City of Omaha

TRAFFIC CALMING PROGRAM

July 1999

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EXECUTIVE SUMMARY

PROGRAM INCEPTION

The City Council of the City of Omaha approved a resolution on October 27, 1998 directing the Planning Director to form a committee to review the Transportation Element of the City's Master Plan for the purpose of conducting a review of residential traffic flow within the zoning jurisdiction of the City of Omaha. This review specifically called for the establishment of a set of guidelines regarding the control of traffic in existing and new residential neighborhoods and that such guidelines and traffic control policies include reference to traffic calming devices. In addition, this review was to look at the issue of increasing public participation in the planning process.

With the support of the Mayor, City staff from the Planning and Public Works Departments assembled a committee to represent all the facets of the development community and existing neighborhood groups. Committee membership included two members of the City of Omaha City Council, a representative from the Mayor's office, attorneys working with the development community, local engineering consultants, six neighborhood citizen representatives, Douglas County engineering staff, Metropolitan Area Planning Agency staff, emergency response personnel from both the City of Omaha and Douglas County, and City of Omaha departmental staff.

VISION AND GOALS OF THE TRAFFIC CALMING PROGRAM

Once assembled, the Traffic Calming Program Committee established the Vision of the Traffic Calming Program based on the City Council's resolution. The Vision is as follows:

> To provide safe local residential streets, signed for a 25 mile-per-hour speed limit, for all residents of Omaha so that all legitimate uses of residential streets, in addition to the automobile, are provided for.

The Goals of the program were established to help attain this Vision. They are as follow:

1. Develop a program designed to address issues regarding the control of speed, volume, and flow of traffic on local streets in existing residential neighborhoods, as well as in new residential subdivisions.
2. Provide a mechanism to implement appropriate traffic calming techniques.
3. Provide citizens of Omaha information on what traffic calming measures are available.

COMMITTEE ACTIVITIES

The Traffic Calming Program Committee met four times throughout the winter and spring of 1999 to accomplish the Goals set out before them. The following document is the product of this committee. Related Master Plan amendments that incorporate this

program into the Master Plan were sent to the City of Omaha Planning Board in June 1999. These amendments, together with a resolution approving the Traffic Calming Program, were then sent to the City of Omaha City Council in July 1999.

This Traffic Calming Program document includes background information regarding the City's Master Plan and the Program's Vision and Goals. It also contains a section providing an overview of available traffic calming techniques, and a section on implementation guidelines. The techniques section reviews allowable traffic calming devices for both existing and new neighborhoods. The implementation section sets out the minimum criteria for inclusion in the Program, as well as a project ranking system for distribution of funds.

The Traffic Calming Program Committee recommended that this program be entirely funded from the City of Omaha general budget. This will allow the Traffic Calming Program to rank and evaluate proposed projects yearly and also design and construct traffic calming projects during the annual construction season. The ranking system will allow projects to be re-evaluated annually if available funding is fully expended during a given year on other higher ranked projects.

The criteria contained in this document are based on information and data collected from national publications and other municipalities across the country. This was the best information available at the time the Committee was assembled and the Program developed. Since traffic calming is very dynamic at this time, with no national standards to follow, and the fact that this is the initial year for this program in the City of Omaha, it was decided that the Committee will reconvene in January of 2000 to review and update this program as needed.

TABLE OF CONTENTS

INTRODUCTION

Over the past half century, much of road building and transportation planning has been geared toward the automobile, making streets less user-friendly for other forms of transportation. Streets have been built with wider pavement and designed for higher speeds all in the name of increased capacity. This has had a detrimental effect on the usefulness of streets for pedestrians, bicyclists, and transit. Recently there have been increased requests to lower speeds and volumes on residential streets that have suffered from this trend. Such requests can be served through traffic calming efforts. Traffic calming, as defined by The Institute of Transportation Engineers (ITE), is "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." (ITE Journal, July 1997, 22)

The vision of this traffic calming program therefore is to provide the citizens of Omaha, in both developing areas and in established neighborhoods, local streets that may be used safely and efficiently by a range of street users including pedestrians, bicyclists, transit, and autos. Obtaining this range of services on local residential streets where automobiles are not the only legitimate form of transportation in use, or at least should not be, is imperative in order to maintain a high quality of life in city neighborhoods. Through this Traffic Calming Program, which will use a combination of mainly physical traffic calming measures on local residential streets signed for 25 miles-per-hour speeds, the City of Omaha will implement a comprehensive implementation and review process, coordinated through the Public Works Department. Funding will be provided as a line-item for the Traffic Calming Program in the City of Omaha's budget.

In this document, the historical context of how the City of Omaha arrived at this point of implementing a traffic calming program is explained to better understand the role traffic calming will play in the future of Omaha's street system. Then an overview of the range of available traffic calming techniques is offered. Finally, an explanation of the implementation process and standards for traffic calming efforts is given.

TRAFFIC CALMING AND THE OMAHA MASTER PLAN

To better understand the applicability of traffic calming in Omaha, it is important to recognize how the City of Omaha arrived at this point of implementing a traffic calming program that helps improve the livability of city neighborhoods. Much of this understanding comes from realizing that dependence on the automobile has been an increasing trend since the end of the Second World War.

> "Following the war, the nation recognized the need for a system of highways which would provide for more rapid inter-city travel and, at the same time, aid in the nation's defense. Soon thereafter work began on a network of interstate highways designed to link the country. Omaha was selected as one of the cities along the proposed interstate system and land use patterns began to change following the construction of Interstate 80 in the 1960s. The new interstate system now allowed Downtown workers to live in the far western part of the city and commute daily to Downtown. Truck transportation enabled industries to spread out further and commercial centers began to develop at the intersection of major roadways. Auto-related commercial development continued to increase and for the first time office buildings began to locate outside of Downtown. Also, after World War II, the nation's road configuration shifted from the grid system to a hierarchical system made up of arterials, collectors, and local roads. As a result, development patterns dramatically changed. Although the grid system and hierarchical system are not mutually exclusive and in fact co-exist in Omaha, the hierarchical system did encourage a more curvilinear, non-contiguous street pattern. Coincidental with the change in street pattern, other trends related to consumer preferences, transportation options, government policies, and development financing and construction techniques worked together to encourage lower density development. As a result, cities became less dense, land uses became rigidly separated, and the cul-de-sac emerged as the preferred type of residential street." (Omaha Master Plan, Transportation Element, 1997, 1)

The Transportation Element of the Master Plan was developed to address the issues raised by this increased dependence on the automobile and the resulting disjointed street system and the proliferation of urban sprawl. This plan began the process of creating "a new transportation system that will incorporate the needs of pedestrians, bicyclists, and transit users while continuing to accommodate the auto. It [also called] for a more efficient street layout." (Omaha Master Plan, Transportation Element, 1997, 2) Such intentions are consistent with the goals of traffic calming.

The vision of the Transportation Element states that "Omaha must be a community committed to promoting and maintaining a high quality of life for all of its people." (Omaha Master Plan, Transportation Element, 1997, 2) Tenants of this vision include the following:

- Omaha's urban form must be carefully designed to eliminate land use conflicts, reduce traffic congestion, encourage pedestrian movement, and incorporate open space.

- Public improvements and services must be provided in a way that promotes balanced growth and redevelopment and distributes costs according to benefits received. Quality, efficiency, and equitable distribution need to be stressed in the provision of public facilities and services. In an effort to improve Omaha's overall quality of life, fiscal, social and environmental costs and benefits must be considered in decisions regarding public services.

Resulting from this vision, goals of the Transportation Element that relate to traffic calming include the following:

- Be pro-active rather than reactive regarding development.
- Establish a contiguous and compact pattern of growth.
- Emphasize people not automobiles in the design of streetscapes.
- Link transportation and land use planning and match street sizes to surrounding land use.
- Reduce traffic congestion and costs by shifting from a "sparse hierarchy" to a more balanced and interconnected transportation pattern with more emphasis on a "dense network" street system. (see Figures 1 and 2)
- Provide for traffic calming techniques on local residential streets, in both existing neighborhoods and in new developments, when appropriate, to attain a better balance between street users including pedestrians, bicyclists, transit, and autos.

