Herein contains the latest printed version of ‘Your Guide to the Las Vegas Neighborhood Traffic Management Program’.

Since it’s publication in 2001, some of the listed polices and procedures have been revised. This publication still serves a valuable tool for traffic mitigation, but please check with City of Las Vegas Traffic Engineering for further details.

Streets

A Users' Manual

City of Las Vegas
neighborhood
traffic management
program

ntmp

Your Guide to the Las Vegas
Neighborhood Traffic Management Program














photo credits: Las Vegas DPW, Dan Burden

Streets: A Users' Manual

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City of Las Vegas

September 2001

This project was funded by a grant from the State of Nevada Department of Motor Vehicles and Public Safety, Office of Traffic Safety.

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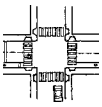

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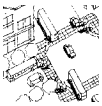

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INTRODUCTION

If you've ever been concerned by speeding traffic, cut-through traffic, or just too much traffic in your neighborhood, this book is for you. Individuals and neighborhood groups who want to see solutions to neighborhood traffic problems, make their neighborhoods more attractive for pedestrians and bicyclists, and be active participants in improving the quality of life in their neighborhoods will enjoy using this handbook to improve and empower their neighborhoods.

Neighborhood traffic management programs are becoming standard practice for cities taking an active role in managing growth and making sure their roadways are safe, attractive, and convenient for all users. Citizens play an integral role in developing successful traffic management programs for their streets, by using street design tools, education, and enforcement to manage and calm traffic.

In Las Vegas, we too have a traffic management program for residential streets. Our program lays out a process for our citizens and city staff to assess local residential streets and address problems related to speeding traffic, excessive traffic volumes, and safety. This handbook is your guide to that program. It contains information on the relationship between managing traffic and maintaining livable communities. It is a resource that can help you better understand issues, identify opportunities, and recommend improvements to streets throughout your neighborhood. This handbook also illustrates how a successful neighborhood street program is just one part of a successful neighborhood plan. It will help you to participate in the development of possible future improvements while preserving the best aspects of your neighborhood streets. As a resident and daily user of your street, your input can provide valuable insight to the activity on the street, what works, and what needs fixing. This handbook will show you how citizens and city staff can get the job done by working together.

HOW TO USE THIS BOOK.

This book is divided into five sections. The first two sections ('The Place We Call Home,' and 'Having Visions') describe the local context—the city and region in which we live—and discuss some basic principles of planning for your neighborhood. In the third part ('Taking it to the Street') the manual explores in greater detail what makes up a street, how streets function, streets and safety, and street design principles. Under 'Tools and Devices' an array of devices that can be used in most neighborhood traffic management programs is presented. Finally, there is useful information on how to actually implement a traffic management project ('From the Ground Up'). A resources chapter and appendix contain more detailed information on traffic management and related issues, and specific city policies.

This manual includes the basic tools you will need in order to begin your neighborhood traffic management program. However, the most important elements of any neighborhood project are the people involved: the involvement, collaboration, and persistence of neighbors cannot be taught by any book, yet these characteristics are the truest measure of success for your project.

1

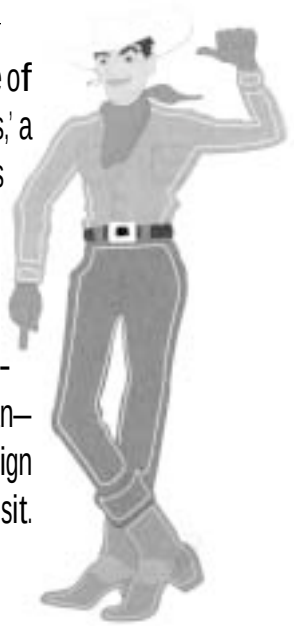
THE PLACE WE CALL HOME

The Las Vegas Valley is a popular area and is growing fast. For decades, Nevada has been the fastest-growing state in the nation, and most of that growth has occurred in the Las Vegas Valley. A mild desert climate, affordable land and homes, and an abundance of good family-wage jobs help to make Las Vegas a desirable place to live, for long-term residents and newcomers alike.

Nearly a half-century into this phenomenal period of growth, we are experiencing consequences of our growth spurt—worsened air quality, traffic congestion, suburban sprawl, loss of open space, changes to our landscape and neighborhoods—many fear we are losing some of the very things people originally came here for.

These unwanted side effects of growth are challenges that must be faced in order to maintain the quality of life in our area. In order to accommodate growth successfully, our fast-growing city needs to make policy, design, and management decisions that work well together to create a strong link between transportation and land use. This book will discuss Las Vegas' neighborhood traffic management program and how it encourages good policy, design, and management practices for your neighborhood streets.

For those of us who make Las Vegas our home, the city is more than a dazzle of neon and a roll of the dice. In Spanish, Las Vegas means 'The Meadows,' a name the town earned as an oasis of springs, creeks, grasses and cottonwoods in the middle of the Mojave Desert. From Mormon settlement to 'Sin City,' our history is rich and complex, and Las Vegans are not easily categorized. We Las Vegans like to take an active role in shaping our future. In a recent community vision survey in which over 500 local residents participated, a majority of people indicated a preference for safe, well–designed and pedestrian–friendly streets. These survey results point toward a need for new street design standards that balance the needs of pedestrians, automobiles, bikes and transit. (See www.questions.net/demo/lasvegas for the sample survey.)



LAS VEGAS' GROWING PAINS

The 2000 census shows that, as it has for the last fifty years, the Las Vegas metropolitan area remains the fastest-growing region in the country, adding about 70,000 people a year to a population of 1.4 million. But troubles abound for this city that was but a gleam in Bugsy Siegel's eye 55 years ago, from bad air to choked traffic to diminishing water supplies to a downtown ignored by the big-money casinos that are just beyond the city limits on the Las Vegas Strip.

Nevada, with a 66 percent population growth rate over the last decade, was the nation's fastest-growing state. Clark County grew by 85% between1990 and 2000. Nevada is attracting young singles and families, who find easy jobs in the booming service and construction economy and can afford to buy homes at the suburban fringe. It is also attracting retirees, such as those who have helped make Henderson, a Las Vegas suburb, the fastest-growing city in the nation for the past decade.

The question some people in Las Vegas are asking is how long until this region resembles the places from which people are fleeing. Bad air and clogged traffic are major concerns, so much so that the Environmental Protection Agency has said Las Vegas could lose some federal money if it does not take steps to clean its air.

The smog is in large measure a result of auto traffic and dust from construction of new houses, federal officials say — a hint that the Vegas boom may be creating the foundation of its own decline.

The older neighborhoods close to the city — somewhat of an oxymoron, given that Las Vegas was basically a train depot with barely 8,000 souls in 1940 — are run down, with few services.

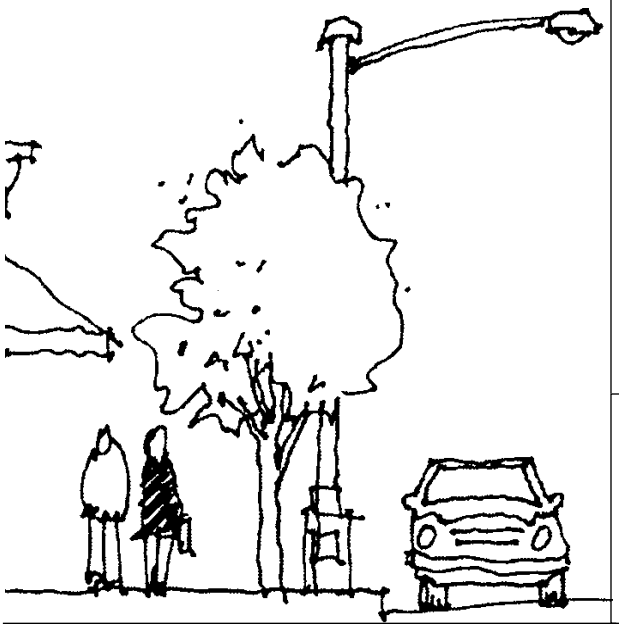
The remainder of the city, with the exception of the Strip, is growing out, not up, gobbling up hundreds of desert acres—and precious water rights—every day. Reinvention, a civic byword, is what Las Vegas Mayor Oscar B. Goodman would like for his city. Since taking office, he has made 'reurbanization,' his primary goal, voicing a need for more public spaces and downtown housing.

If Las Vegas does not act to channel the additional half-million people expected to move here in the next decade into some semblance of a dense, vibrant city, the mayor said, then it is only inviting the kinds of urban ills that have plagued older cities. But then again, he is not so sure what to make of the metropolis growing fat in the Mojave.

"Las Vegas is either the most unreal place in the world or the most real place," Mr. Goodman said. "I've lived here 37 years, and I've yet to figure out which it is."

Condensed from The New York Times, January 26, 2001.

Continued growth is on the horizon for Las Vegas and the Valley.



2

HAVING VISIONS : PLANNING FOR YOUR NEIGHBORHOOD

WHERE WE ARE AND WHERE WE WANT TO BE—OUR CITY, OUR NEIGHBORHODS, AND OUR STREETS

Las Vegas Strategic Plan 2005

Before we start to plan for our streets, we must understand the context. A good street program derives from a good neighborhood plan, which fits into the overall vision of a citywide or region-wide strategic plan. Las Vegas' master plan recognizes the need for a comprehensive and organized approach to planning for the future, and that means managing growth, maintaining a good quality of life, and revitalizing our urban core.

The strategic plan understands the need for safe streets and strong neighborhoods, and has a goal of instilling a sense of community, all in keeping with the city's commitment to become a singularly livable city.

MISSION AND GOALS: STRATEGIC PLAN 2005

The vision of the City of Las Vegas is to be recognized locally, nationally, and internationally as a world-class city, a leader in public sector innovation, and a singularly livable city.

There are four areas of emphasis in the Las Vegas 2005 Strategic Plan: growth, quality of life, re-urbanization, and fiscal responsibility.

Neighborhood planning and traffic management directly relate to growth and quality of life strategies. They are also important tools in the re-urbanization of Las Vegas.

Neighborhood planning

Neighborhoods, too, have their own visions, or blueprints, for how they want to grow. Neighborhood planning is grassroots planning, from the bottom up, as opposed to old-fashioned 'from the top down' approach to planning. Instead of government telling neighborhoods what is best for them, governments and neighborhoods now work together to plan for the future of their communities. One goal of neighborhood planning is for citizens

and government to work together on projects that will serve both the neighborhood and the city into the future. People in neighborhoods in many American cities are now directing their own futures, developing and implementing solutions to their challenges. Neighborhood planning is the forefront of community planning, and has been successful in many American cities.

Planning for your neighborhood

Why do neighborhood planning? As growth and change occur, they affect all portions of the region, including neighborhoods. By working within neighborhoods, focusing on key interest areas, and coordinating with the overall goals and objectives of the city's strategic plan, neighborhood planning can provide specific direction for city policy changes as well as projects that will implement neighborhood visions.

Las Vegas' Neighborhood Traffic Management Program (NTMP) is a good example of how neighborhood planning works. The city and its neighborhoods work together to identify traffic issues of concern and figure out acceptable solutions. Neighbors meet neighbors at public meetings or while working on a piece of their overall traffic management plan. City staff can get to know the neighbors in each community and can look to them for guidance on future projects. The final product, a neighborhood traffic management plan, is a blueprint for the future that has the support of the community and the city.

What is a neighborhood, and how is it defined?

Neighborhoods are typically defined by geographic, physical, and social characteristics. A neighborhood is also defined by its street grid or network. Neighborhood streets should have a hierarchy: residential streets tend to be narrower, accommodating slower moving local traffic, parking, landscaping, and sidewalks. Wider, busier streets are often the location of major commercial and cultural activities, and may also define the edges of the neighborhood. Neighborhoods may be characterized by their mixed uses, including a diversity of housing types, and a variety of commercial buildings of different sizes and ages.

One of the best qualities of a strong neighborhood is walkability. Walking from your home to transit, shopping, or your job along the streets in your neighborhood has many benefits, not the least of which is that walking is great exercise. Walkable neighborhoods have balance: commercial areas are near residences, cars travel at speeds that are compatible with walking and bicycling so that all users can travel comfortably. Streets in shopping districts are easy to access by pedestrians and have buildings with shop windows adjacent to the sidewalks with parking alongside or behind the building.

What is in a neighborhood plan

A good neighborhood plan includes a vision statement, along with its goals, objectives, and a list of proposed projects to achieve the vision. It identifies assets, challenges, and areas of opportunity: parks and open space, neighborhood landmarks, neighborhood business, public safety, transportation, traffic and parking, jobs, education, institutions, neighborhood character, and design

elements. Neighborhood plans can deal with land use, economics, transportation, job retention, housing, public safety, arts and culture, and planning for major institutions. A street program is one element of a good neighborhood plan.

GROWING SMARTER

In communities across the nation, there is a growing concern that current development patterns — dominated by what most call 'sprawl'— are no longer in the long-term interest of our cities and existing suburbs. Though supportive of growth, communities are questioning the economic costs of low-density sprawl, which requires massive amounts of infrastructure to support it. They are questioning the social costs of the mismatch between new employment locations in the suburbs and the available workforce in the city. They are questioning the wisdom of eating up open space at the suburban fringe, and polluting the air of an entire region by driving farther to get places. Spurring the smart growth movement are demographic shifts, a strong environmental ethic, increased fiscal concerns, and more nuanced views of growth. The result is both a new demand and a new opportunity for smart growth.

Smart growth recognizes connections between development and quality of life. It leverages new growth to improve the community. In general, smart growth invests time, attention, and resources in restoring community and vitality to existing developed areas. New smart growth is more town-centered, is transit and pedestrian oriented, and has a greater mix of housing, commercial and retail uses. It also preserves open space and many other environmental amenities. But there is no "one-size-fits-all" solution. Successful communities do tend to have one thing in common — a vision of where they want to go and of what things they value in their community — and their plans for development reflect these values.

