San Diego Region
Congestion Mitigation Strategies
Research Project

Final Report

November 26, 2003

Prepared for:
SANDAG
San Diego's Regional Planning Agency

Prepared by:
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
(619) 294-9400
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Purpose and Objectives</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Overview of the Congestion Management Program (CMP)</td>
<td>1</td>
</tr>
<tr>
<td>1.3 The Congestion Mitigation Strategies (CMS) Project as Part of the CMP</td>
<td>1</td>
</tr>
<tr>
<td>2.0 Congestion Mitigation Strategies (CMS) Project Process</td>
<td>3</td>
</tr>
<tr>
<td>2.1 Elements of the CMS Project</td>
<td>3</td>
</tr>
<tr>
<td>2.2 The CMS Project Working Papers</td>
<td>4</td>
</tr>
<tr>
<td>2.3 The CMS Project Workshops and Meetings</td>
<td>5</td>
</tr>
<tr>
<td>3.0 CMS Project Work Products</td>
<td>7</td>
</tr>
<tr>
<td>3.1 The CMS Toolbox</td>
<td>7</td>
</tr>
<tr>
<td>3.2 The TRO Framework</td>
<td>8</td>
</tr>
<tr>
<td>3.3 The Trip Reduction Guidelines</td>
<td>8</td>
</tr>
<tr>
<td>4.0 Application of the CMS Project Work Products</td>
<td>9</td>
</tr>
<tr>
<td>4.1 Using the CMS Project Work Products When Reviewing New Development Projects</td>
<td>10</td>
</tr>
<tr>
<td>4.2 Using the CMS Project Work Products to Improve Existing Local Congestion</td>
<td>13</td>
</tr>
<tr>
<td>4.3 Using the CMS Project Work Products in the Preparation of Corridor Deficiency Plans</td>
<td>13</td>
</tr>
<tr>
<td>5.0 Summary of Key Conclusions and Recommendations</td>
<td>14</td>
</tr>
</tbody>
</table>

### APPENDIX

- A The Congestion Mitigation Strategies (CMS) Toolbox
- B The Trip Reduction Ordinance (TRO) Framework
- C The Trip Reduction Guidelines
1.0 Introduction

1.1 Purpose and Objectives

In January of 2002, the San Diego Association of Governments (SANDAG) commissioned a research study of alternative congestion mitigation strategies. This study was undertaken in order to respond to directives, contained within SANDAG’s 2002 Congestion Management Program (CMP) Update, to develop alternative congestion mitigation strategies that could be used within the San Diego region to mitigate existing and future traffic congestion. The study was called the “Congestion Mitigation Strategies (CMS) Project”, and consisted of extensive research, regional and subregional workshops, working papers, and the completion of three work products for future use in the region.

This final report documents the CMS Project process, discusses the final work products and applications of the work products, and recommends future direction for implementing and expanding the alternative congestion mitigation strategies identified. The final work products are included in their entirety as appendices to this report. In addition, each work product is discussed in greater detail within the respective working papers, available from SANDAG.

1.2 Overview of the Congestion Management Program (CMP)

The original Congestion Management Program (CMP) was adopted for the San Diego region in 1991; with the most recent update (2002 CMP Update) completed in January of 2003. The CMP, with three primary functions, has proven effective in monitoring transportation system performance, developing programs to address congestion, and integrating transportation and land-use. In order to effectively manage future growth and development, the 2002 CMP Update recommended that the region undertake a number of new directions in dealing with congestion, such as a greater focus on non-traditional strategies, increased use of deficiency plans, more effective mitigation of traffic impacts associated with new developments, and increased CMP compliance monitoring.

1.3 The Congestion Mitigation Strategies (CMS) Project as Part of the CMP

The objective of the CMS Project was to establish three primary tools for use by local jurisdictions and the County, as well as SANDAG, to mitigate congestion and development-related traffic impacts consistent with the requirements and intent of the CMP legislation and the Enhanced CEQA Review process.

The 2002 CMP Update suggested a “medicine cabinet” approach for reducing regional and local congestion. In order to develop this approach and the accompanying tools for congestion mitigation, SANDAG commissioned the CMS Project. Figure 1 illustrates the basis for the CMS Project development process.
The CMS project includes the development of three primary work products to help mitigate congestion:

- **CMS Toolbox** – A menu of traditional and innovative congestion mitigation strategies for use by agencies in the region. The CMS Toolbox contains an extensive list of alternative congestion mitigation strategies.

