shape, though not always
- * usually landscaped in their center islands, though not always
- * often controlled by YIELD signs on all approaches, but many different signage approaches have been used
- * key design features are the offset distance (distance between projection of street curb and center island), lane width for circling the circle, the circle diameter, and height of mountable outer ring for large vehicles such as school buses and trash trucks

POTENTIAL IMPACTS:

- * no effect on access
- * reduction in midblock speed of about 10 percent; area of influence tends to be a couple hundred feet upstream and downstream of intersection
- * only minimal diversion of traffic
- * intersection collisions have been reduced on average by 70 percent and overall collisions by 28 percent
- * can result in bicycle/auto conflicts at intersections because of narrowed travel lane

EMERGENCY RESPONSE ISSUES:

- * emergency vehicles typically slow to approximately 13 mph; approximate delay of between 5 and 8 seconds per circle for fire trucks
- * fire trucks can maneuver around traffic circles at slow speeds provided vehicles are not parked near the circle

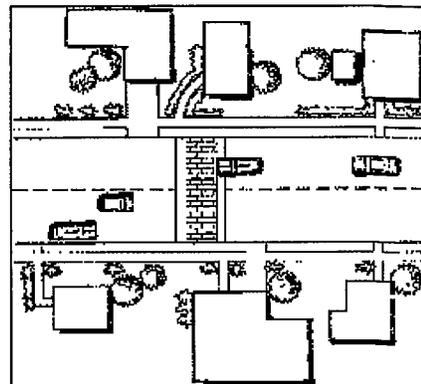
OTHER/SPECIAL CONSIDERATIONS:

- * large vehicles may need to turn left in front of the circle (which could be unsafe at higher volumes); legislation may be required to legally permit this movement
- * quality of landscaping and its maintenance are key issues
- * landscaping needs to be designed to allow adequate sight distance
- * care must be taken to avoid routing vehicles through unmarked crosswalks on side-street approach

SPEED TABLE

DESCRIPTION:

- * long raised speed humps with a flat section in the middle and ramps on the ends; sometimes constructed with brick or other textured materials on the flat section
- * sometimes called flat top speed humps, trapezoidal humps, speed platforms, raised crosswalks, or raised crossings



APPLICATIONS:

- * local and collector streets
- * main roads through small communities
- * typically long enough for the entire wheelbase of a passenger car to rest on top
- * work well in combination with textured crosswalks, curb extensions, and curb radius reductions
- * can include a crosswalk

DESIGN/INSTALLATION ISSUES:

- * typically 22 feet in the direction of travel with 6 foot ramps on each end and a 10 foot flat section in the middle; other lengths (32 and 48 feet) reported in U.S. practice
- * most common height is between 3 and 4 inches (and reported as high as 6 inches)
- * ramps are typically 6 feet long (reported up to 10 feet long) and are either parabolic or linear
- * careful design is needed for drainage

POTENTIAL IMPACTS:

- * no effect on access
- * speeds are reduced, but usually to a higher crossing speed than at speed humps (typically between 25 and 27 miles per hour)
- * traffic volumes have been reduced on average by 12 percent depending on alternative routes available
- * collisions have been reduced on average by 45 percent on treated streets (not adjusted for traffic diversion)
- * reported to increase pedestrian visibility and likelihood that driver yields to pedestrian

EMERGENCY RESPONSE ISSUES:

- * typically preferred by fire departments over 12 to 14-foot speed humps
- * generally less than 3 seconds of delay per hump for fire trucks

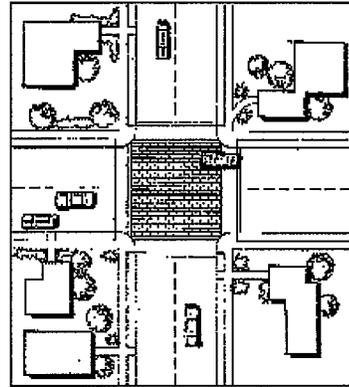
RAISED INTERSECTION

DESCRIPTION:

- * flat raised areas covering entire intersections, with ramps on all approaches and often with brick or other textured materials on the flat section and ramps
- * sometimes called raised junctions, intersection humps, or plateaus