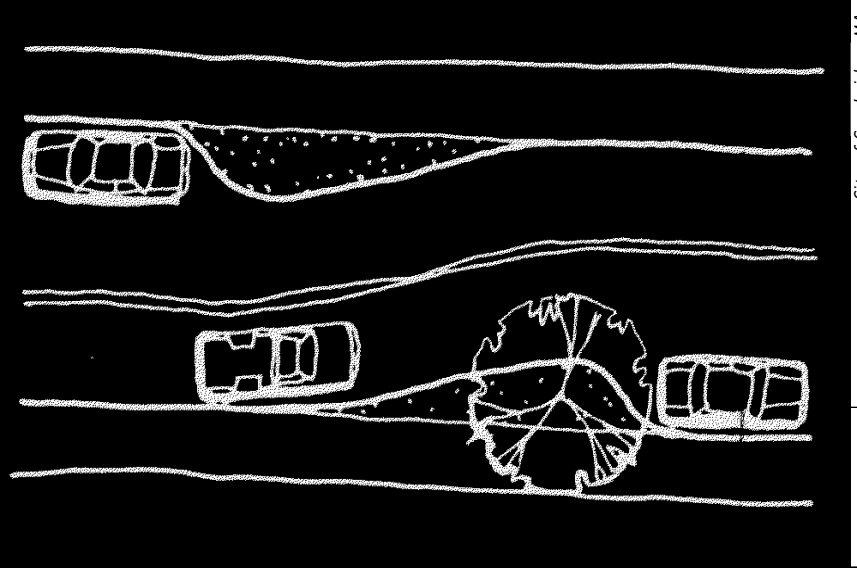
Closely related to smart growth is the New Urbanism movement. Based on the development patterns used prior to World War II, New Urbanism seeks to reintegrate the components of modern life—housing, workplace, shopping and recreation—into compact, pedestrian-friendly, mixed-use neighborhoods linked by transit and set in a larger regional open space framework.

New Urbanism is best known for projects built in new growth areas, but the principles defining New Urbanism can also be applied successfully to sites within existing urbanized areas. In fact, the leading proponents of New Urbanism believe that infill development should be given priority over new development in order to revitalize city centers and limit sprawl.

Major Principles of New Urbanism

- Compact, walkable neighborhoods with clearly defined edges, and a center including public uses.
- Neighborhoods that encourage transit use and pedestrian activity without excluding automobiles. An interconnected street network (usually in a grid pattern), forming coherent blocks where building entrances front the street rather than parking lots.
- A diverse mix of activities (residences, shops, schools, workplaces and parks) within walking distance. A wide spectrum of housing options. No large developments featuring a single use or serving a single market segment.
- Prominence given to civic buildings and open spaces.

Adapted from the executive summary of Why Smart Growth: A Primer, by International City/County Management Association with Geoff Anderson, July, 1998; and New Urbanism Basics, by The Congress for the New Urbanism (from their website, www.cnu.org).



City of Cambridge, MA

3

TAKING IT TO THE STREET

We started with a citywide vision and have taken it to the neighborhood level. Now it's time to bring your neighborhood vision to street level. First, let's discuss how your streets fit into a regional transportation network.

From the narrowest alley to the largest interstate highway, all streets help us to get around our growing region. From trucks to cars to pedestrians to bicycles and buses, Las Vegas' street system accommodates many modes of transportation and connects to other modes, such as air and rail.

Each street has a different function and can be designed and operated to carry out this function as effectively as possible.

Consider how the streets in your neighborhood fit into this city and regional street system.

- *Interstate highways and many principal arterials are designed to carry large volumes of people and freight over long distances at high speeds.*
- *Streets in business districts are designed to accommodate pedestrians, cars, transit and bicycles, and serve a mix of activities.*
- *Streets in residential areas are designed to carry people to and from their homes.*

WORD ON THE STREET

What is a street? Who uses it?

Streets are the principal public space in any city or town. Historically, streets were used more for communication and public gathering than for transportation. In modern times, the emphasis has been almost exclusively on transportation, and most recently, on moving cars and traffic. A growing number of people are now working to correct what is perceived as an unbalanced use of the street, and to restore a more balanced set of uses for neighborhood streets.

Streets serve a variety of functions, including:

- **Linkage**. They connect parts of cities to each other, one town to another, and activities and places.
- **Transportation**. They provide the surface and structure for a variety of modes. All modes and users should be provided for: pedestrians, bicyclists, transit, motor vehicles, emergency services, and maintenance services.
- **Access**. They provide public access to destinations.
- **Public right-of-way**. Space for utilities and other infrastructure is a necessary but often unseen function of the street.
- **Space and place**. The street is a definable place, a place for people to interact, and the heart of a community. In this role, some streets often serve as a place for parties, fairs, parades and community celebrations.

Streets are often designed to emphasize some functions over others. At one extreme is a limited access highway, which serves as a corridor for motor vehicle travel. At the other is a private cul-de-sac, which has no linkage and limited access. Some streets may have been improperly designed, so that certain desirable functions are not met. Examples include commercial streets where access to destinations is difficult, and strip development along high-speed roads where no sidewalks or pedestrian crossings exist. Poor street design can be bad for business!

When streets and roads are evaluated for improvements, it is helpful to consider whether the design effectively meets all the desired functions of the roadway. If not, the street should be redesigned to adequately meet those functions.

Streets must balance the needs of, and be shared by, all users

The objective and principal challenge of a neighborhood traffic management program is to develop and implement a plan that can successfully balance the needs of the many users of the street. In some cases, this may require shifting a balance that now falls in favor of the automobile to include pedestrians, bicyclists, and transit.

Hierarchy of streets: balancing needs for all users

Street classifications define the function of a street and the standard to which it should be designed and operated. Many factors are taken into account when determining a street's classi-

fication. These include: travel demand, street right-of-way width, maintenance costs, needs for access to adjacent property, safety, preservation of neighborhood character, distance between arterials, adjacent land uses, connections to the regional transportation network and to major destinations. Street classifications can limit the kinds of possible design or operation changes to a street.

The terms 'arterial streets' and 'residential streets' are used throughout this guide. (The treatments presented in this guide are intended for use only on residential streets.) The use of nearby properties determines the category into which each street belongs. The arterial street system is designed to carry the majority of the traffic through and around Las Vegas. An arterial street generally carries 1,500 to over 40,000 vehicles per day. Residential streets are designed to provide access to and from individual homes to destinations via the arterial system and generally carry fewer than 1,500 vehicles per day.

Anatomy of a street

What are the components of a street? Who 'owns' the street? Who maintains it? What are the roles and responsibilities?

Each street has an anatomy of parts, and each component has its function. Curbs, for example, perform several functions including defining the edge of the roadway, separating pedestrians from motor vehicles, and channeling excess runoff water to storm drains. Street lights increase our ability to see and be seen after dark, and in doing so increase safety. Street lights can also be used as an urban design element of the streetscape. Signs orient us to our location and warn us about upcoming obstacles or changing conditions. Utilities and sewers, though often underground, are equally important to the smooth function of streets.

A closer look at the street reveals the interplay of buildings, streets and sidewalks, and how cars, pedestrians, bicyclists and transit all fit together to make the neighborhood street function...or not.

The street is more than the sum of its parts, however. Streets are the basic framework on which a neighborhood, a city, and a region, are formed. For example:

The street right-of-way is the publicly owned area between property lines. It can include elements such as lanes for vehicle travel, parking lanes, sidewalks, street furniture, bus stops, utility poles, planting strips, and signs.

The intersection of two streets is the area where drivers, pedestrians, bicyclists and other users of the street meet and navigate the same space. Traffic control devices such as stop signs or traffic signals help define who has the right-of-way. Crosswalks and curb ramps help define the pedestrian crossing area, and make crossings easier and safer.

Sidewalks and unpaved shoulders are frequently the scene of some of the liveliest activity on the street right-of-way.

The picture on this page will help you to understand the workings and complexity of a street.

This cutaway view of a Las Vegas street shows all the activity that takes place on, around, above and under the street. Cars and trucks, pedestrians, sewer lines, utilities, street lights and street furniture, signs and numerous other functions must use and compete for space within the street right–of–way.

STREETS, LAND USE, AND URBAN DESIGN

How the design of a street affects neighborhood character and activity

Transportation and land use are closely linked. Higher density land uses make it more efficient, easier, and cheaper to provide transit service, and can attract pedestrians and bicyclists. Mixing land uses provides opportunities for living, shopping, and working in the same area, reducing the need for vehicular travel. In lower density areas, the automobile is often the only means of transportation.

The street environment is shaped by the location and design of adjacent buildings. These are controlled by land use ordinances. Buildings with blank faces on the street are unpleasant to walk along, while those that are built to the sidewalk and have windows and entrances are inviting to pedestrians. Buildings that have signs readable at driving speeds, or are separated from the sidewalk by driveways or parking lots are designed for drive-by traffic and create and automobile-oriented environment.

TRANSPORTATION CHOICES AND LAND USE

Which came first: the strip mall or the highway to carry cars to it? If that sounds like a chicken-and egg scenario, it is. The interrelationship of urban form and the street network is very closely linked. A street that favors pedestrians and walking is usually narrow, with shorter distances between crosswalks, houses and/or small storefronts, and has slow moving traffic. There may be amenities such as pedestrian-scale lighting, trees, telephone booths, and newspaper boxes. A street which favors the car features more (and typically wider) traffic lanes, great distances between crossings, large-scale commercial or retail buildings, and amenities for cars, such as curb cuts, driveways and drive-throughs, large parking lots in front of the buildings, and turn lanes. Such streets can move many cars quickly, but pedestrians and bicyclists may not be comfortable in such an environment.

Some land uses lend themselves to certain kinds of street activity and transportation choices. For example, a coffee shop with outdoor seating is a magnet for pedestrians. Customers will come by foot, bus, and bicycle to enjoy the ambience of the street while they drink their coffee. On the other hand, a car wash or gas station creates an entirely different type of environment: one that is convenient for automobile access, but difficult and undesirable for pedestrians.

The same kind of use can be designed to give priority to one type of user over others. For example a bank can be designed with a front door and a walk-up cash machine that faces directly onto the sidewalk. The same bank can be designed to favor the automobile by locating its ‘front’ door facing a parking lot. In these examples, the activities are closely tied to the patterns of transportation choice and affect the character of the streets on which they are located. These various mixes of access have profound effects on the street and on neighborhood character.

The density of residences and/or employment in an area is also an important factor in what happens on the streets. Above a minimum threshold of residential density, transit service will be

viable. Moreover, a 'critical mass' of neighborhood activity can sustain a variety of retail shops that are accessible on foot or on bicycle.

The overall activity patterns of an area are very important to understanding the roles that streets play in creating a livable city. Areas with a diverse mix of residences, shops, restaurants, and other destinations open into the evening hours will indicate the overall importance of pedestrian activity and transit service. In contrast, streets in a quiet, low-density residential area may be best suited to accommodate local traffic and deliveries. The neighborhood planning work you do with this book will be based on these kinds of distinctions.

COMMUNITIES RECLAIMING PEDESTRIAN PLACES

When Sarah Van Gelder moved to suburban Seattle with her husband and daughter, she was drawn by a seemingly affordable, family-friendly neighborhood on a hill that was a short walk to the glittering blue waters of Lake Washington. But despite being able to get occasional glimpses of the lake and having a few backyard trees, vestiges of the area's once plentiful forests, the young mother was shocked to find the suburban lifestyle anything but healthy. The nearby streets, says Van Gelder, "are a nightmare of speeding cars and congested intersections flanked by gas stations and tiny, or nonexistent, sidewalks." The beach was just a 15-minute walk away, but "the fumes from the cars roaring up the road beside the sidewalk, the danger of letting go of my daughter's hand for even a second, made the trip impossibly stressful." The curving cul-de-sacs? "I felt like a rat in a maze," she says, recalling that her quest for back streets always led nowhere, back into the main traffic arterial. Having just moved from a lively, walkable city neighborhood, where shops, parks, and conveniences were situated close by, she found street life in suburbia stultifying.

"People living next to each other for years didn't even know each other. Maybe it was because people walked directly to their garages from the house," she laughed, "never even setting foot on the street!"

Van Gelder's situation reflects the suburban life most Americans live. But if studies like those by Anton Nelessen of Rutgers University are correct, most people prefer a traditional neighborhood to the communities created by many developers today.

Using questionnaires and land-use photos, Nelessen has found that people he surveyed are attracted to open space surrounded by higher-density buildings and narrower streets than are found in most suburban streetscapes. This social dissatisfaction could be what is making the old-style Main Street new again. "People want to be able to walk again, and want a more powerful sense of community," says Peter Calthorpe of San Francisco, a leading planner among the New Urbanist designers of walkable, mixed-use developments. Such streetscapes can vastly improve quality of life, he says, while raising real estate values in the process. Among other benefits: lower crime rates, greater sense of community, better environmental quality due to lower dependence on cars, and improved health from more exercise.

A survey conducted in Las Vegas in 1999 and 2000 revealed a similar desire for more traditional neighborhoods and commercial districts. (www.questions.net/demo/lasvegas)

"People's lifestyles are intimately connected with their health — and physical design can be a key part of that," says Sarah James, an architect/planner in Cambridge, Mass. "That extends from feeling comfortable walking down a street to feeling physically safe and less vulnerable to street crime."

Adapted from an Internet article by Francesca Lyman, courtesy MSNBC.

WHAT IS TRAFFIC MANAGEMENT? WHY HAVE A NEIGHBORHOOD TRAFFIC MANAGEMENT PLAN?

Traffic management is a process for identifying and addressing problems related to speeding, excess traffic volume, and safety on streets. The practice of using roadway geometry to improve safety has come to be known as traffic calming. Speed bumps, curb bulbs, and other combinations of geometry, landscape, and street furniture can be effective in lowering drivers' speed on local streets.

Traffic management and traffic calming: what's the difference?

Although they are sometimes lumped together, traffic management and traffic calming are different tools and address different problems. Traffic management includes the use of traditional traffic control devices to manage volumes and routes of traffic. Traffic calming deals with what happens to traffic once it is on a street. For example, limiting access to a street (e.g., diverting traffic from entering a street on one end) may reduce the amount of traffic on that street, but will do nothing to affect the speed of the traffic that travels on that street or others. Traffic management and traffic calming are often complementary, and a plan to retrofit an area often includes a variety of tools.

Communities should think about the broader context of traffic. If there is too much traffic on any one street, it may be that there is too much traffic everywhere. A more significant plan to reduce overall traffic volumes would be appropriate: encouraging and providing for alternate modes of travel, implementing transportation demand management, enhancing transit systems, and improving land use planning. Comprehensive traffic reduction or mitigation strategies are important but beyond the scope of this guide. Resources that provide guidance on these issues are included in the reference section.

Livable Las Vegas

Most neighborhood groups undertake a traffic management program because they are seeking a more livable community. A livable community is one that is safe, secure, and attractive, where it is easy to travel by bicycle, car, transit, or on foot. In a livable community, there are many opportunities to interact with other people because the streets are pleasant places to walk and socialize.

