City of El Cerrito

Neighborhood Traffic Management Program (NTMP)

FINAL REPORT

September 2010

Adopted by the
El Cerrito City Council on
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1. Introduction

This Neighborhood Traffic Management Program (NTMP) represents the City of El Cerrito's commitment to enhance the safety and livability of El Cerrito and relies on the active participation of community members. This Program provides City staff and community members the resources to work together in addressing neighborhood traffic concerns such as speeding, high traffic volumes, and pedestrian and bicycle obstacles. The NTMP provides citywide guidelines, procedures and a toolbox of potential traffic management measures to create neighborhoods in El Cerrito that are safer for residents living in these neighborhoods and all modes of travel through them.

1.1. Background

An increasing number of El Cerrito residents are concerned about vehicular speeds, traffic volumes, and pedestrian and bicycle comfort and safety in their neighborhoods. The City of El Cerrito has employed enforcement, education, and engineering measures to address these concerns. The mission of the Public Works Department is to design, construct, and maintain public facilities and infrastructure that enhance the quality of life for the citizens of El Cerrito. A major goal of the Department is to plan and construct safe, efficient, and accessible facilities for all modes of travel in the City, including pedestrians, bicycles, persons with disabilities, automobiles and transit. The Public Works Department has regularly responded to neighborhood traffic concerns by installing standard traffic control devices such as warning and regulatory signs, pavement markings, striping and curb markings.

The Public Works Department has traditionally responded to traffic requests in the order they were received. In 2005, this process was formalized with the development of a tracking system to help organize and follow-through on requests. This traffic request process will remain in place and work hand-in-hand with the Neighborhood Traffic Management Program (NTMP) to respond to conditions that do not meet the threshold for the NTMP process.

To more fully address concerns regarding speeding on local streets, the City established the Speed Hump Program in 1996. To date, speed humps have been installed on 10 street blocks in various parts of the City. Most of these were installed within the first five years. More recently, to address pedestrian and bicycle safety as well, the Public Works Department began installing high-visibility signs and pavement markings including fluorescent pedestrian signs, double-sided signs, in-street pedestrian crossing signs, "ladder" crosswalks, advance warning symbol markings, and white edge lines.

Enforcement and education tools are regularly applied by the Police Department. The City established the Traffic Safety Unit of the Police Department in 2003 to focus its efforts on a variety of traffic safety matters including speed enforcement, pedestrian and bicycle safety and driving under the influence (DUI) suppression and education, among others. The mission of the Traffic Safety Unit is to gain voluntary compliance with the traffic laws and to increase safety for the motoring, pedestrians and bicyclists. More specifically, it is a goal of the Traffic Safety Unit to

decrease speed-related collisions. The Traffic Safety Unit also conducts directed enforcement for pedestrian safety-purposes, such as the "Pedestrian in the Crosswalk" campaign that utilizes a police decoy to detect and cite drivers failing to yield to pedestrians in marked crosswalks. Although the Traffic Safety Unit understands that no driver likes to receive a citation, the increased enforcement efforts have led to a positive reduction in injury and non-injury collisions. The Traffic Safety Unit also conducts pedestrian and bicycle safety classes. As an additional education measure, the Traffic Safety Unit regularly deploys the speed feedback radar trailer to make drivers more aware of their speed. Finally, as of 2008, the Police and Public Works Departments meet on a monthly basis to discuss on-going and potential efforts to address the traffic safety concerns of El Cerrito residents.

Because many residential streets did not meet the prior qualifying criteria established by the Speed Hump Program and the Traffic Safety Unit cannot target all streets at all times, the Public Works Department has implemented other engineering measures to manage neighborhood traffic concerns. The measures implemented included intersection median treatments, one-way streets, traffic circles and speed tables. Because the City previously had no formalized process to verify the need for these types of measures, City staff addressed resident requests on a first-come/first-serve basis – with each request becoming a unique process and each involving extensive City resources. The major problem with this method was that requests were not put into the proper context – which ones have priority and which ones represent "normal" traffic conditions on residential streets. Another problem with this method was its inability to systematically evaluate impacts on surrounding local streets when a traffic modification is considered.

1.2. Program Development

Many jurisdictions face problems similar to those described above, and they often develop a program to systematically address traffic issues involving the livability and safety of residential neighborhoods. The City of El Cerrito NTMP was prepared to best meet the needs of El Cerrito based on past efforts in the City, guidance provided by the City's General Plan and City Council, policies and lessons learned from other jurisdictions, practices published by the transportation industry, and community input regarding traffic concerns and ideas for improvements.

The development of a NTMP for El Cerrito serves as the implementation measure for various transportation-related policies in the City of El Cerrito General Plan. General Plan, Transportation and Circulation Element - Goal T3 calls for a transportation system, including safe and adequate streets, sidewalks, street trees, and signs, that not only maintains, but also improves the livability of the City. The following polices under Goal T3 are being addressed by this Program:

- *Policy T3.2 Streets as Public Spaces.* Recognize the role of streets not only as vehicle routes but also as part of an extensive system of public spaces where people live, city residents meet, and businesses reside;
- *Policy T3.3 Residential Streets.* To discourage cut-through traffic on residential streets, maintain the existing system of arterial and collector streets. Where necessary, employ

traffic management techniques to control the speed of vehicles traveling on residential streets, including residential portions of arterial and collector streets; and

- *Policy T3.4 Street Closures.* Keep all neighborhood streets open unless there is an existing or potential safety or cut-through traffic problem and there are no acceptable alternatives, or unless the closure would increase the use of alternative transportation modes.

The City Council, in a study session held in July 2009, provided initial guidance on the framework for the NTMP. Specifically, Council discussed traffic concerns that should be addressed by the Program, potential criteria for qualification and prioritization of requests, and the types of traffic management measures that should be explored. The NTMP was drafted based on the discussion at City Council Study Session, the lessons learned from other jurisdictions (for the most part, in the Bay Area), City staff's insight regarding the types and locations of traffic concerns on residential streets based on the existing traffic request database, and practices published by the Institute of Transportation Engineers (ITE) and Federal Highway Administration (FHWA), among others.

To continue development of a NTMP Program, two community meetings were held in March 2010 (March 25 and 31). The meetings were publicized via the City's website, a press release and the Community Calendar section of the El Cerrito Journal (Contra Costa Times). Meeting notifications were also sent to over 900 residences on a representative sample of street segments for which City staff had received requests concerning speeding and traffic volumes over the past two and half years. The purpose of the community meetings was to obtain public comments on the draft program specifically to determine if it adequately captured the most important neighborhood traffic concerns and potential strategies to address those concerns, as well as, garner other ideas on how to improve traffic conditions and livability in El Cerrito neighborhoods. In April 2010, information on the NTMP was posted on the City's website to solicit additional public comments. The public input received from about 40 residents either in attendance at the meetings or via phone conversations and email was used to craft a NTMP tailored to meet the needs of El Cerrito residents.

1.3. Program Objectives

The basic goal of any Neighborhood Traffic Management Program (NTMP) is to maintain and enhance residents' sense of well-being and improve safety on residential streets. The objectives of the NTMP are as follows:

- Promote safe and convenient travel by pedestrians, bicyclists and vehicles.
- Encourage compliance with designated speed limits.
- Encourage through traffic to take more appropriate travel routes based on roadway classification, but limit impacts to other local streets.
- Maintain capacity and facilitate traffic flow on the City's arterial and collector streets.
- Closely collaborate with Police and Fire to balance neighborhood traffic management needs with public safety needs, specifically emergency response.
- Provide a well-defined process that is responsive to all neighborhoods in El Cerrito and avoids neighborhood divisiveness.
- Provide objective criteria to help City staff prioritize requests.
- Provide a process that maximizes neighborhood participation and decision-making, and obtains measureable consensus from the neighborhood throughout.

- Use the least restrictive measure that will address neighborhood concerns, and test any physical measures before permanent installation when appropriate and possible.
- Maintain and enhance existing routes for accessibility.
- Provide for effective and timely implementation of needed traffic management measures.

It must be noted that all traffic projects or measures implemented as a result of the process contained herein are considered City projects and must be approved by the City Engineer. In addition, the City Engineer will continue to initiate traffic projects separately from the NTMP.

- Use the least restrictive measure that will address neighborhood concerns, and test any physical measures before permanent installation when appropriate and possible.
- Maintain and enhance existing routes for accessibility.
- Provide for effective and timely implementation of needed traffic management measures.

The City Engineer will continue to initiate projects separately from the NTMP.

2. Neighborhood Traffic Management Framework

The framework of the Neighborhood Traffic Management Program (NTMP) is designed to provide well-defined, citywide guidelines for addressing neighborhood traffic concerns in an equitable and effective manner. Guidelines regarding primary concerns to be addressed by the NTMP, balancing user needs, the affect of roadway classifications, qualifying criteria, and types of measure to be considered are discussed below.

2.1. Primary Neighborhood Concerns

High speeds and volumes are usually the two most worrisome traffic safety factors to residents, so the NTMP must deal with these at a minimum. Many El Cerrito residents are concerned about traffic speeds more so than traffic volumes. Almost all of El Cerrito streets have a posted or prima facie speed limit of 25 miles per hour (mph). Many factors influence a driver's selection of travel speed. For example, the width and length of a street affects the driver's sense of what is an appropriate speed for the environment. The number of people visible, amount of landscaping, weather conditions, number of parked cars, and other factors are quickly processed by the driver's mind to select a speed. The driver's temperament, trip purpose and schedule are other considerations. The result is that many drivers do not adhere to the legal speed limit. And, unfortunately many times speed limit signs/pavement markings and periodic enforcement do not guarantee full compliance.

The majority of traffic collisions occur away from local streets in most cities. However, speed plays an important role in traffic collisions on all types of roadways. Speed affects the probability of being in a collision, although collisions are complex events that can rarely be attributed to a single factor. Speed is most directly linked to severity of a collision. More specifically, the probability of severe injury increases sharply with the impact speed of a vehicle in a collision. The risk is even greater when a vehicle strikes a pedestrian, the most vulnerable of road users.

El Cerrito residents are upset by drivers who exceed the speed limit of 25 mph on residential streets because they reason that the faster a vehicle goes on a residential street, the harder it is to stop in time for a child darting into the street to chase a ball or to cross to see a friend. As a result, these residents request that traffic be calmed on their streets. As traffic volumes increase on a residential street, the number of imprudent drivers likewise increases as does the noise from passing traffic. At some threshold volume, the number of residents who dislike traffic on their street is larger than those who ignore it. Studies show that this volume lies between 1,000 and 4,000 vehicles daily depending on the function of the street. This is the "environmental capacity" of a residential street – not the traffic carrying capacity which can be four or five times higher.

High speeds and volumes also contribute to the sense that it is unsafe to walk or bike in a neighborhood. Other key concerns involve obstacles to convenient and safe walking and bicycling. These concerns involve either the lack of protected crossings and pathways or discontinuous facilities. Finally, residents are concerned that the street patterns in or around certain neighborhoods create short-cuts that attract drivers who are trying to avoid delays at traffic signals or stops signs. The traffic using these short-cuts is typically referred to as cut-through traffic. Some El Cerrito residents feel their neighborhoods are experiencing cut-through traffic that has created excessively high traffic volumes on their streets. Related concerns include difficulty getting out of driveways and parked cars getting hit by passing vehicles.

2.2. Balancing User Needs

The Neighborhood Traffic Management Program (NTMP) must carefully balance the needs of all who share El Cerrito streets. Users of the street include pedestrians of various ages and abilities, bicyclists and the motoring public. The NTMP seeks to reconcile the desire for quiet, low-speed streets versus efficient and convenient mobility by designing a street environment that functions well for pedestrians, bicyclists and the motoring public. A key element in balancing user needs is to design pedestrian-friendly neighborhood streets. In a pedestrian-friendly environment, people feel safe walking, the environment is comfortable, and access to destinations is logical and convenient. The intent is that, in pedestrian-friendly areas, children and others who do not drive automobiles will be less reliant on others for their transportation and those who do drive will drive less. Bicyclists also share streets and must also be considered during the process of developing neighborhood traffic management strategies.

The NTMP must also address the needs of those traveling via motor vehicles. Because community members place a high value on maintaining reliable vehicular access to streets that carry them to work, freeways and other regional destinations, the NTMP strives to maintain efficient and convenient routes for vehicles along collector and arterial streets. The NTMP also strives to maintain the traditional use of residential streets for traffic circulation within a neighborhood and between adjacent neighborhoods. However, neighborhood traffic management measures may be used to discourage extraordinary amounts of cut-through traffic utilizing local streets and instead guide this traffic to collector and arterial streets. This is consistent with the roadway classifications identified in the City's General Plan as described below.

Schools, transit nodes, and other activity centers such as churches, parks, senior centers, libraries, and shopping areas provide important services to the community and require special consideration. City staff and residents must collaborate with the operators of these facilities so that streets will continue to provide the functionality needed by these facilities for access, circulation and loading/unloading. Finally, the NTMP must meet the needs of those who provide various other neighborhood services, including the occasional moving van, garbage and recycling services, and, most importantly, emergency service providers.

2.3. Roadway Classification

The Transportation and Circulation Element of the General Plan provides general guidance on the uses and functions for each street within the City. In terms of motor vehicles, the street hierarchy ranges from a principal/major arterial that provides the greatest mobility for through traffic to a local access street that provides the lowest mobility function. As such, the NTMP evaluation process will consider the functional classification of streets.

The NTMP, initially intended to be limited to local and collector streets, will also address minor arterial streets. This is because many of them are residential in nature and generate numerous requests concerning speeding from residents. Only principal/major arterial streets, which are limited to only a few streets in El Cerrito, will be excluded from the NTMP. However, educational and enforcement measures in the NTMP can be applied to these streets as well.

Typically, each street classification is defined as follows:

Local streets are low-speed, low-volume roadways that provide direct and full access to abutting land uses. They typically have two travel lanes with parking on both sides and daily traffic volumes of less than 1,000 vehicles per day (vpd).

Collector streets are relatively low-speed, low-volume roadways that collect and distribute local traffic moving between local and minor arterial streets. They typically have two travel lanes with parking on both sides. Collector streets often carry some amount of through traffic and may carry transit. They are designated as emergency response routes.

Minor arterial streets interconnect with principal/major arterials. Typically, minor arterial streets have greater right-of-way and paved widths, including wider travel lanes, than collector streets. Minor arterial streets carry through traffic providing intra-city mobility. Minor arterials are emergency response routes and typically transit routes as well.

