NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

City of Mountain View
Public Works Department

Adopted December 11, 1996
Revised June 30, 1998, September 24, 2002

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

ACKNOWLEDGEMENTS

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OVERVIEW

In 1996, the City Council adopted the Neighborhood Traffic Management Program (NTMP) to establish a consistent set of guidelines to provide residents and property owners with a means to obtain relief from traffic-related concerns, namely speeding vehicles and cut-through traffic on their residential street. This is accomplished through a multi-step process involving an initial petition, a traffic survey, neighborhood meetings, a postcard survey and the possible installation of traffic-calming measures.

When the NTMP was approved, the concept of traffic management was, for the most part, theoretical. Today, most cities in California have adopted similar programs and staff has been able to refine the NTMP process. In September 2002, the City Council approved this revision, which reduces the number of steps necessary to complete the process, modifies the installation criteria and updates the types of traffic-calming devices available to mitigate speeding or cut-through traffic.

GUIDING PRINCIPLES

- The primary purpose of the NTMP is to address neighborhood concerns and to reduce the speed and volume of traffic on local residential and residential collector streets. The NTMP does not apply to roadways designated as arterial roads.

- Some diversion of traffic from a traffic-managed street to an adjacent street will be unavoidable. An increase of up to 25 percent of existing vehicles or 500 vehicles per day, whichever is less, would trigger an automatic analysis of that street. The analysis could be performed at a lower level of impact, if deemed appropriate by the Council Transportation Committee or City Council. This standard comes from the City's Environmental Guidelines. Some diversion of traffic from a local street to a collector street is appropriate based on the functional definitions of the two types of streets.

- Traffic not generated by and related to a specific residential neighborhood (nonneighborhood or through traffic) should be encouraged to use arterial streets designed for such purposes. The General Plan designates street types and will be used as a guide. However, the General Plan also designates some streets as residential arterials. The Policy Guidelines do not apply to residential arterials as they are wider than local residential streets and are intended to carry higher traffic volumes than local streets. Changes to residential arterials shall be taken to the Council Transportation Committee for recommendations.

- A low level of nonneighborhood traffic on local streets usually exists and is virtually unavoidable. Ambient through traffic is estimated at between 10 percent and 20 percent of total daily traffic volume.

- Emergency vehicle access will be maintained in all traffic management plans. Emergency vehicle travel times will also be considered when evaluating traffic management measures.

- Reasonable automobile, pedestrian and bicycle access should be maintained to streets with traffic management plans.

- Removal of some on-street parking spaces may be necessary to install some traffic management measures. Parking loss at specific locations will be balanced with the neighborhood's desire for the traffic management device.

- Only approved traffic-calming devices included in this manual will be considered for installation under the NTMP. Public Works staff will examine the feasibility of the installation of a particular device before a recommendation is made.

- Traffic management devices will be planned, designed and used in keeping with sound engineering and planning practices. The installation of traffic control devices such as signs, markings and speed humps will be in compliance with the State of California Vehicle Code.

- Requests for traffic management devices shall be taken on a first-come, first-served basis and implemented up to the limit of funds available.

- The initial installation of traffic-calming devices will be for a one-year evaluation period. Depending on the success and neighborhood acceptance of the devices, they will either be permanently installed or removed.

- Only approved signs from the State of California Traffic Manual and the Manual on Uniform Traffic Control Devices shall be installed.

- Traffic management measures require approval by affected residents and property owners prior to implementation.

FUNDING

The City allocates General Fund dollars each year for the NTMP program. Projects are funded on a first-come, first-served basis, and if the budget is exhausted, remaining projects will be carried over to the next year. Larger projects, which might deplete the budget, may be considered as a mid-year capital improvement project. Permanent installation of some devices could require CIP programming. Those projects would compete with other City projects for funding and may be scheduled in future fiscal years.

THE NEIGHBORHOOD TRAFFIC MANAGEMENT PROCESS

To be successful, the Neighborhood Traffic Management Program includes a structured, seven step planning process. In most cases, the total process from initial inquiry to installation takes four to six months. A diligent effort has been made to streamline this procedure as much as possible. Each step in this process is outlined below.