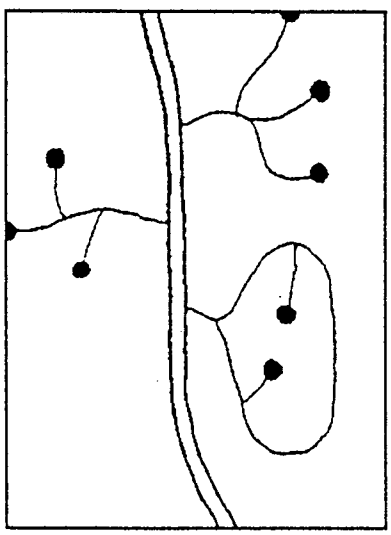


Figure 1: Sparse Hierarchy

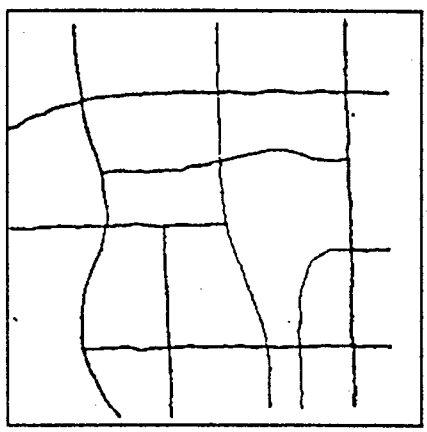


Figure 2: Dense Network

Street design standards in the Transportation Element, in accordance with the City's Arterial Access Policy, state that a "dense network" of streets, using three through routes at the quarter mile points of each mile section in the north/south and east/west directions, will be planned for when designing new developments. Offsets of these through streets are encouraged to reduce high-speed cut-through traffic, but the three through routes are not to be laid out in a confusing and indirect manner. (see Figure 3) Arterial streets are to have straight alignments, while collectors and local streets may have curvilinear alignments. On-street parking is prohibited on arterial streets while collector and local streets may have

parking on them if it does not restrict other uses on the street such as bicycle lanes, transit stops, and maintenance operations. The street design standards go on to say that traffic calming devices and techniques may be installed along local residential streets where appropriate. (Omaha Master Plan, Transportation Element, 8)

These design standards, along with the vision and goals of the Transportation Element, are related to ideas espoused by traffic calming literature. In effect, the Transportation Element of the City of Omaha Master Plan lays the groundwork for the development of a traffic calming program that provides neighborhoods the opportunity to improve their quality of life through better balancing of the relationship between the automobile and other legitimate street uses. The desire therefore of both the Transportation Element of the Master Plan and the Traffic Calming Program is to emphasize people, not automobiles, in the design of streetscapes in residential neighborhoods while ensuring the efficiency of the overall street system in Omaha, especially that of the arterial street system. The efficiency and level of service of the arterial street system, especially at the intersections of arterial streets and ¼ mile through streets, must remain at a high level when installing any changes in the local street system. This must be done to limit the attractiveness of cutting through neighborhoods to circumvent congestion along the arterial streets, thus retaining the through routes for local traffic use.

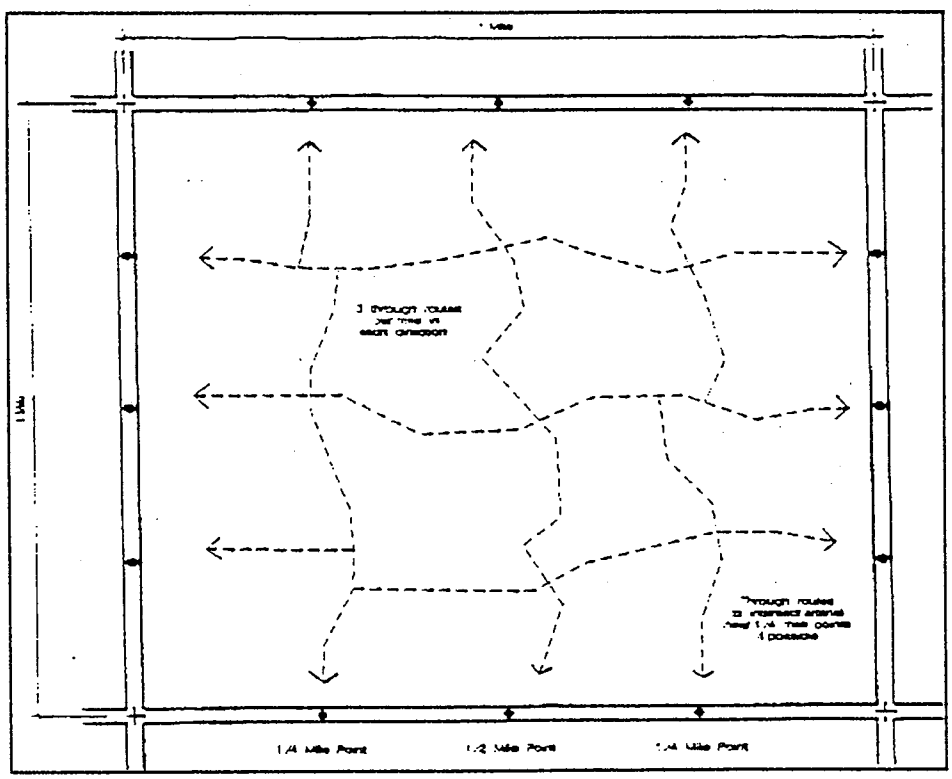


Figure 3: Three ¼ Mile Through Streets

VISION AND GOALS OF THE TRAFFIC CALMING PROGRAM

The Traffic Calming Program builds off of the Transportation Element of the Master Plan by using the framework of vision and goals the Transportation Element provides. The vision of the Traffic Calming Program is to provide safe local residential streets, signed for a 25 mile-per-hour speed limit, for all residents of Omaha so that all legitimate uses of residential streets, in addition to the automobile, are provided for. (Collector streets, as identified by the MAPA Federal Functional Classification Map, that have speed and volume issues and are residential in character are to be addressed on a case-by-case basis by the City of Omaha Public Works Department.) One goal of this Traffic Calming Program is to develop a system designed to address issues regarding the control of speed, volume, and flow of traffic on local streets in existing residential neighborhoods, as well as in new residential subdivisions. The resulting guidelines and traffic control policies are to use traffic calming devices intended to improve the quality of life for residents of Omaha and complement and support the basic concepts of the Transportation Element of the Master Plan. Other goals of the Traffic Calming Program are to provide the City and its citizens information on what traffic calming measures are available, and to provide a mechanism to implement appropriate traffic calming techniques.

A number of distinctions must be made for the proper identification and implementation of the wide range of available traffic calming devices. Keep in mind the definition of traffic calming in use for this program; it states that traffic calming is "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." (ITE Journal, July 1997, 22) One necessary distinction therefore is to identify what physical, or active, measures are available as compared to available passive measures. Another needed distinction is in whether the neighborhood under study is existing and established, or if the neighborhood is part of a new development that is in the platting stage and under design review. These distinctions determine the appropriate combination of available traffic calming tools that can best help alleviate traffic concerns in a neighborhood. It is imperative to keep in mind that the use of just one device, be it passive or active, in existing or new areas, may not solve all the traffic volume, speeding, and flow issues facing a neighborhood. Implementation of one device may simply divert the problem to an adjacent street. A coordinated traffic calming plan that implements a number of devices best suited for certain locations is needed, as is active involvement of residents of the impacted neighborhood. To accomplish this, a program of implementation and review is essential and is therefore a part of this Traffic Calming Program as explained in the implementation guidelines section of this document. A system that allows officials to respond to citizen requests to study a certain location or neighborhood to see if traffic calming will help, and one that provides for a number of devices to be considered and implemented, and then reviewed for effectiveness, is desired. Of course, funding for such a program that provides for the construction and implementation of traffic calming devices is also necessary. The Traffic Calming Program Committee determined that funding for this program should come from a line-item in the annual City of Omaha budget.

TRAFFIC CALMING TECHNIQUES

This section provides a listing of traffic calming devices that includes active devices, passive devices, preemptive tools for new developments, and retrofitting tools for existing neighborhoods. The intent of this listing is to present a description of possible devices available to the City of Omaha and to offer generally accepted views on their usefulness. Some devices are more intensive than others as far as impacts to the physical environment are concerned. Each has varying impacts on traffic speeds and volumes. Particular neighborhood characteristics must be studied so that the most effective device or group of devices can be designed and implemented accordingly. Other devices not listed in this report could be deemed appropriate and more effective for particular future situations. Such devices may be used if approved by the City Engineer.

Much of the information presented here has been researched from the American Planning Association's Planning Advisory Service Report #456, "Traffic Calming," by Cynthia Hoyle, the Northwestern University Traffic Institute's Program of Instruction Workshop on Strategies for Urban Traffic Congestion, and the Institute of Transportation Engineers publication "Neighborhood Traffic Control." Recommendations and specifications in this Traffic Calming Program may be adjusted in the future if national traffic calming standards are adopted or amended.

ACTIVE CONTROL DEVICES

Active control traffic calming devices are physical measures that are installed on the street system to alter driving behavior for the sake of improved conditions along the street for non-motorized street users. Often a range of physical measures is needed, possibly using more than one in a single neighborhood, to help meet the traffic needs of that area. There is a definite distinction between implementing active devices in established neighborhoods and installing active devices in new developments under design review. Therefore, implementation of active devices for each situation will be explained below.

Implementing Active Traffic Calming Devices in New Neighborhoods

One of the most effective arenas in which traffic calming efforts may be implemented is in the platting process for new developments within the jurisdiction of the City of Omaha. It is in the planning for new and improved streets in relation to new residential developments that segments of the transportation system can be built in accordance with traffic calming guidelines. Such proactive planning will help establish more livable new neighborhood streets that are better suited for the range of legitimate transportation uses. There are a number of traffic calming techniques available during the platting process, most of which are already being implemented by City departments.