Principal/major arterial streets carry traffic to regional routes and freeways. Principal/major arterials typically have multiple lanes of traffic in each direction. They are also emergency response and transit routes. Principal/major arterials typically carry traffic volumes in excess of 10,000 vpd.

The City's Circulation Plan for Bicyclists and Pedestrians designates bicycle and pedestrian routes that connect with each other and key destinations in the City. Evaluation methods in the NTMP will also consider these pedestrian and bicycles routes. Appendix A of this report provides the roadway classification, pedestrian routes, and bikeways maps for the City of El Cerrito.

2.4. Initial Traffic Request

The first step in initiating a potential NTMP process is for a resident to contact the Public Works Department and describe the concern. The Public Works Department can be contacted in several ways:

- Calling (510) 215-4382;
- Writing 10890 San Pablo Avenue, El Cerrito, CA 94530; Attn: Engineering Manager
- Emailing engineer@ci.el-cerrito.ca.us; or
- Visiting http://www.el-cerrito.org/engineering/pdf/rampimpvmtform.pdf

An initial traffic request form is provided in Appendix B. Staff will identify the specific problem and first evaluate if it can be solved through the regular traffic request process, which generally produces solutions that are less likely to adversely affect neighboring streets. This will be the case for concerns such as those regarding unsafe speeds or limited visibility at an isolated curve or intersection that could possibly be addressed through the installation of straightforward solutions such as centerline striping, red curb markings or warning signs. These types of requests will be evaluated in the order they are received. If the traffic problem persists, or a straightforward solution is not available, the resident will be directed to follow the NTMP process in the next section of this report.

Before or after contacting the Public Works Department regarding speeding concerns, residents are also highly encouraged to contact the El Cerrito Police Department's Traffic Safety Unit to request the deployment of the Speed Feedback "Radar Trailer". The Radar Trailer is an effective visual reminder to drivers to stay within the speed limit. A computer inside the radar trailer tracks the speed and the time all of the vehicles that pass the trailer during the time it is deployed. This

traffic flow and speed data is then reviewed by a police officer. As a follow-up to the request for the trailer, an officer will often conduct traffic enforcement at the same location. The Traffic Safety Unit can be contacted in several ways:

- Calling (510) 215-4436; or
- Visiting http://www.el-cerrito.org/police/traffic.html

Note that the Police and Public Works Departments meet on a monthly basis to discuss on-going and potential efforts to address traffic concerns in El Cerrito neighborhoods.

2.5. Qualifying Criteria

Requests regarding neighborhood traffic concerns such as speeding, high traffic volumes, and pedestrian and bicycle issues can be numerous from residents across the City. The problem is how to place these requests in context – which ones have priority and which ones represent "normal" traffic conditions on residential streets. The criteria for when a street qualifies for the evaluation of neighborhood traffic management measures are based on thresholds for which research shows a majority of residents would likely agree that there is a problem as discussed in Section 2.1. For conditions that do not exceed one of the thresholds, the NTMP process will not be implemented. However, the resident may resubmit the request at a later date.

Requests for neighborhood traffic management must be for a street not classified as a principal/major arterial and satisfy at least one of the thresholds listed below.

1. The 85th-percentile speed* must be in excess of the posted speed limit by more than 2 to 4 miles per hour (mph) as follows:
    a. Local Streets or Pedestrian Routes - 27 mph
    b. Other Collector or Minor Arterial Streets - 29 mph

    *Note: When the speeds of all motorists at one location are ranked from slowest to fastest, the 85th-percentile speed separates the slower 85 percent from the fastest 15 percent, who typically pose the greatest safety hazard.
2. Average daily vehicular traffic volume must exceed the amount of traffic that would typically be generated by land uses with direct access on that block and the following:
    a. Local Streets - 1,000 vehicles per day (vpd)
    b. Collector Streets - 2,500 vpd
    c. Minor Arterial Streets – 4,000 vpd
3. Collision data during the last available 36 months demonstrates that the numbers of collisions are above the City-wide average for a similar type of street/intersection.

2.6. Project Prioritization:

NTMP request meeting the qualifying criteria will be prioritized based on the following:

- Travel Speeds - The greater the 85th percentile speed exceeds the designated speed limit by more than 2 mph, the higher the priority ranking up to 15 points.
- Traffic Volumes - The greater the vehicular traffic volume, the higher the priority ranking, up to 10 points.
- Collision History – Locations with a larger number of preventable collisions will receive a higher priority ranking up to 15 points.
- Pedestrian/Bicycle Facilities – Locations that lack pedestrian paths or sidewalks, or a bicycle or pedestrian route designated in the El Cerrito Circulation Plan, will receive a higher priority ranking up to 12 points.
- Pedestrian/Bicycle Activity – Locations near schools, activity centers and transit facilities will receive a higher priority up to 12 points.

A ranking list of these NTMP requests will be established on an annual basis.

2.7. Types of NTMP Measures

City staff will recommend and/or assist the community in identifying the specific concerns that need to be evaluated and potential traffic management measures that may be appropriate to address those concerns. Neighborhood traffic management measures consist of various types of measures used to influence the behavior of drivers. The Institute of Transportation Engineers (ITE) defines traffic calming as *"the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users."* Generally, traffic calming is a set of physical measures, while an NTMP is the program to evaluate and implement various types of measures consisting of not only physical devices, but also education, enforcement, and low-cost engineering measures.

Selection of measures will be based on one of two categories depending on the type and extent of the investigated issues as described below. The least restrictive measure that will address the neighborhood concerns will be implemented first. Tier I measures are non-physical measures that typically do not require City Council approval except for certain regulatory signs. Tier II measures are physical measures that may be more controversial and the City Engineer may request City Council approval on a case-by-case basis or as required by code. Refer to Section 4 for more detailed information on the toolbox of NTMP measures.

Tier I Measures (Non-Physical)

Tier I measures include education and enforcement initiatives combined with relatively low-cost engineering measures. An NTMP request would likely include several of these engineering measures at one or more locations unlike a regular traffic request, which would involve only one of these measures at a single location. The latter types of requests will be handled through the regular traffic request process and evaluated in the order they are received as previously described. The Tier I measures listed below are anticipated to provide effective solutions for most of the neighborhood traffic concerns in El Cerrito.

<u>Educational Measures</u>

- Speed "Radar Trailer"
- Neighborhood Pace Car/Pledge Program
- Neighborhood Speed Watch Program
- Pedestrian and bike safety classes
- Public information (flyers, newsletters, website)

Educational and enforcement measures, which are typically led by the Police Department, can be used independent of other measures. In these instances, the entire NTMP process will not need to be undertaken.

<u>Enforcement Measures</u>

- Speed Enforcement
- Crosswalk Enforcement
- Parking Enforcement

Engineering Measures

- Regulatory signs
  - Speed Limit signs
  - Truck restriction signs
  - Parking prohibition signs*
  - Turn Prohibition signs*
  - Residential Street Multi-way Stop signs*
- Static warning and specialty signs
  - High-visibility signs (fluorescent, double-sided, in-street)
  - Pedestrian and Bicycle signs
- Special striping and markings
  - Reduced lane width (edge lines and centerlines)
  - Marking of intersection narrowing features (cross-hatching)
  - High visibility crosswalks (ladder markings)
  - Advance warning symbol markings
  - Delineators/Botts' Dots

Additional Measures

- Changes in lane configuration
- Changes in traffic signal timing
- Changes to street trees and landscaping
- Street lighting improvements

*Note: These regulatory signs require City Council approval. Also, as part of this program, new warrants for multi-way stop signs on residential streets are proposed. Preliminary warrants are contained in Appendix F. However, an ordinance and separate resolution will need to be adopted by the City Council.

Tier II Measures (Physical)

Tier II measures are mostly physical engineering measures and thus a more restrictive form of traffic management. These measures are generally higher in cost and have more significant impacts than Tier I measures. Commonly-used measures that are anticipated to be appropriate for the needs of El Cerrito neighborhoods are listed below.

<u>All Streets</u>

- Textured pavement
- Speed feedback signs
- Crosswalk Warning Systems
- Speed Cushions
- Medians/Pedestrian Refuge and Gateways
- Speed Tables/Raised crosswalks
- Reduced Corner Radius at Intersections
- Bulb-outs, Chokers and Curb Extensions
- Traffic Circles
- Sidewalk/pathway construction

<u>Local Streets Only</u>

- Speed Humps*
- Chicanes
- Forced-turn Channelization/Diagonal Diverter
- Raised Intersection
- Half-street Closure
- One-way Street
- Full Closure

*Note: The existing Speed Hump Program is being integrated into this NTMP.

Examples of the effectiveness of some of these Tier II measures are shown in Table I below.

Table I: Sample of Traffic Calming Effectiveness

Measures	*Speed*			*Volume*		
	After Measure (mph)	*Change (mph)*	*% Change*	*After Measure (vpd)*	*Change*	*% Change*
12' Humps	27.4	-7.6	-22	1,617	-355	-18
14' Humps	25.6	-7.7	-23	1,876	-529	-22
22' Tables	30.1	-6.6	-18	3,043	-415	-12
Circles	30.3	-3.9	-11	5,567	-293	-5
Narrowing	32.3	-2.6	-4	2,367	-263	-10
Half Closures	26.3	-6	-19	2,225	-1611	-42
Diverters	27.9	-1.4	-4	930	-501	-35

2.8. General Impacts and Requirements

The pros and cons associated with engineering measures, more specifically Tier II measures are listed below.

Pros

- *Safer residential streets (due to lower vehicle speeds and volumes)*
- *Less anxiety*
- *More cycling and walking comfort*
- *Less traffic noise (effect varies with volumes and traffic calming plan)*
- *Opportunity for streetscaping/landscaping*
- *Physical measures are generally self-enforcing*

Cons

- *Inconvenience to motorists*
- *Cost to design, construct & maintain*
- *Diversion to other local streets*
- *Arterial street delays and queues*
- *Emergency response delays*
- *On-street parking loss*

Tier I and II measures must comply with applicable state and federal regulations on traffic control and standard guidelines for roadway design features including the following documents: El Cerrito Municipal Code, California Vehicle Code, California Manual on Uniform Traffic Control Devices (California MUTCD), and the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets. It is important to emphasize that all measures must comply with the Americans with Disabilities Act and that any implemented measures must not create impediments in routes that currently provide accessible travel alternatives. Refer to Section 4 for more information on NTMP measures.

3. NTMP Process

The NTMP process involves well-defined procedures and active neighborhood participation to evaluate neighborhood traffic concerns in an efficient, fair, and timely manner. Neighborhood stakeholders include homeowners, residents, business owners and other property owners. A successful NTMP process will include a submission of NTMP request petition(s), preliminary evaluation, project prioritization, neighborhood meeting(s), engineering analyses, and neighborhood consensus to implement traffic management solutions that are uniquely tailored to each neighborhood.

The NTMP process is described below and shown on the NTMP flow chart in Appendix B. All requests will initially be treated as Tier I and then elevated to Tier II for only the most severe traffic conditions. The process is intended to be completed under one year and, after funding has been approved by City Council, the initial measures implemented as appropriate.

3.1. Procedures for Tier I Measures

Implementation of Tier I measures will follow the steps described below.

1. ***NTMP Petition Request:*** A resident submits an NTMP Petition Request Form to alert the City about a neighborhood problem that involves speeding, large volumes of traffic, and/or obstacles to walking/biking. The NTMP Petition Request Form is contained in Appendix C. The form requires a written description of the location and nature of reported concerns and 60 percent approval from the addresses on the project street, which is the block or blocks on which the neighborhood traffic management is being requested. Once the request is submitted, it will be processed in the order it is received. The resident submitting the request form will become the "neighborhood lead" and serve as the primary contact for City staff.

The neighborhood lead should make a reasonable effort to contact the property owner and the current resident/business at each address. Multiple responses from one address will be counted as one response. Multi-family buildings will be counted as one to initiate the NTMP process, but each individual unit will be contacted for input during the remainder of the process. Also, if the responses from a property owner and resident of an address are in conflict, they will not be counted. If the project street crosses jurisdictional boundaries, the neighborhood lead should also make a reasonable effort to contact both the property owner and the current resident/business at each address in that jurisdiction. However, those addresses may not necessarily be included in the tally. Also, for a project street that includes extra long blocks (i.e., longer than 900 feet), the approval percentage may be reduced to 55 percent.

City staff will review the completed NTMP Petition Request Form to ensure that 60 percent of the addresses would like to pursue NTMP measures. If not, City staff will inform the requestor that the traffic issues will be addressed through the regular traffic request process. If the form has a 60 percent approval, City staff will prepare an initial response to the neighborhood lead with information regarding the next steps in the NTMP process.

2. ***NTMP Criteria Evaluation:*** City staff will review the reported concerns including any available collision, traffic volume and speed data. This is to determine if raised traffic issues meet the NTMP qualifying criteria. If City staff determines that the reported traffic issues do not meet the criteria, staff will inform the contact resident that no further action will be taken at this time. However, the resident may resubmit the request at a later date.

If the criteria are met, City staff will also identify boundaries of the study area in consideration of the nature of reported traffic issues, any potential corrective measures and areas potentially affected, impacts to emergency response or other consequences. At a minimum, the study area will include the project street, which is the block or blocks on which the neighborhood traffic management is being requested, and adjacent streets within one block. Multiple requests for nearby locations may be combined by staff into a single request for a neighborhood project. If the potentially affected area includes streets under other city or county jurisdictions, efforts will be made to coordinate with the other jurisdiction if appropriate to evaluate the plan impacts.

3. ***Project Prioritization:*** City staff will rank NTMP requests meeting the qualifying criteria based on the aforementioned priority criteria using the worksheet contained in Appendix D. A ranking list of qualifying NTMP requests received by September 1st will be established on an annual basis. Those submitted after September 1st will be ranked the following year along with any carry-over requests. City staff will inform the neighborhood lead regarding the timeline for moving ahead based on their priority ranking and availability of City staff.

4. ***Initial Neighborhood Meeting:*** City staff will notify the property owners and current residents/businesses within the study area regarding an initial neighborhood meeting and post a meeting notice on the City's website. Notifications will be sent via U.S. mail and/or door-hangers as determined by City staff.

The initial neighborhood meeting will be held to discuss reported traffic concerns and the Neighborhood Traffic Management Program. It is important that everyone involved hears the different views and experiences of other neighbors, as well as, the results of the preliminary evaluation by City staff. City staff and residents together will explore the various NTMP measures available to address the neighborhood traffic concerns. The need to revise the study area, if appropriate, and funding options will also be discussed. Through this process, a shared definition of the reported issues can be developed, along with desired outcomes and applicable solutions that can be further investigated. In the process, staff can recommend an alternative course of action, such as the Tier II procedures, or continue on with the Tier I procedures.