Step 1: Initial Inquiry and/or Petition by Residents

The first step in the NTMP process begins with an inquiry, to the City Traffic Engineer, from one or more residents or property owners. If, during the initial inquiry, the property owner/resident requests signing and striping, the Public Works Director can approve the installation of the sign. No further action would be necessary.

If a speed or warning sign is not sufficient, staff will direct the resident or property owner to obtain signatures, on a petition, from a minimum of 10 percent of the residents or property owners on the street in question. This petition should also have a statement explaining the traffic concern. Through this petition, there is an assurance the individual's concerns also reflect the concerns of the neighborhood.

Step 2: Traffic Study, Identification of Appropriate Measures and Establishment of Notification/Voting Area

After a petition has been received, staff will conduct a traffic or speed survey to determine if the speed of traffic or the amount of cut-through traffic on the street exceeds the NTMP criteria. The criteria established for local residential and collector streets are detailed in Table 1 and Table 2 below. If the survey verifies the traffic concern, staff will move to the next step in the process.

During this phase of the NTMP, staff will also establish a notification/voting area. This area will only include those residences that are directly affected by the traffic issue and the possible traffic-calming measures to mitigate the concerns. Only residences on the segment of street in question, or on cul-de-sacs or courts directly connected to the street, will be included in the notification/voting area. Individuals on separate or distant areas of the same street or on streets with alternate ingress and egress will not be included in the notification area. These areas are not included as they will not be directly affected by traffic-calming measures.

Table 1: Local Residential Streets (25 mph Speed Limit)

Speed Criteria	Cut-Through Volume Criteria
15% (85th percentile speed) of the vehicles on the street exceed 32 mph or 30 mph in a school zone.	25% or more of the traffic on the street is cut-through traffic.

Table 2: Collector Streets

Speed Criteria		Cut-Through Volume Criteria
25 mph Limit	• 32 mph 85th percentile speed, or • Over 150 vehicles per day traveling above 32 mph.	25% or more of the traffic on the street is cut-through traffic.
30 mph Limit	• 37 mph 85th percentile speed, or • Over 150 vehicles per day traveling above 37 mph.	
35 mph Limit	• 42 mph 85th percentile speed, or • Over 150 vehicles per day traveling above 42 mph.	

Step 3: Neighborhood Meeting with Affected Residents/Property Owners to Identify Preferred Traffic-Calming Measures

Staff will arrange a neighborhood meeting with the residents and property owners within the notification area and send out an informational letter about the meeting. Whenever possible, staff will arrange to hold the meeting at a public venue near the affected area.

At this meeting, City staff will present the traffic-calming measures described in the Appendix. Staff will also address concerns and answer questions about these devices and the NTMP process in general.

Staff will then explain the initial installation of traffic-calming devices, if approved, will be on a demonstration basis for one year. Depending on the results of subsequent traffic studies and neighborhood satisfaction, staff will either recommend permanent installation or removal.

At the conclusion of the meeting, staff will poll the individuals in attendance to see if there is agreement on the type of traffic-calming device they would like to see on their street. If a consensus can be reached, staff will move to Step 4 of the process, a postcard

survey. If there is not clear direction from the residents, staff will arrange a second and final neighborhood meeting. If, at the conclusion of the second meeting, a consensus cannot be reached, the process may be concluded depending on the desires of the residents and property owners.

Step 4: Postcard Survey

At the successful conclusion of Step 3, City staff will send out a postcard survey to all the residents and property owners within the notification area, asking them for a yes-or-no vote on whether or not they would like to see the selected traffic-calming device(s) installed on their street for a one-year demonstration period. For a device to be installed, a supermajority (67 percent) approval is needed.

If a supermajority is not received, the NTMP process does not proceed. Residents and property owners receive a notification of vote results and are informed they may reapply for the process in one year.

Step 5: Approval by Staff and/or the City Council Transportation Committee/City Council

Depending on the type of device(s) selected from the traffic-calming device inventory in the Appendix, the Public Works staff will approve the installation of the device or will bring a recommendation to the City Council Transportation Committee and, in some instances, to the City Council. To determine what type of approval is necessary for a particular device, refer to Table 3 below.