Traffic calming addresses the following measures of livability:

- **Access and mobility**: Safer streets balance mobility and access for all users, particularly for those who travel by non-motorized means, like pedestrians and bicyclists. This is especially important for children, the disabled, and the elderly.
- **Quality of life**: Traffic calming improves 'livability' by reducing the number of automobile trips taken, thereby decreasing levels of pollution and traffic-related noise. Traffic calming devices can provide additional space within the street right-of-way for landscaping, street furniture and outdoor eating areas, and transit shelters. These amenities create pleasing

streets that attract pedestrians, encourage people to walk more frequently for short trips, and increase the likelihood of interactions among neighbors.

- **Safety**: Traffic travels slowly on traffic-calmed streets, resulting in fewer and less severe accidents. The number of fatalities due to motor vehicle crashes is also reduced on streets with slower-moving traffic. In fact, streets where traffic management or traffic calming is at work are proven to be safer than other streets in a variety of ways, as shown below.

STREET DESIGN AND SAFETY

Setbacks, street walls, and speeds

When buildings are set back far from the street edge, the roadway appears to be very wide. This often results in excessive vehicle speeds. Buildings that are adjacent to the sidewalk create a 'street wall' that frames the street and narrows the driver's field of vision. Taller buildings placed

This pharmacy in Las Vegas is set back far from the street, in a parking lot.

both—Tom Phillips, townmeetingdirect.com

This grocery store in San Diego is next to the sidewalk, creating a street wall and contributing to a pedestrian–friendly environment.

close together create a solid street wall and give the street a sense of enclosure. Pedestrians tend to feel more comfortable walking on streets with a sense of enclosure. How wide are your neighborhood streets? Is there sense of enclosure?

A recent community vision survey for Las Vegas showed that the most popular images were those showing tree-lined streets in residential areas, and commercial buildings close to the street in business districts (as shown in the photograph above at right). Both trees and buildings contribute to the sense of enclosure.

Drivers will drive faster on wider, straighter streets than on those that are perceived to be narrower. In a recent study in the city of Longmont, Colorado, the most significant relationships to injury accidents were found to be street width and street curvature. The analysis illustrates that as street width increases, accidents per mile per year increase exponentially.

(Peter Swift and Associates, Longmont, CO, 1998. From their website: http://members.aol.com/Phswi/Swift-street.html).

Safety and driver behavior

Field of vision at 15 mph...

...at 25 mph...

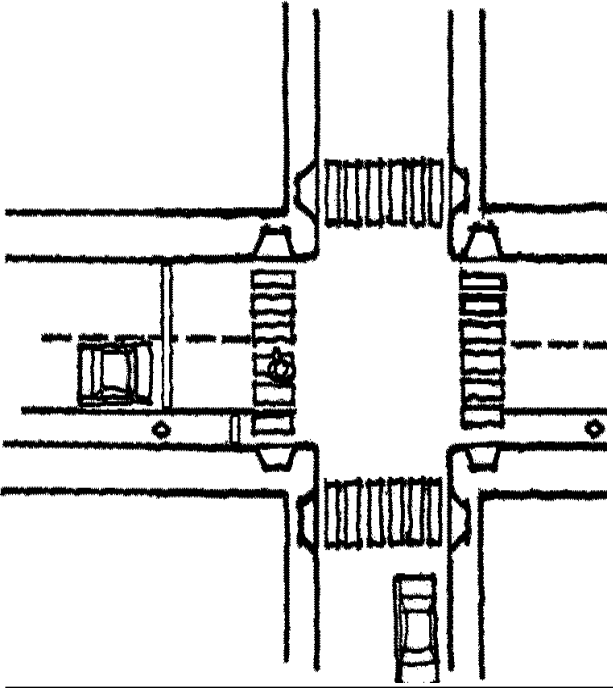
...at 30 mph.

Maintaining slower speeds allows drivers to be more aware of their surroundings. The series of pictures above shows how a driver's field of vision is reduced as he or she increases the speed of the vehicle being driven. The setting for these pictures is a busy street in a commercial district. Shops and residential buildings line both sides of the street. At 15 miles per hour (mph), the driver can see that he or she must share the road with pedestrians and bicyclists. At 25 mph, the driver's field of vision is greatly reduced, and at 30 mph all the driver sees clearly is the roadway in the distance.

Streets and life safety

Another area of concern often expressed by those dealing with the subject of traffic management and traffic calming is maneuverability and response time for emergency vehicles, typically fire trucks. A recent report shows that many kinds of traffic calming devices and strategies can work effectively and still permit unimpeded access for these vehicles. (Emergency Response, Traffic Calming and Traditional Neighborhood Streets. Local Government Commission, Sacramento, California, 2000.)

Related to this theme, communities must also decide their safety priorities when designing their streets and undertaking traffic management and traffic calming programs. While fire rescue is of primary importance, so is the prevention of injury and death on neighborhood streets. Fire safety is but one part of the larger picture of life safety. And in residential neighborhoods, the biggest threat to life safety, by a very large margin, is car accidents. Indeed, if wider streets with wider turning radii are actually contributing factors to increases in accidents and injuries, as current research indicates, perhaps it is time to reconsider priorities for public safety when designing streets and traffic management programs.



Michael Kimelberg

4

TOOLS AND DEVICES: DESIGNING A NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

PLANNING FOR YOUR STREETS

Now that you have been introduced to some of the basic concepts about streets, you are ready to develop a traffic management program as part of an overall program to make your community more livable.

Las Vegas' Neighborhood Traffic Management Program

The City of Las Vegas adopted a neighborhood traffic management program for residential streets in 1995. The program represents the commitment of the City of Las Vegas and its Department of Public Works to the safety and livability of Las Vegas' neighborhoods. See the appendix of this book for details on Las Vegas' neighborhood traffic management program.

LAS VEGAS' NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM OBJECTIVES

- Improve neighborhood livability by mitigating the impact of vehicular traffic on residential neighborhoods
- Promote safe and pleasant conditions for all users of neighborhood streets.
- Encourage citizen involvement in all phases of neighborhood traffic management activities
- Make efficient use of city resources by prioritizing traffic management requests.
- Support policies contained in the comprehensive plan.

The planning process—where are we now, where do we want to be, and how do we get there?

While this guide can be used by individuals as a reference for understanding streets, it will be most effective when used as part of a larger plan involving many people. That plan can be for a single block, or the streets of an entire neighborhood; it can focus on a single issue, such as the design of a

street, or cover issues other than streets.

Making choices about the design of and possible changes to streets is a form of planning. Planning offers a way to solve problems, balance differing points of view, and set and achieve goals. Planning is also a cyclical process, in which ideas are tested against goals and actual conditions to find the best solutions. Neighborhood planning involves working closely with others in your community, as well as professionals in government and the private sector.

Getting started

Where should you begin investigating potential traffic safety problems? Which areas should be identified? What can you do to improve the quality of life in your neighborhood? What are sources of data that you can use to begin studying your community? Whom should you contact to get more information? This chapter will help you answer these questions and take you through the process of preparing a traffic management plan for your neighborhood.

Will traffic management work in my neighborhood?

Traffic calming and other traffic management strategies can work in most neighborhoods. Communities that are organized, active, and motivated are most likely to design and carry out effective traffic management programs. Communities with a capacity to develop a plan for their future and work together to carry it out are likely to find and solve traffic problems. Strong communities where people look out for each other and place a high value on the quality of their neighborhood have what it takes to set up and carry out a traffic calming program.

Traffic management is a process as much as a product. Because traffic management is a relatively new idea in Las Vegas, most people do not understand its benefits. Many people would rather live with what they have than entrust their future to an unknown idea or plan. Because people who live within a neighborhood have the ability to generate widespread support, they are in a better position to make changes to their street. For traffic management to be accepted, a majority of the people living in the area must be in favor of the program. Typically, 60 to 75% approval from neighbors is sought by the city in order to begin a traffic management project.

The process works best if many people are involved: your neighbors, students and staff from nearby schools, local business owners and employees, city staff, representatives from police and fire agencies, and anyone else who uses neighborhood streets on a regular basis.

Reach out

Get everyone involved. A good plan is one on which the entire neighborhood and the city can have consensus. Develop a process for frequent and open meetings and plenty of opportunities for public involvement to suit all age levels, abilities, and interests.

Identify groups or individuals whom you are likely to be working with. Include those who may be opposed to your project!

What organizations currently exist to serve your neighborhood? Are there new ones to be formed?

What are the issues facing your neighborhood?

Who are your contacts with city and regional government? How is your neighborhood connected (formally or informally) with these agencies? What are the roles?

The neighborhood charrette

One good way to get people involved is to hold a neighborhood design workshop, also called a charrette. It is an intensive, fast-paced, highly interactive workshop where everyone's ideas, hopes, and issues about the neighborhood are expressed, and then organized by the charrette leaders into a clear action program for future work.

Charrettes work best when they involve as many members of the entire community as possible. The activities that take place during a charrette draw out issues and problems and help people to identify practical solutions, or longer-term approaches to problems. The priorities and projects coming out of a charrette will form the framework of your traffic management program.

THE NEIGHBORHOOD CHARRETTE

1. Find a location—Select a time and a place in a location that is easy to get to. A good rule of thumb is to select a place that can be reached easily by someone in a wheelchair. Make sure the room is large enough, has plenty of tables and chairs, and can be darkened to show slides.

2. Invite people—Work with your city staff contacts as well as neighborhood friends and groups to advertise the charrette. Invite your neighbors. Phone calls, fliers, and announcements at meetings are good ways to spread the word. On the day of the charrette, post signs to direct people to the right room. Have nametags and something to eat or drink. Encourage people to sign in so you can compile a mailing list to inform people of the progress of your project.

3. Show slides—Begin the program with a slide show of traffic management treatments that explain how traffic management can make communities more livable.

4. Identify the problem—Following the slide show, invite people to describe their street-related problems. Have someone from the group be a 'scribe,' that is, record everyone's observations on a flip chart. Post the lists on a wall.

5. Vote—After everyone has had a chance to speak, give each participant up to ten colored dot stickers and ask them to place dots on the statements that describe their highest priorities.

6. Work—Following the voting, ask the participants to assemble in small groups of six to eight participants. Each group gets a large-scale map of the study area. The group should take 30 to 60 minutes to identify (on the map) solutions to the problems the entire group has identified in the previous exercise. A scribe takes notes and a group leader is appointed to help keep the group focused on the task. The group leader summarizes the results of the exercise.

7. Present—Each table sends a presenter to describe the team's issues and solutions. Typically, the audience begins to realize that many of the groups are in agreement on key issues. The overall design team can work out any areas of disagreement later.

DEFINING THE PROBLEM

Define and describe a neighborhood vision

Streets are public places and are used by many people over the course of an average day. By working together, neighbors can define a successful street environment for their neighborhood—how the streets should function, and how they should look. These descriptive terms for the character of the neighborhood and its streets form the core of a neighborhood vision.

City of Las Vegas Dept. of Public Works

Neighborhood visions for Las Vegas

These are some of the responses given by residents of Las Vegas neighborhoods when asked to describe a vision for their neighborhood ten years from now:

General character

- A destination, and a place to enjoy
- Quiet
- Well-kept
- Walkable
- Safe for everyone
- A good place to raise children
- Stable

Community involvement

- More involved neighbors with better participation
- Great sense of community pride
- Neighbors knowledgeable of neighborhood history and context

Physical appearance and land use

- Attractive landscaping
- Single family homes and long-term resident homeowners who care for their homes
- No more busing, but neighborhood schools

Safety

- Better lighting
- More police presence
- Safer school bus stops

Transportation and access

- Less traffic, especially less cut-through traffic
- Traffic calming on busier streets
- Slower traffic

- Better signage and traffic control, with traffic regulated to 15-25 mph
- A better way to reach the nearby shopping center, by foot or by car
- Re-use of recreational trails
- More entry and exit points to and from the neighborhood

Take stock of your streets: inventory, problem areas, and type of problem

Once you have agreed on your vision for the neighborhood and its streets, the next step is to inventory what is there now. For streets, there are two important components to this step—identifying the local street network, and the neighborhood streets' role in the larger transportation network. To help define those roles, every street in the city has been assigned a street classification. Your street's classification will, in part, suggest the tools that may be appropriate and the options available for traffic management and street redesign.

Map your neighborhood

Exercise: Define and describe your neighborhood. Show how it is connected to other parts of the city and region.

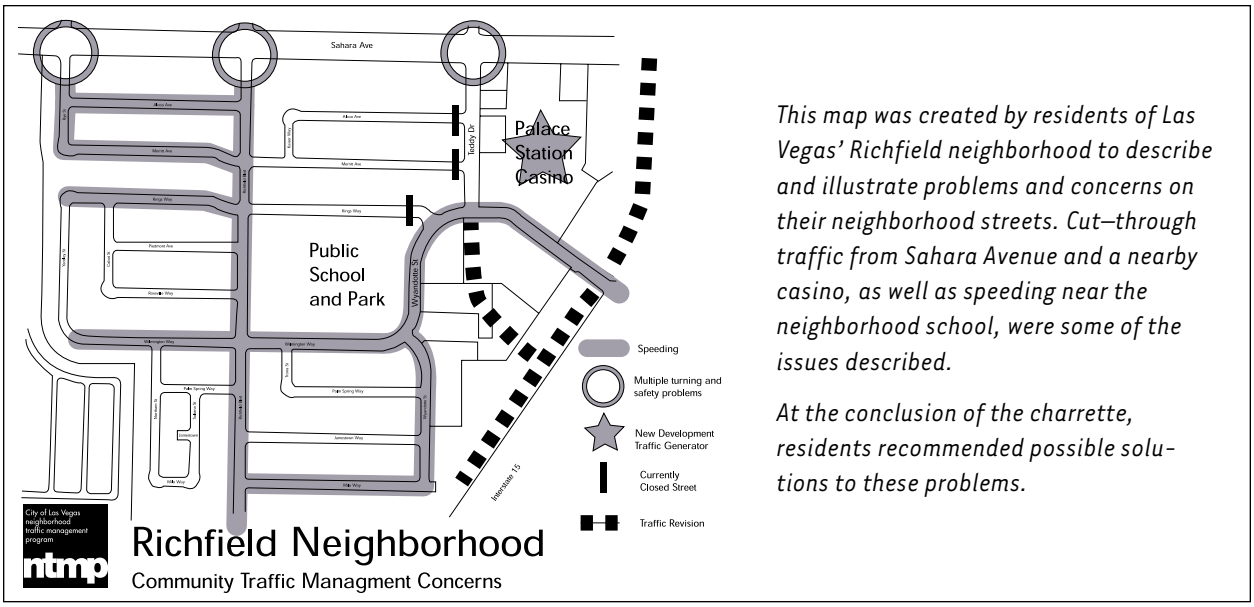
Identify neighborhood boundaries, landmarks, major institutions and sites, general land uses. What are the major destinations? Identify supermarkets or shopping centers, library, post office, schools, places of worship, businesses, and gathering spots. How do people travel to these places? At what times of day or days of the week? How do they get there?