5. ***Engineering Analysis:*** City staff will conduct an engineering analysis, and determine the most appropriate Tier I measures to address neighborhood concerns and any special parameters identified at the neighborhood meeting. The analysis will be based on roadway classification, multi-modal traffic data, results of traffic control warrant analyses, land uses within the impacted area, emergency service response, public transit routes and compliance with existing regulations. This review is essential to reduce the potential for plans being advanced that are not feasible or warranted, or the implementation of measures that may need to be removed at some future time.

6. ***Second Neighborhood Meeting:*** City staff will notify the property owners and current residents/businesses within the study area regarding a second neighborhood meeting using the same notification procedures for the first meeting and accounting for any changes in the study area. The purpose of the notification and second meeting is to present the City staff findings regarding the measures to be implemented. City staff will confirm that all of the property owners immediately adjacent to the traffic management measure agree with the measure. Community members disagreeing with staff decisions may appeal to the City Manager.

7. ***City Council Approval, if appropriate:*** City staff will present its recommendations for certain regulatory signs, if required by the El Cerrito Municipal Code, to City Council for approval. The Council can deny or recommend revisions to staff recommendations.

8. ***Implementation of Tier I Measures:*** Tier I measures will be implemented by the City Engineer upon identification of a funding source. Work order(s) will be prepared and forwarded to the Public Works Maintenance Division for installation.

9. ***Follow-Up Review, if appropriate:*** City staff will conduct a follow-up review to evaluate the effectiveness of the measures within a six-month period. The evaluation will include, at a minimum, a review of traffic volumes and vehicle speeds. Based on the evaluation, staff will retain, modify or remove the Tier I measures and may also recommend that the neighborhood continue the process on a Tier II basis.

3.2. Procedures for Tier II Measures

Implementation of Tier II measures will follow Steps 1 through 5 above and the procedures described below.

6. ***NTMP Petition Form II:*** Since Tier II measures impact many people in a neighborhood and the measures tend to be costly, it is necessary to determine if there is a high-level of support from the project street for the process before continuing. If it is determined that Tier II measures may be appropriate, City staff inform the neighborhood lead that completion of a NTMP Petition Form II is required. A NTMP Petition Form II is contained in Appendix E. The neighborhood lead will be responsible for completing a NTMP Petition Form II indicating 70 percent approval from the addresses on the project street which is the block or blocks on which the neighborhood traffic management is being requested. The same procedures provided for the first NTMP Petition Form must be followed.

7. ***Draft Neighborhood Traffic Management Plan (Plan):*** City staff will review the NTMP Petition Form II to ensure that 70 percent of the households/businesses would like to pursue NTMP measures. If the petition does not achieve the required approval from the addresses on the project street, the neighborhood may resubmit an NTMP Request Form after a minimum of one-year lapse from the submittal of this petition. If the petition does achieve 70% approval, City staff with the help of qualified consultants, if needed, will proceed with developing a draft Neighborhood Traffic Management Plan based on public input from the first meeting and second petition.

The development of the plan will first require detailed data collection that may include speeds, volumes, collision history, and other information needed to define the problem and later measure the success of the plan. The City may approach neighborhood representatives for volunteers to assist with the data collection. Enough data will be collected and evaluated to provide an accurate picture of the current conditions throughout the neighborhood.

A detailed analysis will help determine which Tier II measures are warranted based on the NTMP Framework in Section 2.0 of this report. This analysis will be based on roadway classification, existing and project traffic conditions, multi-modal travel counts and facilities, land uses within the impacted area, emergency service routes, public transit routes, potential for traffic diversion to other residential streets, and compliance with existing local and state regulations.

Consultation with Police and Fire Departments will take place to determine if the street is a critical emergency vehicle response route, and therefore not eligible for certain features. Consultation may also include transit agencies, the school district, individual schools, and any other service provider affected by the requested traffic management plan. The Planning Division will also be consulted to determine the requirements for environmental clearance at a later stage in the process.

8. ***Second Neighborhood Meeting:*** Once a draft Plan is prepared, City staff will notify the property owners and current residents/businesses within the study area regarding a second neighborhood meeting using the same notification procedures for the first meeting and accounting for any changes in the study area. The purpose of the notification and second meeting is to present City staff recommendations for measures to be implemented, and obtain input on the level of the acceptance from the neighborhood and needed plan changes. Additional neighborhood meetings may be held as necessary.

9. ***Resident Survey for Trial Installation (Initial Ballot):*** City staff will distribute a survey with mail-in ballot to property owners and current residents/businesses throughout the study area. The survey will include a description of the analysis and proposed Plan including detailed description, advantages, disadvantages, previous community input, and estimated cost for plan implementation. Approval for the trial installation will require support based on the Composite Voting System shown in Table II.

Table II: Composite Voting System – Approval Rating*

Project Street	*Neighboring Streets*
70 to 80%	50%
80 to 90%	40%
90 to 100%	30%

Note: Generally modeled after the City of San Leandro Composite Voting System.

The Composite Voting System gives all the study area a vote, but offers greater weight to the project street than to the neighboring streets (which include streets surrounding the project street where traffic may be altered as a result of implementing the traffic measures). For example, if a 90% to 100% approval rate is obtained on the project street, the project would pass if at least a 30% approval rate is obtained on the neighboring streets. However, if a 70% approval rate is obtained on the project street, the project would not pass unless at least a 50% approval rate is obtained from the neighboring streets.

The approval percentage for the project street will be based on all addresses including individual units in multi-family buildings. The response from the neighboring streets will be evaluated using a protest vote method. The protest vote method will count no-votes and compare them to the entire neighboring streets to determine the approval percentage.

10. ***City Council Approval, if appropriate:*** If the plan is approved by the neighborhood, City staff may present it to City Council for approval of a six-month trial installation if appropriate. The Council may approve, deny or make revisions to the plan.

11. ***Temporary Installation:*** Subject to Council approval of the plan and funding source, Tier II measures will be installed using temporary materials for a trial period of six months if appropriate

and possible. If necessary, emergency response access will be tested for various design options in the field using a response apparatus.

Depending on the type of traffic management feature, temporary materials may not be available that sufficiently replicate the permanent measure. Therefore, the trial installation may be constructed of permanent materials with the provision that it they be removed at the end of the trial period.

12. ***Follow-up Studies:*** Follow-up studies will be conducted within six months of the installation of temporary features. These studies should be comparable with the initial data collection and may include speed surveys, volume counts, and, if necessary, a traffic operations analysis. These follow-up studies will be conducted to evaluate the impacts of the Tier II measures and to learn more about how they affect drivers' behavior. This information can be used to determine whether the desired outcomes have been achieved. The follow-up studies will also be used to determine if the traffic problem has shifted to other neighborhood streets.

On local streets, the Portland Impact Threshold Curve will be used to determine acceptability of diverted traffic. Acceptability will be based on the net diverted traffic from the current project plus all preceding projects under the NTMP. If the current project causes the net cumulative diverted traffic on any street to exceed the limit, the installation of temporary features will be modified to reduce the cumulative diversion to within acceptable limits. An exhibit of the Portland Impact Threshold Curve is contained in Appendix F. On arterial and collector streets, the levels of service at stop-controlled and signalized intersections will be measured to ensure acceptable levels of service are being maintained per the General Plan.

13. ***Resident Survey for Permanent Installation (Final Ballot):*** At the conclusion of the trial period, City staff will distribute a survey with mail-in ballot to property owners and current residents/businesses throughout the study area. The purpose of the survey is to determine whether they consider the Tier II traffic management plan measures to be successful and if they wish them to be implemented on a permanent basis. Results of the follow-up studies, including numerical results, will be conveyed to assist them in making this decision. The survey language will explain and graphically show the location and nature of proposed changes. Support based on the Composite Voting System above must be demonstrated through this survey process prior to considering permanent implementation. A second survey may be distributed to those addresses that do not respond to the first survey.

14. ***City Council Final Approval, if appropriate:*** If community consensus is reached in favor of the permanent implementation of Tier II measures and when any necessary environmental clearances have been obtained, City stall will present the results and recommendations to City Council for final review if appropriate. City Council may decide to approve, deny or make revisions to the permanent establishment of Tier II measures. Based on the Council's decision, the temporary traffic management features will be either removed or replaced with permanent features.

15. ***Permanent Implementation:*** If permanent implementation is decided and a funding source is identified, detailed design drawings will be prepared either in-house or by a qualified consultant. The final engineering drawings will be made available to the neighborhood prior to the actual construction. This is important to ensure that there are no surprises once construction starts. Residents also need to be aware in advance of the impacts of construction (noise, dust, potential traffic rerouting, etc.) and the anticipated construction schedule to minimize frustrations during the

actual construction. Permanent construction of the Tier II measures will most likely be completed by a contractor hired by the City.

4. NTMP Measures Toolbox

As traffic management has evolved in the past few decades, it is generally considered to consist of a combination of educational, enforcement and engineering measures that reduce the negative effects of motor vehicle use, alter driver behavior, improve safety for non-motorized street users, and improve neighborhood livability.

4.1. Typical Measures

Appendix G contains typical traffic management measures that may be used in El Cerrito. A description, illustration, application and limitation, advantages and disadvantages, and typical costs are provided for various measures. The measures listed are not meant to be comprehensive and some of the measures need additional development and/or City Council approval, such as the residential street multi-way stop signs. Furthermore, for a variety of reasons, not all measures will be acceptable or desirable in all situations. For example, some physical measures are not acceptable for use on streets designated as emergency response routes. The determination of which measures best suit which application will be worked out between neighborhood residents and City staff, including the Public Works, Police, Fire and Community & Economic Development Departments, following the NTMP guidelines in Section 2. Many of the measures described herein may be used in combination with each other, and there are also many design variations of each measure. Residents are encouraged to see and experience traffic calming measures that are already in place in El Cerrito and nearby communities.

The traffic management measures in this inventory are listed generally in order of increasing effectiveness at reducing speeds and/or the volume of shortcutting traffic. The least restrictive measures are usually "passive," meaning that drivers can choose whether or not to obey them. The most typical examples of passive measures are traffic signs and striping. The next level is the "active" measures that physically constrain the driver to certain paths or areas in the roadway. The most effective active measures are those that force drivers into horizontal or vertical movement, therefore causing drivers to reduce speed--the primary objective of traffic management. Reduced speed translates into increased travel time that, in turn, may decrease traffic volumes because drivers may abandon a slower route. Some examples of these measures are traffic circles and speed humps. The most restrictive of these measures are those that partially or completely block traffic movements, with dramatic effects on traffic volume and the incidence of speeding. Half street closures are examples of this type of measure.

The most restrictive measures will generally not be encouraged except in cases of overriding concerns. Furthermore, their use will likely require an environmental impact analysis or other forms of detailed investigation and approval requirements.

4.2. Internet Resources

Appendix H list website resources that provide information on additional traffic management measures including detailed descriptions and illustrations.

5. Program Implementation

5.1. City Resources and Funding

The ability of the City to evaluate and implement NTMP projects in any given year will be limited by the availability of City staff and funding for such purposes. The NTMP process for Tier I projects are generally less resource intensive than Tier II projects. However, both Tier I and II projects will require data collection of speed and volumes and collision analysis. As such, funding for the evaluation and implementation of NTMP projects will be prioritized by City staff as a part of overall City's annual budgeting and Capital Improvement Program (CIP) process and will be subject to the approval of City Council. If staff determines that a project will be too large for the available budget, the project may be phased. Also, if a neighborhood desires high-aesthetic measures including landscaping and irrigation, the potential funding of these improvements by individuals or groups of property owners will be explored. Finally, staff may also seek outside funding, such as state and federal grants, for the project, including landscaping if desired.

5.2. Program Review

Based on the experience of various jurisdictions throughout the Bay Area, the success of a Neighborhood Traffic Management Program depends on its adaptability. There is no one program or process that works perfectly for all cities and for that matter all neighborhoods. Therefore, as the City changes, new problems and solutions are discovered, and the procedures are tested, City staff will periodically review the NTMP and identify appropriate changes that would improve its responsiveness to El Cerrito residents.

6. Study References

6.1. TJKM Personnel

Christopher Thnay, PE, AICP	Project Manager
Steve Au, PE	Design Chief
Jeffrey Lacap, EIT	Project Engineer
Vishnu Gandluru	Transportation Engineer
Margie Pfaff	Word Processing

6.2. City Staff Consulted

Jerry Bradshaw, PE
Yvetteh Ortiz, PE
Lt. Stephen Bonini

6.3. El Cerrito City Council (July 2009)

Sandia Potter
Janet Abelson
Ann Cheng
William C. Jones III
Greg Lyman

6.4. Other Agencies

See Appendix I for agencies consulted including Mountain View, Santa Clara, Los Altos, San Leandro and San Mateo.