Designing New Streets with Offset Intersections

One technique plans for the offset of intersections on the ¼ mile local through streets at their intersections with other through streets. These through streets, called for in the Transportation Element of the Master Plan, provide the dense network of streets that will help maintain the integrity of the 1-mile arterial streets as larger volume and higher speed transportation routes. This is accomplished by providing locally generated traffic multiple

routes for travel and not forcing local traffic out on to the arterial street system for travel between neighborhoods. This limited discontinuity with the use of offsets of the planned through streets within a residential area, using 150 foot offsets, has the effect of interrupting sight lines of would be non-local cut-through drivers and therefore limiting the attractiveness of the local streets as quick cut-through routes. (see Figure 4)

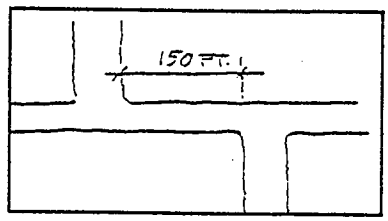


Figure 4: Offset Intersections

Interruption of the sight line of a street causes motorists to slow down since a clear and continuous cut-through route is not perceived. With slower travel times resulting, the benefit of cutting through a neighborhood diminishes along with the number of cut-through drivers. However, it is very important to limit the severity of the discontinuity of the ¼ mile through street so that the integrity of its usefulness for local traffic is maintained.

Limiting the Length of Unimpeded Straight Road Segments

Another preemptive traffic calming tool is to limit the length of unimpeded straight segments of new roadways to 1,000 feet. (see Figure 5) Any stretch of unimpeded road that is longer than 1,000 feet is to be designed with an appropriate traffic calming technique, or combination of techniques, unless the stretch of road under consideration is not perceived as a through route (i.e.-the street segment dead-ends in a T-intersection).

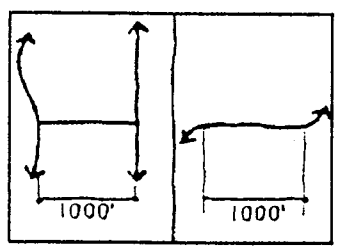


Figure 5: Limit Unimpeded Segments

There are a number of ways to accomplish this. One way to limit the length of unimpeded streets is to design the road with an **offset intersection,** as explained above. (see Figure 4) Other effective techniques to accomplish this include installing traffic circles and designing limited curvilinear streets as explained below.

Traffic Circle

Installing a traffic circle is a way to limit unimpeded new road segments. A traffic circle is a raised island which is usually landscaped and located at the intersection of two streets. The use of these devices is recommended on residential nonarterial streets where they have been found to be very effective in reducing traffic speeds and accidents without diverting traffic onto adjacent residential streets. This device has proven to reduce accidents when compared to two-way or four-way stop signs and traffic signals. Larger radius circles tend to reduce

vehicle speeds more than smaller circles. These larger radius circles are recommended by the City of Omaha to be used in the design of new streets while the smaller radius circles are better for retrofitting existing intersections where right-of-way acquisition and design restraints are issues. (see Figure 6) Reductions in traffic volume are not associated with the installation of traffic circles if used alone. However, if used in concert with other traffic calming devices along the same street, traffic volumes can be reduced.

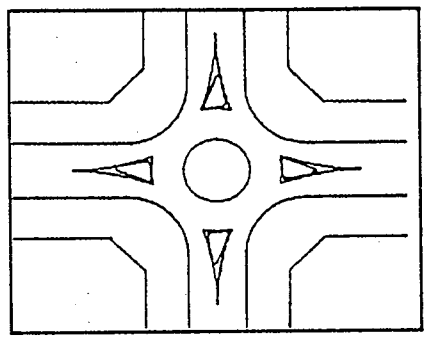


Figure 6: New Street Traffic Circle

Design Limited Curvilinear Streets

Designing a limited curvilinear street will give the appearance of a discontinuous street to non-local drivers using the local street system as a cut-through route. (see Figure 7) Without the ability to view a clear path between intersections, especially when used with other traffic calming measures, the apparent cut-through route becomes much less attractive. It is much easier to design new streets in this manner rather than retrofit existing streets that involve existing right-of-way alignments and buildings. Thus this is most useful when planning for new developments.

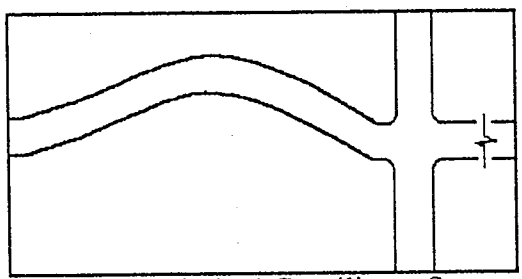


Figure 7: Limited Curvilinear Street

Raised Intersections and Raised Crosswalks

A raised intersection is used to reduce speed and deter some traffic volume through an intersection. The entire intersection is raised a few inches above the normal grade level, with ramps conforming to the grades of adjacent streets. Raised crosswalks are used in similar fashion but are concentrated on pedestrian crossings.

Decreased Driving Lane Widths

Neotraditional planning efforts that attempt to give some control of the residential street back to the pedestrian rather than total control by the auto have attempted to do so with the construction of narrower paved driving lanes for autos. Instead of building streets with

typical driving lane widths of 11 or 12 feet, neotraditional street planning calls for driving lanes to be built 9 or 10 feet wide. (see Figures 8 and 9) The intended result of narrower driving lanes is to alter the driver's perception of safe driving speeds and therefore provide a safer environment for pedestrians with resulting lower speeds. Decreased lane widths are best implemented when planning for new developments. If this tool is considered appropriate, approval of the design from the State Board of Public Roads Classifications and Standards must be granted before implementation.

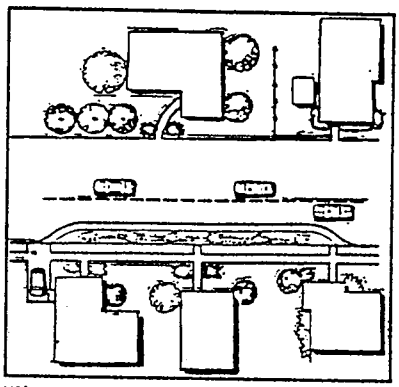


Figure 8: Decreased Driving Lane

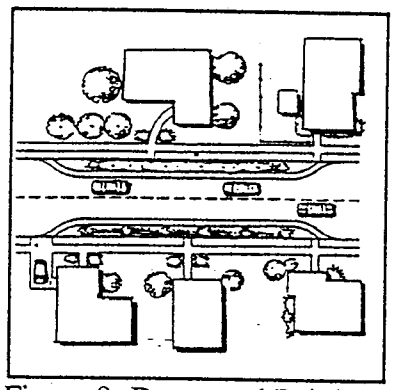


Figure 9: Decreased Driving Lane

On-street Parking

On-street parking can be used to slow traffic on a residential street by decreasing the amount of open pavement for vehicles to drive on and can be easily provided for when designing and building new residential streets. (see Figure 10) This is another example of creating a streetscape that tells the driver that there is a need to decrease speed because parked vehicles and pedestrians are also using the street. It should be noted, however, that the population using the provided parking should be the local residents and not outsiders traveling to nearby nonresidential uses. If there is a traffic generator on an adjacent arterial street with limited parking, the local residential street that provides on-street parking becomes a viable option for users of that facility. This could increase traffic volumes on the local street. With this in mind, limiting or banning on-street parking may in fact be the proper action to take in order to limit the amount of non-local traffic on a local residential street. Resident permit parking only restrictions, time-limited parking, or bans on on-street parking are parking limitation options available to limit the non-resident use of the street.

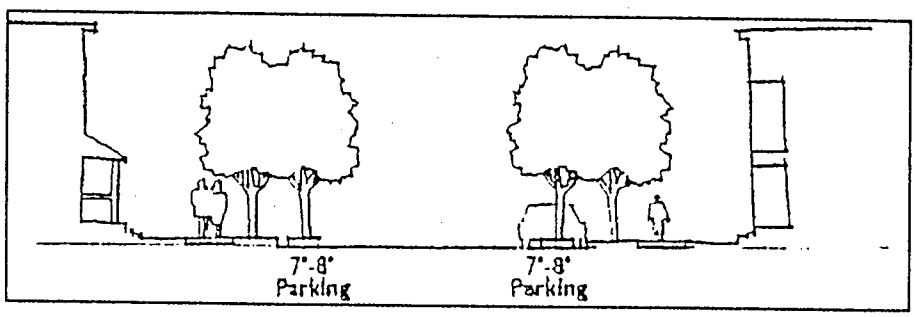


Figure 10: On-street Parking

Planting Street Trees

Another technique that is effective in altering the sight line of a driver is the planting of trees along roadways during road construction. This technique is a fairly low-cost way of calming traffic. Usually street trees are planted no more than 30 feet apart. (see Figure 11) When fully grown, trees provide an interruption in the view of drivers so that higher speeds appear less safe. In addition, a planting strip with trees provides a buffer for pedestrians and bicyclists using the street. A streetscape with tree plantings also provides a more aesthetic feel to the neighborhood thus improving the quality of the street experience for all street users.