Table 3: Traffic-Calming Device Approval

Device	Approval Process
• Speed/warning signs and striping	Public Works Director approval
• Turn restriction signs • Curbside trees	Public Works Director and resident/property owner approval (67% majority)
• Speed humps • Narrow median islands	Public Works Director recommendation, resident/property owner approval (67% majority) and approval by the CTC
• Traffic circles • Chokers/bow-outs • Street closures/cul-de-sacs • Raised intersections • One-way entrance/exits to two-way streets • Forced turn channelization • One-way chicanes • Woonerf	Public Works Director recommendation, resident/property owner approval (67% majority) and approval by the CTC and City Council

Step 6: Installation of Traffic-Calming Device(s)

After the project has been approved, staff will arrange to install demonstration traffic-calming devices. To reduce cost, some demonstration devices (e.g., speed humps or narrow median islands) will become permanent installations upon final approval.

Step 7: Evaluation, Permanent Installation or Removal After One Year

After the one-year evaluation period, staff will conduct another speed or traffic survey to determine if traffic speed or the volume of cut-through vehicles has been reduced. This step does not apply to speed/warning signs, striping or curbside trees. At this point, three possible actions can be taken. Table 4 below details the removal requirements for each device.

- If the traffic concern has been successfully resolved and the residents and property owners are satisfied with the results, staff will make the installation permanent or recommend a permanent installation to the Council Transportation Committee or City Council.

- If the residents and property owners are unhappy with the installation, even though the traffic study shows the devices have been successful, they may request removal of the device. For a device to be removed by the residents and property

owners, a petition needs to be submitted with signatures from at least 10 percent of the people in the affected area. After the petition is received, staff will send out a postcard survey to determine support for removal. If 67 percent or more of the individuals who respond request removal, the device will be removed and the NTMP process will automatically restart.

- If traffic study shows the speed of traffic or the volume of cut-through traffic has not been reduced, staff may remove the device or ask the Council Transportation Committee and/or the City Council for approval to remove. Staff will automatically arrange for another neighborhood meeting to determine if the residents want to consider a different device.

Table 4: Traffic-Calming Device Removal

Device	Removal Process
• Speed/warning signs and striping • Curbside trees	Devices typically not removed. Trees only removed if deemed a safety hazard.
• Turn restriction signs	Public Works Director approval or resident/ property owner approval (67% majority)
• Speed humps • Narrow median islands	Public Works Director recommendation and approval by the CTC or resident/property owner approval (67% majority)
• Traffic circles • Chokers/bow-outs • Street closures/cul-de-sacs • Raised intersections • One-way entrance/exits to two-way streets • Forced turn channelization • One-way chicanes • Woonerf	Public Works Director recommendation and approval by the CTC and City Council or resident/ property owner approval (67% majority)

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APPENDIX

TRAFFIC MANAGEMENT DEVICE INVENTORY

SPEED AND WARNING SIGNS

Speed limit signs, including street legends, are intended to inform the motorist of the speed limit and gain compliance with the speed limit. Warning signs and striping provide information to the motorist, such as the presence of a crosswalk ahead. However, the effectiveness is short-lived on the driver who routinely travels the same route. The proliferation of signs and striping could cause visual blight or visual pollution in some neighborhoods. All signs will be installed following applicable State and municipal codes. After a sign has been installed, it is typically not removed.

Estimated Cost:

Approximately $200 per item.

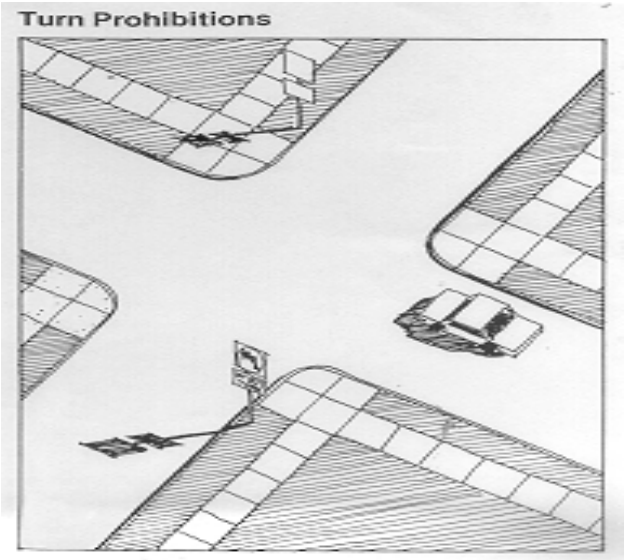
TURN RESTRICTION SIGNS

The purpose of turn restriction signs is to prohibit certain turning movements to block cut-through traffic on residential streets. However, these signs are often as effective as speed and warning signs. Traffic volume reduction is potentially significant, but a high violation rate reduces their effectiveness. Speed and noise may or may not be reduced with these prohibitions. Diversion to collector streets is encouraged.