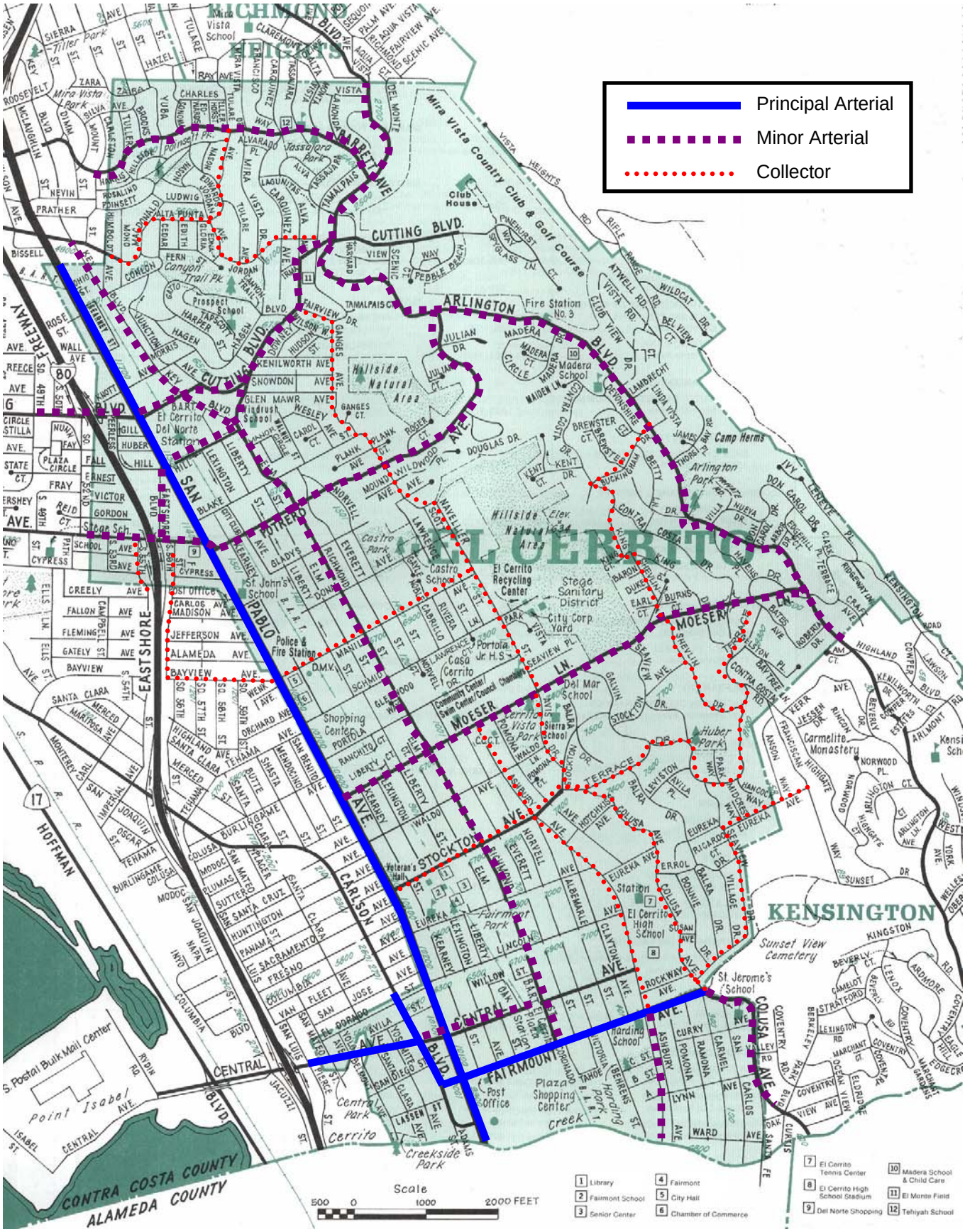
6.5. References

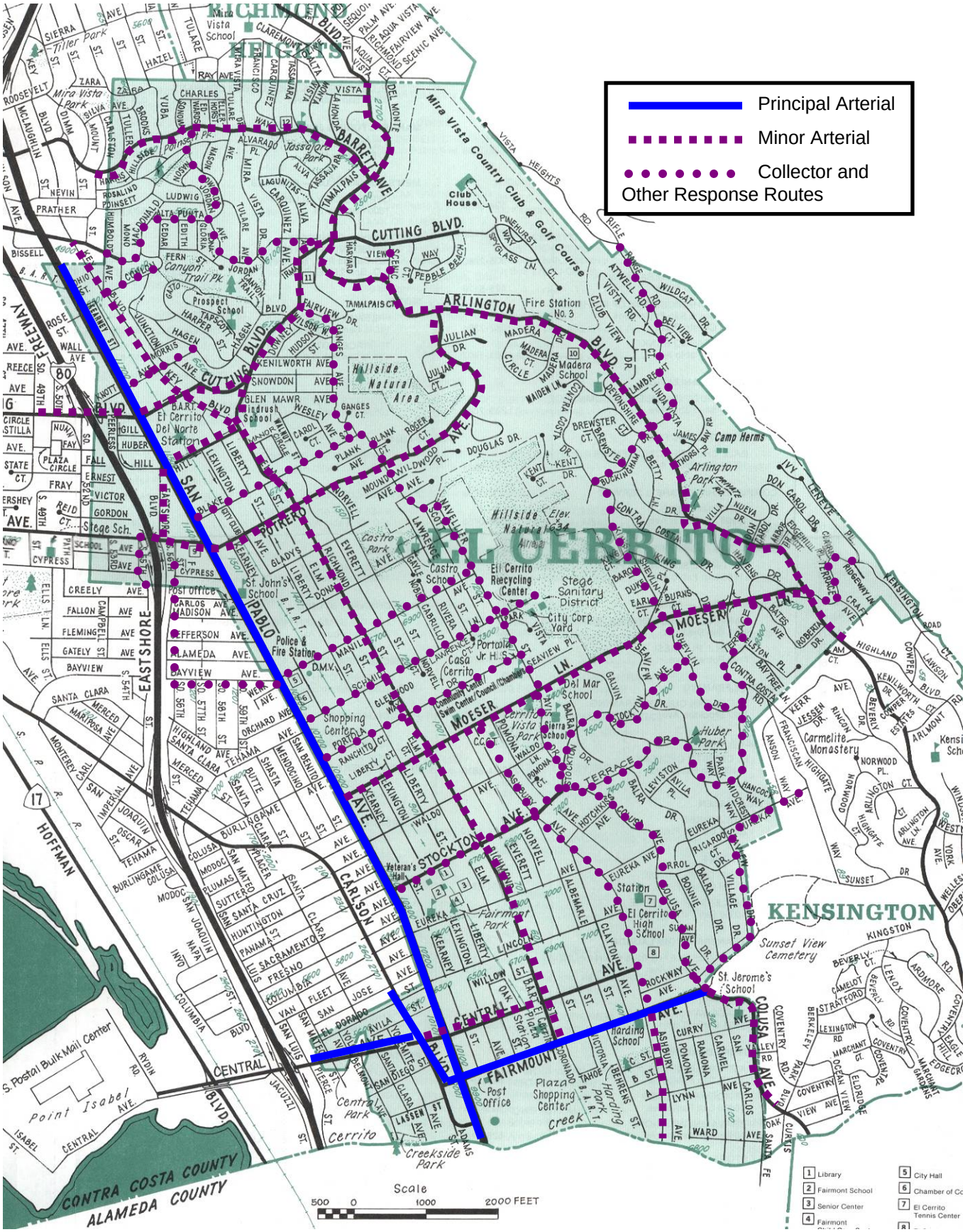
Traffic Calming: State of the Practice, ITE/FHWA, August 1999

State of the Art: Residential Traffic Management, FHWA, 1980

Street Design Guidelines for Healthy Neighborhoods, Local Government Commission, Center for Livable Communities, January 1999.

Appendix A – El Cerrito Roadway Classification, Pedestrian Route and Bikeway Maps


Principal Arterial
Minor Arterial
Collector
RICHMOND HEIGHTS
EL CERRITO
KENSINGTON
CONTRA COSTA COUNTY
ALAMEDA COUNTY
Scale
500 0 1000 2000 FEET
1 Library
2 Fairmont School
3 Senior Center
4 Fairmont
5 City Hall
6 Chamber of Commerce
7 El Cerrito Tennis Center
8 El Cerrito High School Stadium
9 Del Norte Shopping
10 Madera School & Child Care
11 El Monte Field
12 Tehiyah School



Emergency Response Routes

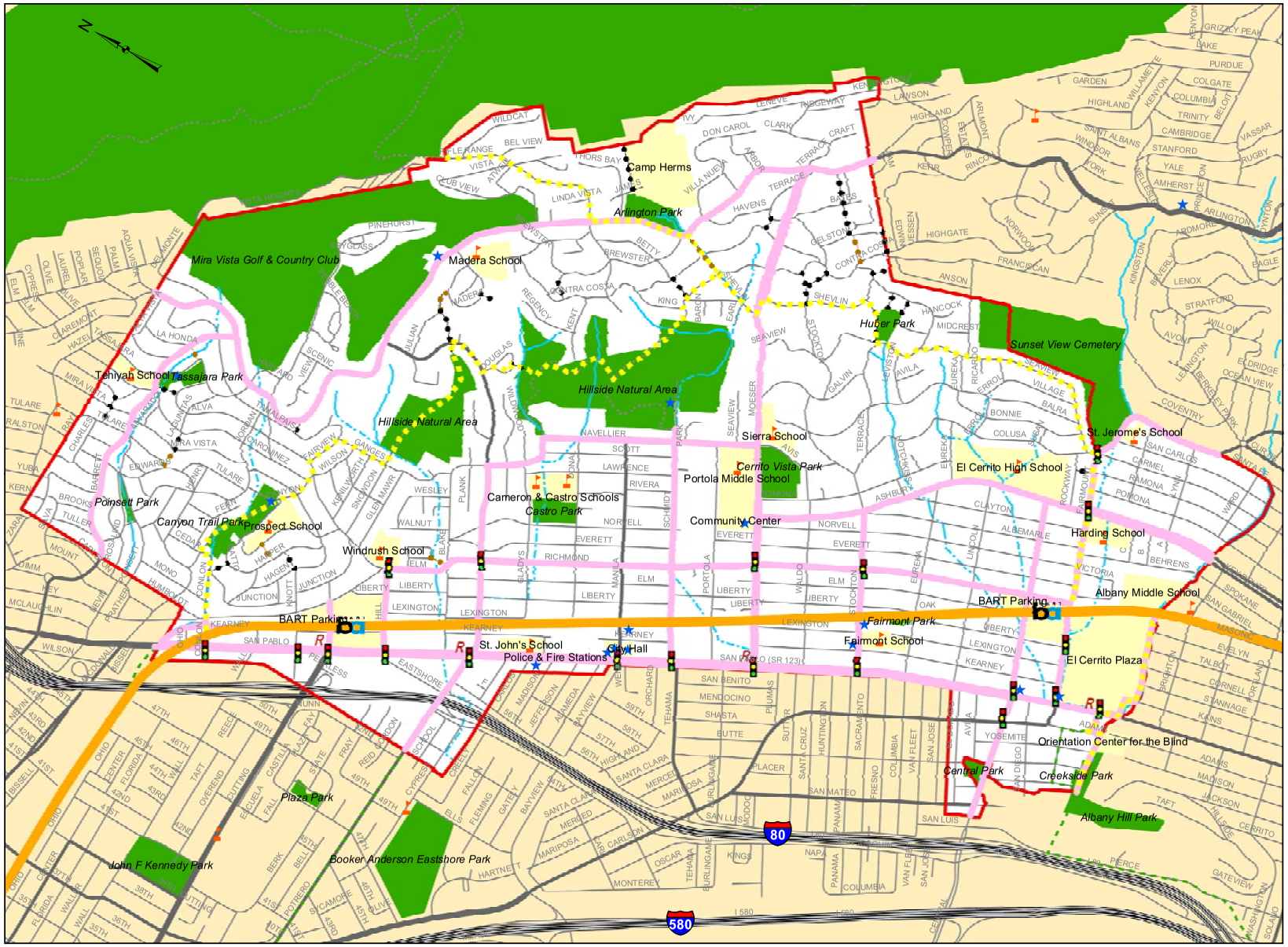


Figure 16

Proposed Pedestrian Routes

- Proposed Pedestrian Route
- Proposed Park Trail Connector
- Civic Building
- School (K-12)
- Traffic Signal
- Highway
- Arterial
- Local Street
- Fire Trail
- Bike & Pedestrian Path Existing
- Bike & Pedestrian Path Planned
- AC Transit Stop
- BART
- BART Station

Hillside Path/Stairway

- Maintained
- Unmaintained

Creeks and Drainage

- Natural
- Concrete
- Earth (constructed)

0 0.25 0.5 Miles

Note: The City of El Cerrito makes no warranty, representation, or guarantee as to the content, sequence, accuracy, timeliness or completeness of any of the database information provided on the map.

City of El Cerrito
Circulation Plan for Bicyclists and Pedestrians

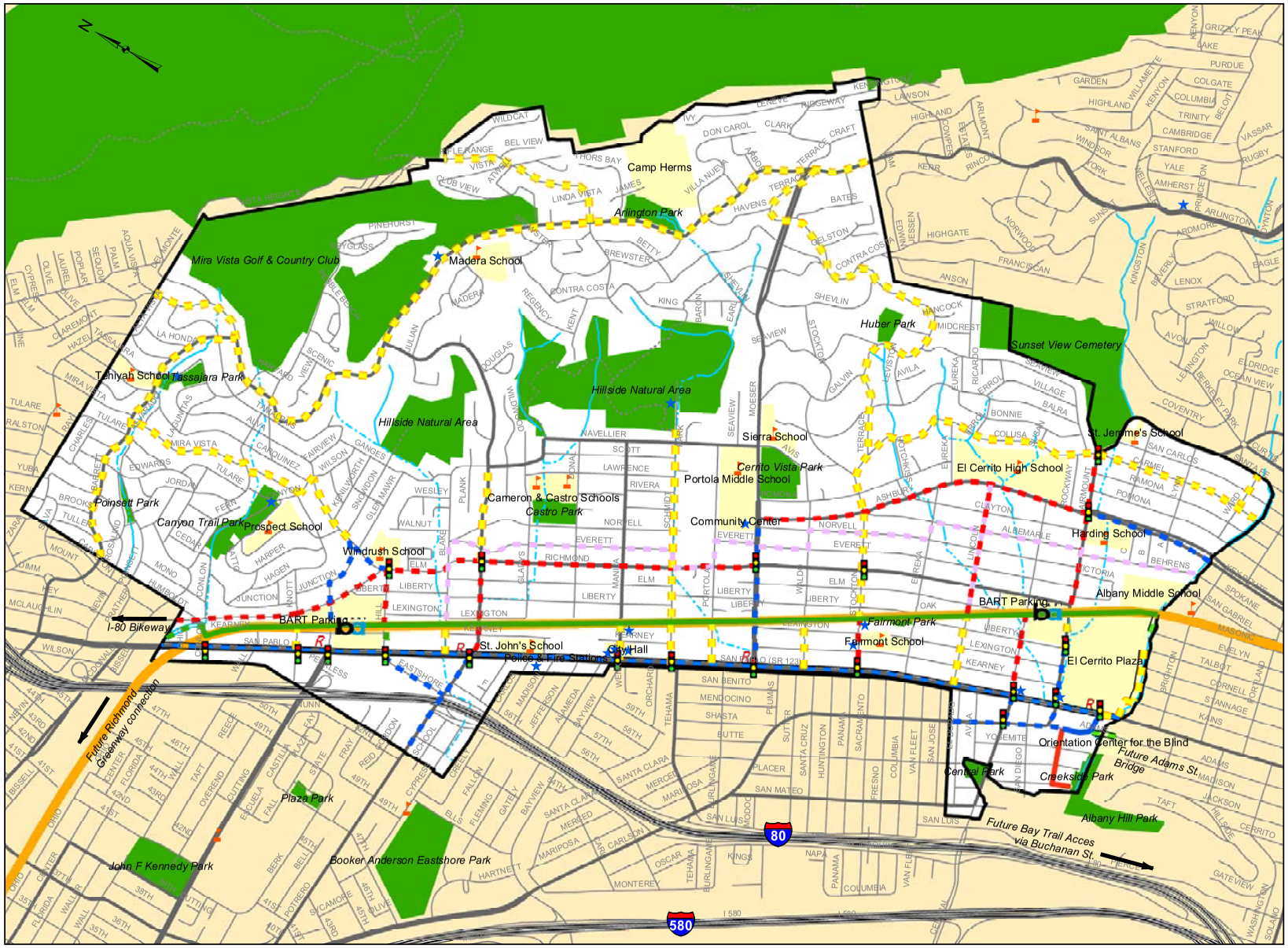


Figure 14

Proposed Bikeways

Bikeways

Existing

- Class I
- Class II
- Class III Shared Roadway Bicycle Marking

Proposed

- Class I
- Class II
- Class III Shared Roadway Bicycle Marking
- Class III Signage Only
- Potential Future Bicycle Boulevard
- Facility to be built by others
- Bicycle Detection Improvements
- Civic Building
- School (K-12)
- Highway
- Arterial
- Local Street
- Fire Trail
- AC Transit Stop
- BART Station
- BART

Creek drainage

Creeks and Drainage

- Natural
- Concrete
- Earth (constructed)

0 0.25 0.5 Miles

Note: The City of El Cerrito makes no warranty, representation, or guarantee as to the content, sequence, accuracy, timeliness or completeness of any of the database information provided on the map.