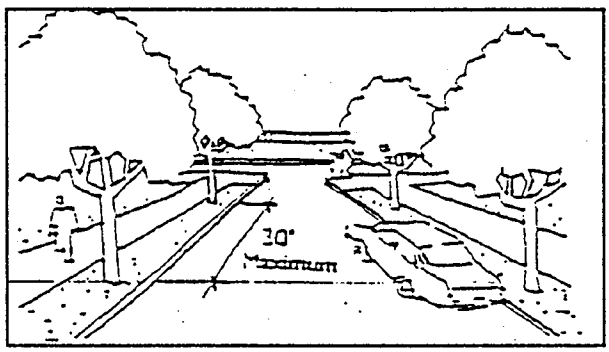


Figure 11: Street Trees

Many of the above techniques limit the sight lines of would-be cut-through drivers and speeders, altering their perception of there being an unimpeded through route or adjusting acceptable speed levels. Without the appearance of a through route, or with less open pavement to drive on, drivers are less likely to use the street as a cut-through route at high speeds, therefore limiting possible negative impacts of non-local traffic, and even that of local speeding traffic. These tools are in use when new residential developments are proposed within the City of Omaha's planning jurisdiction.

Implementing Active Traffic Calming Devices in Established Neighborhoods

Installing physical measures in established neighborhoods can be best described as retrofitting the street system to deal with current traffic problems. In older areas of the City where the grid street system is established and the differences between collector and local streets are less obvious, the City Engineer will determine which streets are local residential streets where appropriate traffic calming measures may be applied. Unlike planning new neighborhoods with traffic calming measures as the roadways are constructed, it is imperative when working with established areas to involve the residents of the neighborhood under study. This provides the residents a voice in how the issues are to be addressed. By doing this, increased understanding of the issues is gained and support for appropriate measures to be taken is more often obtained. The following is a listing of the range of physical devices available to retrofit existing neighborhood street systems.

Speed Humps

Speed humps are raised undulations in the paved surface of a street that extend across the roadway, usually at midblock. A speed hump is longer than the traditional speed "bump" so that the negative impacts of bumps are mitigated. (see Figure 12) The City's specifications for speed humps involve a 4 inch rise over 6 feet, making the entire length of the hump 12

feet long. There has been concern regarding the use of speed "bumps" in regard to interference with winter snow plowing operations and the real or perceived questions regarding their safety. Also, emergency response times are impacted. Speed humps appear less likely to cause such problems. They can be comfortably crossed at 15 to 25 miles per hour. Studies have shown that speed humps do reduce speeds and traffic volumes if placed along the street properly (usually less than 800 feet apart). It is important to note that the use of this traffic calming measure on minor arterials and collector streets, even if residential in character, should be avoided because the level of restraint they impose is inconsistent with the functional purpose of these streets. This is primarily a local street traffic calming device. The City of Omaha has previously adopted engineering criteria for the installation of speed humps through the City's Speed Hump Program. These criteria will continue to be used for this Traffic Calming Program and include the following:

- No stop sign or traffic signal shall be located within 300 feet of the proposed speed hump location.
- The street segment where the proposed speed hump is being considered is to have no adverse conditions such as steep grades or severe curves which would contribute to or cause a safety hazard.
- The street segment must have vertical curbs. At locations where there are roll over or no curbs, problems have been experienced with motorists driving off the roadway to avoid the speed humps. This is a concern because of the potential for destruction of property and the obvious safety hazard of vehicles driving on shoulders and sidewalks.

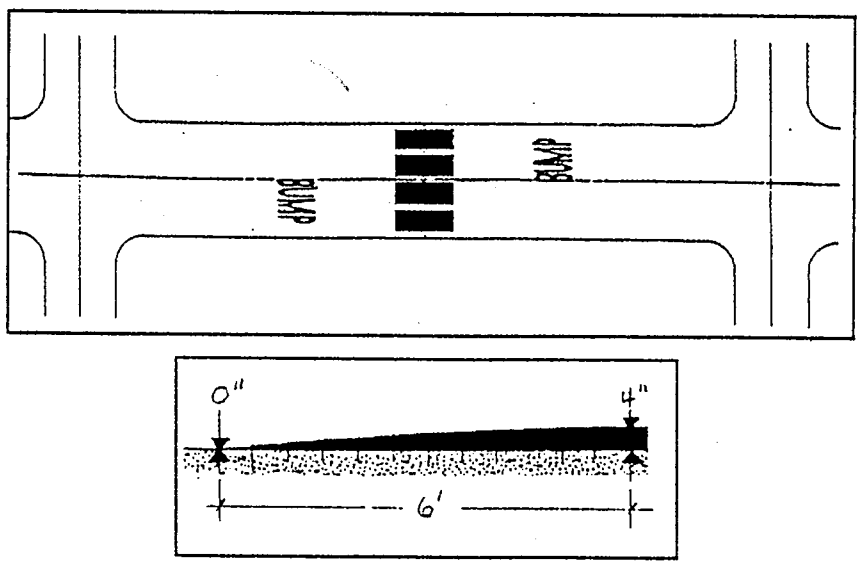


Figure 12: Speed Hump

Raised Intersections and Raised Crosswalks

A raised intersection is analogous to a speed hump used to reduce speed and deter some traffic volume through the intersection. The entire intersection is raised a few inches above the normal grade level, with ramps conforming to the grades of adjacent streets. Raised crosswalks are used in similar fashion but are concentrated on pedestrian crossings.

Semi-diverters, Neck-downs, and Chokers

A semi-diverter is a barrier to traffic, in the form of a curb extension, at the intersection of two streets in which one direction of the street is blocked, but traffic from the opposite direction is allowed to pass through. (see Figure 13) A "Do Not Enter" sign accompanies such a treatment as well as turn prohibition signs on the crossing street. They are best used when one direction on a street is used as a shortcut. A semi-diverter blocks only half the street and can be violated. Studies have shown that these devices can significantly reduce traffic volumes. Neck downs are the same in design as semi-diverters but are located at mid-block. They allow two-way traffic for only a portion of the block. (see Figure 14) Chokers are basically the same type of device as a semi-diverter or neck-down, depending on whether they are located at mid-block or at intersections.

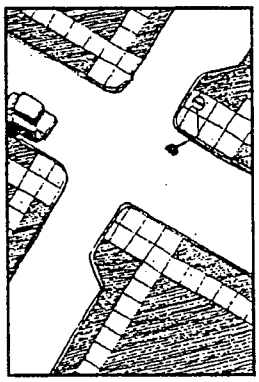


Figure 13: Semidiverter

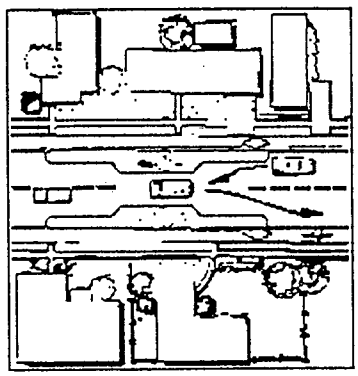


Figure 14: Neckdown

Chicanes

Chicanes are a form of curb extension (like chokers), which alternate from one side of the street to the other, creating a serpentine appearance to the street. This often gives the illusion that a street no longer continues or is not a direct route for cut-through drivers. (see Figure 15) Studies have shown that chicanes lower both volume and speed where applied. A benefit of this device is that emergency vehicle access is not impacted. Use of this device may be preferred over speed humps along emergency response routes. On-street parking layouts are impacted by the installation of these curb extensions and should be carefully adjusted.