- **Trip Reduction Ordinance (TRO) Framework** – A framework for implementing a Trip Reduction Ordinance for local jurisdictions in the region along with examples and supporting TDM program(s) and strategies.
Trip Reduction Guidelines – Includes methodologies for the estimation of vehicle trip reductions associated with the strategies contained in the CMS Toolbox for use in the analysis of traffic impacts for new developments. These guidelines are in reference to Sections 7.0 and 9.0 of the existing CMP Traffic Impact Study (TIS) Guidelines which allow for trip reductions and alternative mitigation measures associated with selected congestion mitigation strategies.

The following chapters provide an overview of the CMS Project process and the individual work products. The work products are included as appendices to this report.

2.0 Congestion Mitigation Strategies (CMS) Project Process

The CMS Project was an extensive research and development effort that included a number of primary components and individual work products. The following sections document the CMS Project research and development process.

2.1 Elements of the CMS Project

The primary objective of the CMS Project was to identify and document alternative tools for congestion mitigation specific to the San Diego region. The CMS Project developed three primary work products with the objectives of providing a comprehensive “medicine cabinet” of strategies and tools for congestion mitigation. These work products are related and can be applied in various manners, depending on the congestion mitigation goals. In order to develop work products that were truly useful to the region and that would be effective in reducing regional and local congestion, the CMS Project consisted of the following elements:

- **Research:** The initial effort of the CMS Project focused on research of existing or innovative congestion mitigation strategies used or proposed throughout the United States, Europe, Asia, and Australia. Specific attention was paid to strategies that have been highly successful at reducing congestion, or strategies that would be highly applicable to the San Diego region. This research effort consisted of review of journal articles, research reports, internet sites, textbooks, and personal interviews. The research focused on traditional capital strategies (such as roadway widening or intersection improvements) and more innovative strategies related to transit, Transportation Systems Management (TSM), land use, and Travel Demand Management (TDM) programs.

- **Presentations and Workshops:** A key component of the CMS Project was the continuous involvement of regional and local stakeholders through presentations and workshops. These presentations and workshops offered extensive opportunity to obtain input and comments from a large cross-section of regional professionals with the objective of developing tools that would be useful and effective in reducing regional and local congestion.

- **Working Papers:** The CMS Project included the preparation of six working papers which documented the progress and key findings and recommendation of the project, in addition to the development of the specific work products identified previously. The working papers covered all aspects of the CMS Project, from the initial research, strategy identifications, to the final work products.
• **Project Work Products:** The project work products were developed to serve as tools for mitigating existing and future congestion. The three work products are individual but closely interrelated tools that work together to achieve a variety of congestion mitigation goals. These tools are intended to be made available to the local jurisdictions for use in reducing congestion, however, local jurisdictions are by no means required to adopt or embrace them.

2.2 The CMS Project Working Papers

The following six working papers were developed by the consultant team and submitted to SANDAG as the key products associated with the CMS Project:

• **Working Paper Number 1: Survey of Congestion Mitigation Strategies** – This initial working paper summarized the results of the research of existing and innovative congestion mitigation strategies from around the United States and abroad. The research results were included in the working paper, along with commentary and recommendations for future consideration. The list of strategies developed from the research was used as the basis for the CMS Toolbox, and were presented at the first regional workshop.

• **Working Paper Number 2: Survey of Travel Demand Management (TDM) Programs** – The results of the research of existing and/or previous Travel Demand Management (TDM) Programs from throughout California and the United States were summarized in this working paper. This working paper identified the components of TDM Programs (in terms of specific strategies), and included information on example programs from across the United States and within California. Working Paper Number 2 also identified the key components of successful TDM Programs which were also used as a guide during the development of the Trip Reduction Ordinance (TRO) Framework.

• **Working Paper Number 3: Regional Workshop Number 1 Results and Recommendations** – This working paper summarized the results and recommendations from the first regional workshop, including the congestion mitigation strategies that regional representatives were most interested in pursuing. This working paper also identified the concerns and comments of the regional workshop attendees and was used as a guide in developing the CMS Toolbox and its specific components.

• **Working Paper Number 4: Congestion Mitigation Strategies (CMS) Toolbox** – The first work product, the CMS Toolbox, was presented in this working paper. This working paper discussed the development of the toolbox, and highlighted the applicability of the various toolbox strategies in terms of increasing transportation system supply or reducing system demand. The strategies contained in the CMS Toolbox were presented, along with a discussion of the various elements and effectiveness and implementation considerations associated with each strategy. This working paper also included reference to the Trip Reduction Guidelines, including specific methodologies for determining the effectiveness of various CMS Toolbox strategies in reducing vehicle trips and application in the traffic impact analysis process.
• **Working Paper Number 5: Trip Reduction Ordinance (TRO) Framework for Local Implementation** – This working paper presented a framework for local jurisdictions to use in developing a local Trip Reduction Ordinance (TRO). The working paper presented an 11-step process for development and implementation of a local TRO, with the goal of guiding a local jurisdiction through the most important questions and decisions associated with implementation of an effective local TRO. This 11-step process was developed based on the “best practices” as identified in the research of effective national and California TDM programs summarized in Working Paper Number 2. The framework provided two distinct versions of a TRO, one requiring mandatory compliance, and the other encouraging voluntary compliance in a checklist format to guide and assist a local jurisdiction through the creation of a TRO.