Diagram your street(s)

Start with basic features, such as the width of the street right-of-way, intersection dimensions (are the turning radii large or small?), number of lanes (how wide are the lanes? are they marked?), and adjacent land uses (e.g., residential, institutional, commercial). Show physical characteristics, such as the width of the sidewalk and planting strip, how the lane by the curb is used (for parking? loading?), locations of streetlights, and landscaping, if any.

Residents of the Richfield neighborhood participating in a neighborhood charrete.

Diagrams can also show relevant traffic information, such as traffic volumes and speeds, peak hours of travel, turning patterns, collision history, conflicts, transit and bicycle routes and volume, freight use, and pedestrian patterns and volumes. Traffic 'bottlenecks' or particularly busy intersections can be indicated. You may need several diagrams to show this information, along with how your street fits into the larger urban transportation network. See the sample from Las Vegas' Richfield neighborhood on the next page. Be sure to describe problems/issues objectively.



This map was created by residents of Las Vegas' Richfield neighborhood to describe and illustrate problems and concerns on their neighborhood streets. Cut–through traffic from Sahara Avenue and a nearby casino, as well as speeding near the neighborhood school, were some of the issues described.

At the conclusion of the charrette, residents recommended possible solutions to these problems.

Analyze results

Ask questions! What works well now? What does not work well? Can pedestrians walk along the streets and cross safely? Is there a sidewalk, and is it in good repair? Is visibility good for pedestrians, drivers, and bicyclists? Does traffic flow smoothly at speeds appropriate for the neighborhood? Is there enough room for trucks (including emergency vehicles) to maneuver safely, and at intervals of 300 feet or less? Do all signs and signals function as they should? Are bus stops attractive and safe? Can bicyclists travel through the area safely and easily? Is the street freely accessible for people with disabilities? Is the street attractive and free of litter? Does it display the quality and character of the neighborhood? Are there adequate lighting and drainage? Are noise levels acceptable? Is there landscaping? Is it healthy, appropriate to a desert climate, and located in the correct places?

Make a plan

This next step is one of the most critical. It is time to match your vision with a plan, one that is informed by the challenges posed by your street and neighborhood inventory, and is also realistic in the time frame and budget you have allotted.

Examine the devices in this chapter for how they might help you and your neighborhood achieve your vision for your streets. Each device description includes advice on the general situation in which that device would be appropriate, but whether or not a device is appropriate ultimately depends on the specific circumstances of a location.

Once potential street improvements have been identified, you will need to work with your city representatives to determine the devices' feasibility at the selected sites. It is important to con-

sult with city staff early in your street program, to ensure that your street improvement program is consistent with existing traffic regulations and requirements.

DO NOT SHIFT THE PROBLEM

We've already mentioned that every street is part of a larger network. And a basic scientific principle states that "every action has a reaction." So what happens if you design a neighborhood street improvement? Well, chances are that unless it is designed properly and takes other streets and adjoining neighborhoods into account, your street improvements are going to be someone else's traffic problems.

Don't shift the problem. If access is limited on a busy street, or if a residential street is closed, the traffic will not go away, it will just go somewhere else. Examine how the improvements you are recommending affect adjacent streets and neighborhoods. If your neighbors will be negatively affected by a proposed street improvement, it is time to think about another solution. As we stated earlier, sometimes too much traffic on one street means too much traffic everywhere, which means it is time to think about region-wide solutions and transportation alternatives.

Build consensus early. If you have a street improvement project that you think would be of great benefit to your neighborhood, make sure to ask others in your community if they support your plan. Building consensus among your neighbors is essential. Including your neighbors NOW will help you in the future as you begin to take the steps necessary to get a street improvement approved and constructed. In many cases the city will require a neighborhood vote on a street improvement. Make sure that those most directly affected by your proposed street project(s) are consulted.

Take responsibility. Some of your street's problems could be solved through working with your neighbors to care for and maintain the streets in your neighborhood. Encourage your neighbors to make sure that the planting strip and sidewalk in front of their property is clean and in good repair. Maintenance of traffic bulbs, circles, and sidewalk planters is the responsibility of the neighborhood. Share ideas about how your block can work together and take responsibility to improve the streets in your area.

MOVING TOWARD SOLUTIONS

Symptoms and potential solutions

The chart on the following page will help you to analyze the symptoms you are experiencing on your streets and identify a course of action. These pages ask you to think about some experiences you may have had on the streets in your neighborhood. The symptoms you experience are keyed to a particular family of solutions. You may find that addressing one symptom may require devices from more than one solution family.

DEVICE	VEHICLE VOLUME	VEHICLE SPEED	NOISE
CHICANES AND ANGLED SLOW POINTS	↓	↓	↓
CHOKERS	↓	↓	↓
CROSSING ISLANDS		↓	↓
CROSSWALK MARKINGS			
CURB EXTENSIONS		↓	
DIVERTERS	↓	↓	↓
FULL STREET CLOSURE	↓	↓	↓
GATEWAYS	↓	↓	
INTERSECTION MEDIAN BARRIERS			
MODERN ROUNDABOUTS		↓	↓
ONE–WAY / TWO–WAY STREET CONVERSIONS	↑	↑	↑
PARTIAL STREET CLOSURE	↓		↓
RAISED MEDIANS		↓	↓
ROAD SIGNS			
SERPENTINE STREET	↓	↓	↓
SPEED HUMPS AND SPEED TABLES	↓	↓	↑
SPEED MONITORING TRAILER		↓	↓
TRAFFIC MINI–CIRCLES		↓	↓
TWO–WAY TURN LANES		↓	

VEHICLE CONFLICTS	TRAFFIC DIVERTED TO RESIDENTIAL STREETS	PEDESTRIAN/ BICYCLE SAFETY	EMERGENCY/SERVICE VEHICLE ACCESS	RECOMMENDED FOR
↓	↑	↓	↓	residential streets
	↓	↑	↓	residential streets
↓	↑	↑	↓	arterial streets
		↑		both
	↑	↓	↓	both
↓	↓	↑	↓	residential streets
↓	↑	↑	↓	residential streets
↓		↑	↓	both
↓	↑	↑	↓	both
↓		↑		arterial streets
↓	↑	↑	↓	arterial streets
↓	↑	↑		residential streets
↓	↑	↑	↓	both
↓				both
		↑	↓	residential streets
		↑	↓	residential streets
				both
↓		↑		residential streets
↓			↑	arterial streets

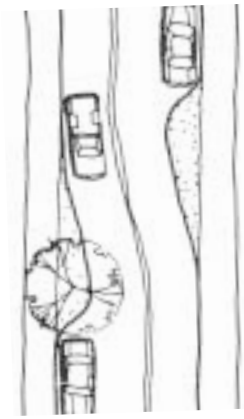
A LIST OF TRAFFIC MANAGEMENT DEVICES

Traffic management: balancing modes

There are many competing demands placed on a city's streets. Each transportation mode places demands on the street system. Sometimes these demands conflict. For example, curb extensions shorten the crossing distance for pedestrians at an intersection. They also reduce the speed at which vehicles can turn at an intersection. For these reasons, curb extensions make intersections safer for pedestrians. Curb extensions also require buses or trucks to maneuver more slowly around turns. If the intersection you are examining is used by many turning trucks or buses, this will factor into how wide the extensions can be or if another type of treatment is more appropriate. The 19 devices described in this chapter can be used either alone or in combination to accommodate many users of our roadways. Keep in mind that traffic management programs are most successful when they have the involvement and support of local communities.

CHICANES AND ANGLED SLOW POINTS

The chicanes pictured here narrow this residential street to one lane and require traffic to move slowly.



Definition:

Chicanes and angled slow points usually consist of a series of bulb-outs or curb extensions, narrowing the street to two narrow lanes or one lane at selected points and forcing motorists to slow down to maneuver between them. Such treatments are intended for use only on residential streets with low traffic volumes. These treatments can be gentler or more restrictive depending on the design and the operational needs of the street. Angled slow points divert the path of travel plus restrict lanes (as described under Chokers).

Benefits:

Chicanes and angled slow points reduce vehicle speeds as long as the taper is significant enough so that motorists must slow down to travel through the device. Shifts in travelways can be created by shifting parking from one side to the other (if there is only space for one side of parking), or by building landscaped islands. If the device does not restrict the number of lanes, chicanes can be created on streets with higher volumes. Chicanes also provide an opportunity for landscaping.

Consider this:

- Chicanes may reduce on-street parking.
- Maintain good visibility by planting only low shrubs or trees with high canopies. (Use the desert planting guide on pages 49-50.)

Share the road:

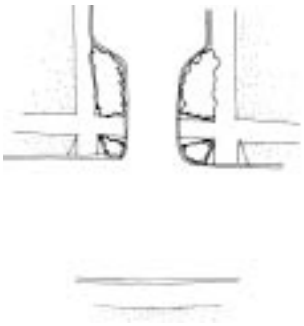
As with all traffic management devices, chicanes and angled slow points must be designed to accommodate bicycles.

Estimated cost:

Costs for landscaped chicanes are approximately $40,000 (for a set of 3 chicanes) on an asphalt street and $60,000 on a concrete street. Drainage may represent the most significant cost consideration.

CHOKER

Chokers create a clear transition between a commercial and a residential area, narrow an overly wide intersection, add room along the sidewalk or planting strip for landscaping and reduce cut-through traffic.



Definition:

Chokers are curb extensions that create a pinch point along the street by widening the sidewalks or planting strips. Chokers can be created by bringing in both curbs, or they can be done by more dramatically widening one side at midblock locations. They can also be used at intersections, creating a gateway effect when entering a street.

Benefits:

Chokers can have a dramatic effect by reducing a two-lane street to one lane at the choker point, requiring motorists to yield to each other. In order for this to function effectively, the width of the travelway cannot be wide enough for two cars to pass.

Consider this:

- If two travel lanes are maintained on a two-way street and/or the travel lane widths are unchanged and do not narrow at the location of the choker, it will have a minimal effect on speed.
- This kind of design is usually only appropriate for low volume, low speed streets.

Estimated cost:

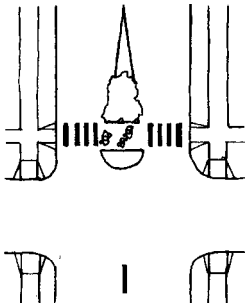
$10,000 to $40,000 depending on site conditions and landscaping. Drainage may represent a significant cost.

Share the road:

As with all traffic management tools, design chokers to allow bicycle access.

CROSSING ISLANDS

This crossing island in the Uplands neighborhood allows pedestrians to deal with only one direction of traffic at a time, stopping part way across the street and waiting for an adequate gap in traffic before crossing the other half of the street.



Definition:

Crossing islands—also known as center islands, refuge islands, or pedestrian islands—are raised islands placed in the center of the street at intersections or midblock. They highlight the crossing for both pedestrians and drivers, and create a safe refuge in the middle of the street for pedestrians particularly at unsignalized crossings.

Benefits:

Crossing islands have been shown to decrease the percentage of car-pedestrian crashes and casualties by 57%–82%. Benefits for pedestrian safety include reduced conflicts, reduced vehicle speeds approaching the island, greater attention called to the existence of a pedestrian crossing, opportunities for additional signage in the road, and reduced exposure time for pedestrians.

Consider this:

- Crossing islands are designed to deviate the travel lane around the island. The approach can be designed to force a greater or lesser slowing of cars, depending on how dramatic the curvature is. The deviation and roadway markings alert motorists that they are in a location where pedestrians may be crossing, and encourage them to reduce speeds.
- Curb extensions may be built in conjunction with crossing islands where there is on–street parking,
- Illuminate or highlight islands with signs and reflectors to ensure that motorists see them.
- Design islands to accommodate those in wheelchairs.
- Crossing islands at intersections or near driveways may affect left turn access.

Estimated cost:

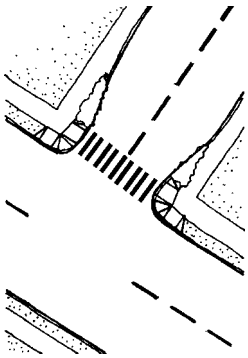
The cost for installing a raised concrete crossing island (with landscaping) is about $20,000 to $40,000. The cost is less for an asphalt island or one without landscaping.

Share the road:

Bicycle lanes (or shoulders) must not be eliminated or squeezed in order to create the islands.

CURB EXTENSIONS

Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance, improving the ability of pedestrians and motorists to see each other, and reducing the time that pedestrians are in the street.



Definition:

Curb extensions extend the sidewalk or curb line into the parking lane, reducing the effective street width. They can be used at intersections and at mid-block locations.

Benefits:

Curb extensions reduce turning speeds at intersections and encourage motorists to travel more slowly. They encourage pedestrians to cross at designated locations and increase the visibility between the pedestrian and driver by extending the curb and sidewalk further out into the street and in the driver's line of vision. Curb extensions at intersections prevent motorists from parking in or to close to a crosswalk, or from blocking a curb ramp. They can be used to place landscaping and street furniture, which is especially beneficial where sidewalks are otherwise too narrow.

Consider this:

- Curb extensions should be used where there is a parking lane.
- If street furniture and landscaping are used with a curb extension, they must not block motorists' views of pedestrians.

- Where intersections are used by significant numbers of trucks or buses, the curb extensions need to be designed to accommodate them. However, it is important to take into consideration that those vehicles should not be going at high speeds, and most can make a tight turn at slow speeds. Keep in mind that speeds should be slower in a pedestrian environment.
- Emergency access is often improved through the use of curb extensions, as intersections are kept clear of parked cars. Emergency vehicles can climb a curb where they would not be able to move a parked car. At mid-block locations, curb extensions can keep fire hydrants clear of parked cars and make them more accessible.

Share the road:

Curb extensions work best for bicyclists in locations where transit and cyclists travel outside the curb edge for the length of the street. They must not extend into travel lanes, bicycle lanes or shoulders.

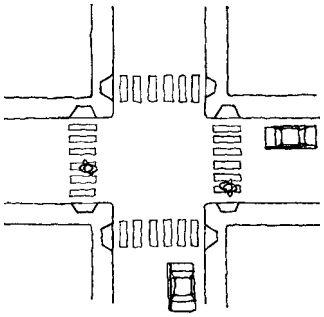
Estimated cost:

Curb extensions cost from $10,000 to $40,000 per corner, depending on design and site conditions. Special paving, drainage and moving existing signal equipment to accommodate a curb extension contribute to the cost.