Cost:

Approximately $200 per sign.

Sylvan Avenue, Mountain View



CURBSIDE TREES

The purpose of planting trees in the parking strip area between the sidewalk and street is to give the impression of a narrower street and thus slow traffic. The trees act as a buffer zone between motorists and pedestrians and also provide a visual barrier between the two. Trees have no impact on the volume of traffic but can have a minor impact on speed once mature. To be effective, trees must be planted consistently along street frontages at a rate of one every 30' to 50'. Trees can also improve the aesthetics of roadways as well as providing value in traffic calming. The Dana Street narrowing project has demonstrated the value large trees can add to a street. After a tree has been planted, it is typically not removed unless deemed a safety hazard.

Cost:

$200 per tree.

Velarde Street, Mountain View

SPEED HUMPS

Speed humps have proven to be the most effective device to slow traffic. The current standard for speed hump design is 3" high and 14' wide. Typically, speed humps extend across the entire street. Speed humps should only be installed on streets longer than 750' and placed no more that 200' to 300' apart. On unimproved streets or streets with rolled curbs, bollards may be installed at each end of the speed hump to deter motorists from traveling around the speed hump.

Minor increases in emergency vehicle response times will be experienced, with the average delay being three to five seconds. Less experienced cyclists may also be uncomfortable traveling around the speed humps. City experience has shown speed humps divert little or no traffic onto adjacent streets.

Cost:

Cost estimates range from $1,500 to $4,000 for each speed hump, including signing and striping.

Dana Street, Mountain View

NARROW MEDIAN ISLAND

Narrow median islands are small raised islands placed in the center of a street at an intersection. They are typically 2' to 3' wide, 10' to 20' long and about 6" high. Typically, the islands are not landscaped but will have decorative hardscape in the center. Narrow median islands are designed to prevent turning vehicles from crossing into opposing travel lanes when making turns onto or from the street. The narrow median island also has a narrowing effect, which will slow traffic. It also provides refuge for pedestrians crossing wider streets. However, depending on the width of the street, on-street parking may be eliminated in the vicinity of the island.

Cost:

On average, narrow median islands cost approximately $1,500 to $3000. However, the cost will vary with the width and length of the narrow median island.

Todd Street, Mountain View

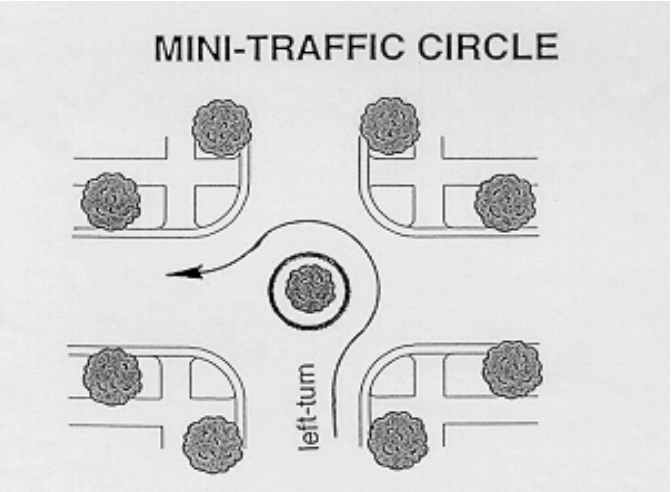
TRAFFIC CIRCLES/ROUNDABOUTS/ISLANDS

Traffic circles are circular islands placed at the center of intersections. The purpose of traffic circles is to reduce speeds along a length of street, if used in a series, and to reduce accidents at problem intersections. Traffic circles in series have reduced traffic by up to 20 percent; however, a single traffic circle may have little effect on traffic volume.