• **Working Paper Number 6: Trip Reduction Guidelines** – This working paper presented the Trip Reduction Guidelines to assist in evaluating the application of various CMS Toolbox strategies as part of the traffic impact analysis process. The Trip Reduction Guidelines focus on methodologies to evaluate the effectiveness of transit strategies, mixed-use developments, and TDM programs. The Trip Reduction Guidelines were presented in the working paper, as well as the proposed inclusion within the existing 2002 CMP as a new Appendix J and with reference within the existing CMP TIS Guidelines. The Trip Reduction Guidelines are also referenced within Working Paper Number 4, to link the specific methodologies for determining the effectiveness of the congestion mitigation strategies.

### 2.3 The CMS Project Workshops and Meetings

During the course of the CMS Project, 19 workshops and meetings were held with various representatives from local jurisdictions, agencies, consultants, and the private sector. A summary of the workshops and meetings is presented in **Table 1**.

**Table 1**  
**Summary of CMS Project Meetings and Workshops**

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Subject(s)</th>
<th>Date(s)</th>
<th>Audience/Attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion Management Strategies (CMS) Research Workshop (#1)</td>
<td>1. Review results of research on:  - Congestion Management Strategies  - TDM Programs  2. Local input for additional strategies  3. Screen actions for further study</td>
<td>03/26/03</td>
<td>Public Agencies</td>
</tr>
<tr>
<td>CMS Traffic Consultants Workshop</td>
<td>1. Discuss Supplemental Traffic Impact Study Guidelines</td>
<td>04/11/03</td>
<td>Traffic &amp; Transportation Consultants</td>
</tr>
<tr>
<td>CMS Transit Agency Meeting</td>
<td>1. Discuss CMS Research Project and specific transit agency comments/concerns</td>
<td>4/29/03</td>
<td>Transit Agency Staff</td>
</tr>
<tr>
<td>CMS Toolbox Strategies Workshop (#2)</td>
<td>1. Review initial draft strategies  2. Refine for further study</td>
<td>05/15/03</td>
<td>Public Agencies</td>
</tr>
<tr>
<td>CMS Model TDM Program/ Ordinance Workshop (#3)</td>
<td>1. Review research material  2. Identify items for TRO Framework.</td>
<td>05/21/03</td>
<td>Public Agencies</td>
</tr>
</tbody>
</table>
### Table 1
#### Summary of CMS Project Meetings and Workshops

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Subject(s)</th>
<th>Date(s)</th>
<th>Audience/Attendees</th>
</tr>
</thead>
</table>
| CMS Model TDM Program/Ordinance Workshop (#4)| 1. Review draft TRO Framework.  
                                           | 2. Provide comments.                                                      | 07/15/03        | Private Sector    |
| CMS Model TDM Program/Ordinance Workshop (#5)| 1. Review draft TDM ordinance.                                              | 07/23/03        | Public Agencies   |
| Proposed CMP Amendments (#6)                 | 1. Present the relationship of the CMS Research Project to the Regional Comprehensive Plan (RCP)  
                                           | 2. Present SANDAG’s next steps.                                           | 11/20/03        | Public Agencies   |
| SANTEC Subcommittee                          | 1. Develop Supplemental Traffic Impact Study Guidelines                     | 05/27/03  
                                           | 06/26/03  
                                           | 07/08/03  
                                           | 10/20/03  | Public Agencies   |
| SANTEC Committee                             | 1. Review Supplemental Traffic Impact Study Guidelines                     | 08/14/03  
                                           | 09/11/03  
                                           | 10/09/03  
                                           | 11/13/03  
                                           | 12/11/03  | Public Agencies   |
| CMS Sub-Regional Workshops                   | 1. Review recommended:  
                                           | - CMS Toolbox  
                                           | - TRO Framework  
                                           | - Supplemental Traffic Impact Study Guidelines | 09/22/03  
                                           | 09/23/03  
                                           | 09/24/03  | Public Agencies   |


The meetings and workshops offered an opportunity for attendees to provide comments on the various components of the CMS Project. The meetings and workshops also provided the opportunity to gauge the clarity and understanding of the proposed applications of the CMS Project work products and to identify areas that required further clarification or refinement.