City of El Cerrito
Circulation Plan for Bicyclists and Pedestrians

Appendix B – Initial Traffic Request Form and NTMP Flow Chart

CITIZEN ROAD IMPROVEMENT/TRAFFIC REQUEST

Please identify problems to be corrected by maintenance work, new or modified traffic signs and striping and/or other projects.

Location: Roadway name _____

Landmarks: (cross street, address, etc.) Be specific! _____

_____

Description of Problem: (What is it and why is it a problem?) _____

_____

_____

_____

Name _____ **Day phone** _____ **Email** _____

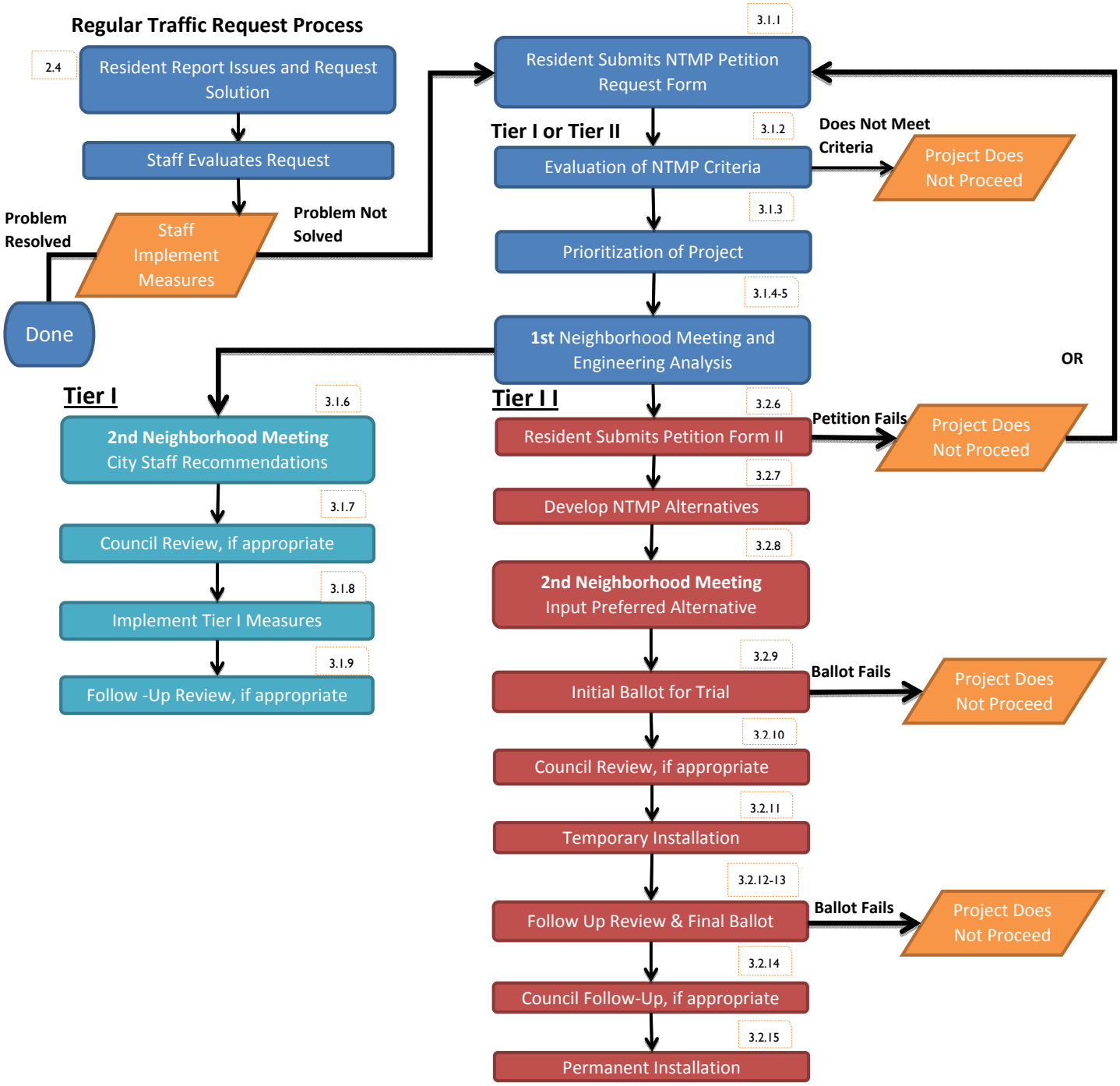
Address _____**Zip** _____ **Date** _____

Please contact:

City of El Cerrito, Public Works Department
10890 San Pablo Avenue; El Cerrito, CA 94530; Attn: Engineering Manager
yortiz@ci.el-cerrito.ca.us
Phone: (510) 215-4382 FAX: (510) 233-5401

Visit us at www.el-cerrito.org

City Of El Cerrito NTMP Process Flowchart



Appendix C – NTMP Petition Request Form

City of El Cerrito

Petition Request Form (Page 1 of 2)

Neighborhood Traffic Management Program (NTMP)

Contact Name: _____ Organization (If applicable): _____

Day Phone: _____ Email: _____ Today's Date: _____

Address: _____

Describe Issues and Concerns:

Please indicate traffic issues that concern residents in your neighborhood.

_____ **speeding** _____ **traffic volumes**

_____ **walking/biking** _____ **other**

Please explain further:

_____

_____

_____

_____

_____

Please describe the boundaries of your neighborhood:

_____

_____

_____

Are you aware of any neighborhood associations that represent your area?

_____

COMPLETE PETITION ON PAGE 2 OF THIS FORM. SEE INSTRUCTIONS BELOW.

1. The form requires 60 percent approval from the addresses on the project street, which is the block or blocks on which the neighborhood traffic management is being requested.
2. The resident submitting the request form will become the "neighborhood lead" and serve as the primary contact for City staff.
3. The neighborhood lead should make a reasonable effort to contact the property owner and the current resident/business at each address on the project street.
4. Multiple responses from one address will be counted as one response. Multi-family buildings will be counted as one to initiate the NTMP process, but each individual unit will be contacted for input during the remainder of the process.
6. If the responses from a property owner and resident of an address are in conflict, they will not be counted.
7. If the project street crosses jurisdictional boundaries, the neighborhood lead should also make a reasonable effort to contact each address in that jurisdiction. However, those addresses may not necessarily be included in the tally.
8. For a project street that includes extra long blocks (i.e., longer than 900 feet), the approval percentage may be reduced to 55 percent.

For Staff Use Only Date Received:

Petition Approval %: _____

Review Action: _____

_____

Additional Comments: _____

_____

Applicant Notified on: _____

Source: TJKM

City of El Cerrito

Petition Request Form (Page 2 of 2)

Neighborhood Traffic Management Program (NTMP)

THE CITY OF EL CERRITO

Contact Name: ______________ Phone: ______________ Email: ______________

Address: ______________ City: ______________ Zip: ______________

We, the undersigned, request a meeting to address the following traffic concerns related to vehicle speeds, traffic volumes and/or pedestrian/bicycle comfort and safety, as further described on Page 1 of this form:

____

____

____

____

____

No.	Print Name / Signature	Address / Email:	Phone (optional) / Date

Source: TJKM

Appendix D – Prioritization Worksheet

City of El Cerrito

Prioritization Worksheet

Neighborhood Traffic Management Program (NTMP)

This worksheet will be completed by the City of El Cerrito staff in accordance with the City's NTMP. It will be used to prioritize the potential initiation of specific neighborhood traffic management processes. The highest scoring residential street will get the highest ranking and so forth.

Date: _____

Name of Study Area/Person: _____

Study Boundary: _____

Total Score: _____

Documented Speed	**Points**
85th Percentile Speed > 2 mph over posted speed limit	7
85th Percentile Speed > 3 mph over posted speed limit	9
85th Percentile Speed > 4 mph over posted speed limit	11
85th Percentile Speed > 5 mph over posted speed limit	13
85th Percentile Speed > 6 mph over posted speed limit	15

Traffic Volumes

Local Street	**Collector/Arterial Street**
Less than 1,000 vpd = 0 points	Less than 2,500 vpd = 0 points
1,000 vpd to 1,250 vpd = 2 points	2,501 vpd to 2,750 vpd = 1 points
1,251 vpd to 1,500 vpd = 4 points	2,751 vpd to 3,000 vpd = 3 points
1,501 vpd to 1,750 vpd = 6 points	3,001 vpd to 3,250 vpd = 5 points
1,751 vpd to 2,000 vpd = 8 points	3,251 vpd to 3,500 vpd = 7 points
2,001 vpd and greater = 10 points	3,500 vpd and greater = 9 points

Collision Data

1 to 2 preventable collisions in a 3-year period = 9 points

3 to 4 preventable collisions in a 3-year period = 12 points

5 or more preventable collisions in a 3-year period = 15 points

Pedestrian and Bicycle Facilities

The pedestrian facility is substantially usable = 0 points

The bicycle route needs improvement = 4 points

The pedestrian facility needs improvement = 8 points

There is no pedestrian facility available = 12 points

Pedestrian and Bicycle Activity

The street is a primary access route to transit service = 4 points

The street is a primary access route to activity center = 8 points

The street is a primary access route to school = 12

Total Project Points _____

Source: TJKM

Appendix E – NTMP Petition Form II

City of El Cerrito

Petition Form II

Neighborhood Traffic Management Program (NTMP)

Tier II Traffic Management Features

Contact Name: ______________________ Phone: ______________ Email: ______________

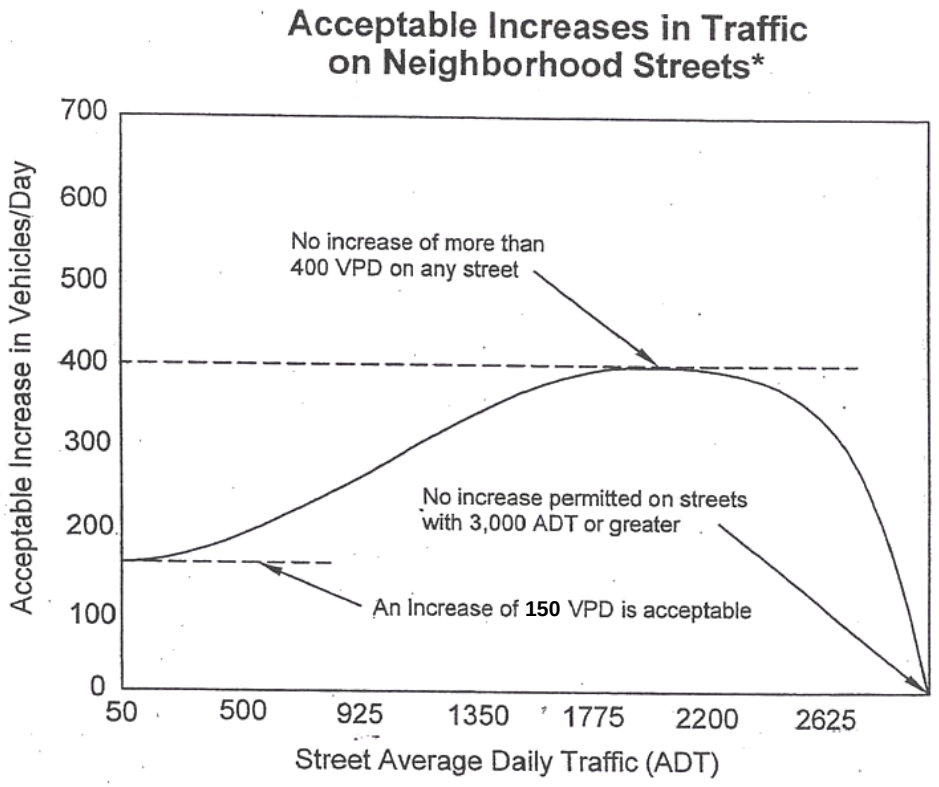
Address: ______________________ City: ______________ Zip: ______________

We, the undersigned, request a meeting to address the following traffic concerns related to vehicle speeds, traffic volumes and/or pedestrian/bicycle comfort and safety, and located within the geographic area shown on the attached map:

No.	Print Name	Address	Phone (optional)
	Signature	**Email:**	**Date**

Source: TJKM

Appendix F – Portland Impact Threshold Curve



The purpose of an impact threshold curve is to help determine whether the "secondary" impacts of diversions caused by traffic calming projects are acceptable. The curve specifically addresses impacts in the form of increased traffic on adjacent, non-project, local service streets. The impact threshold curve identifies the range of traffic diversion that is acceptable. Impact limitations are expressed as a curve because the level of impact that is considered acceptable will vary, depending on the characteristics of the street that is affected by the project.

Use of the curve assures residents of adjacent non-project streets that traffic problems on one local service street will not be solved simply by shifting the problem to other local service streets. The impact curve provides a quantifiable and objective standard for measuring secondary impacts of diversions.