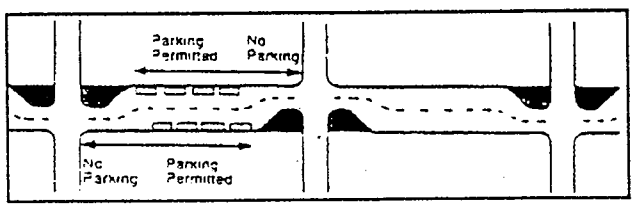


Figure 15: Chicane

On-street Parking

On-street parking can be used to slow traffic on a residential street by decreasing the amount of open pavement for vehicles to drive on. This is another example of creating a streetscape that tells the driver that there is a need to decrease speed because parked vehicles and

pedestrians are also using the street. It should be noted, however, that the population using the provided parking should be the local residents and not outsiders traveling to nearby nonresidential uses. If there is a traffic generator on an adjacent arterial street with limited parking, the local residential street that provides on-street parking becomes a viable option for users of that facility. This could increase traffic volumes on the local street. With this in mind, limiting or banning on-street parking may in fact be the proper action to take in order to limit the amount of non-local traffic on a local residential street. Resident permit parking only restrictions, time-limited parking, or bans on on-street parking (especially if the local street is too narrow to safely provide parking) are parking limitation options available to limit the non-resident use of the street. (See Figure 10 on page 9)

Decreased Driving Lane Widths and Curb Bulb-outs

Neotraditional planning efforts that attempt to give some control of the residential street back to the pedestrian rather than total control by the auto have attempted to do so with the construction of narrower paved driving lanes for autos. Instead of building streets with typical driving lane widths of 11 or 12 feet, neotraditional street planning calls for driving lanes to be built 9 or 10 feet wide. The intended result of narrower driving lanes is to alter the driver's perception of safe driving speeds and therefore provide a safer environment for pedestrians through lower speeds. This active device can be used as a retrofitting tool in established neighborhoods through lane striping, installing an on-street bike lane, instituting on-street parking, or by adjusting existing curb lines. (see Figures 8 and 9 on page 9)

Curb bulb-outs act like decreased lane widths with similar impacts but are located at the intersection of streets. Not only are the driving lane widths decreased with the additional sidewalk and/or landscaped area, but pedestrian crossings are shorter, thus making it safer for those crossing the street at these locations. (see Figure 16)

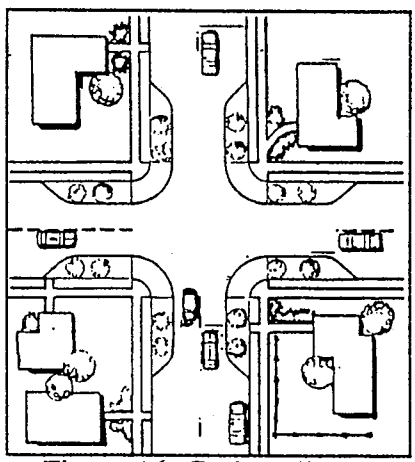


Figure 16: Curb Bulb-out

Median Barriers

Median barriers are usually used to improve traffic flow on major streets. They can also be used, however, to reduce traffic flow on to residential streets by preventing left turns off a major street on to a residential street, or preventing traffic from one neighborhood crossing the major street into another. (see Figure 17) Studies have shown median barriers provide substantial decreases in traffic volumes on local streets and can aid major street flow.

However, modifications are often needed at downstream intersections on the major street to accommodate the diverted left-turn and through traffic from the minor streets. Since the median barrier is an accepted arterial treatment, it is less likely to arouse opposition than some other physical treatments. A median barrier is most effective if applied at all local street intersections along the major street. Otherwise, the effect may be to merely shift traffic from one local street to another. Care must be taken when implementing this measure to ensure the efficiency of the arterial street is maintained.

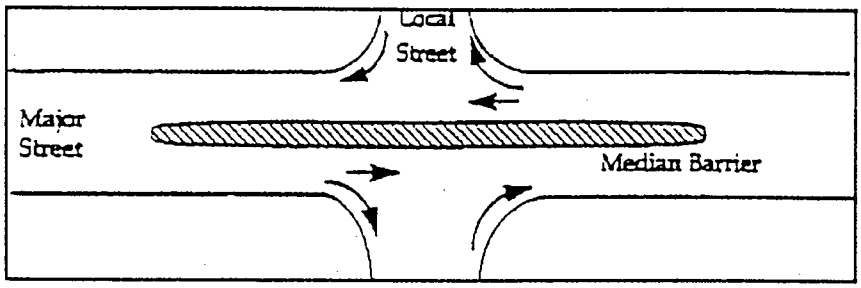


Figure 17: Median Barrier

Traffic Circles

A traffic circle is a raised island that is usually landscaped and located at the intersection of two streets. The use of these devices is recommended on residential non-arterial streets where they have been found to be very effective in reducing traffic speeds and accidents without diverting traffic onto adjacent residential streets. This device has proven to reduce accidents when compared to two-way or four-way stop signs and traffic signals. Larger radius circles tend to reduce vehicle speeds more than smaller circles. Reductions in traffic volume are not associated with the installation of traffic circles if used alone. However, if used in concert with other traffic calming devices along the same street, traffic volumes can be reduced. As noted earlier, traffic circles are part of the proactive traffic calming tool box and are used during the planning stage of new developments. When using traffic circles as a retrofitting tool in established neighborhoods, a smaller circle is used in order to fit better in the existing intersection cross-section. (see Figure 18)

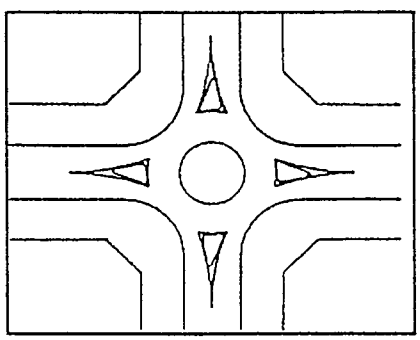


Figure 18: Retrofit Traffic Circle

Diagonal Diverters

A diagonal diverter is a barrier placed diagonally across an intersection to convert the intersection into two unconnected streets, each making a sharp turn. (see Figure 19) Its

primary purpose is to make travel through a neighborhood circuitous, while not entirely preventing such travel. Used alone, the diverters will affect only the two specific streets involved. This application is most effective in reducing traffic volumes if used as part of a planned system for the neighborhood that will discourage through traffic. Speed is usually only reduced in the immediate area of the diverters if no other device is used. Pedestrian, bicycle, and disabled access along the interrupted street should continue to be served across the diverter. The design of the diverter should allow for emergency vehicle access while restricting automobile passage. This device should be avoided along ¼ mile local through streets since it would completely interrupt the planned purpose of these through streets.

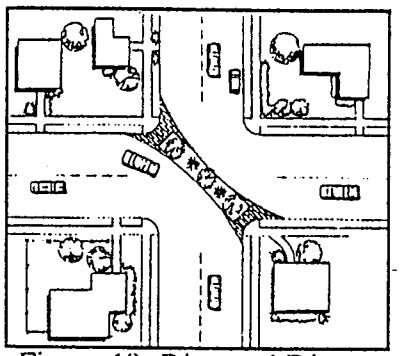


Figure 19: Diagonal Diverter

Forced-Turn Channelization

Forced-turn channelization is usually installed in the form of traffic islands that prevent traffic from executing specific movements at an intersection. These devices basically function in the same way as a diagonal diverter except for the fact that they allow specific movements that the diagonal diverter does not. (see Figure 20) For this reason, forced-turn channelization can take numerous forms and must be customized to deal with specific traffic movements to be prevented. They are mainly used to prevent traffic flow from one neighborhood to another at the intersection of a major and local street with its basic function to make travel on local streets difficult, but not prevent it entirely. Results show that channelization is effective in reducing local street volume if the movements prevented are significant contributors to overall traffic on the street. Little effect is made on traffic speed.

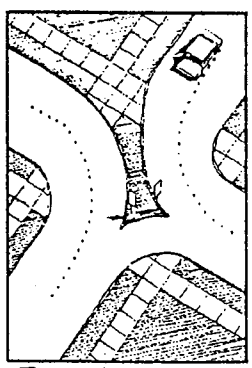


Figure 20: Forced Turn Channelization

Planting Street Trees

Another technique that is effective as a retrofitting tool is the planting of street trees. This technique is a fairly low-cost way of calming traffic and can be used effectively as a

proactive traffic calming tool during new development as well. Usually street trees are planted no more than 30 feet apart. When fully grown, trees provide an interruption in the view of drivers so that higher speeds appear less safe. In addition, a planting strip with trees provides a buffer for pedestrians and bicyclists using the street. A streetscape with tree plantings also provides a more aesthetic feel to the neighborhood thus improving the quality of the street experience for all street users. (see Figure 11 on page 10)

Intersection Cul-de-sacs and Mid-block Cul-de-sacs

An intersection cul-de-sac is a complete barrier of a street at an intersection, leaving the block open to the other street. (see Figure 21) As such, a cul-de-sac represents the most extreme technique for deterring traffic short of barring all traffic from the street in question. Since a cul-de-sac is completely effective at its task of preventing through traffic, the choice of where and whether or not to use it depends largely on other aspects of traffic movement. Consideration must be given to emergency vehicle access, service to nearby traffic generators, and accommodations to continue service to pedestrians, bicyclists, and people with disabilities. In locations where a high traffic generator borders a residential area, a midblock cul-de-sac can be especially useful. The midblock barrier can permit access to the generator from a major street while protecting the neighborhood from through traffic. (see Figure 22) It should be noted, however, that there is a greater probability of motorist confusion when a midblock cul-de-sac cannot be seen from the intersection of the boundary streets. A cul-de-sac should be clearly identified by signs indicating the street is not a through street. A cul-de-sac may be considered as a last resort in locations where obstinate drivers violate other less effective devices. Caution should be employed in making use of the cul-de-sac option since diversion of traffic will occur and will impact adjacent streets. The City Engineer will identify appropriate application of this tool given the extreme impact of this technique.