Increased maintenance is required for landscaping, but there is no impact on drainage or street sweeping. Emergency vehicle response times may also increase.

Cost:

The cost ranges from $2,000 for a small, temporary circle to $30,000 for a permanent small landscaped circle.



Farley Street, Mountain View

NECKED INTERSECTIONS OR CHOKERS AND BULB-OUTS

The purpose of the necked intersections, also referred to as chokers or bulb-outs, is to narrow the lanes of travel so they "feel" very tight to the motorist, thus slowing vehicle speed and often reducing cut-through traffic. The narrowing of the street is usually accomplished by extending the curb line into the street.

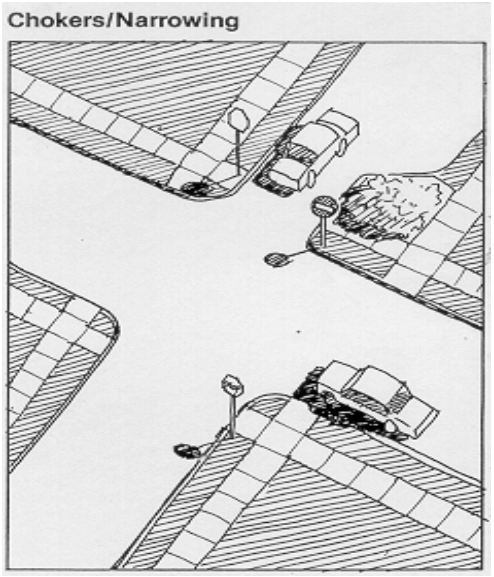
Chokers used at intersections will slow turning vehicles as well as decreasing the crossing length for pedestrians. However, chokers bring vehicles close to the curb, which could increase pedestrian hazards. Narrowing of the lanes also forces motor vehicles and bicycles closer together, which may make cycling uncomfortable for less experienced riders. Parking may also be impacted as some or all on-street parking may be eliminated, depending upon the extent of the chokers/bulb-outs installed.

In most instances, the final installation of a chokers or bulb-outs will be landscaped, while the temporary installation will not. Painting only of chokers and bulb-outs has not proved effective. If installed, increased maintenance will be required for street sweeping, gutter clearing and landscaping.

Cost:

The cost ranges from $2,000 for a simple raised berm to $40,000 for low-maintenance/high-aesthetic landscaped islands, per set (one on each side of the street).

Sylvan Avenue, Mountain View



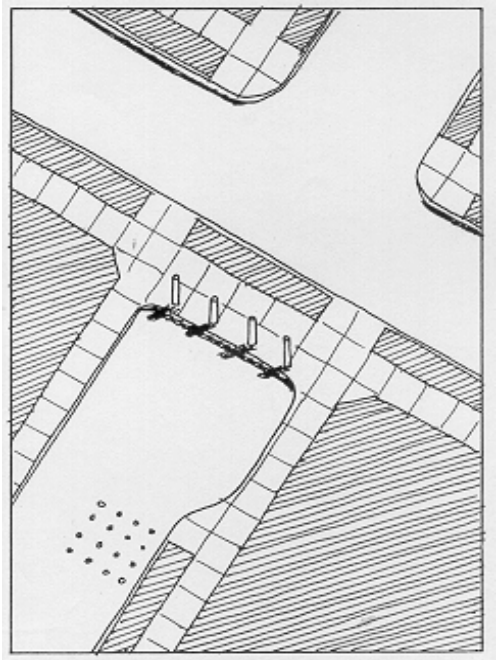
STREET CLOSURES/CUL-DE-SACS (Permanent or During Specified Hours)

This device can be the most effective at reducing the volume of traffic. A street closure involves the complete closure of a street at an intersection or mid-block and may be permanent or during designated hours. If the closure is permanent, it will result in the creation of a cul-de-sac. Access for emergency vehicles can be maintained, but response times may be impacted. In most cases, bicycle and pedestrian access will be maintained and some on-street parking may be lost at the closure. The street closure will reduce traffic speed, noise and traffic accidents in the immediate vicinity. Signage is required and aesthetics will depend upon the type of closure installed.