The following guidelines are followed in establishing numeric impact limitations on non-project local service streets:

1. The standard impact curve is expressed in terms of total traffic volume-i.e., vehicles per day (vpd). The parameters of the curve are:

a) There is a floor of at least 150 vehicles per day. In other words, an increase of up to 150 vehicles per day as a result of a calming project is acceptable on any local service street (subject to the restriction in "c", below), regardless of its prior volume.

b) There is a ceiling of no more than 400 vehicles per day-i.e., no increase of more than 400 vpd is acceptable on any local service street.

c) The resulting traffic volume on any local service street should not exceed **2,000** vehicles per day

2. Because of the margin of error inherent in traffic volume data (resulting from machine error and daily volume fluctuation), a range of plus or minus 50 vehicles per day, or 10 percent of the measured pre-calming volume, whichever is greater, is allowed. An increase in traffic volume that falls between the curve and the lower margin of error would ordinarily be acceptable. An increase that falls between the curve and the upper margin of error might possibly be acceptable. An increase that falls above the upper margin would clearly not be acceptable.

Portland Impact Threshold Curve

Appendix G – NTMP Measures Tool Box

Speed Feedback Radar Trailer

Traffic Management Toolbox

Residents are encouraged to contact the El Cerrito Police Department's Traffic Safety Unit to request the deployment of the Speed Feedback "Radar Trailer". The Radar Trailer is an effective visual reminder to drivers to stay within the speed limit. A computer inside the radar trailer tracks the speed and the time all of the vehicles that pass the trailer during the time it is deployed. This traffic flow and speed data is then reviewed by a police officer. As a follow-up to the request for the trailer, an officer will often conduct traffic enforcement at the same location.

REQUEST THE RADAR TRAILER ON YOUR STREET

To request the radar trailer, contact Officer John Molica jmolica@ci.el-cerrito.ca.us or call during business hours at (510) 215-4436. When sending an email or leaving a message, be sure to include the following:

- Your name
- Your address
- Your contact information (phone and or email)
- Location where you are requesting the trailer (must be a City street)
- Time of day when you are requesting the trailer
- Brief description regarding the problem (such as speeding vehicles, reckless drivers, etc.)

ADVANTAGES:

- Speeds may be reduced by 3 to 5 mph during short intervals where the radar trailer is located.
- An effective educational tool.

CONSIDERATIONS:

- Not effective on multi-lane roadways that have significant traffic volumes.

General Education

Traffic Management Toolbox

Education is a key component of a NTMP. Common driver behavioral issues that could be addressed through public education include speeding within school zones, red light running, violations of stop control, and violation of pedestrian right-of-way at crosswalks. Pedestrians also jaywalk and violate drivers' right-of-way. Some bicyclists, for example, choose to ride their bicycles on sidewalks, thereby endangering pedestrians' safety. Based on experience of some Bay Area cities, the following are sample of education initiatives that could be implemented.:

• Brochures/flyers for constituents, postings at bus shelters and on buses, newsletter articles and City website information.

• Presentations and circulation of information to neighborhoods, business groups, organizations and at community events.

• Media advertisements in radio, newspaper press releases and cable TV broadcasts.

• School safety education at elementary, middle and high schools. Safety education at elementary schools could consist of classroom and field training for students, as well as distribution of educational materials for parents. Generally these programs focus on pedestrian and bicycle safety, safety patrol training, proper student pick-up and drop-off practices, compliance with reduced speed limits in school zones, etc. For the middle and high school presentations, it could be undertaken by traffic safety officers, and are geared towards developing in new drivers a proper respect for traffic laws and understanding the dangers of inappropriate driving behavior.

• Partner with surrounding cities and other public agencies in educational initiatives.

Possible educational messages could be:

• For drivers to choose walking, bicycling, or riding transit as an alternative to driving.

• For drivers to slow down if they cannot see clearly because of poor lighting or weather conditions.

• For drivers to give the right-of-way for pedestrians crossings even if the crosswalk is not marked.

• For drivers to obey posted speed limits.

• For drivers to be especially attentive around schools and parks.

• For drivers to stop at red lights and stop signs.

• For pedestrians to cross only at intersections and marked crosswalks.

• For pedestrians to step into the street only after checking of upcoming traffic including turning vehicles.

• For pedestrians to walk facing vehicular traffic along roadways that do not have sidewalks.

• For pedestrians and cyclists to wear bright colors and carry a flashlight/bicycle light when walking or cycling in the dark.

• For pedestrians to watch for entering and exiting cars at parking lots.

• For pedestrians not start crossing at signalized intersections when a flashing "DON'T WALK" is displayed.

• For cyclists to share the road with vehicular traffic and not cycle on sidewalks or against traffic.

Neighborhood Pace Car/Pledge Program

THE CITY OF EL CERRITO

Traffic Management Toolbox

The Neighborhood Pace Car/Pledge Program encourages residents to take responsibility for the impact of their own driving while setting the "pace" for safer streets and neighborhoods. The program was first developed in Boise, Idaho and is currently being implemented in many cities throughout the country and the Bay Area such as San Carlos, CA and Davis, CA. The purpose of the program is:

-to encourage drivers to drive the legal speed limit on neighborhood streets;
-to encourage driver awareness of the neighborhoods and not just the road through the neighborhoods;
-to raise awareness that motorists share the roads with people walking and biking, and to promote courteous habits.

Residents are asked to complete a pledge form committing to driving safely, courteously, and within the posted speed limit as follows:

- drive within the speed limit on all city streets;
- stop for pedestrians at marked and unmarked crossings;
- be courteous to all pedestrians and bicyclists and share the road safely with them;
- give myself enough travel time so that I'm not sacrificing courtesy or safety;
- devote my full attention to driving and avoid distractions such as cell phones;
- display the PACE CAR sticker on my vehicle, and encourage others to join.

Once the pledge form has been signed and submitted to the Police Department, the residents are given a sticker which is displayed in the rear window of their vehicle. The sticker identifies the resident as a " Pace Car." By setting the example for proper driving, the vehicle sets the pace or speed for other vehicles on the road by requiring cars behind the pace car to also drive within the speed limit.

Neighborhood Speed Watch Program

THE CITY OF EL CERRITO

Traffic Management Toolbox

A neighborhood speed watch program, a traffic-related variation of a neighborhood watch/crime watch program, encourages citizens to take an active role in changing driver behavior on their neighborhood streets by helping raise public awareness about speeding. Residents can borrow a hand-held radar unit from a City Department (typically Police, but Public Works can also be involved). A resident or a group of residents meet with City staff to obtain instructions on use of the radar unit and information regarding speed limits and speeding. Residents observe and record the speed of motor vehicles in their neighborhoods to determine the amount of speeding in their neighborhood. Residents obtain first-hand knowledge regarding on how fast vehicles are traveling on their street and can interact with each other as part of a neighborhood effort. As part of a broader educational campaign to the motoring public, the radar speed trailer can be placed on the street before and/or after the residents conduct their survey.

ADVANTAGES:

- Residents become aware of local traffic issues.
- City staff gain additional information regarding problems.

CONSIDERATIONS:

- Needs City staff to work with neighborhoods.
- Requires hand-held radar units or other measurement equipment.

Striping and Markings

Traffic Management Toolbox

DESCRIPTION: Streets can be restriped and marked in various ways to alter driver behavior. This can include yellow centerlines, edge/shoulder striping or bike lane striping, cross-hatching, high-visibility crosswalks (ladder markings), advance warning symbol markings, delineators/Botts' dots, and generally restriping lanes to have narrower widths or reducing the total number of lanes.

APPLICATION: On wide roadways, it may be desirable to narrow the travel lanes. For example, 12-foot travel lanes can be narrowed to 10-foot travel lanes using striping. If appropriate, bicycle lanes or markings can be added to a street resulting in reductions in width of other travel lanes. Narrower lanes may give drivers the impression of a narrower street with less room for maneuvering, thereby potentially reducing speeds. Impacts to emergency vehicles would be minimal.

LIMITATIONS: The lack of physical limitations results in substantially less impact on driver behavior than other physical measures. Use of striping to achieve traffic calming can be considered a passive measure, since drivers are not physically forced to change their behavior. Enforcement may be required to produce effective results.

ADVANTAGES:
- May have slight impact on reducing vehicle speeds
- Minimal impact on emergency vehicles
- May provide facilities for bicyclists

DISADVANTAGES:
- Requires voluntary compliance.
- May require enforcement

Impact on Speed:
Low

Impact on Volume:
Low

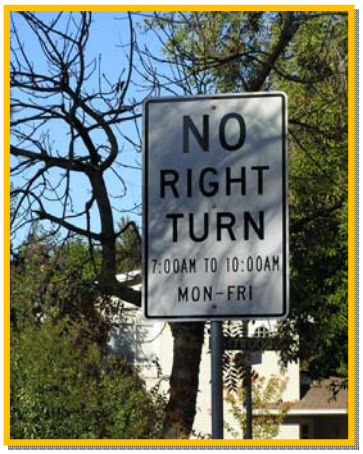
Typical Cost: Construction and maintenance costs range from $2.00 to $5.00 per linear foot of striping.

Turn Restriction Signs

Traffic Management Toolbox

DESCRIPTION: Turn restriction signs are regulatory signs that prohibit left or right turns at an intersection. They can be in effect at all times or only during specified hours.

APPLICATION: The objective is to reduce a particular pattern of through movements, such as cut through traffic, by forcing through traffic to take other more appropriate routes. Turn restriction signs are best when used with specific, peak period, time of day limits to target commuter traffic. They are typically located on perimeter of neighborhoods on collector and arterial streets at entrances to local streets.



LIMITATIONS: The lack of physical limitations results in substantially less impact on driver behavior than other physical measures. Use of signing to achieve traffic calming can be considered a passive measure, since drivers are not physically forced to change their behavior. Enforcement is usually required to produce effective results. Requires City Council resolution for each location.

R33A (CA)

ADVANTAGES:

- Effectively reduces through traffic volume
- Redirects traffic to collector or arterial streets
- May reduce "speeders" who cut through
- Offers flexibility in time of day restrictions
- Has minimal impact on emergency response times
- Inexpensive to install

DISADVANTAGES:

- Requires voluntary compliance
- May require ongoing police enforcement
- May increase trip length for drivers
- May divert traffic to parallel local streets
- May increase congestion/queues on collector and arterial streets

Impact on Speed:
Low

Impact on Volume:
Moderate to High

Typical Cost: Construction and maintenance costs range from $300 to $400 per sign.

Residential Street Multi-Way Stop Signs

Traffic Management Toolbox

The primary purpose of multi-way stop sign is to assign right-of-way. Multi-way stop signs are the most effective when the volumes on all the approaches to the intersection are near equal. The greater the difference between the traffic volumes on the major street compared to the traffic volume on the minor street, the less effective the signs will be. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. There are specific local conditions that are not reflected in the State's (Caltrans') criteria for multi-way stop signs that occur within the City of El Cerrito and that should be considered for multi-way stops. The following outlines the proposed criteria for the installation of multi-way stops on residential streets (which are defined as having residential frontage, two lanes, and existing 25 mph speed limits) in the City of El Cerrito:

1. Traffic and Pedestrian Volumes

The combined pedestrian, bicycle and motor vehicle volume entering the intersection from all approaches must equal at least 300 units per hour for any eight hours of an average day, and the combined pedestrian, bicycle and motor vehicle volume from the minor street must equal at least 1/3 of the total volume entering the intersection (100 units per hour) for the same eight hours; or

2. Collisions

The total number of reported collisions of a type susceptible to correction by multi-way stop signs has averaged three (3) or more per year for the past two years.

3. Visibility

There is a significant restricted visibility problem that limits the pedestrians', bicyclists', or motorists' views of opposing/conflicting movements for a travel distance of less than 150 feet and it cannot be corrected by normal maintenance activity (vegetation trimming) or the installation of parking restrictions.

4. Neighborhood Circulation

Volume warrants are reduced to 60% of the values above if ALL of the following conditions are met:

(a) Neither street is an arterial street.

(b) No existing stop sign or signal is located on the more heavily traveled street within a distance of 600 feet.

(c) Installation of a multi-way stop is compatible with overall traffic circulation needs for the neighborhood.

5. Special Conditions

Volume warrants are reduced to 60% of the values above where other measures have not been effective or are judged not feasible in regulating crossing safety for pedestrian, bicyclists, or motorists within 600 feet of a school, park/playground or community facilities, or near steep grades or curves.

Application of new stop sign criteria first requires City Council adoption of an ordinance and, then separate resolution for each location.

Textured Intersections and Crosswalks

THE CITY OF EL CERRITO

Traffic Management Toolbox

DESCRIPTION: Crosswalks or intersections can be textured by means of special pavers or decorative concrete.

APPLICATION: In commercial districts, there may be an integrated design concept that includes special pavement for intersections and crosswalks. Such treatment calls attention to a junction or crosswalk. The intention may be to alert the driver that the area being traversed has some special identity, such as where pedestrian traffic is frequent or that requires special attention.

When used as part of a larger traffic management project, the primary intention is to impart a message to the driver that the area being traversed has some special identity, such as an area where pedestrian traffic is frequent, and/or that requires special driving attention.

LIMITATIONS: There may be reductions in speed. Generally, special textured pavement has a minimal effect on traffic flow and should be used primarily as an enhancement of the more effective management devices on collectors and arterials.

By themselves, textured crosswalks are not particularly effective traffic calming devices. They are best used in conjunction with other traffic calming measures, such as bulbouts, raised crosswalks and raised intersections.

ADVANTAGES:

- May enhance driver attention
- May enhance the streetscape

DISADVANTAGES:

- May not be effective in reducing vehicle speeds
- May increase noise as vehicles traverse the textured surface

Impact on Speed:

Low

Impact on Volume:

Low

Typical Cost:

Costs range from $10,000 to $25,000, depending upon the surface treatment. Annual maintenance cost is $300.

In-Pavement Lights Crosswalks

Traffic Management Toolbox

DESCRIPTION: Studies show that a greater proportion of drivers yield the right-of-way to pedestrians in these specially-equipped crosswalks. The lights can be activated either by the pedestrian, or passively through detection. The lights are an application of aircraft runway landing lights embedded in the pavement and are very bright, even in direct sunlight.

APPLICATION: This device can be used to enhance pedestrian safety at a crossing location with a high number of pedestrians, such as in front of a school or in a commercial district. These devices may be coupled with bulb-outs, medians and other devices for even greater pedestrian crossing notification.

LIMITATIONS: There are no long term studies of whether drivers become used to these lights and revert to more typical behavior of not yielding to pedestrians in crosswalks. The City will be evaluating the recently installed in-pavement lighted crosswalks to determine their long term effectiveness. These devices shall not be installed in locations already controlled by other traffic control devices, such as at stop signs or traffic signals. Caution should be used when determining if the use of in-pavement lighted crosswalks are an appropriate application.