This curb extension at an intersection in Venice, Florida, makes the crossing shorter for pedestrians and creates a space for landscaping.

Dan Burden

CROSSWALK MARKING



Definition:

Legal crosswalks exist at all intersections, but they are not always marked by signs or pavement markings. Crosswalks can be marked at intersections and at midblock locations. Crosswalks are usually marked lines, either two parallel lines or a ladder-type pattern. They can also be textured or made of colored concrete. Midblock crosswalks are accompanied by signs or flashing beacons.

Benefits:

Marked crosswalks alert motorists that they are approaching a high pedestrian location, and guide pedestrians to a safer crossing. A marked crosswalk also identifies a preferred crossing for the pedestrian, one that optimizes sight distance, reduces crossing distance, and reduces the potential for pedestrian/vehicle conflicts.

Consider this:

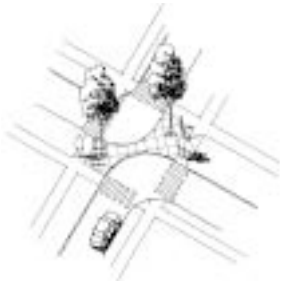
- Marked crosswalks work best if they are used by a high number of pedestrians at intersections.

Estimated cost:

The cost for a regular striped crosswalk is $100, $300 for a ladder crosswalk, and $3,000 for a patterned concrete crosswalk.

DIVERTERS

By eliminating direct passages through a neighborhood, communities can ensure that through traffic remains on the appropriate roadways. This treatment is best used as part of an overall neighborhood traffic management plan.



Definition:

A diverter is an island built across a residential street intersection that prevents certain through and/or turning movements. A diagonal diverter breaks up cut-through movements and forces right or left turns in certain directions. A star diverter consists of a star-shaped island placed at the intersection which forces right turns from each approach. A truncated diagonal diverter is a diverter with one end open to allow additional turning movements.

Share the road:

Design diverters to allow bicycle access. If this cannot be done and the street is a major bicycle corridor, a diverter should not be used.

Benefits:

The main benefit of diverters is to discourage traffic from cutting through a neighborhood. Diverters must be used in conjunction with other traffic management devices. Any of these diverters can be designed for bicycle and pedestrian access.

Consider this:

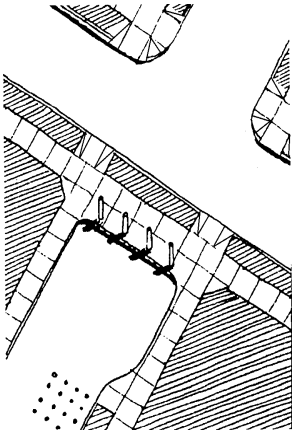
- Diverters impact residents more than through traffic, so they must have strong neighborhood support to be successful. Consider less restrictive measures first.
- Evaluate traffic patterns to determine whether other streets would be adversely affected.
- Diverters generally do not effectively address midblock speeding problems.
- Consideration should be given to diverters' effect on emergency and service vehicles.

Estimated cost:

$30,000-$60,000 each, depending on the type of diverter.

FULL STREET CLOSURE

Access is temporarily closed to this Las Vegas residential street.



Definition:

A full street closure, including cul-de-sacs, has a physical barrier that blocks the street to motor vehicle traffic.

Benefits:

This device creates the ultimate limitation of motor vehicle traffic to certain streets. If used, it should be designed so that emergency vehicles can access the street by using a barrier or gate that permits large vehicles to traverse it but not automobiles. Examples are mountable curbs or an access way with a raised element in the center that a low vehicle would hit.

Consider this:

- Full street closures should be used in the rarest of circumstances and as part of an overall traffic management strategy. Neighborhoods with cul-de-sac streets require extensive out-of-the-way travel, which is both a convenience issue for local residents and typically has significant negative impacts to other streets. All traffic is forced to travel on feeder streets, which has negative consequences for the people who live on those streets and forces higher levels of controls at critical intersections.

- Analyze whether other streets would receive diverted traffic as a result of the street closure, and whether alternative streets exist for through traffic.
- Provide a turn-around area for motor vehicles including service vehicles and provide for surface drainage.
- This device will not address speeding problems.
- Full street closures may be considered for local streets but are not appropriate for collector streets.
- Does not adversely affect access by children to community areas.
- Not an appropriate measure for addressing crime or other social problems.

Share the road:

If a street closure is done, it should always allow for the free through movement of pedestrians (including wheelchair users) and bicyclists.

Estimated cost:

The cost for a full, landscaped street closure varies from approximately $30,000 to $100,000, depending on conditions.

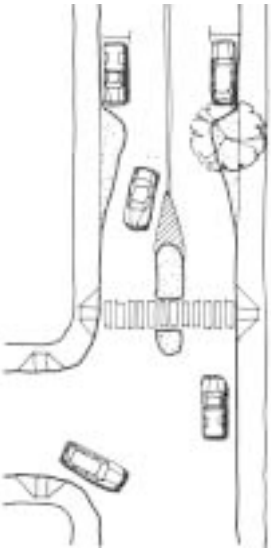
Note: See "City of Las Vegas policy for the closure of residential streets" in the appendix to this book.

In Phoenix, this full street closure is accompanied by bollards and landscaping.

Dan Burden

GATEWAYS

Gateways, such as this landscaped median and circle, create a unique image for an area and send a clear message to motorists that they have reached a specific place and must reduce speeds.



Definition:

A gateway is a physical landmark that indicates a change in environment from a higher speed road to a lower speed residential or commercial district. Gateways may be a combination of street narrowing, medians, signing, archways, roundabouts or other identifiable features.

Benefits:

Gateways create an expectation for motorists to drive more slowly and watch for pedestrians where traffic enters a commercial business or residential district from a higher speed roadway. Gateways are only an introduction and slower speeds are not likely to be maintained unless the entire area has been redesigned or other traffic calming features are used.

Consider this:

- Traffic slowing effects will depend upon the device chosen and the overall traffic calming plan for the area.

Share the road:

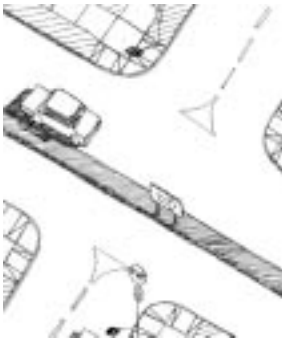
Design gateway features to ensure bicycle safety and access.

Estimated cost:

Varies widely depending on measures chosen.

INTERSECTION MEDIAN BARRIERS

Intersection median barriers reduce cut-through traffic and restrict vehicle movement onto neighborhood streets.



Definition:

A shorter version of a raised curb median placed in the center of the roadway across the intersection, an intersection median barrier prevents traffic from traveling through the intersection or making left turns onto the main street.

Benefits:

By restricting through and turning movements, this device reduces the number of conflict points for a pedestrian at the intersection. It also reduces cut-through traffic by restricting vehicles from entering neighborhood streets.

Consider this:

- The barriers that keep cut-through traffic out of your neighborhood will also restrict your access. Consider local access needs to make sure that any diversion is acceptable to the community.
- An analysis of traffic patterns should be done to ensure that cut-through traffic would not be diverted to a nearby street.
- Ensure that emergency access is not negatively impacted. Some designs (e.g. high mountable curbs) may allow fire truck access while inhibiting cars.

Estimated cost

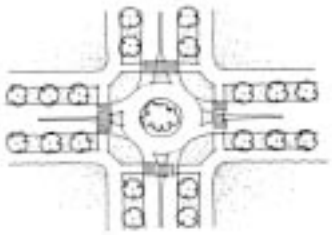
$20,000 - $40,000

Share the road:

Create a barrier free cut–through for cyclists and pedestrians to ensure safe, convenient bicycle and pedestrian access.

MODERN ROUNDABOUTS

Modern roundabouts create gateways into a neighborhood while slowing speeds at large, complicated intersections. They can replace signalized intersections at locations with heavy traffic backup and congestion.



Definition:

A modern roundabout is a large, circular, raised island located at the intersection of an arterial street with one or more crossing roadways. Splitter islands at the approaches slow vehicles and allow pedestrians to cross one lane at a time. Roundabouts may take the place of a traffic signal. Traffic maneuvers around the circle in a counter-clockwise direction, and then turns right onto the desired street. All traffic yields to motorists in the circle and left-turning movements are eliminated.

Benefits:

Unlike a signalized intersection, vehicles generally flow and merge through the roundabout from each approaching street, traveling at slower speeds, and yielding to traffic already in the circle. Vehicles are not required to stop and wait for a signal where long traffic queues can form and create congestion, including blocking access to side streets. A roundabout needs to accommodate pedestrians and bicyclists. Pedestrians may need to travel out of their way to cross the intersection, but generally have a shorter wait than with a signal and have only one direction of approaching traffic to watch for. The large circular island at the center of a roundabout provides space for entry markers, gateway features and landscaping.

Consider this:

- Street width or right-of-way must be sufficient to accommodate a properly designed roundabout.
- Roundabouts have a mixed record regarding bicyclist safety—low design speed required.
- Roundabouts are generally not appropriate if traffic volumes are extremely high.
- Roundabouts often work best where there is a high percentage of left-turning traffic.
- Deflection on each leg of the intersection must be set to control speeds to 15-18 mph.
- Visually impaired people have difficulty crossing at roundabouts. This issue needs to be adequately addressed in the design of roundabouts.

Share the road:

Bicyclists usually have a difficult time with roundabouts. Unless the road is very narrow (one lane in each direction), speeds very slow, and traffic very light, bicyclists may not be able to share the road comfortably. In larger roundabouts, an off-road bicycle path should be created to direct cyclists to follow the pedestrian route; while this is usually inconvenient and takes longer, it is generally safer.

Estimated cost:

The cost for a landscaped roundabout varies widely and can range from $100,000 – $250,000.

In Las Vegas, several roundabouts have been constructed in the Summerlin area.

ONE-WAY/TWO-WAY STREET CONVERSIONS

This one-way street also includes a parking lane and a bike lane.

Definition:

Converting the flow of traffic on a street from two-way to one-way to manage traffic patterns and reduce conflicts, or from one-way to two-way to reduce speeds.

Benefits:

A one-way to two-way conversion will generally reduce speeds. One-way streets can simplify crossings for pedestrians, who must look for traffic in only one direction. While studies have shown that conversion of two-way streets to one-way generally reduces pedestrian crashes, one-way streets tend to have higher speeds, which creates new problems. If a street is converted to one-way, it should be evaluated to see if additional changes should be made, especially if the street or lanes are overly wide. Also, traffic circulation in the broader area must be carefully considered before conversion to one-way streets. As a system, one-way streets can increase travel distances of motorists and create some confusion, especially for non-local residents. One-way streets operate best in pairs, separated by one block to no more than one-quarter mile. Conversions can go the other way as well: some places are returning one-way streets back to two-way to allow better local access and to slow traffic. Two-way streets tend to be slower due to traffic 'friction,' especially on residential streets without a marked centerline.

Consider this:

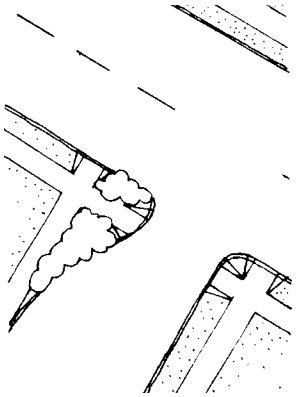
- Consider impacts on other streets.
- Be careful not to create speeding problems where a two–way street is changed to a one–way street. Redesign or traffic calming measures may be required to address this.

Estimated cost:

$20,000–$200,000 depending on length of treatment and if the conversion requires modification to signals.

PARTIAL STREET CLOSURE

This partial street closure in Las Vegas allows vehicles to exit from the neighborhood street but not to enter.



Definition:

A partial street closure involves physically closing or blocking one direction of vehicle travel into or out of an intersection. It could also involve blocking one direction of a two-way street.

Benefits:

Partial closures prevent turns from an arterial street onto a residential street. They also reduce the use of the street as a cut-through route and restrict access to a street without creating one-way streets. A partial closure provides better emergency access than a full closure. Since this design allows motorists to easily violate the prohibitions, police enforcement may be required.

Share the road:

The design of this measure should allow for easy access by bicyclists and pedestrians.

Consider this:

- Analyze whether less restrictive measures would work.
- Analyze whether other local streets will be adversely affected and/or access into or out of the neighborhood would not be adequate.
- This device will create out-of-the-way travel for residents and put additional traffic on other streets.
- Do not use if the street is an emergency or school bus route.
- Will not solve speeding issues; speeds may increase on the new one-way street.

Estimated cost:

A well-designed, landscaped partial street closure at an intersection typically costs approximately $30,000-$50,000.

RAISED MEDIANS

This landscaped median in the Scotch Eighties neighborhood of Las Vegas narrows the street to one lane in each direction.

Definition:

Medians are raised barriers in the center portion of the street or roadway. Raised medians manage motor vehicle traffic and provide comfortable left-hand turning pockets with fewer or narrower lanes. They are most useful on high volume, high speed roads.

Benefits:

Raised medians provide a refuge for pedestrians crossing the street and create space for street trees and other landscaping which can help reduce speeds by changing the character of a street. They also have benefits for motorist safety when they replace center turn lanes. Desired turning movements need to be carefully provided, so that motorists are not forced to travel on inappropriate routes such as residential streets, or an unsafe U-turn condition is not created. In some environments, medians can be constructed in sections creating an intermittent rather than continuous median. Another good alternative device for two, three or four lane roads is the crossing island, which provides the crossing refuge for pedestrians, and in some designs, aids in decreasing vehicle speeds (see p. 29).

Share the road:

Ensure that there is enough room for wider sidewalks, bike lanes, and planting strips before proceeding with construction.

Consider this:

- In some cases, raised medians can increase traffic speeds by decreasing the perceived friction through separating traffic flow directions.
- Medians may take up space that can be better used for wider sidewalks, bicycle lanes, landscaping buffer strips, or on-street parking.
- Consider crossing islands if cost is an issue or space is limited.
- Landscaping in medians should not obstruct the visibility between pedestrians and approaching motorists.
- Midblock crossings must be fully wheelchair accessible.

Estimated cost:

The cost for adding a raised median is approximately $20,000-$40,000 per 100 feet, depending on the design, site conditions, and whether the median can be added as part of a utility improvement or other street construction project.