Cost:

Approximate cost ranges from $1,000 for simple removable bollards to $40,000 for a landscaped island. Temporary installation of freeway or construction type barriers is considerably less expensive and is recommended for a trial demonstration.

16th and San Salvador Streets, San Jose



Cul-de-Sac/Street Closures

ONE-WAY ENTRANCES/EXITS TO TWO-WAY STREETS

One-way entrances and/or exits to two-way streets are accomplished through various devices that prevent motorists from turning in a specified direction. These devices are designed to limit traffic volume and have proved to be quite effective. However, one-way entrances and exits do not slow traffic. It may be necessary to install different devices at different locations depending upon the intersection. An example of a variation of this situation can be seen at Houghton Street and Dana Street. Both Houghton Street and Dana Street can only turn right in and right out as shown below.

Cost:

Costs range from $1,000 for a simple raised island to $20,000 for a large landscaped device.

Houghton Street, Mountain View

FORCED-TURN CHANNELIZATION

Forced-turn channelization consists of one or more traffic islands designed to prevent traffic from making certain movements at an intersection. A diagonal diverter usually forces all traffic onto the intersecting street, thus breaking up through routes and making travel through a neighborhood more difficult. This results in a reduction in cut-through traffic and speed may also be reduced, especially near the intersection. Noise is also lessened due to fewer vehicles on the street. Emergency vehicles may not be able to continue through the intersection, which could result in increased response times. Trip diversion of about 10 percent on each of the adjacent neighborhood streets should be expected. Diversion to collector streets is encouraged.

Cost:

Costs range from $1,000 for a simple berm to $40,000 for a low-maintenance landscaped island.

San Jose near San Jose State University

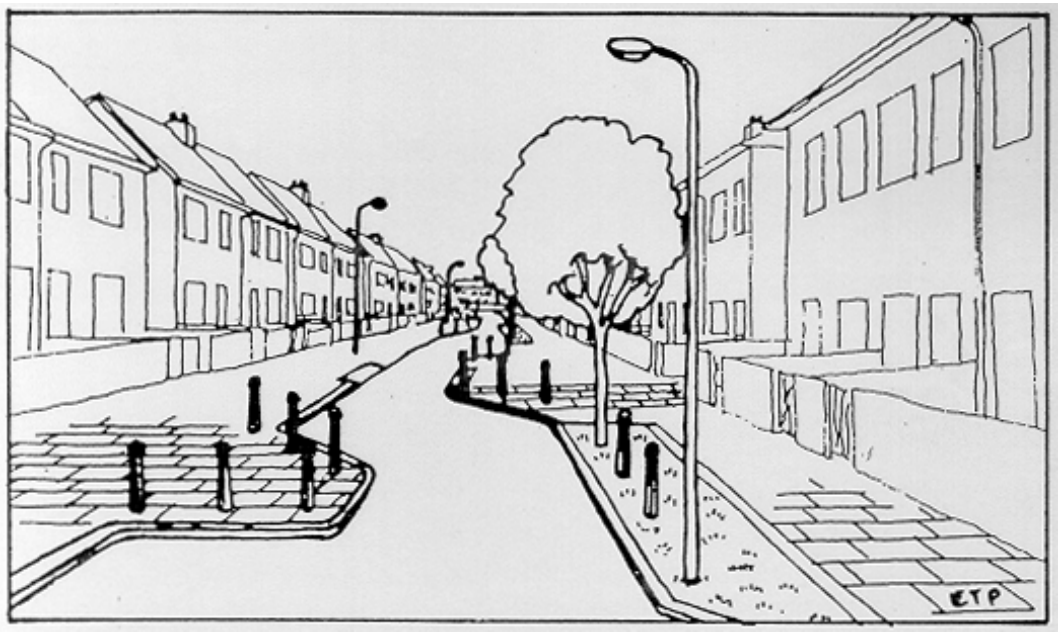
ONE-WAY CHICANES

A one-way chicane is an artificially created series of small tight turns with only enough width for one-way travel through a short section. They are similar in construction to chokers or bulb-outs but protrude more substantially into the street. While chokers merely reduce the width of streets, chicanes eliminate one lane. The purpose of a one-way chicane is to reduce both the speed and volume of traffic. One-way chicanes are quite effective; in Seattle, volumes were reduced up to 35 percent and speeds were reduced up to 25 percent. Some noise may be generated by braking and accelerating in the chicane area. However, overall noise should be reduced due to lower speeds and fewer vehicles. All parking is lost at the location of each chicane. There would be a substantial delay to emergency vehicles if a chicane is very long, but access to the entire street is maintained.