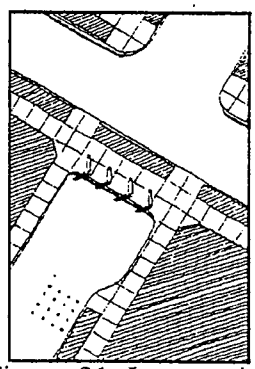


Figure 21: Intersection Cul-de-sac

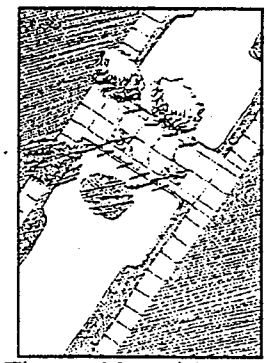


Figure 22: Mid-block Cul-de-sac

PASSIVE CONTROL DEVICES

Passive devices, or those that do not physically alter the roadway, include the following:

- Speed Limit Signs
- Turn Prohibition Signs
- Slow Signs
- Flashing Yellow Beacons on School Zone Signs
- Do Not Enter and Local Access Only Signs
- Electronic Speed Display Boards

The need for most of these devices is currently addressed by following the Manual for Uniform Traffic Control Devices (MUTCD) and the Public Works Department provides their installation. They are usually installed or changed only when warranted. It is clear, however, that some of the above passive devices can be and are used to compliment and increase the effectiveness of active traffic calming measures. If these passive tools are used alone, however, the rate of violation can be very high if there is no active enforcement by local officials and the local residents do not accept their usefulness. For the purposes of this Traffic Calming Program, passive control devices will be used only when warranted or if they compliment an active control device. With that, some further information is needed on two traffic control devices that are often misinterpreted as being traffic calming devices.

A Word About Stop Signs

Stop signs are not considered effective traffic calming devices. Stop signs are designed to assign the right-of-way at intersections with high traffic volumes or high accident rates. Installation of a Stop sign should only take place when necessary warrants are clearly met, thus necessitating the Stop sign. Stop signs not warranted by traffic volumes or site-specific safety concerns (i.e. inadequate sight distance) may tend to increase traffic accidents because once drivers become aware that the sign is unwarranted, they will disregard it. The presence of several unwarranted Stop signs may, in turn, create a general disregard of all Stop signs in a neighborhood. Numerous studies have shown that Stop signs do not significantly reduce speed or volume of traffic in neighborhoods. While Stop signs may decrease speed at the intersection, studies have shown that between intersections they are either ineffective or produce the contrary effect. Where local streets provide significant savings in travel time over congested arterial streets, the installation of Stop signs will have little influence on traffic volumes.

Traffic Signals

Traffic signals have a dramatic effect on traffic in neighborhoods. Frustration with delays at arterial street signals is a major reason for neighborhood cut-through traffic. Maintaining the integrity of the arterial street system will help keep non-local traffic in search of a faster cut-through route off local streets. Interconnecting signal systems to reduce delay, especially during peak hours of the day, can decrease cut-through traffic in neighborhoods. But because of their expense and need to meet warrants, the use of traffic signals as a traffic calming device in neighborhoods is very rare. To limit easy access to local streets off arterial streets, fully signalized intersections should be limited to the ¼ mile spacing of collector streets only when warranted.

IMPLEMENTATION POLICIES AND PROCEDURES

Each of the above mentioned techniques is available to the City of Omaha for implementation if appropriate situations present themselves. However, a comprehensive program of responding to citizen requests, studying the entire neighborhood and reviewing possible alternatives with the residents, implementing an agreed upon course of action, and then reviewing the results of such action is imperative to any successful traffic calming program. When reviewing possible measures to be taken, the overall street design must be considered. This not only includes what traffic calming devices to use, but it also considers landscaping measures that can help interrupt continuous sight lines of drivers, and the installation of sidewalks or pedestrian crosswalks where they are needed. Involving the residents of the neighborhood under study provides an opportunity for them to become stakeholders in the process, thus increasing the acceptance and effectiveness of the decided course of action. Also, involvement of emergency response agencies in the process is imperative to maintain the critical balance between emergency response times and more livable streets. It must be kept in mind as well that the use of just one traffic calming device most often will not solve all the traffic issues facing a neighborhood. By creating a comprehensive implementation and review process, a more livable and safe street system can be achieved for all residents of the City of Omaha.

The following is an explanation of the policies and procedures of the Traffic Calming Program. Included in this explanation is an overview of the minimum eligibility requirements to qualify for the program and the ranking system that will prioritize qualified projects if funding is limited. The City of Omaha Public Works Department will administer this program and will have a summary document available to the public for implementation purposes.

POLICIES FOR THE TRAFFIC CALMING PROGRAM

1. This program is limited to residential streets with a posted speed limit of 25 MPH and defined by the MAPA Federal Functional Classification map as 'LOCAL'. Residential streets defined by the MAPA Federal Functional Classification map as 'COLLECTOR' will be dealt with separately on a case-by-case basis.
2. The City of Omaha will provide yearly moneys for "Traffic Calming" in its annual budget to provide all funding for this program. These moneys will be spent on projects that have been ranked by a scoring system. This scoring system is defined below.
3. Property owners interested in this program are obligated to request routine speed enforcement from the Omaha Police Traffic Division along the street segment in question prior to initiation into this program.
4. The request for a project will come from those property owners along a local residential street which are negatively impacted by excessive through traffic volumes and speeds.

City staff will determine the project area for each project. Examples of the proposed project area definitions are provided in Appendix A. The project area for a mid-block treatment will be defined as those property owners on both sides of the street segment between two intersections, whereas the project area for intersection treatments will be defined as those property owners within 300 feet of the intersection, or ½ block, whichever is smaller.

5. Traffic may be rerouted to another adjacent street as a result of a traffic calming project. The City of Omaha staff, on a case-by-case basis, will define the allowable increase of this traffic.
6. Reasonable emergency access must be preserved.
7. Reasonable vehicular access will be maintained. This program will also promote pedestrian, bicycle, and transit movement.
8. The City Traffic Engineer will continue to direct the installation of all traffic control devices (signs, signals, and markings) in compliance with the Manual of Uniform Traffic Control Devices.
9. The City reserves the right to modify and update this program as additional national or state traffic calming policies are published.
10. The minimum criteria that are required to participate in this program are as follows:

NEIGHBORHOOD APPROVAL

66% of the property owners within the defined project area must support traffic calming for the street (one lot = one vote).

TRAFFIC SPEEDS

Eighty-fifth percentile speed greater than 30 MPH along the street is mandatory.

TRAFFIC VOLUMES

ADT (average daily traffic) greater than 1000 vehicles on the street is mandatory.

11. The scoring system for the ranking of projects that meet the above minimum criteria is as follows. This is based on a 33 point scale:

SPEED

Minimum threshold for speed is 30 MPH for 85% speed. Scoring is based on 1.5 points awarded for every MPH of the 85% speed over 30 MPH.
Maximum score is 15 points.

VOLUME

Minimum threshold for volume is 1000 ADT (average daily traffic). Scoring is based upon 1 point per 200 vehicles per day above the minimum 1000 ADT.

Maximum score is 10 points.

PEDESTRIAN GENERATOR POINTS

Extra points are given for pedestrian generators such as schools and parks. One point is given for each pedestrian generator impacting the study area.

Maximum score is 3 points.

REAPPLICATION CREDIT

Additional points will be awarded if a proposed project, that meets the minimum criteria for inclusion in the program but is not funded because other qualified projects rank higher and expend available funding, is resubmitted the following year for continued consideration. The first such reapplication will receive 2 additional points on the project's ranking score. Each subsequent reapplication will receive 1 additional point for a total reapplication credit not to exceed 5 points. The project under consideration must continue to meet the minimum criteria of the program each year the project is resubmitted for funding consideration.

Maximum score is 5 points.