ROAD SIGNS

This sign instructs drivers to share the road with bicycles, and reminds them that others use the road also.

Definition:

Signs provide regulations or information to road users as to what to expect and how to behave.

Benefits:

Signs can provide important information that can improve road safety. By letting people know what to expect, there is a greater chance that they will react and behave appropriately. For example, giving motorists advanced warnings of upcoming pedestrian crossings or that they are entering a traffic-calmed area will enable them to modify their speeds. Regulatory signs, such as 'Stop,' 'Yield' or turn restrictions require certain driver actions and can be enforced. Warning signs can provide helpful information, especially to motorists and pedestrians unfamiliar with an area. Some examples of signs that affect pedestrians include pedestrian warning signs, motorist warning signs, 'No Turn on Red' signs, and guide signs. Advance pedestrian warning signs should be used where pedestrian crossings may not be anticipated by motorists, especially if there are many motorists who are unfamiliar with the area. A new fluorescent yellow-green color is now approved for use on non-motorized warning signs. This bright color attracts the attention of drivers because it is unique. In some cases, signs may be used to prohibit pedestrian crossings at an undesirable location and re-route them to a safer crossing location, or warn pedestrians of unexpected driver maneuvers.

Consider this:

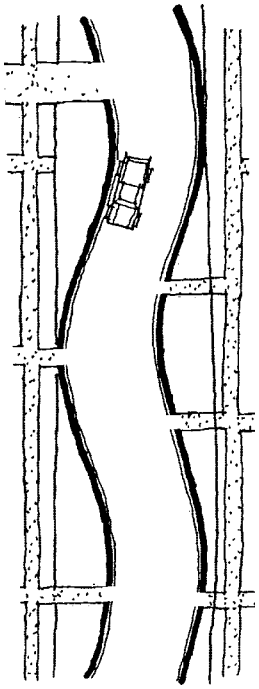
- Overuse of signs breeds noncompliance and disrespect. Too many signs can lead to visual clutter with the result that a driver is not likely to read or pay attention to any of the signs.
- Traffic signs must be in compliance with the Manual on Uniform Traffic Control Devices.
- All signs should be periodically checked to make sure they are in good condition, free from graffiti and continue to serve a purpose.

Estimated cost:

$100-$200 per sign.

SERPENTINE STREET

A winding street, landscaping and colored pavement are the visual cues that slow drivers down in this illustration.



Definition:

A serpentine street refers to the use of a winding street pattern. Driveways create a link to the street for residents.

Benefits:

The winding street allows for two-way through movements while forcing vehicles to slow.

The serpentine pattern provides areas which can be landscaped to create visual interest and slight visual obstructions, forcing vehicles to slow.

Purpose:

- Sends a visual cue about the function of a street.

Considerations:

- This type of design can be more expensive than other traffic calming options and needs to be coordinated with driveway access.
- Ideal to build when a street is being reconstructed for major utility or other purposes, or when slow streets are being designed as part of the construction of a new neighborhood.
- Don't use if lower-cost traffic calming strategies would be more effective.

Estimated Cost:

$90,000 and higher.

SPEED HUMPS AND SPEED TABLES

Speed humps are frequently used on residential streets to reduce speeds. However, they can create unwanted noise if they are too severe, or cause motorists to slow down more than is necessary.

Definition:

Speed humps are a paved, raised device usually constructed out of asphalt. They are approximately 3-4 inches high at their center, and extend the full width of the street. Speed humps should not be confused with a speed bump that is often found in mall and casino parking lots. Speed humps are longer (12-22 feet) are designed to slow traffic, and do not require vehicles to stop in order to travel over them. A speed table is a very long and broad speed hump that can accommodate a pedestrian crossing in the flat portion of the speed table. Speed tables can be used in combination with curb extensions where parking exists.

Benefits:

Speed humps and speed tables reduce vehicle speeds. Raised measures tend to have the most predictable speed reduction impacts. They also enhance the pedestrian environment and pedestrian crossings.

Consider this:

- Do not use if sight distance is limited and/or if the street is on a steep grade.
- If the street is a bus route or primary emergency route, design must be coordinated with operators. Usually some devices are acceptable if used prudently—one device may be appropriate if used in a location in most need of slowing traffic to improve pedestrian conditions.
- The aesthetics of speed humps and speed tables can be improved through the use of color and special paving treatments.
- Noise may increase particularly if trucks use the route regularly.
- May create drainage problems on some streets.

Share the road:

Make sure to design speed humps and tables to accommodate bicyclists.

Estimated cost:

The cost for each speed hump is approximately $4,000. Speed tables are $8,000–$15,000, depending on drainage conditions and materials used.

Note: See "City of Las Vegas policy for the use of speed humps on residential streets," in the appendix to this book.

SPEED MONITORING TRAILER

Speed monitoring trailers let motorists know the speed limit, and the speed they are traveling.

Definition:

Speed monitoring trailers—signboards on trailers that display the speed of passing vehicles—are used by police departments as educational tools that can enhance enforcement efforts directed at speed compliance.

Benefits:

Enhanced enforcement efforts through public education and awareness. Speed radar trailers are best used in residential areas and may be used in conjunction with Neighborhood Speed Watch or other neighborhood safety education programs. They can help raise residents' awareness of how they themselves, not just 'outsiders,' are often those speeding. Speed trailers are not substitutes for permanent actions to address neighborhood speeding issues, such as traffic calming treatments. Speed trailers can be used at several locations and should have occasional police monitoring and enforcement to maintain driver respect.

Consider this:

- Occasional enforcement is needed to supplement the speed trailers.
- Speed trailers are not a substitute for engineering measures.

Estimated cost:

$10,000 plus the costs to move the trailer to different locations.

Note this

A successful neighborhood traffic management program is composed of three basic objectives—education, enforcement, and engineering. Speed trailers are an enforcement tool.

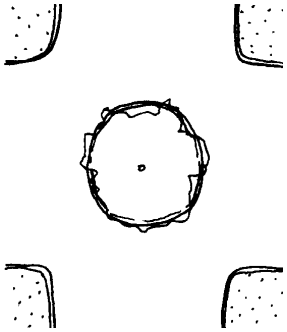
Education — Guided by Public Works staff, you and your neighbors will receive the information and tools necessary to make informed decisions regarding traffic concerns in your area.

Enforcement — Community-identified strategies can be supported by targeted police and parking enforcement.

Engineering — Through this partnership, traffic calming strategies will be implemented based on engineering principles and community input.

TRAFFIC MINI-CIRCLES

A traffic mini-circle helps reduce vehicle speeds, but still allows cars, buses and other large vehicles to pass through the intersection with little difficulty.



Definition:

Mini-circles are raised circular islands in the center of residential street intersections.

Benefits:

Mini-circles manage traffic at intersections where volumes do not warrant a signal. In Seattle, they have been found to reduce motor vehicle crashes at the intersections of residential streets by an average of 90 percent. They can reduce vehicle speeds at the intersection when used on a series of intersections along a local street as part of a neighborhood traffic improvement program. They are commonly enhanced with landscaping or special paving treatments.

Consider this:

- Signs may be installed within the circle to direct motorists to proceed around the right side of the circle before passing through or making a left turn.
- Traffic circles with splitter islands make crossing easier for pedestrians (especially for persons with disabilities) and control vehicle movements entering the intersection, but require more space.
- Larger vehicles that need access to streets (e.g. school buses and fire engines) may need to make left hand turns in front of the circle. They can also be accommodated by creating a mountable curb in the outer portion of the circle.
- Use yield, not stop controls.

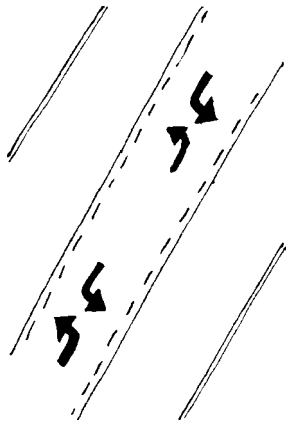
Estimated cost:

The cost is approximately $20,000–$40,000 for a traffic mini-circle on an asphalt street and about $30,000–$60,000 for a mini-circle on a concrete street.

Share the road:

Mini-circles must be properly designed to benefit pedestrians and cyclists. Right-turning vehicles are not controlled at an intersection with a mini-circle, potentially putting pedestrians and cyclists at risk. Do not make generous allowances for motor vehicles by increasing the turning radii — this compromises pedestrian and cyclist safety.

TWO-WAY TURN LANES



Definition:

Two-way left turn lanes are marked in the center of the street. Usually, a two-way left-turn lane can be accommodated by reducing the number of through lanes or by eliminating parking.

Benefits:

Left turn lanes move turning vehicles out of the traffic flow. Two-way left turn lanes can help decrease accidents, slow traffic, create smoother traffic flow, and provide crossings for pedestrians. Two-way left turn lanes can be used in conjunction with bicycle lanes to make the roadway appear narrower.

Consider this:

- A two-way left turn lane may be marked as an interim solution in locations where a future median may be constructed.
- A two-way left turn lane can be successful in an area experiencing collisions involving left-turning traffic, or on streets with many intersecting driveways and cross streets.
- Do not use if the street is not wide enough to accommodate a two-way left turn lane, or if the project conflicts with a need for on-street parking.
- Some studies have shown that two-way left turn lanes do not reduce speeding.

Estimated cost:

The estimated cost for a left turn lane is $1,000 per block.

Landscaping and Xeriscaping

Southern Nevada Water Authority

In a recent community vision survey of Las Vegas residents, the image of a well-landscaped residential streetscape emerged as the epitome of a walkable neighborhood. The careful use of landscaping along a street can provide separation between motorists and pedestrians, reduce the effective width of the roadway (which in return can reduce vehicle speeds) and provide a more pleasant street environment for all. In the preceding discussion of traffic management devices, specific mention was given to the integration of landscaping into these devices.

However, our dry desert climate demands careful consideration of any type of planting program. *Xeriscaping* is the name of the program the Southern Nevada Water Authority (SNWA) has developed to promote water-efficient landscaping. A neighborhood xeriscape (pronounced *zeer–ih–scape*) program can include plantings from the SNWA's list of over 250 native and desert-tolerant plants, and should follow recommended guidelines for watering and/or irrigation. Some xeriscape programs may also be eligible for water credits.

Neighbors should be prepared to maintain their street-planting program. A good maintenance program consists of:

- Fertilizing, pruning and winterizing
- Removal of tree stakes when appropriate
- Aerating and fertilizing turf
- Pest and disease control
- Watering or irrigation.

See the plant list on the following page, contact the Southern Nevada Water Authority, or visit the Desert Demonstration Gardens for more information on xeriscaping.

Southern Nevada Water Authority
Conservation Helpline
(702) 258-SAVE (7283)
www.snwa.com

The Southern Nevada Water Authority is committed to managing Southern Nevada's water resources and to developing solutions that will ensure adequate future water supplies for the region.

Desert Demonstration Gardens
3701 West Alta Drive
(702) 258-3205

The Desert Demonstration Gardens are eleven theme gardens featuring plants suited to Southern Nevada's climate. Free workshops, tours and classes covering a wide range of landscape and irrigation issues are offered.

all—Southern Nevada Water Authority

A Desert Plant Sampler

These are some of the more than 250 colorful plants that neighbors can use to help create an attractive and inviting desert landscape.

Name	**Type**
Aloe vera	accent
Banana yucca	accent
Joshua tree	accent
Ocotillo	accent
Soaptree yucca	accent
Mojave prickly pear	cactus
Blue fescue	groundcover
Ground morning glory	groundcover
Bear grass	shrub
Bearded iris	shrub/flower
Creosote	shrub
California poppy	shrub/flower
Coarse verbena	shrub
Chapparal sage	shrub
Dwarf bottlebrush	shrub
Mormon tea	shrub
Colorado mesquite	tree
Blue palo verde	tree
Fig tree	tree
Fremont cottonwood	tree
Heritage live oak	tree
Olive tree	tree
Pomegranate	tree
Cape honeysuckle	vine
Virginia creeper	vine

5

FROM THE GROUND UP: IMPLEMENTING YOUR STREET PROJECT

Now that you have identified your goals and issues with the streets in your neighborhood, and established a program over which you have neighborhood consensus, how do you go about getting a project done? Here is how to begin:

- You will likely be presenting your proposals to a variety of groups, including neighborhood groups and perhaps City Council. Present your proposals clearly and concisely. Use pictures and diagrams whenever possible.
- Use the figures given in this guide to estimate the cost of your program.
- Prioritize your recommendations. While sometimes an opportunity comes up to redesign a street all at once (such as a major utility project), improvements are often made one at a time. Setting priorities allows you to focus on key improvements first.
- Document community support. Many of the devices in this book require neighborhood petitions. Community validation is important in building and maintaining the credibility of your program.
- Work with your contacts in city government, preferably as you are formulating your recommendations. There may often be multiple ways to achieve your neighborhood's goal. City staff can help you determine the effect of a project on the safety and functioning of a street, or the likelihood of obtaining outside grant funding for a project.
- Finally, be patient but persistent. Redesigning a street can take many years, many meetings, and much convincing, but most all who have participated in such a project say it has been worth the effort.

5 STEPS TO A STREET PROJECT

1. Neighborhood audit
2. Street inventory
3. Problem definition
4. Program design and implementation
5. Program evaluation

Las Vegas' Neighborhood Traffic Management Program has an existing procedure that helps the City to implement neighborhoods' requests for traffic management projects. This procedure is as follows:

THE IMPLEMENTATION PROCESS

From initial request through monitoring and follow-up

Request:

Traffic management projects can be requested by individual citizens or by neighborhood associations. A petition describing the neighborhood concerns and the requested improvements shall be submitted to the city's Traffic Engineering Division to initiate the process. This petition must include the signature of at least 10 residents residing along the street requested for consideration. City staff will gather preliminary data about the traffic request, including volume, speed, and accident information. Staff will assign points to the request, as described in the appendix. A minimum of 40 points is required for a project to be eligible for this program.

Request for speed humps meeting the minimum criteria will be presented in a public hearing at the monthly Traffic and Parking Commission meeting, and if approved, forwarded to City Council for consideration. City staff will notify by mail those residents fronting the affected street of the public hearing date. Speed humps approved by City Council will be placed on a construction schedule.

All other request for traffic management improvements such as traffic circles, chokers, street closures, and other improvements will follow the process described in the following paragraphs. All requests are also reviewed by the traffic engineer for other possible solutions. If the preliminary review shows that an immediate hazard to the public exists, the city may choose to address the problem separately from the NTMP.