ADVANTAGES:

- Effective in enhancing pedestrian visibility

DISADVANTAGES:

- Additional studies are needed to determine long term effects
- May not be appropriate under certain circumstances

Impact on Speed:

Low to Moderate

Impact on Volume:

Low

Typical Cost:

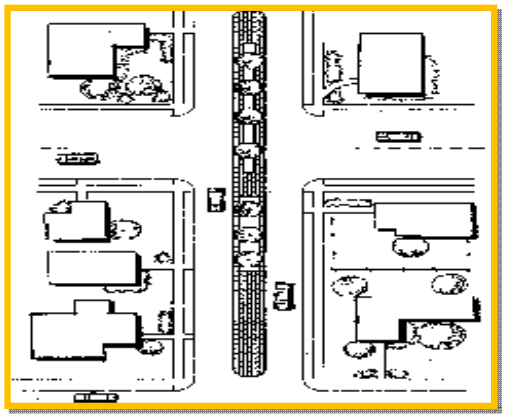
Typical costs range from $35,000 to $50,000. Annual maintenance cost is $1000.

Medians and Gateways

Traffic Management Toolbox

DESCRIPTION: A median is a raised island in the center of the roadway with one-way traffic on each side. A gateway consists of an architectural or roadway feature on each side and/or in the center of a roadway used primarily to indicate to drivers that they are entering a special area. In the case of traffic calming, it is usually a residential neighborhood or commercial district.

APPLICATION: Medians are used on wide streets to narrow each direction of travel and to interrupt sight lines down the center of long straight streets. Neighborhood gateways can include a median island to identify entry into a neighborhood. The most effective gateways include vertical elements such as trees or columns. Gateways may be formed by curb bulb-outs, fences, poles, signs, artwork, and other features that can be combined with each other. Medians can also reduce the occurrence of head-on collisions by separating two-directional traffic. Speed reduction depends on the amount of horizontal deflection and the width of the travel lanes. Traffic diversion is expected to be minimal.



LIMITATIONS: Long medians may adversely impact emergency vehicle access and operations. Medians may also disrupt driveway access. To accommodate a median, it may be necessary to remove on-street parking and/or narrow travel lanes. Since medians tend to narrow travel lanes, it may force bicyclists and motor vehicles to share the same space. If this is being considered on a major bikeway, design consideration should be made to accommodate the bicyclist, however this usually negates the effectiveness of reducing vehicle speeds.

ADVANTAGES:

- May be slightly effective in reducing vehicle speed
- May provide an opportunity for enhanced landscaping or decorative hardscaping
- Can be used to control access and turning movements

DISADVANTAGES:

- May reduce emergency vehicle access
- May require on-street parking removal
- May disrupt driveway access

Impact on Speed:
Low to Moderate

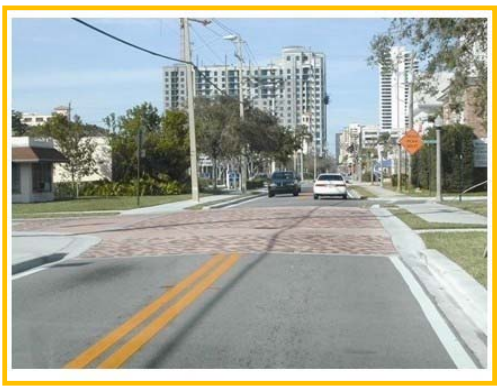
Impact on Volume:
Low to Moderate

Typical Cost: Costs range greatly depending upon the length and design of the median. A typical 40-foot median may cost $25,000 for construction and annual maintenance cost is $200.

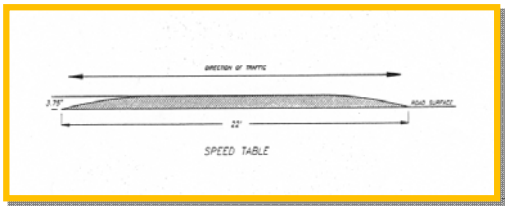
Raised Crosswalks or Speed Tables

Traffic Management Toolbox

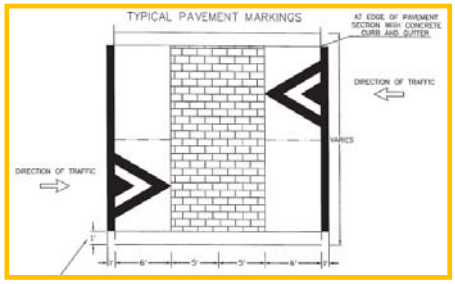
DESCRIPTION: A raised crosswalk is a flat-topped speed hump built as a pedestrian crossing with a maximum height of 3 inches over a distance of 22 feet in the direction of travel. The central 10-foot section of the table is flat.



APPLICATION: They may be used singly for a raised crosswalk, or in a series of two or more for the purpose of speed reduction; similar to a speed hump. The raised crosswalk should extend all the way to the curb, possibly requiring new storm drainage construction, thus increasing the cost considerably. The design application is similar to a speed hump. This design is appropriate for heavily used crosswalks near schools and recreation facilities. Raised crosswalk and speed tables are fairly effective in reducing vehicle speed similar to that of speed humps. However, due to longer crossing distance, it results in less abrupt speed reduction. If an alternate travel path is available, traffic diversion may occur.



LIMITATIONS: All traffic calming/management plans must be approved by the Fire Department. Typically, raised crosswalks may delay emergency vehicles up to 10 seconds. In order to be effective in reducing vehicle speeds, it should be used in conjunction with other traffic calming devices. Raised crosswalk may not be used on non-residential roadways.



ADVANTAGES:

- Effective in reducing vehicle speeds
- Enhances pedestrian visibility in the crosswalk
- Clearly designates crosswalks

DISADVANTAGES:

- Increases emergency response times
- May increase vehicle noise in the vicinity of the raised crosswalk or speed table
- May require extensive signing

Impact on Speed:
Moderate to High

Impact on Volume:
Moderate

Typical Cost: Typical costs range between $5000 and $12,000, depending upon drainage issues. Annual maintenance cost is approximately $250.

Bulb-Outs, Chokers, and Curb Extensions

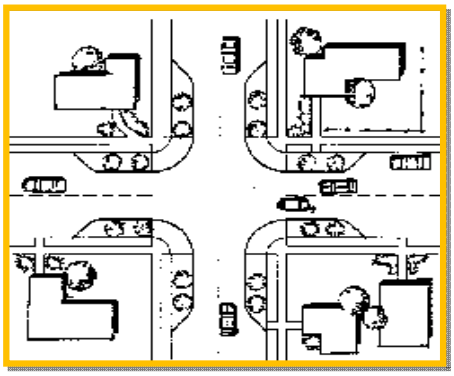
Traffic Management Toolbox

DESCRIPTION: Bulb-outs, chokers, curb extensions and neckdowns are synonymous for an extension of the curb into the formerly paved street area, typically for the width of a parallel parking space.

APPLICATION: Bulb-outs may be installed at intersections or mid-block, on one or both sides of the street. They usually do not impede or redirect traffic flow; rather they reduce the width of the traveled way to the minimum required for two-way traffic. They may be used for numerous purposes including:

- Reducing curb radii at intersections to slow turning traffic
- Enhance pedestrian safety at pedestrian crossings
- Provide extra space for landscaping and sidewalk amenities
- Possibly reducing speeds by creating a sense of narrowness
- Create a neighborhood gateway feature

Bulb-outs can be combined with small medians between them to further restrict the driver's path, and to slow the speed of turning traffic, especially at intersections that are angled greater than 90°.



LIMITATIONS: The low-cost version of the curb bulb may be less expensive to construct, but may be more expensive to maintain due to debris accumulating between the original curb line and the new island. The narrowed travel way may present challenges to bicyclists by forcing bicyclists and motorists to share the same space. Minimum corner radii requirements for small trucks and emergency vehicles may reduce the effectiveness of this option in slowing vehicles. Overall effects on vehicle speeds can be fairly modest.

ADVANTAGES:

- May enhance pedestrian safety
- May provide the opportunity for decorative hardscaping or landscaping
- May reduce vehicle speeds slightly

DISADVANTAGES:

- May need to consider design impacts on bicyclists and emergency vehicles
- May require removal of on-street parking

Impact on Speed:
Low to Moderate

Impact on Volume:
Low to Moderate

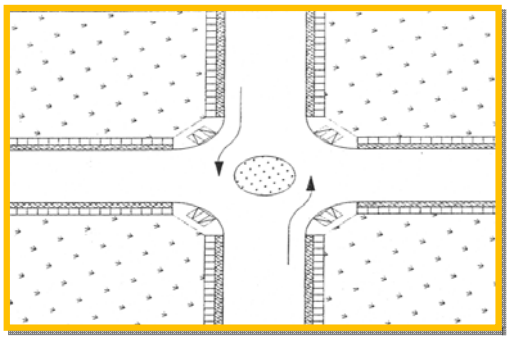
Typical Cost: Costs typically range from $25,000 to $50,000 per pair of bulbs, depending upon design and extent of landscaping and/or hardscaping and drainage. Annual maintenance cost is $400 each intersection.

Traffic Circles

Traffic Management Toolbox

DESCRIPTION: As used for traffic calming or management purposes, traffic circles are relatively small circular or oval median islands (usually landscaped with raised curbs) placed at the center of intersections of local and/or residential collector streets.

APPLICATION: Their primary purpose is to reduce speeds through an intersection or, if used in a series, reduce speeds for several blocks. They reduce speeds by forcing motorists to negotiate horizontal curves and also by reducing long straight lines of sight on long straight roadways by providing landscaping in the intersection. Traffic circles reduce speeds within 100 to 200 feet of an intersection, and if used between 300 feet and 600 feet apart, can effectively reduce average speeds on a street to below 30 mph, and eliminate all speeds above 40 mph. Circles may reduce traffic volumes based on the traffic circulation and the availability of alternate routes. Depending upon their design, traffic circles can also reduce conflicts at intersections. Caution must be applied when using traffic circle on roadways with more than 6,000 average daily trips.



LIMITATIONS: Depending upon the design, traffic circles may delay emergency equipment from 6 to 12 seconds. Traffic circles may create conflicts for pedestrians if the vehicle is forced to drive in the path of the pedestrian crosswalk. Vehicles are forced to share the lane with bicyclists since the travel lane is narrow through the intersection. Also, large trucks (i.e., moving trucks) may not be able to negotiate left turns around the traffic circle. It may be necessary for these trucks to turn the wrong way around the circle, which is generally acceptable as long as special consideration is taken by the driver.

ADVANTAGES:

- Effective in reducing vehicle speeds
- Breaks up sight-line on long straight streets
- Opportunity for enhanced landscaping

DISADVANTAGES:

- May reduce emergency response time
- May impede left turns by large trucks
- May pose conflicts for pedestrians and bicyclists
- May require removal of on-street parking

Impact on Speed:
Moderate

Impact on Volume:
Low to Moderate

Typical Cost: Typical construction costs range between $25,000 and $40,000. Annual maintenance cost is approximately $2,000.

Speed Humps

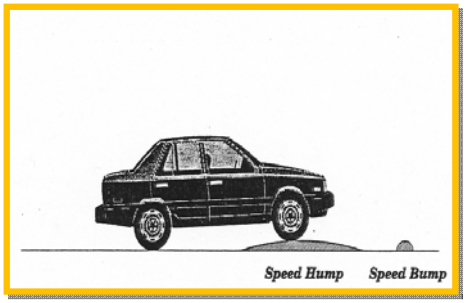
THE CITY OF EL CERRITO

Traffic Management Toolbox

DESCRIPTION: Speed humps are a gradual rise and fall in the pavement surface, usually with a circular profile, to a maximum height of 3 or 4 inches over a distance of 12 to 14 feet in the direction of travel.

APPLICATION: They are usually used in controlling maximum speeds. Typical average speeds within 100 feet of the humps are not higher than 22 mph, and if positioned no further than 600 feet apart, they usually control average speeds to less than 30 mph and eliminate all speeds above 40 mph. They also may reduce traffic volumes by about 10 to 20 percent if there is an alternate travel path. They should be installed at 300 to 600 foot spacing and properly signed with a 15-mph advisory speed. The preferred marking for humps is similar to the "zebra-striped" crosswalk. Speed humps may be appropriate on local residential roadways and residential collectors with traffic volumes less than 4,000 average daily trips.

LIMITATIONS: All speed hump plans must be approved by the City's Fire Department. Typically, speed humps delay emergency response vehicle approximately 10 seconds. Speed humps cannot be placed within roadway curves due to sight distance issues and they cannot be installed within 200 feet of an intersection. Additionally, speed humps cannot be installed on grades steeper than 8%. Speed humps are for local streets only.



ADVANTAGES:
- Effective in reducing vehicle speeds
- Requires minimum maintenance

DISADVANTAGES:
- Increases emergency response times
- May increase traffic noise in vicinity of hump
- Several humps are required on long blocks in order to be effective

Impact on Speed:
High

Impact on Volume:
Moderate

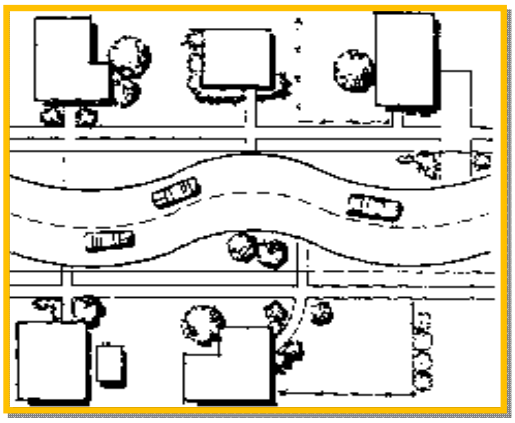
Typical Cost:
$4,500 per hump. Typical annual maintenance cost is $400 per hump.

Chicanes

Traffic Management Toolbox

DESCRIPTION: A serpentine street or chicane is an artificially created, curving, two-way street on a naturally straight road section. The curvilinear alignment requires additional maneuvering and breaks up long straight sight lines for motorists.

APPLICATION: The curves can be created by offset centerline striping, a series of bulb-outs or parking areas installed on alternating sides of the street, or by varying the size or shape of a series of median islands. The length of the curve and the amount of side-to-side offset can be varied to obtain more or less reductions in speed. They may be used at both midblock and at intersections. In addition to the forced speed reduction, a serpentine alignment that is created by landscaped islands gives the appearance that a street may not be a convenient shortcut. Chicanes may reduce traffic volumes depending upon the traffic circulation and the availability of alternate routes. Travel lanes usually need to be narrowed in order to further reduce the ability of drivers to straighten the curves.