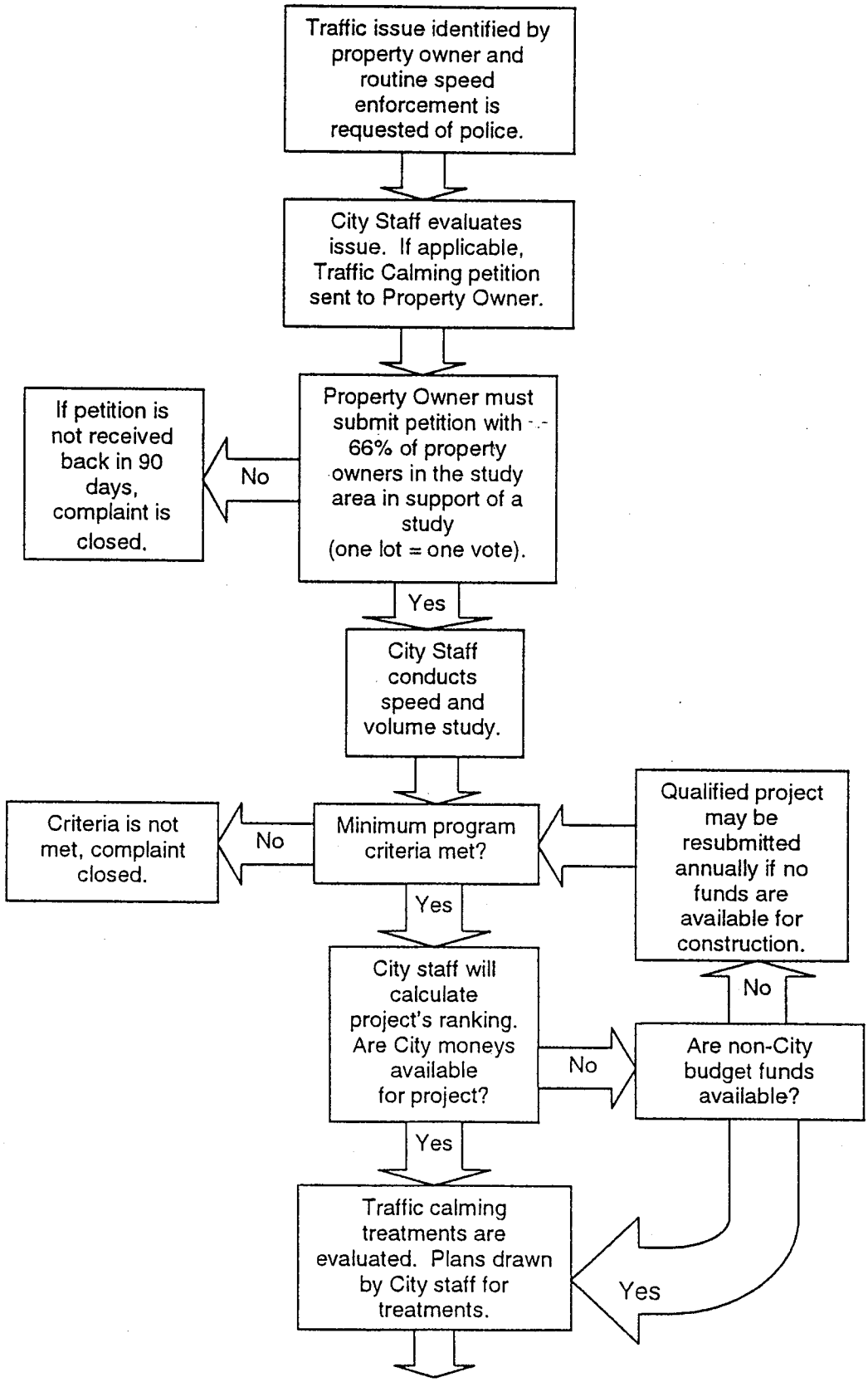
12. New developments will have traffic calming issues addressed during the platting process.

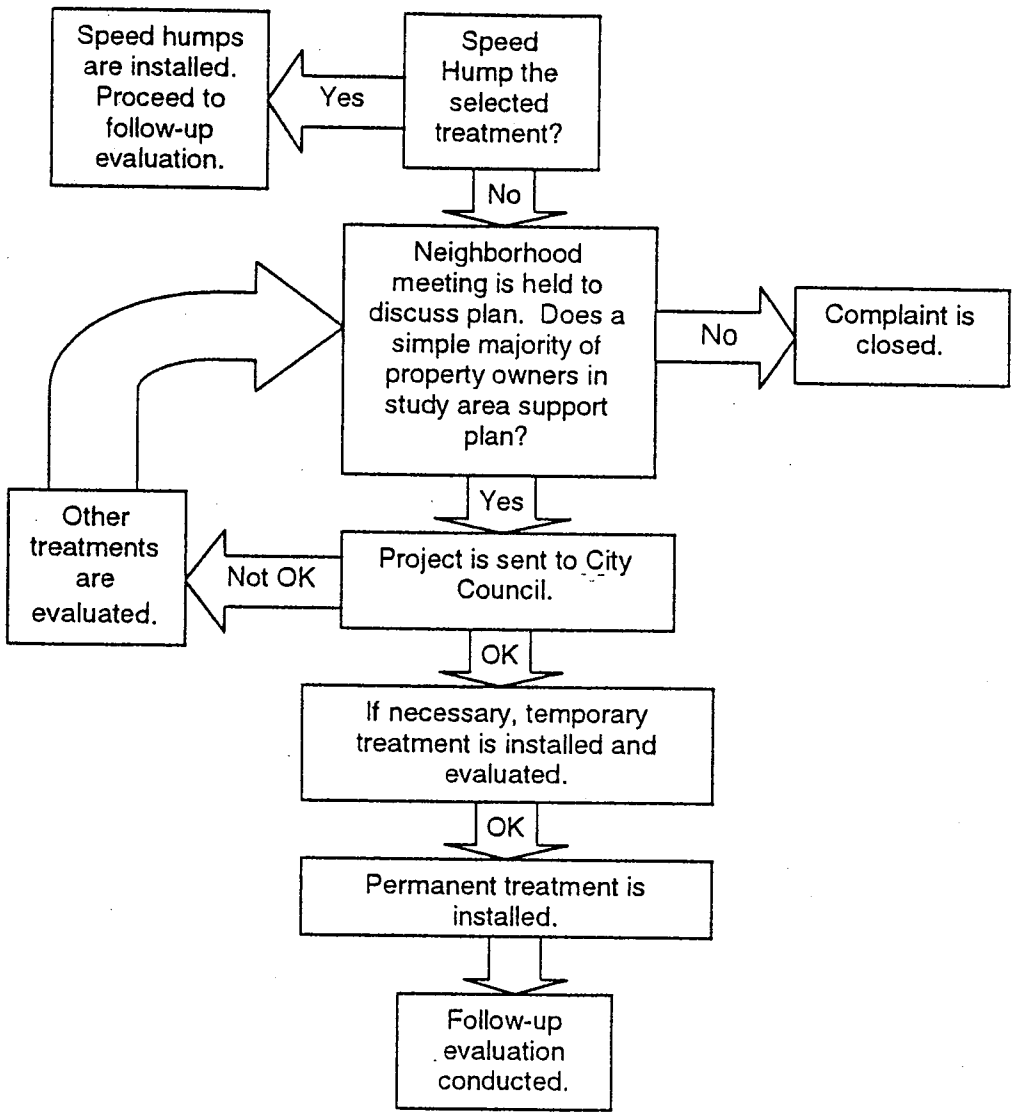
PROCESS OF THE TRAFFIC CALMING PROGRAM

1. Property owners contact City Staff regarding neighborhood traffic problem(s).
2. City staff will evaluate the traffic problem(s). If the concern is appropriate to be considered for the Traffic Calming Program, the property owner(s) will be sent a Traffic Calming Program Petition. (see Appendix B) The City staff will define the petition area to be covered. The petition area will be based upon established guidelines. (see Appendix A for examples)
3. Property owner must obtain signatures of other property owners in the petition area. Signatures of property owners representing 66% of the property owners within the defined petition area are required to move the traffic calming project forward (one lot = one vote). If a signed petition representing 66% of the property owners in the petition area is not received within 90 days of the petition mailing date, the initial investigation will be closed.