Key concerns and issues voiced at the workshops were:

- Will SANDAG require compliance with any or all of the CMS Research Project work products?
- Who will pay for these strategies?
- Are any of the strategies or programs in use in the San Diego region, or is there proven effectiveness within the region?
- Will there be required monitoring of effectiveness?

By holding these workshops and meetings, the CMS Project was able to introduce the alternative congestion mitigation strategies to a wide audience. The workshops and meetings, as well as the CMS Research Project, should be viewed as the first steps toward implementing alternative mitigation strategies throughout the San Diego region. As alternative congestion mitigation strategies are implemented throughout the region, the measures of effectiveness of specific strategies can be refined, and wider application can be promoted.
The subregional workshops, held in September 2003, allowed the CMS Project team to present the work products in their entirety, and also allowed the local jurisdictions to understand how the strategies could be used in a variety of applications. These workshops provided an important link to SANDAG’s CMP by associating the CMS Project’s work products with the objectives of the 2002 CMP.

### 3.0 CMS Project Work Products

The CMS Project work products consist of the three components identified in Section 1.3. Each work product is described in greater detail below:

#### 3.1 The CMS Toolbox

The CMS Toolbox is a collection of various strategies that local jurisdictions can pursue to reduce local and regional traffic congestion. The CMS Toolbox contains congestion mitigation strategies within the following categories:

- Transit Strategies – Involving transit service and accessibility.
- Land use Strategies – Involving site selection, design, and land use planning.
- Travel Demand Management (TDM) – Involving better management of commuter traffic.
- Transportation Systems Management (TSM) – Involving a more efficient management and operation of a local and regional transportation system.
- Capital Strategies – Involving the construction of additional transportation facilities to increase capacity.

The CMS Toolbox contains approximately 40 strategies to support the following key congestion mitigation objectives:

- Increasing the capacity of the transportation system
- Increasing the performance of the transportation system
- Effecting a mode shift away from drive alone
- Shifting peak period trips to other time periods
- Vehicle trip reductions

It was the goal of SANDAG and the CMS Project to provide information for local jurisdictions so that they may choose and apply the strategies contained within the CMS Toolbox to:
Congestion Mitigation Strategies
Final Report

- Provide guidance to new development and the promotion of transit-oriented designs and other strategies that result in reduced vehicle trip generation for the proposed project;

- Reduce congestion associated with existing developments; and

- Develop mitigation measures for roadways identified as deficient corridors, in order to comply with the Congestion Monitoring Program.

The CMS Toolbox is proposed to be included as an appendix to the CMP (CMP Appendix E), and is included in Appendix A of this report.

3.2 The TRO Framework

The Trip Reduction Ordinance (TRO) Framework provides guidance for local jurisdictions in the development and implementation of a TRO specific to their local congestion mitigation goals, while conforming to the overall congestion mitigation goals of the region. The TRO Framework provides examples of both voluntary and mandatory TRO compliance, along with appropriate language and text to provide maximum flexibility for a local jurisdiction to develop a TRO specific to their needs and requirements within both approaches.

The TRO Framework outlines an 11-step process for a local jurisdiction to follow in developing a local TRO. The 11-step process was developed based on the research of successful TDM programs and best practices throughout California and the United States. Research and experience has shown that Travel Demand Management (TDM) programs are most effective when they are reinforced by a local TRO.

By providing a standard format and content for both voluntary and mandatory TROs, the TRO Framework provides local jurisdictions the ability to develop individual TROs that address their local congestion mitigation goals while conforming to the overall congestion mitigation goals of the San Diego region.

The TRO Framework is proposed to be included as an appendix to the CMP (CMP Appendix C), and is included in Appendix B of this report.

3.3 The Trip Reduction Guidelines

The current TIS Guidelines provide references to incorporating congestion mitigation strategies, specifically in relation to transit, mixed-use developments, and TDM programs. These current guidelines, however, lack specific guidance. The Trip Reduction Guidelines provide methodologies for incorporating selected congestion mitigation strategies into the traffic impact assessment process and estimating their effectiveness in terms of associated trip reduction potential.