The bulb-outs created by a one-way chicane may be landscaped and warning signs and reflectors required. Maintenance would be increased for landscaping, street sweeping and gutter clearing. Chicanes should only be installed on local residential streets at least 750' long.

Cost:

The cost ranges from $4,000 for a simple bulb-out to $80,000 for low-maintenance/high-aesthetic islands.



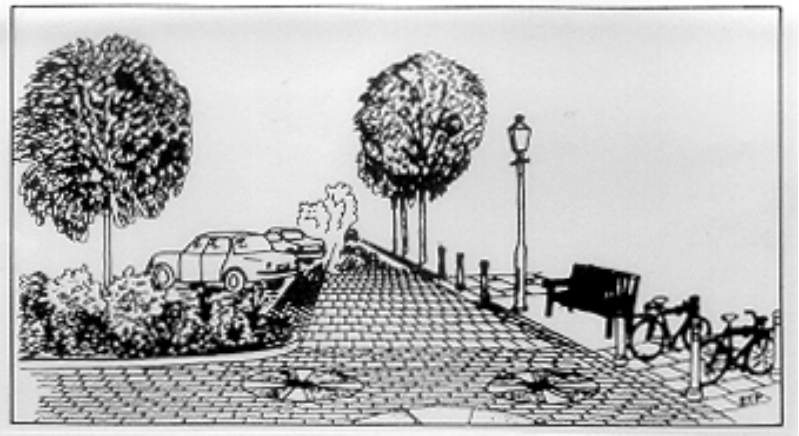
WOONERF

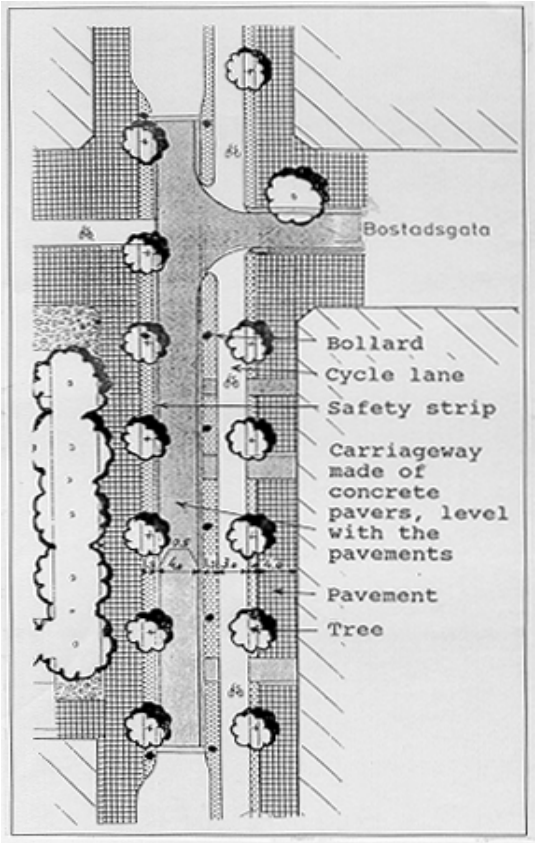
A Woonerf, common in Europe and Japan, is an area in which all vehicular and pedestrian activities are merged, with no grade changes or separations. In the Netherlands, about 2,700 residential streets were converted to Woonerven between 1976 and 1983. Through traffic is permitted, but landscaping and street furniture make it impossible to drive fast. The street clearly indicates entry into a residential precinct. The street may only be wide enough for traffic in one direction at a time, although two-way traffic is allowed. The street is used as play space for children as well as transportation uses.

This concept is generally not seen in the United States and specific cost data are not available. However, the cost of renovating an existing street may be prohibitively high, but it may be cost-effective if installed in a new development as they can be constructed as part of the entire development. They are also a possibility for private streets, whether they are retrofitted or installed during construction.

Cost:

The cost could be upward of $200,000.