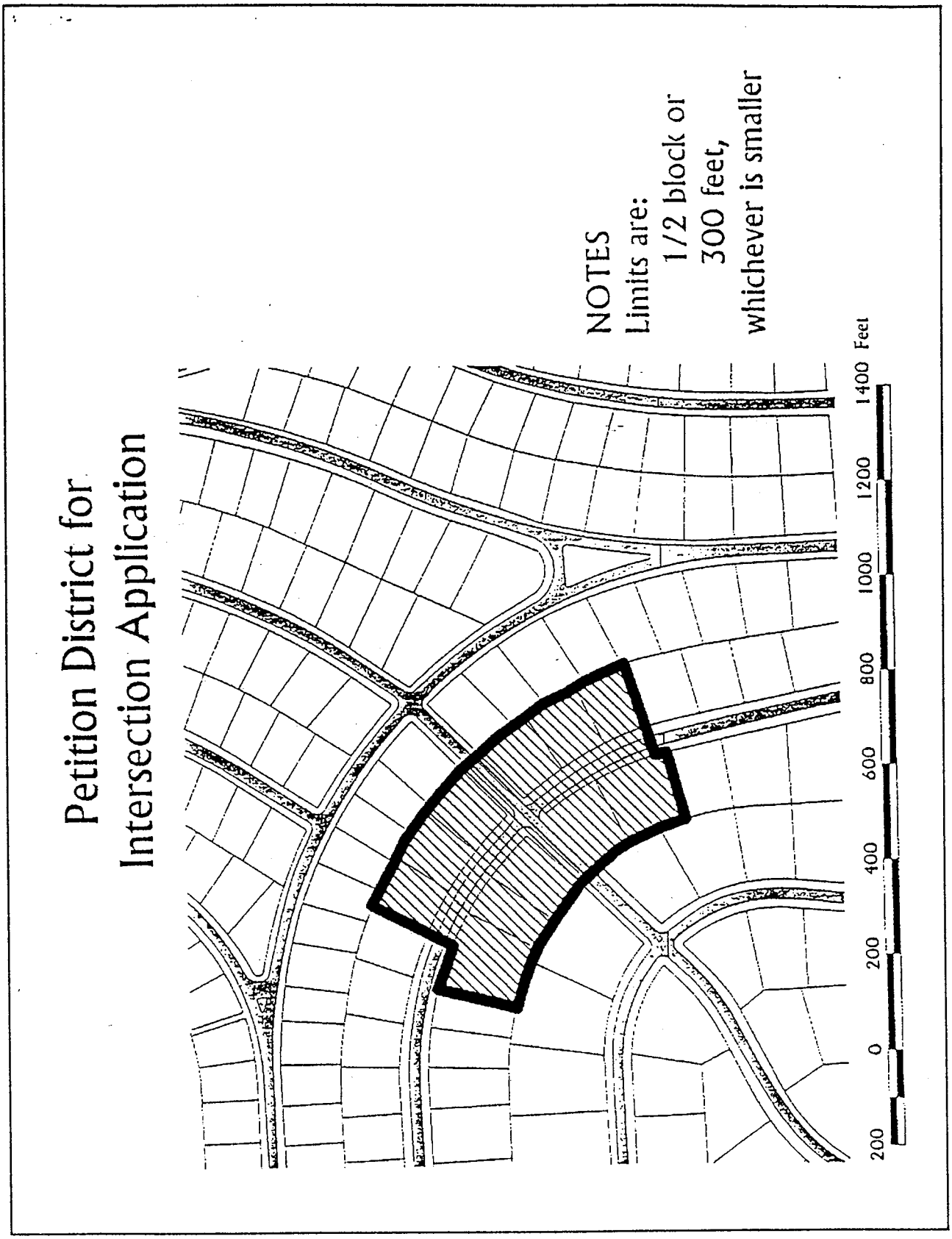
4. Once the property owner submits a qualifying petition, the City staff will schedule the speed and volume study.
5. The proposed street segment must meet the minimum criteria, as explained above, to be considered for the traffic calming program.
6. If minimum program criteria are met, the project's rank will be calculated using the scoring system explained above. The City of Omaha will maintain an annual project listing for each construction season. When moneys are available for a project (based upon its ranking), City staff will proceed with the development of an appropriate traffic calming treatment. City staff will draw up any required plans. Funding mechanisms that do not include City budget moneys will be considered for qualified projects that do not rank high enough on the priority list to be funded through the City budget during a given construction season. If such "outside" funding is not available, a project that continues to meet the minimum qualifications may be resubmitted for City funding the following year and will be given bonus points in the ranking system for continued interest and support.
7. If the construction of speed humps is the proposed traffic calming treatment, City staff will proceed with the location and installation. (Proceed to step 12, as steps 8 through 11 are not applicable for the installation of speed humps.)
8. A neighborhood meeting will be held to discuss the proposed method of treatment and the construction schedule if speed humps are not proposed.
9. If property owners within the study area support the proposed treatment by a simple majority, then the project is sent through City Council for approval.
10. If needed or appropriate, the traffic calming treatment is tested with a temporary treatment.
11. If both property owners and the City approve the temporary treatment for effectiveness, permanent construction commences.
12. City staff reviews treatment for overall effectiveness. Adjustments are made accordingly.

Traffic Calming Project Process Flow Chart

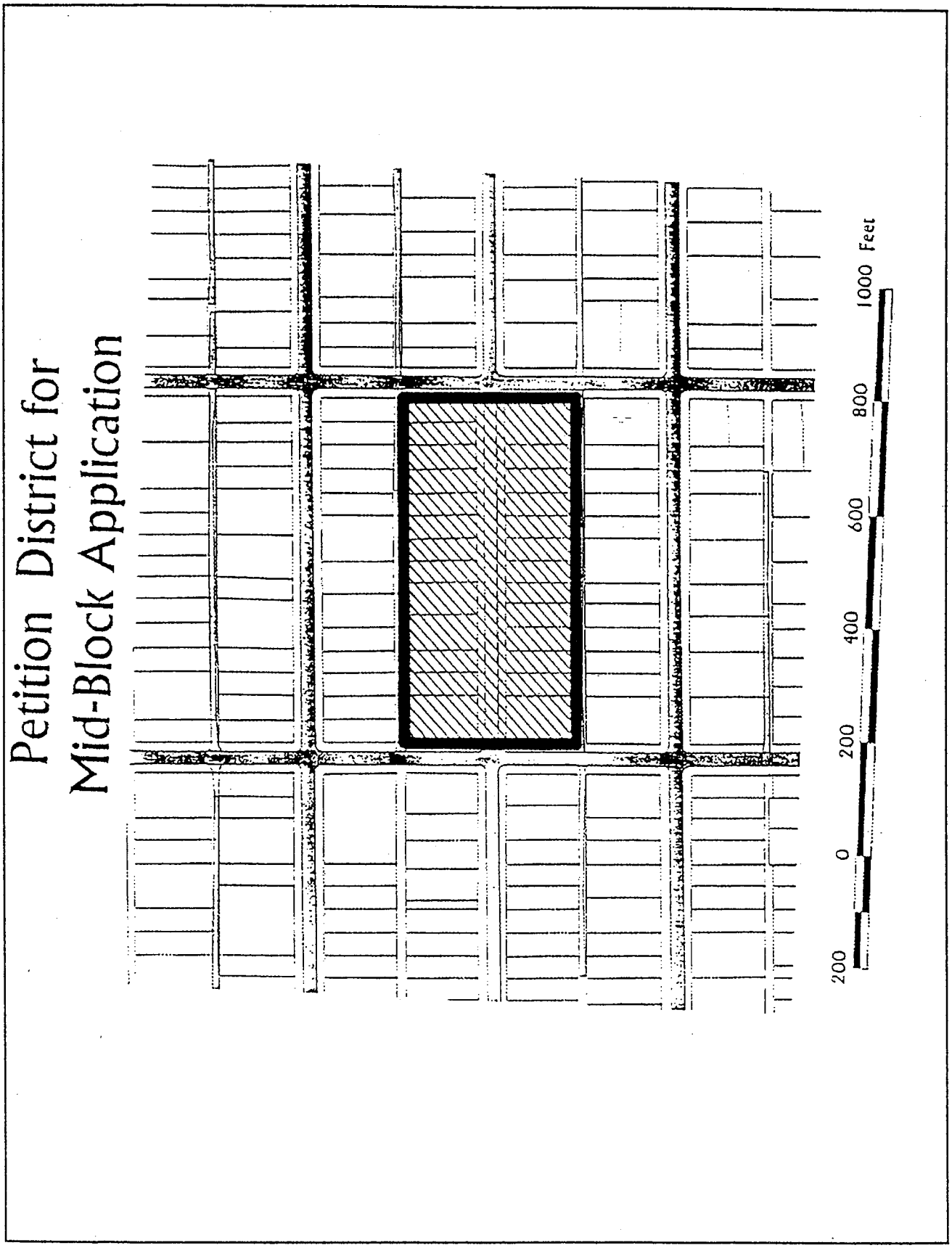



Speed humps are installed. Proceed to follow-up evaluation.
Yes
Speed Hump the selected treatment?
No
Neighborhood meeting is held to discuss plan. Does a simple majority of property owners in study area support plan?
No
Complaint is closed.
Yes
Other treatments are evaluated.
Not OK
Project is sent to City Council.
OK
If necessary, temporary treatment is installed and evaluated.
OK
Permanent treatment is installed.
Follow-up evaluation conducted.

APPENDIX A


Petition District for
Intersection Application
NOTES
Limits are:
1/2 block or
300 feet,
whichever is smaller
200
0
200
400
600
800
1000
1200
1400
Feet

APPENDIX A


Petition District for
Mid-Block Application
200
0
200
400
600
800
1000 Feet

TRAFFIC CALMING PETITION

We, the undersigned, being the property owners on _____ do concur to be included in a Traffic Calming Project. We also agree to any parking removal, pavement marking and signage installation that may be required by the Traffic Calming Project.

Traffic Calming Projects will be ranked by an established scoring system. Projects will be completed in the order of ranking based on available funding.

PRINTED NAME	SIGNATURE	ADDRESS	TELEPHONE	DATE

Petitioner Name: _____

Address: _____

Omaha, NE _____

Return To: Chris Faulk
Traffic Engineering Division
1819 Farnam Street, Suite 603
Omaha, NE 68183

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