Balloting:

Projects meeting the minimum score requirement will proceed for further evaluation. A ballot advising the area residents of the proposed improvement will be mailed out. City staff establishes the balloting area, based on information obtained in the preliminary review. This area is generally defined as those households fronting on the affected segments of the project street. In the case of a single intersection problem, the minimum area would be approximately one block in all directions. If significant diversions to other residential streets are reasonably expected, those streets' residents would also be included in the study area. The purpose of the ballot is to determine the level of agreement with the proposed improvement among the project street residents. If two-thirds of the ballots indicate agreement with the proposed improvements, the item is placed on the following Traffic and Parking Commission agenda for consideration. Those items approved by the Traffic and Parking Commission are then forwarded to City Council with a recommendation for approval. (2 months)

Alternate plan development:

The city may hold a public meeting in the neighborhood if the majority of the ballots indicate a disfavor with the proposed improvement. This meeting will inform area residents of the concerns

of some of their neighbors, describe the NTMP process, and gather additional information about the traffic problems and related neighborhood needs. A neighborhood traffic committee of no more than six individuals may be formed at this stage. This traffic committee will be selected by the area citizens to represent them while working with city staff to develop an alternate plan to address the neighborhood concerns. Plan development consists of the following steps:

- Assessment of problems and needs
- Identification of project goals and objectives
- Identification of evaluation criteria
- Development of alternative plans/solutions
- Selection of a proposed plan

The first two steps are accomplished through public meetings, neighborhood association meetings, and traffic committee meetings. The traffic committee, in conjunction with city staff, will proposes possible solutions based on the area citizen input. City staff will provide technical assistance based on sound engineering principles and current city ordinances, regulations and laws, to this committee. Possible solutions and their impacts are evaluated by the traffic committee, city staff, and other affected agencies. The selected plan will be presented in a public hearing before the Traffic and Parking Commission. If approved by the Traffic and Parking Commission, the item will be placed on the City Council for their consideration. (4 months)

Test installation:

City Council may elect to provide a test installation prior to approving/denying the final plan. This test installation can range anywhere from 30 to 120 days. The purpose of the test installation is to provide the residents an opportunity to see what effects the improvement will have on their neighborhood and to allow city staff to perform studies to evaluate the effectiveness of this proposal. If the city traffic engineer finds that an unforeseen hazard is created by the test, the test installation may be revised or removed. (2–6 months)

Project evaluation:

Following the test period, the city evaluates how well the test has performed in terms of the previously defined problems and objectives. The evaluation includes the subject streets and streets affected by the project, and is based on before-and-after speeds and volumes, impacts on emergency vehicles or commercial uses, and other evaluation criteria determined by the traffic committee during plan development. If, in the evaluation, desired improvements in quality of life are not met to the satisfaction of the traffic committee and city staff, the traffic plan may be modified and additional testing conducted. The final test results will be reviewed with the traffic committee, area residents, and relevant city staff, and the information distributed during the second balloting stage. (1 month)

Second Ballot:
To forward the project to the stage of placing on the ranking list for permanent improvements, approval from the majority of the residents and property owners within a defined ballot area must be obtained through a second mail ballot administered by the city. The ballot area includes all properties located on the project street and on adjacent local residential streets that may have experience a substantial traffic volume increase due to the proposed improvements. A majority of returned ballots must be in favor for a project to continue. (1 month)

City Council action:
Based on the project evaluation and a positive ballot, city staff prepares a report and recommendations for the City Council. The report outlines the process followed, includes the project findings, and states the reasons for the recommendations. If the proposed traffic management program includes the vacation of streets, the request will be forwarded to the Planning Commission before action by City Council. After receiving staff report and hearing testimony from affected citizens, City Council will vote on the project. (2 months)

Ranking:
Projects approved by City Council are ranked citywide. Highest-ranking projects will be undertaken first. The number of projects initiated in any given year is dependent on available city resources and funding. At any time, a neighborhood may request consideration to proceed with the implementation of an approved NTMP project that does not involve city funding. The neighborhood seeking this approval will responsible for all costs, including design and construction, associated with this project. All requestors are notified of the status of their request after the annual ranking. The city also will make available the status of the ranked projects upon request.

Once in the process, a project is considered in the annual priority-ranking step for up to three years. If, after three years, a project has not received a high enough ranking or there isn't sufficient funding for that particular project to proceed, it is no longer eligible for consideration. The requestor is notified when the three-year time limit expires. (Rankings are done annually in August).

Design and construction:
Final design and construction are administered by the city after City Council approval and will based on project annual ranking and availability of funds. (6 months to 2 years)

Monitoring:
The city will monitor constructed traffic management devices. The city will be responsible for maintenance of the physical features of the devices. (ongoing)

Follow-up evaluation:
The city may conduct a follow-up evaluation to determine if the project's goals and objectives have continued to be met if dramatic changes in traffic patterns or land uses occur. The evaluation may entail traffic studies of volumes, speeds, and accidents. (within 3 to 5 years)

How projects are ranked

Projects are ranked annually in August. They are given a numerical score, and are compared against other neighborhoods' projects. A high ranking project may be bypassed for the following lower cost project(s) if there is not sufficient funding available for the higher ranked project.

These are the factors used to rank a neighborhood traffic management project:

- Traffic volume—if volume is below 800 vehicles per day, the NTMP will not be applied
- Speed—percent of vehicles traveling at greater than 5 mph over the speed limit
- Accidents—accident rate over three consecutive years
- Elementary schools—within 200 feet of the subject street
- Other extraordinary circumstances—includes pedestrian-oriented facilities, such as elderly housing or parks, school bus stops, public projects external to the neighborhood, side streets with sight visibility below 25 mph.
- Designated pedestrian routes.

See the following page for a sample project ranking sheet.

Typical project time frame

It can take approximately one to three years (depending on the complexity of a project) from initial submittal of a project to its completion. An estimated timeframe for each of the steps is shown in parentheses above.

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

_____ **DATE OF COUNT:**

85TH PERCENTILE SPEED

85TH PERCENTILE SPEED MUST BE GREATER THAN 35 MPH _____ MPH FACTOR =

36 MPH - 40 MPH = FACTOR OF 1.1 TO 1.5

GREATER THAN 40 MPH = FACTOR OF 2

*TOTAL POINTS TO BE MULTIPLIED BY 85TH %TILE FACTOR

EMERGENCY RESPONSE ROUTE

STREET CANNOT BE A MAJOR EMERGENCY RESPONSE ROUTE

MAJOR EMERGENCY RESPONSE ROUTE: _____

SECONDARY EMERGENCY RESPONSE ROUTE: _____

TRAFFIC VOLUME

AVERAGE DAILY TRAFFIC VOLUME (ON THE SEGMENT OF THE PROJECT STREET HAVING THE HIGHEST VOLUME), DIVIDED BY 100. ADT= _____ PTS

30 POINTS MAXIMUM SCORE.

[NOTE: IF THE VOLUME IS BELOW 800 VPD, THE NTMP SHALL NOT BE APPLIED, REGARDLESS OF OTHER SCORES]

SPEED

PERCENTAGE OF VEHICLES TRAVELING MORE THAN 5 MPH OVER THE SPEED LIMIT (ON THE SEGMENT OF THE PROJECT STREET HAVING THE HIGHEST PERCENTAGE OVER THE LIMIT), DIVIDED BY 4. _____ % PTS

20 POINTS MAXIMUM SCORE.

ACCIDENTS

ACCIDENT RATE OVER 3 CONSECUTIVE YEARS (ACCIDENTS PER MILLION VEHICLE MILES TRAVELED).

20 POINTS MAXIMUM SCORE.

PROJECT LENGTH IN MILES= _____

ACCIDENTS IN LAST 3 YEARS= _____

PTS=(# ACC)(PROJECT LENGTH)(ADT)(3 YEARS)/(1MILLION) PTS

ELEMENTARY SCHOOLS

5 POINTS FOR EACH PRIVATE OR PUBLIC ELEMENTARY SCHOOL ON OR WITHIN 200 FEET OF THE SUBJECT STREET . EA.= _____ PTS

OTHER EXTRAORDINARY CIRCUMSTANCES

UP TO 5 POINTS FOR EACH INDIVIDUAL PEDESTRIAL-ORIENTED FACILITY, SUCH AS ELDERLY HOUSING OR A PARK ON OR WITHIN 200 FEET OF THE SUBJECT STREET. EA.= _____ PTS

1 POINT FOR EACH SCHOOL BUS STOP ALONG THE STREET SEGMENT. EA.= _____ PTS

UP TO 5 POINTS FOR EACH PUBLIC PROJECT EXTERNAL TO THE NEIGHBORHOOD WHICH WILL SIGNIFICANTLY INCREASE THE TRAFFIC CUTTING THROUGH THE NEIGHBORHOOD. EA.= _____ PTS

1 POINT FOR EACH SIDE STREET WHICH HAS SIGHT VISIBILITY BELOW 25 MPH.

10 POINTS MAXIMUM SCORE. EA.= _____ PTS

DESIGNATED PEDESTRIAN ROUTES

5 POINTS WHENEVER A SUGGESTED ROUTE-TO-SCHOOL CROSSES THE SUBJECT STREET. EA.= _____ PTS

FIVE (5) MORE POINTS IF THE CROSSING IS LOCATED WHERE TRAFFIC ON THE SUBJECT STREET IS NOT CONTROLLED BY EITHER A STOP SIGN OR A TRAFFIC SIGNAL. EA.= _____ PTS

TOTAL POINTS=

***TOTAL POINTS X 85TH%TILE FACTOR** **TOTAL NTMP PTS =**

A MINIMUM OF 40 POINTS IS REQUIRED FOR A PROJECT TO BE ELIGIBLE FOR THIS PROGRAM.

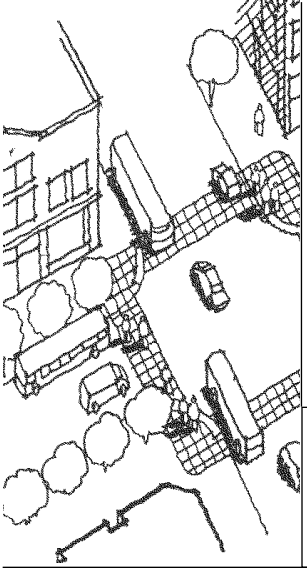
CRITERIA MET:

TYPE OF TRAFFIC MANAGEMENT DEVICE RECOMMENDED _____

COMMENTS

POSTED SPEED: 25 MPH

RIGHT-OF-WAY WIDTH: 60 FT.



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RESOURCES FOR IMPLEMENTATION AND INFORMATION

Sources and programs for assistance and funding include existing programs for neighborhoods, the City of Las Vegas general fund, and other transportation funding programs.

The Las Vegas Neighborhood Partners Fund

The Neighborhood Partners Fund is a city-sponsored program designed to assist in improving the livability of Las Vegas neighborhoods through community-matched funding for neighborhood improvement projects. Neighborhood associations, homeowners associations, or business associations whose primary purpose is neighborhood improvement may apply for Neighborhood Partners funds. Joint applications are also encouraged.

The program will issue grants up to $5,000 per neighborhood association. The funds must be matched by the neighborhood with cash, volunteer labor, donated supplies, equipment, or professional services.

Eligible project types include neighborhood physical improvements, projects that reduce crime and enhance public safety. All projects must be completed within the proposed twelve-month fiscal year period.

For more information on this program, contact the Department of Neighborhood Services, Neighborhood Planning and Support division, phone (702) 229-6269.

OTHER CITY FUNDING PROGRAMS

The NTMP receives approximately $100,000 annually through the City of Las Vegas general fund. To date, this program has funded the majority of NTMP projects. Additionally, the Regional Transportation Commission is a funding clearinghouse for a variety of transportation improvements from gas taxes and other sources. While most of these transportation projects are related to highways and arterial streets, including a NTMP project as part of a larger street repaving project can reduce its cost.

Other Sources

The Nevada Department of Motor Vehicles and Public Safety Office of Traffic Safety funds some local projects that improve safety.

Additionally, for new residential subdivisions, the City of Las Vegas encourages developers to build traffic management devices to city standards.

COMPLETED PROJECTS IN LAS VEGAS

Approximately 197 speed humps have been installed since the implementation of the NTMP, with the most recent installations on San Jonas Drive, between Ducharme Avenue and Genzer Drive; on Gilmore Avenue, between El Capitan and Buffalo Drive; and on Saylor Way, between Washington Avenue and Carmen Boulevard.

A traffic circle has recently been installed at the intersection of Lake South Drive and Crystal Water Way. Street closures have been implemented on Peseo Cresta Avenue and Hualapai Way and Merialdo Lane at Charleston Boulevard.

RESOURCES FOR NEIGHBORHOODS

Websites:

- Narrow Streets Database
  http://www.sonic.net/abcaia/narrow.htm
- Institute of Transportation Engineers
  http://www.ite.org/
- Walkable Communities, Inc.
  http://www.walkable.org/
- Pedestrian and Bicycle Information Center
  www.walkinginfo.org
- Smart Growth Network
  http://www.smartgrowth.org/index2.html
- Congress for the New Urbanism
  http://www.cnu.org/
- Center for Livable Communities
  http://www.lgc.org/clc/

Other cities' websites:

- Albuquerque Neighborhood Traffic Management Program
  http://www.cabq.gov/streets/ntmp.html
- City of Austin Neighborhood Traffic Calming Program
  http://www.ci.austin.tx.us/roadworks/tc.htm
- City of Boulder Department of Public Works
  www.ci.boulder.co.us/publicworks/

- Orlando Traffic Calming Library
  http://www.ci.orlando.fl.us/departments/public_works/trans/TCdrawings.htm
- City of Sacramento Neighborhood Traffic Management Program
  http://pw.sacto.org/traffic/ntmp.html
- Scottsdale Traffic Calming programs
  http://www.ci.scottsdale.az.us/traffic/trafficcalmprog.asp
- Seattle Transportation: Making Streets that Work
  http://www.ci.seattle.wa.us/td/mstw.asp

Manuals

- The Guide: The Citizen's Guide to Traffic Calming in Honolulu, City and County of Honolulu Department of Transportation Services (1998)
- Making Streets That Work, City of Seattle Transportation Department (1996)
- Pedestrian Users' Guide, Federal Highway Administration (TBA)

APPENDIX

LAS VEGAS NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM: ADOPTED POLICIES

The following policies are established as part of the Neighborhood Traffic Management Program (NTMP) for local residential streets:

a. Through traffic should be routed to arterial streets, as designated in the Master Plan of Streets and Highways. Arterial streets are those of sufficient width to be marked for four or more travel lanes.
b. Traffic may be rerouted from one local residential street to another as a result of an NTMP project. The amount of rerouted traffic that is acceptable should be defined on a project-by-project basis.
c. Adequate emergency vehicle access must be preserved.
d. Reasonable automobile access should be maintained. NTMP projects should encourage and enhance pedestrian, bicycle, and transit access to neighborhood destinations.
e. Application of NTMP shall be limited to local, public residential streets, herein defined as streets with 60 feet or less of right-of-way, except as arterial treatments contribute to improvement of conditions on local residential streets.
f. The City shall typically employ traffic management devices to achieve the NTMP's objectives. Traffic management devices are roadway features and shall be planned and designed in keeping with sound engineering and planning practices. The City Traffic Engineer shall direct the installation of traffic control devices (signs, signals, and markings) as needed to accomplish the project, in compliance with the municipal code and pertinent state and federal regulations.
g. To implement the NTMP, certain procedures shall be followed by the Department of Public works in processing traffic management requests according to applicable codes and related policies and within the limits of available resources. At a minimum, the procedures shall provide for submittal of project proposals, evaluation of proposals by city staff, citizen participation in plan development and evaluation, and communication of any test results and specific findings to area residents and affected neighborhood organizations before installation of permanent traffic management devices.