APPLICATIONS:

- * intersections of local or collector streets
- * work well with curb extensions and textured crosswalks
- * often part of an area wide traffic calming scheme involving both intersecting streets
- * in densely developed urban areas where loss of parking would be unacceptable



DESIGN/INSTALLATION ISSUES:

- * typically rise to sidewalk level
- * may require bollards to define edge of roadway
- * Canadian installations typically have gentle 1:40 slopes on ramps
- * storm drainage modifications are necessary

POTENTIAL IMPACTS:

- * reduction in through movement speeds at intersection
- * reduction in midblock speeds typically less than 10 percent
- * no effect on access
- * make entire intersections more pedestrian-friendly
- * no data available on volume or safety impacts

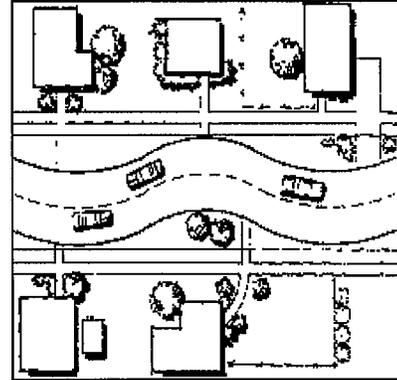
EMERGENCY RESPONSE ISSUES:

- * slows emergency vehicles to approximately 15 miles per hour

CHICANE

DESCRIPTION:

- * a series of narrowings or curb extensions that alternate from one side of the street to the other forming S-shaped curves
- * also called deviations, serpentines, reversing curves, twists, and staggerings



APPLICATIONS:

- * local and collector streets
- * appropriate for midblock locations only
- * most effective with equivalent volumes on both approaches
- * typically, is a series of at least three curb extensions
- * can use on-street parking to create chicane

DESIGN/INSTALLATION ISSUES:

- * unless well-designed, chicanes may still permit speeding by drivers cutting straight paths across the center line
- * European manuals recommend shifts in alignment of at least one lane width, deflection angles of at least 45 degrees, and center islands to prevent drivers from taking a straight "racing line" through the feature

POTENTIAL IMPACTS:

- * no effect on access
- * limited data available on their effect on speed, volume, and collisions
- * street sweeping may need to be done manually
- * can impact parking and driveway access
- * provides opportunity for landscaping

EMERGENCY RESPONSE ISSUES:

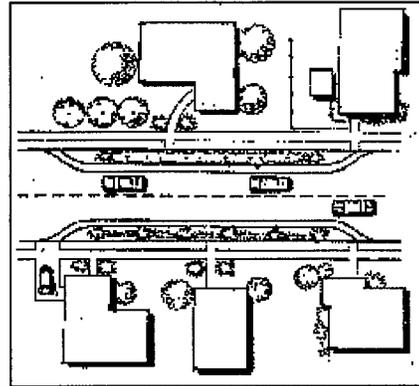
- * limited data available on their effect on delay to emergency response

- * emergency response typically prefer two-lane chicanes to speed humps

CHOKER

DESCRIPTION:

- * curb extensions at midblock or intersection corners that narrow a street by extending the sidewalk or widening the planting strip
- * can leave the cross section with two narrow lanes or with a single lane
- * at midblock, sometimes called parallel chokers, angled chokers, twisted chokers, angle points, pinch points, or midblock narrowings
- * at intersections, sometimes called neckdowns, bulbouts, knuckles, or corner bulges
- * if marked as a crosswalk, they are also called safe crosses



APPLICATIONS:

- * local and collector streets
- * pedestrian crossings
- * main roads through small communities
- * work well with speed humps, speed tables, raised intersections, textured crosswalks, curb radius reductions, and raised median islands

DESIGN/INSTALLATION ISSUES:

- * some applications use an island which allows drainage and bicyclists to continue between the choker and the original curb line
- * typically designed to narrow road to 20 feet for two-way traffic; typically avoid the use of widths between 13 and 17 feet
- * adequate drainage is a key consideration
- * provides opportunity for landscaping
- * vertical delineators, bollards or object markers are often used to make visible to snowplow operators