RAISED INTERSECTION

A raised intersection includes pavement raised to the level of the sidewalk, usually around 4" to 6". In some locations, the raised area has been given a special pavement treatment to differentiate the area from the normal paving surfaces.

The concept of the raised intersection has been used widely in Europe. In the United States, they have been used more for enhancements for pedestrian safety and aesthetics rather than for neighborhood traffic management.

Due to the long, raised plateau of the intersection, drivers will take care to slow their speed. This device also benefits pedestrians as the street is raised to the same level of the sidewalk. However, because the intersection has been raised, emergency vehicles will need to slow their speed, increasing response times.

Though specific cost data are not available. Installation of such a device would also require modifications to the drainage system at the intersection. Raised intersections are more easily installed in new developments or redevelopments. They are also a possibility for private streets, whether they are retrofitted or installed during construction.

Cost:

The cost could be upward of $50,000.

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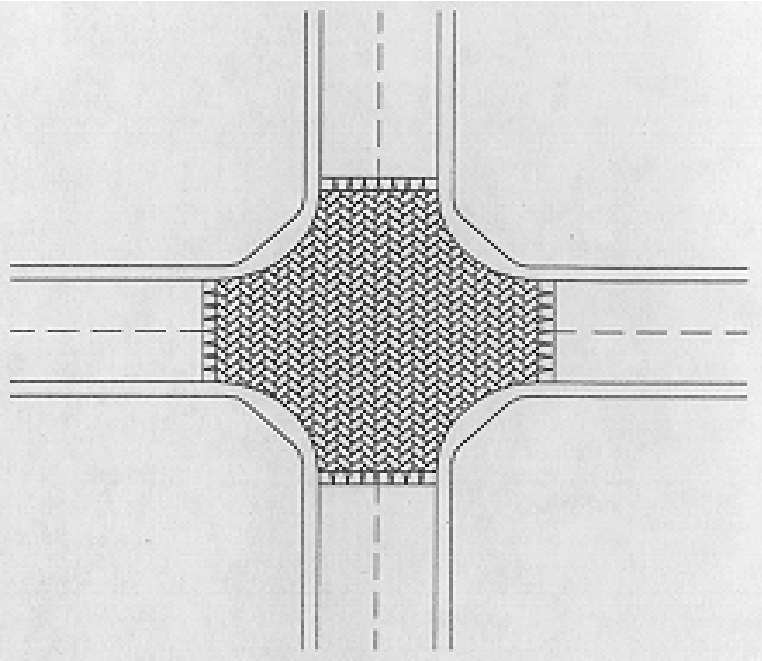

GLOSSARY

Access	The ability to enter and/or exit a property, street or neighborhood; includes both ingress and egress.
ADT	Average daily traffic, or the number of vehicles that travel a roadway in one 24-hour weekday period.
CIP	The City's Capital Improvement Program, used to schedule and budget major capital projects.
General Plan	The City General Plan is the planning document for Mountain View. It contains several chapters that describe and discuss various important aspects of the City and sets goals, policies and actions. The Circulation Chapter applies to traffic and transportation.
Ingress and Egress	The ability to enter (ingress) and exit (egress) a property, street or neighborhood, such as a driveway into a parking lot.
ITE Trip Generation Handbook	The Institute of Transportation Engineers (ITE) professional manual that compiles surveys of the amount of vehicle trips generated by land use type.
Prima Facie Speed Limit	The apparently obvious speed limit on a street with no posted speed limit, such as 25 miles per hour on a local residential street.
Safe Stopping Distance	Also safe sight distance. A distance of sufficient length such that a driver can avoid striking an unexpected obstacle on the roadway.
Sight Distance	The maximum distance at which a driver can clearly see an oncoming vehicle, a stopped vehicle or an obstacle in the roadway; this distance is often reduced by the vertical and horizontal alignment of a roadway.
Speed Survey	A survey of vehicles performed with radar to determine the speed at which they are traveling. The 85th percentile speed is commonly used as the indicator of the appropriate

	roadway speed (see 85th Percentile). Radar may be used to enforce a speed limit set with a radar survey.
85th Percentile	The speed at or below which 85 percent of vehicles surveyed travel. This measurement is one criterion used to set the speed limit on roadways.

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NTMP-2003-Glossary^