CITY OF LAS VEGAS POLICY FOR THE USE OF SPEED HUMPS ON RESIDENTIAL STREETS

The City of Las Vegas is committed to preserving neighborhood integrity. One of the issues in the maintenance of livable communities is traffic and the need to minimize non-essential vehicular traffic on residential streets and the need to ensure that those vehicles using those streets do so at an appropriate rate of speed. A technique that has been used successfully to manage this situation is the installation of speed humps.

Administrative procedures

1. A Neighborhood Traffic Management Program (NTMP) project includes issues of excessive speeds, and the traffic engineer finds that a speed hump installation may be appropriate.
2. Staff evaluates the site based on minimum criteria. Evaluation would include recommended locations on both the requested street and adjacent streets where installation may be required to mitigate impact of installation.
3. Following the procedures contained in the NTMP, public comment and approval are received.
4. Action by City Council to approve installation.

Minimum criteria

To effectively use speed humps for neighborhood traffic control, specific minimum criteria must be met before the installation. They are:

1. Street speed limit must be 25 m.p.h.
2. 85th percentile speeds must be greater than 35 m.p.h.
3. Average daily volumes must be between 800 and 3,000.
4. Street is not classified higher than neighborhood collector, with no more than one lane in each direction.
5. Installation location must be visible from 200 feet.
6. Street grades cannot be higher than 8%.
7. Street cannot be a major emergency response route.

8. Hump installation should not cause diversion of traffic to other residential streets.
9. Street cannot be a Citizens Area Transit (CAT) route.

Placement of speed humps

The following guidelines should be used to determine the number and placement of speed humps for various street lengths:

1. Single short blocks (less than 400 feet) with speed control problems are unusual. Where such blocks must be treated, a single hump positioned near mid-block would likely provide satisfactory speed control over the entire block.
2. Where control is required on single block segments of moderate length, a two-hump configuration should be satisfactory.
3. On very long blocks, three or more humps may be necessary.
4. On lengthy continuous segments or on control segments composed of a number of blocks, it appears desirable to space interior humps 400 to 600 feet apart, although spacings up to 750 feet apart may be satisfactory. At least one hump should be placed in each block of a control segment.
5. The first hump that is approached in a system should be located within 100 feet of the street entry.

Signs and markings

It is essential to warn roadway users of a speed hump's presence and guide their subsequent action.

Signs: The most common warning sign will be the MUCTD W8-1 "BUMP" warning sign. The sign should be located based on MUCTD Table II-1, "A Guide for Advance Warning Sign Placement Distance." Advisory speed plates should be added indicating the recommended crossing speed and to educate unfamiliar roadway users of the recommended crossing speed when the humps are initially installed.

Markings: The speed humps will be marked with distinctive painted markings, so as to be visible to the approaching traffic.

Implementation

Installation angle: Speed humps should be installed exactly at a right angle to the vehicular travel path.

Drainage and utilities: Speed humps should be installed with appropriate provisions made for roadway drainage and utility access. Humps should generally not be located over or contain maintenance access holes, or be located next to fire hydrants.

Ideally, a hump should be installed at a location immediately on the downside of an existing drain inlet. If this is not feasible, the construction of a bypass drain or other treatment to route water around the hump should be considered.

Roadway edge treatments: On roadways with 'L' curbs, humps should ideally extend fully across the road from curb to curb. If tapering is necessary for drainage or other reasons, the edge taper should be accomplished at an angle that will not affect the downstroke of bicycle pedals or subject vehicles to undercarriage damage.

A phenomenon known as 'gutter running' may be encouraged with the tapered hump edges since drivers can drive with one wheel in the gutter, thereby reducing the hump's ability to slow vehicles. If humps are installed with tapers, or used on non-curbed roadways (not recommended), raised pavement markings, delineator posts, or other treatments should be considered to eliminate or reduce the possibility of vehicles attempting to partially or totally avoid the hump. It should be recognized, however, that these devices may have an impact on maintenance. If installed on roadways with paved shoulders, the hump should ideally extend across the shoulder to discourage vehicles from attempting to avoid the hump.

Coordination with traffic operations: Speed humps should not be installed within an intersection or driveway or within 250 feet of a traffic signal. This suggestion is not intended to apply to the use of a raised intersection as a valid traffic management technique.

On-street parking: Care should be taken to ensure that the vehicles parked on streets do not diminish the effectiveness of the signing and marking for speed humps. Should parking be removed adjacent to or before the hump, the ability of vehicles to avoid tapered humps by 'gutter running' will be enhanced. Each hump installation should be evaluated independently for site-specific parking consideration.

Street lighting: to improve nighttime visibility, especially where sight distance is less than desirable, coordination of hump locations with existing or planned street lighting should be considered.

Construction materials: The construction of the hump can be pre-cast concrete sections, concrete cast in place, asphalt or brick/concrete pavers. Experience has shown that the use of soft material will result in deformations as the top of the hump is pushed in the direction of the traffic stream.

Construction procedures: It is recommended that a template be constructed to verify the accuracy of the hump profile and to ensure that the desired dimensions are attained within the reasonable tolerances (normally one-half inch or less). If the profile is incorrect, hump characteristics will be changed, which may result in vehicle damage or ineffective speed control.

If the hump is constructed in place, it is recommended that the road surface be excavated at the tapering edges to prevent spalling.

Monitoring and evaluation

The type, number, and extent of studies performed to determine the effectiveness and impacts of speed humps will vary based upon the particular circumstances of each installation. However,

some review should be performed after installation to ascertain whether the humps have achieved the desired results without creating unexpected problems.

On-site observations: Immediately after the speed humps' installation and at selected times thereafter, observations will be made to determine motorists' behavior patterns and any unusual operating conditions (such as gutter running.) The observations should be scheduled during both day and night conditions.

Speed studies: Speed studies should be performed before hump installation. After installation, speed studies should normally be performed before, at, and beyond each speed hump to determine its impact on vehicle operating speeds.

Volume studies: Traffic volume counts should be made on the subject street and on those streets where traffic diversion may be expected. These counts should be made before installation and after traffic patterns have stabilized to determine the magnitude and specific location of this diversion. Both turning movements and 24–hour volume counts may be needed to quantify these impacts.

Stop sign obedience: Studies may be desirable before and after hump installation to determine if the speed humps have impacted the compliance rate of affected stop sign locations. Increased violation rates should be considered in speed hump evaluations, and selective enforcement may be necessary to address the problem.

Travel time studies: Based on the particular requirements of the installation, it may be desirable to perform detailed travel time studies before and after hump installation to determine the effect on overall travel time along the subject street or through the area.

Accident analysis: A thorough before and after accident analysis should be performed to determine if accident trends have been noticeably impacted by the speed hump installation. It may be necessary to establish ongoing analysis at some locations to gauge the longer-term trends of accident rates.

Resident and driver surveys: within 30 to 60 days after installation (or at the end of the established trial period), it may be desirable to survey adjacent residents and other affected residential areas to assess their concerns and perception of the speed humps' performance. Motorists continuing to travel the street may also be selectively surveyed to assess their opinion of the speed humps' installation. Emergency and service agencies should also be offered the opportunity to comment on the installation.

Liability concerns

Speed humps and other pavement undulations are not traffic control devices as defined by the Manual on Uniform Traffic Control Devices. They are, however, geometric design features of the roadway and should be designed, installed, operated, and maintained using accepted engineering principles and prudent engineering judgment.

If speed humps are not installed in a proper manner and with due care, and vehicle damage or personal injury occurs, it is possible that the installing agency could be found to be maintaining a public nuisance, i. e., a known defect in the street system which may result in increased liability exposure. Therefore, complete and proper documents should be retained to justify the decisions made. Local and state laws should also be reviewed to identify any regulations pertaining to roadway design, roadway maintenance, traffic control, or other elements that may be related to the use of speed humps or other geometric design features.

Vehicle and cargo damage: Where streets with speed humps are expected to carry substantial numbers of long wheel-base vehicles or other special vehicle types such as motorcycles and bicycles, a special attempt should be made to warn and notify drivers of these vehicles that speed humps exist and how they should be driven to minimize problems. It may also be desirable to modify the standard hump design to further minimize impacts to these users.

Other considerations

Coordination with pedestrian crossings: If mid-block pedestrian crossings exist or are planned, it may be desirable to coordinate them with the speed humps, since vehicular speeds will generally be lowest at speed hump crossings. In fact, it may be desirable to install a hump directly adjacent to or on the pedestrian crossing. Pedestrian access can be encouraged by paving any grassed area connecting the hump to nearby sidewalks. In addition to standard signing, pedestrian crossing signs should be installed for any established crossing.

Aesthetic considerations: it is possible that speed humps can be constructed of special materials such as brick pavers or specially treated concrete to enhance their appearance. However, consideration should be given to street maintenance requirements in the area and whether special materials can be properly maintained by the responsible agency.

Incorporation in new street design: It is desirable in the planning of new residential subdivisions to configure and design local streets to minimize excessive speed, excessive volumes, and cut-through traffic from outside the immediate neighborhood. However, where adequate subdivision planning and street design have not or cannot be achieved, and one of the aforementioned problems is considered likely, it may be appropriate to include speed humps as a part of new street construction only after consideration of less restrictive design or traffic control techniques. Adequate signs, markings, and other devices should also be provided to support their installation.

Enforcement needs: During the initial stages of speed hump experience, it will be generally be desirable to employ special police assignment to enforce traffic violations occurring at or near speed humps and along routes experiencing diversion.

Maintenance issues: Care should be taken in the initial installation and monitoring of speed humps to ensure that edge raveling and profile deformation do not exceed established tolerances. Regularly scheduled inspections and maintenance should be performed to maintain the appropri-

ate design relationship between the hump and the street, so the hump continues to perform its intended purpose within allowable tolerances. If pavement maintenance activities result in speed hump markings being reduced or eliminated, they should be promptly replaced or supplemented with temporary signs providing the same warning to motorists.

CITY OF LAS VEGAS POLICY FOR THE CLOSURE OF RESIDENTIAL STREETS

The City of Las Vegas is committed to preserving neighborhood integrity. One of the issues in the maintenance of livable communities is traffic and the need to minimize non-essential vehicular traffic on residential streets and the need to ensure that those vehicles using those streets are not using them to bypass arterial streets. A technique that has been used successfully is the closure of the street to normal traffic.

The purpose of this policy shall be to set forth the process and criteria by which modification of traffic flow or closure of public streets may be considered by the City's staff and elected officials and to identify the condition under which closures or modifications may be enacted. This policy should only apply to the closure or modification of traffic flow on public streets initiated by citizens. This policy should not apply when initiated by a local agency to address specific traffic safety issues or to comply with state and federal standards and warrants. The policy also does not apply to temporary changes in traffic that are needed to stage construction/maintenance activities or special events.

Administrative Procedures

5. Neighborhood Traffic Management Program (NTMP) project includes issues of excessive volumes of traffic and the project engineer finds that a street closure may be appropriate.
6. Staff evaluates site based on minimum criteria. Evaluation would include recommending a location on both the requested street and adjacent streets where a closure or other mitigating measures may be required to mitigate impact of the closure.
7. Following the procedures contained in the NTMP, public comment and approval are received.
8. Action by City Council to approve installation.

Minimum criteria

To effectively use street closures for neighborhood traffic control, specific minimum criteria must be met before the installation. They are:

1. Street speed limit must be 25 m.p.h.
2. The street should be primarily residential in nature.
3. Average daily volumes should be more than 2,000 vehicles per day for complete closures or 1,000 vehicles per day for partial closure.

4. Street should not be classified higher than neighborhood collector, with no more than one lane in each direction.
5. Street cannot be a major emergency response route.
6. Closure should not cause diversion of traffic to other residential streets.
7. Street cannot be classified a Citizens Area Transit (CAT) bus route.

PLACEMENT OF STREET CLOSURE

The following guidelines should be used to determine the placement of the street closure:

1. The street closure should be made on the perimeter of the neighborhood.
2. Street closures should not be made in such a way as to interrupt internal neighborhood travel patterns. For example, the closure should not separate elementary school students from their school.
3. The closure of a street by a neighborhood association or other group of individuals will require the vacation of the street right-of-way. The application for the vacation of the street is submitted to the Planning Commission through the community Planning and Development Department. Once vacated, the land will revert to the adjacent property owners. The City may retain easements for utilities, drainage, or emergency access through the vacated right-of-way. The neighborhood association will be responsible maintenance of the vacated street.
4. Unless otherwise approved by the fire chief, all closures will have to be constructed with an emergency access per Fire Services Department standards.
5. The street closure will require the construction of a cul-de-sac to terminate the street sections. A mid-block closure would require that both stub streets be terminated with cul-de-sacs. The radius of the cul-de-sac will be dependent on parking restrictions. If parking is prohibited, a smaller radius will be allowed. If the resultant stub street contains frontage for four or fewer homes, the traffic engineer, with the concurrence of the city engineer and the fire chief, may waive the cul-de-sac requirement.

Signs and markings

It is essential to warn roadway users of the street closure and guide their subsequent action. All signs and markings shall be in conformance with the Manual of Uniform Traffic Control Devices (MUCTD).

ACKNOWLEDGMENTS

Funding for this project is by a grant from the State of Nevada Department of Motor Vehicles and Safety, Office of Traffic Safety. This revised Neighborhood Traffic Management Program was adopted by the Traffic and Parking Commission on May 24, 2001.

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