POTENTIAL IMPACTS:

- * can impact parking and driveway access
- * reduces pedestrian crossing width and increases visibility of pedestrian
- * speeds have typically been reduced on average by 4 percent for two-lane chokers and 14 percent for one lane chokers
- * minor decrease in traffic for two-lane and 20 percent reduction for one-lane chokers
- * collision data not available
- * bicyclists prefer not to have the travelway narrowed into path of motor vehicles

EMERGENCY RESPONSE ISSUES:

- * preferred by many fire department/emergency response agencies to most other traffic calming measures

OTHER/SPECIAL CONSIDERATIONS:

- * one-lane chokers rely on regulatory signs and driver courtesy to work

CLOSURE

APPLICATIONS:

- * local streets
- * closures are typically applied only after other measures have failed or been determined to be inappropriate
- * for all types of closures, provisions are available to make diverters passable for pedestrians and bicyclists
- * often used in sets to make travel through neighborhoods more circuitous - typically staggered internally in a neighborhood, which leaves through movement possible but less attractive than alternative (external) routes
- * closures have been used as a crime prevention tool

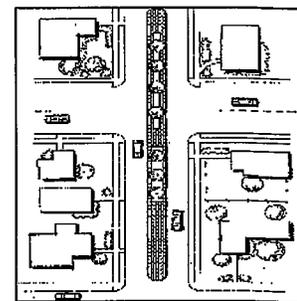
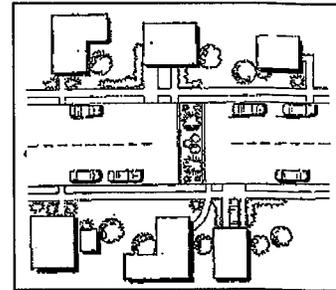
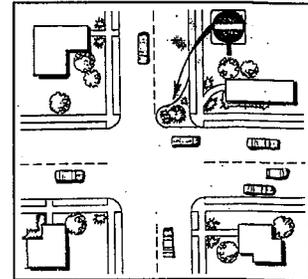
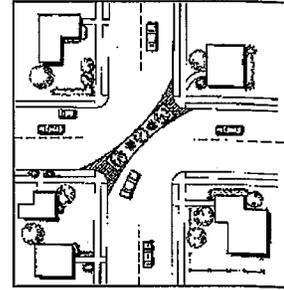
DESCRIPTIONS:

* Diagonal diverters are barriers placed diagonally across an intersection, blocking through movement; they are sometimes called full diverters or diagonal road closures

* Half closures are barriers that block travel in one direction for a short distance on otherwise two-way streets; they are sometimes called partial closures, entrance barriers, or one-way closures (when two half-closures are placed across from one another at an intersection, the result is a semi-diverter)

* Full-street closures are barriers placed across a street to completely close the street to through-traffic, usually leaving only sidewalks open; they are sometimes called cul-de-sacs or dead-ends

* Median barriers are raised islands in the centerline of a street and continuing through an intersection that block the left turn movement from all intersection approaches and the through movement at the cross street



DESIGN/INSTALLATION ISSUES:

* there may be legal issues associated with closing a public street

* can be placed at an intersection or midblock

* barriers may consist of landscaped islands, walls, gates, side-by-side bollards, or any other obstruction that leave an opening smaller than the width of a passenger car

POTENTIAL IMPACTS:

* concern over effects on emergency response, street network connectivity and capacity, and parallel local streets that carry diverted traffic

* may divert significant traffic volumes

* no significant effect on vehicle speeds beyond the closed block

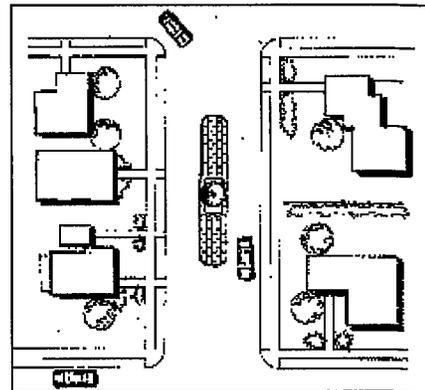
EMERGENCY RESPONSE ISSUES:

- * half closures allow a higher degree of emergency vehicle access than full closures or diagonal diverters
- * all three types of closures can be designed to allow emergency vehicle access

CENTER ISLAND NARROWING

DESCRIPTION:

- * raised islands located along the centerline of a street that narrow the travel lanes at that location
- * sometimes called midblock medians, median slow points, or median chokers



APPLICATIONS:

- * local and collector streets
- * are often nicely landscaped to provide visual amenity and neighborhood identity
- * can help pedestrianize streets by providing a mid-point refuge for pedestrians crossings
- * sometimes used on wide streets to narrow travel lanes
- * work well when combined with crosswalks

POTENTIAL IMPACTS:

- * may reduce parking and driveway access
- * reduces pedestrian crossing width
- * may visually enhance the street through landscaping but may also limit visibility of pedestrian crossings
- * bicyclists prefer not to have the travel way narrowed into path of motor vehicles
- * collision, speed and volume data are not available

EMERGENCY RESPONSE ISSUES:

- * preferred by fire department/emergency response agencies to most other traffic calming measures

APPENDIX A



NEIGHBORHOOD ACTION REQUEST FORM NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

We the undersigned, request that the Manheim Township Neighborhood Traffic Management Team investigate vehicle traffic concerns at the location stated below. After a review of this information, we believe our neighborhood traffic situation may meet the warrants of the Township's Neighborhood Traffic Management Program. The following signatures represent at least 25 percent of the residents and businesses in the neighborhood. This indicates the neighborhood's commitment to work with the Neighborhood Traffic Management Program for a safer traffic environment within our neighborhood.

Neighborhood: _____ Today's Date: _____

Location of Concern: _____

Nature of Concerns: _____

<u>Signature</u>	<u>Address</u>	<u>Telephone No. (Day/Time)</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

Contact Name: _____ Day Telephone: _____

Address: _____

Thank you for taking the time to complete the Neighborhood Action Request Form. After completing the form, please return it to the Manheim Board of Commissioners, c/o James M. Martin, Township Manager, 1840 Municipal Drive, Lancaster, Pennsylvania, 17601.

APPENDIX B



NEIGHBORHOOD QUESTIONNAIRE NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

The Manheim Township Neighborhood Traffic Management Program was established by the Manheim Township Board of Commissioners to address neighborhood concerns regarding problems associated with speeding, cut-through and unsafe vehicle traffic. This process is resident-driven and neighborhood oriented. Simply stated, neighborhood residents identify traffic problems in their neighborhoods and are part of the team developing and implementing solutions.

The administration of this Neighborhood Traffic Management Program is undertaken by a Team comprised of Township Commissioners and Township staff. This Team has become aware of a reported problem in your area of the Township. Therefore, the Team is interested in addressing the reported problem within the framework in the proposed Neighborhood Traffic Management Program.

One of the first steps to be taken when a neighborhood traffic problem is identified is to survey the immediately affected area to gauge resident's opinion on the nature of the problem, the severity of the problem, and whether you would be interested in having a traffic calming project to proceed.

Please complete the following questionnaire and return it in the enclosed self-addressed envelope before: _____.

For any project to go forward, at least 80% of the surveys must be returned and a majority of the responses must indicate a willingness to consider the installation of improvements as a method to slow or divert traffic in the neighborhood.

THANK YOU FOR YOUR ASSISTANCE AND WE LOOK FORWARD TO HEARING FROM YOU!

Name: _____ Address: _____

Do you believe there is a problem with vehicle traffic in your neighborhood?

Yes _____ No _____

If yes, what is the nature of the problem? (Check all that apply)

Traffic Speeds _____

Cut-Through Traffic _____

Amount of Traffic _____

Pedestrian Safety _____

Bicycle Safety _____

Other (Describe) _____

Would you consider the installation of improvements to the roadway that may slow or divert traffic in an effort to address the problems identified?

Yes _____ No _____

Thank you for taking the time to complete the Neighborhood Questionnaire. A public meeting, open to all residents within the neighborhood, will be held to discuss the results of this questionnaire. You will be contacted regarding the time and place of this meeting.