LIMITATIONS: If raised islands do not force the lane offsets, many drivers will easily "straighten the curves" by not staying in the proper lane in the transition area, thus reducing the effectiveness of this measure. Any chicane must be designed to permit travel by emergency equipment. Because the designs are so diverse, it is not possible to generally describe the added delays to emergency equipment. Chicanes tend to be ineffective on roadways with more than two lanes due to the tendency to cut a straight path. This measure is for local streets only.

ADVANTAGES:

- Provides for landscape opportunities
- Minimal impact on emergency vehicles

DISADVANTAGES:

- Relatively expensive
- Needs to be combined with narrowing lanes
- May require on-street parking removal

Impact on Speed:
Moderate

Impact on Volume:
Moderate

Typical Cost: Costs are highly dependent upon the design and may range from $15,000 to $30,000. The annual maintenance cost is approximately $250 per block.

Diagonal Diverter/Forced-Turn Channelization

THE CITY OF EL CERRITO

Traffic Management Toolbox

DESCRIPTION:
Physical feature at intersection approaches to force traffic to make or forego certain movements.

APPLICATION: The objective is to reduce cut through traffic by forcing through traffic to take other more appropriate routes. Residents must adopt a new driving route to access the affected street. Bicycle and pedestrian access is usually maintained. Similar restrictions in traffic movements may be accomplished by regulatory signing only, but the raised islands provide a physical deterrence that signing by itself cannot provide.

LIMITATIONS: They are typically located on perimeter of neighborhoods on collector and arterial streets at entrances to local streets. They reduce accident potential in the immediate vicinity, but may shift the potential to other streets. If an opening in the barrier provides emergency access with a raised block in the center ("pan basher"), fire and paramedic vehicles will encounter minimal delay, but police vehicles may be more impacted. A forced turn channelization island for right-turns only requires a relatively wide street width for effective implementation. On narrow streets, half closures may be more appropriate. This measure is for local streets only.

ADVANTAGES:
- Eliminates through traffic
- May reduce "speeders" who cut through
- Provides area for landscaping
- Reduces intersection conflicts
- Increases pedestrian safety
- Can allow bicycle through movements
- **Self-enforcing**

DISADVANTAGES:
- Inconvenient for residential access and on-street parking
- May increase trip length for drivers
- May impact emergency vehicle response times
- May shift traffic to other nearby local streets
- May increase congestion/queues on collector/ arterial streets
- Some loss of on-street parking
- Increase in long-term maintenance needs

Impact on Speed:
Low to Moderate

Impact on Volume:
Moderate to High

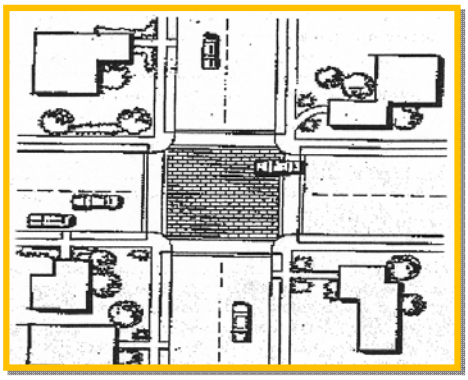
Typical Cost: $15,000 - 40,000. High range includes landscaping and irrigation.

Raised Intersections

Traffic Management Toolbox

DESCRIPTION: A raised intersection is a raised section of roadway at an intersection where the pavement is elevated to be flush with the top of curbing and the approaches are ramped like speed humps.

APPLICATION: This technique has been used extensively in Europe. Raised intersections control speeds in similar fashion to raised crosswalks. They are much more expensive, but they can be used on both local streets and residential arterials and in commercial areas. In the U.S., they have more often been used as enhancements for pedestrian safety and aesthetics in shopping areas, rather than for neighborhood traffic management. The raised intersection may be given a special pavement treatment. The ramp is 10 to 12 feet along the path of the vehicle. Raising the intersection to 3 inches, results in a gentle grade of only 2.1% which can be easily negotiated by emergency equipment.



LIMITATIONS: Raised intersections slow emergency equipment from 3 to 9 seconds, depending upon the height of the intersection. Raised intersections are relatively expensive, especially if changes in drainage, manholes or other utilities are required, and if decorative pavement treatments are used. Due to the lack of curb separation at the corners of the intersection, some motorists may tend to cut corners. Therefore, a design feature such as bollards may be necessary to keep motorists from driving onto the sidewalk.

ADVANTAGES:

- Effective in reducing vehicle speeds
- Opportunity for attractive pavement treatments
- Improved pedestrian safety at intersections

DISADVANTAGES:

- May reduce emergency vehicle response times
- May require bollards to define corners of the intersection
- Relatively expensive

Impact on Speed:
Moderate to High

Impact on Volume:
Moderate

Typical Cost: Costs range from $25,000 to $150,000, depending upon the specific design and size of the intersection and drainage issues. Annual maintenance cost is $1,000.

Half Closure

Traffic Management Toolbox

DESCRIPTION:
A half closure is a physical barrier at an entrance to a street that restricts turns into a street. Unlike a one-way street, the half closure maintains full access and movement within a street.

APPLICATION: The objective is to reduce cut through traffic by forcing through traffic to take other more appropriate routes. Ideally, through traffic will be mostly rerouted to streets intended for that purpose (arterials and, to a lesser degree, collectors). Access for emergency vehicles can be provided across the closure. Bicycle and pedestrian access is maintained.

LIMITATIONS: This is one of the most extreme traffic management measure. Residents must adopt a new driving route to access the affected street. This measure is for local streets only.

ADVANTAGES:
- Effectively reduces through traffic volume
- May reduce "speeders" who cut through
- Self-enforcing
- Provides opportunity for landscaping
- May reduces pedestrian crossing distance
- Can include bicycle connection

DISADVANTAGES:
- Inconvenient for residential access and on-street parking
- May increase trip length for drivers
- May impact emergency vehicle response times
- May shift traffic to other nearby local streets
- May increase congestion/queues on collector and arterial streets.
- Some loss of on-street parking
- Increase in long-term maintenance needs

Impact on Speed:
Moderate

Impact on Volume:
High

Typical Cost:
$15,000 - $50,000. High range includes street reconstruction, landscaping and irrigation for permanent installation.

One-Way Street

Traffic Management Toolbox

DESCRIPTION:
One-way streets legally limit travel on a street to one direction only. It can be implemented through signs and markings only.

APPLICATION: The objective is to reduce cut through traffic volume by discouraging a particular direction of through movement. Conversion to one-way is best on narrow streets because wider streets are more subject to deliberate violation and mistaken use. On wider street, physical measures, such as curb bulb-outs may be desirable to change the way the street space is used.

LIMITATIONS: This is one of the most extreme traffic management measure. Residents must adopt a new driving route to access the affected street. This measure is for local streets only.

ADVANTAGES:
- Effectively reduces through traffic volume
- May provide opportunity for landscaping

DISADVANTAGES:
- Inconvenient for residential access
- May increase trip length for drivers
- May increase traffic speeds on wide streets
- May impact emergency vehicle response times
- May shift traffic to other nearby local streets
- May increase congestion/queues on collector and arterial streets.

Impact on Speed:
Low

Impact on Volume:
High

Typical Cost:
See signing and striping costs.

Full Closure

Traffic Management Toolbox

DESCRIPTION:
Barriers placed across the roadway to close the street completely, usually leaving only the sidewalk or bicycle access open.

APPLICATION: Its primary purpose is to eliminate shortcutting or through traffic on the local street on which it is installed. Ideally, through traffic will be mostly rerouted to streets intended for that purpose (arterials and, to a lesser degree, collectors). Access for emergency vehicles can be provided across the closure. Bicycle and pedestrian access is maintained.

LIMITATIONS: This is the most extreme traffic management measure in that it requires a complete detour for all drivers. Street closures are discouraged in the City's General Plan. Street closures are controversial because (i) unless carefully sited, they unbalance the traditional traffic street grid, easily diverting large volumes of traffic onto other residential streets; and (ii) they impose significant detours for local residents. This measure is for local streets only.

ADVANTAGES:
- Effectively reduces through traffic volume
- May reduce "speeders" who cut through
- Self-enforcing
- Provides opportunity for landscaping
- May reduces pedestrian crossing distance
- Can include bicycle connection

DISADVANTAGES:
- Inconvenient for residential access and on-street parking
- May increase trip length for drivers
- May impact emergency vehicle response times
- May shift traffic to other nearby local streets
- May increase congestion/queues on collector/ arterial streets
- Some loss of on-street parking
- Increase in long-term maintenance needs

Impact on Speed:
Moderate

Impact on Volume:
High

Typical Cost:
$15,000 - $100,000. High range includes street reconstruction, landscaping and irrigation.

Appendix H – NTMP Measure Web Resources

Internet NTMP Sources

Traffic Management Toolbox

http://www.ite.org/traffic/
The Traffic Calming Library contains a searchable database of reports, articles and other documents related to traffic calming. In some cases the full publication is available online and in others only a source listing or abstract is available. All full-text material in the library is provided with permission of the copyright owner.

http://www.bicyclinginfo.org/index.cfm
The Pedestrian and Bicycle Information Center (PBIC) is a national clearinghouse for information about health and safety, engineering, advocacy, education, enforcement, access, and mobility for pedestrians (including transit users) and bicyclists. The PBIC serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, police enforcement, and the health community.

http://www.walkinginfo.org/
The Pedestrian and Bicycle Information Center (PBIC) is a national clearinghouse for information about health and safety, engineering, advocacy, education, enforcement, access, and mobility for pedestrians (including transit users) and bicyclists. The PBIC serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, police enforcement, and the health community.

http://www.roundaboutsusa.com/
The site dedicated to free traffic flow through the design and use of roundabouts. This site provides the most recent news and information about the progress of roundabouts in the USA. This roundabout site is provided to people interested in learning more about roundabouts: what they are, where they are currently located, how effective they are, and how they operate.

http://www.fhwa.dot.gov/environment/tcalm/
This web sit is dedicated to all the known and/or electronically publicized transportation programs and studies that pertain to traffic calming.

http://www.trafficlogix.com/press-releases-details.asp?id=46
Show cased a full line of traffic calming products, all of which meet ITE (Institute of Transportation Engineers) safety specifications. Hundreds of these solutions have already been installed in cities across the United States and Canada. Our offices are located in Spring Valley, New York.

Appendix I – Comparable Speed and Volume Thresholds

NTMP Thresholds of Some Bay Area Cities

City	THRESHOLD CRITERIA	PRIORITY CRITERIA
Sunnyvale131,000 pop22 sq. mi.	85th %tile above 32mph 95th %tile above 35mph (responds to concerns of high speed) volume above 1,000vpd	1st come, 1st serve Have only implemented 2 projects since program established late 90's, few have qualified
Santa Clara114,000 pop19 sq. mi.	85th %tile > 33mph Volume between 1,000 vpd - 3,500 vpd For speed humps -- street must be at least 600 feet in length	Studies of Level 2 & 3 devices done on 1st come, 1st serve basis Priority Points for Level 2 & 3 installations: 1pt for each % of vehicles exceeding posted speed 1 pt for every 100 vehicles over 1,000 ADT 10 pts for each speed related crash in prior 2 years 5 pts for each schools or park within 1 block 1 pt for each % support by property owners
San Mateo95,000 pop12 sq. mi.	85th%tile speeds > 32mph (for speed devices), OR ADT > 1,000vpd AND at least 25% of traffic is cut-thru (for diverters) Streets with < 1,000 vpd are NOT ELIGIBLE for Step 2 devices	85th %tile speeds: 32mph (12pts), 33mph (14pts), 34mph (16pts), 35mph (18pts), 36mph & up (20pts) 1,000 - 1,499 vpd (6pts), 1,500 - 2,000 vpd (8pts), >2,000 vpd (10pts) Cut-thru: 25-49% (6pts), 50% & up (10pts) Crashes, worst year in past 5: 2 in 1 yr (6pts), more than 2 (12pts) Pedestrian Generators adjacent to street: 3 pts each Neigh. Impact: 1 pt for each 250 feet of street with problem Neighborhood Score: Above process is completed for all streets in a study area and totaled. Total is multiplied by % of neigh. support Prioritization ranking occurs annually at end of the fiscal year. Results presented to PW Commission. Only petitions submitted by May 1 are considered. Petitions last 3 years. May need to repetition, due to budget limitations.
Livermore81,000 pop22 sq. mi.	85th %tile at least 33mph, AND volume at least 1,000 vpd	Top priority projects selected for study each year -- based on threshold data & priority points, select 1 Project to implement. Others placed on waiting list Priority Points (35 max) 85th%tile speed: 34mph (2pts), 35mph (4pts), 36mph (6pts), 37mph & up (8pts max) 85th%tile speed: 8-9mph above posted (1pt), 10mph & up (2pts max) Volume: Local (1000vpd & up), Minor Collector (2000vpd & up), Major Collector (3000vpd & up) -- (1-10pts max) Crashes: 1 pt for each crash preventable by device, average annual over prior 3 years (5pts max) Residential Frontage: 25-40% (1pt), 41-60% (2pt), 61-75% (3pt), 76-90% (4pt), 91-100% (5pts max) Pedestrian Generators: 1pt for each (5pts max), schools weighted double
San Leandro80,000 pop.15 sq. mi.	85th %tile at least 32mph (local), 34mph (collector) -- regardless of posted ADT at least 1,000vpd (local), 2,000vpd (collector) -- regardless of posted	City staff develops prioritized list based on volume, speed, crash history, pedestrian activity. Application deadline Sept. 1st Priority Points - will send
Mountain View73,000 est.12 sq. mi.	85th %tile at least 7mph over posted However, if volume exceeds 1,000 vpd will consider road humps if min. 150 vehicles exceed 32mph / 37mph	1st come, 1st serve
Cupertino50,000 pop13 sq. mi.	85th %tile -- 32mph (local), 34mph (minor collector), OR Volume -- 1,000 vpd (local), 2,000 (minor collector)	Priority Points (30 max) 1 pt for each mph, 32mph / 34mph & up (10 max) 1 pt for each 100 vpd, 1000 / 2000 vpd & up (10 max) 1 pt for each crash correctable by traffic calming in prior 3 years (5 max) 1 pt for each public facility that generates significant pedestrian traffic -- schools weighted double (5 max)
Los Altos27,000 pop8 sq. mi.	85th %tile above 32mph, AND/OR 800-3500 vpd 750' min. roadway length 25-50% cut-thru (based on device) Crashes at intersection (circles) 800-3500 vpd (chokers, bulb-outs)	1st come, 1st serve

Source: TJKM