The following congestion mitigation strategies were identified as being most applicable to application within the traffic impact analysis process:

- Development Near Transit Stations and Transit Corridors
• Mixed-use Developments

• Transit Service and Operational Enhancement Strategies

• Travel Demand Management (TDM) Programs

The primary objective of the Trip Reduction Guidelines was to incorporate standard methodologies for estimating the effectiveness of selected congestion mitigation strategies into SANDAG’s current TIS Guidelines as contained in the 2002 CMP. This will best ensure that all local jurisdictions within the San Diego region are following a consistent set of procedures and methodologies when considering congestion mitigation strategies. The Trip Reduction Guidelines also outline a number of options for offering incentives to developers for including congestion mitigation strategies into proposed developments.

The current TIS guidelines will be amended with a reference to the Trip Reduction Guidelines. In order to provide the necessary linkage between the Traffic Impact Study (TIS) Guidelines, the Congestion Mitigation Strategies (CMS) Toolbox, and the (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, modifications to those documents were also proposed.

It was recommended that the Trip Reduction Guidelines be revised in the future, as needed, to more accurately reflect local experience and traffic conditions. The Trip Reduction Guidelines also include options for local jurisdictions to require on-going traffic monitoring as a condition of project approval with the objective of building a solid database of local information on the local effectiveness of congestion mitigation strategies specific to the San Diego region.

The Trip Reduction Guidelines are proposed to be included as an appendix to the CMP (CMP Appendix J), and are included in Appendix C of this report.

4.0 Application of the CMS Project Work Products

The CMS Project work products provide individual tools that can be used in a number of applications related to existing congestion, future congestion, and preparation of CMP deficiency plans, as illustrated in Figure 2.
The extent and scope of their application and individual use will vary as described in the following sections.

4.1 Using the CMS Project Work Products When Reviewing New Development Projects

The CMS Project work products can have potential applications during the various stages of the new development review process, as shown in Table 2. The examples given provide references as to what strategies or areas of the specific CMS Project work products apply to the various new project development steps.
### Table 2
**Application of the CMS Project Work Products for New Developments**

<table>
<thead>
<tr>
<th>Project Development Steps</th>
<th>Applicable Congestion Mitigation Strategies Project Work Product</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CMS Toolbox</td>
<td>TRO Framework</td>
</tr>
</tbody>
</table>
| Project Location          | X           |              |                        | ▪ Locate project near transit corridors or transit nodes  
                            |             |              | ▪ Locate a single-use project in a mixed-use area  
| Project Design Features   | X           | X            |                        | ▪ Incorporate mixed land uses  
                            |             |              | ▪ Incorporate design features that encourage TDM programs  
| Traffic Impact Analysis   |             |              | X                      | ▪ Evaluate impacts of project location, design features, or proposed mitigation measures  
                            |             |              |             | ▪ Adjustments to project trip generation  
| Project Mitigation        | X           | X            |                        | ▪ Use appropriate toolbox strategy to mitigate traffic impacts  
                            |             |              |             | ▪ Implement requirements of adopted TRO  
| Conditions of Approval    |             | X            | X                      | ▪ Provide ongoing monitoring to document assumed trip reductions  
                            |             |              |             | ▪ Build a database of local effectiveness  


Application of the Trip Reduction Guidelines to the new development review process is further illustrated in **Figure 3**.
Figure 3
Incorporating the Trip Reduction Guidelines into the New Development Review Process

New Development Project

Traditional Traffic Impact Analysis

Trips Generated by Development

Smart Growth Features Or Project Mitigation?

Additional Traffic Impact Analysis

Potential Additional Trip Adjustments

Net Trips Generated By Project

Use Traffic Impact Study Guidelines

Use Trip Reduction Guidelines

Potential Reductions due to:
1) Proximity to transit facilities
2) Mixed use developments
3) Transit improvements
4) TDM programs
4.2 Using the CMS Project Work Products to Improve Existing Local Congestion

The CMS Project work products can be used to address and improve existing local congestion through a variety of approaches, as illustrated in Table 3. The examples given provide references as to what strategies or areas of the specific CMS Project work products apply to the various approaches for mitigating existing local congestion. As shown, the Trip Reduction Guidelines are not applicable to mitigating existing local congestion, because the CMP TIS Guidelines are only applicable to new developments.

Table 3  
Application of the CMS Project Work Products  
to Improve Existing Local Congestion

<table>
<thead>
<tr>
<th>Approach</th>
<th>Applicable Congestion Mitigation Strategies</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CMS Toolbox</td>
<td>TRO Framework</td>
</tr>
</tbody>
</table>
| Improve traffic flows      | X           |               | ▪ Improved traffic control devices  
                              |               |               | ▪ Advanced traveler information  
                              |               |               | ▪ Value/congestion pricing     |
| Promote use of alternative transportation modes | X           | X             | ▪ Access to light rail/commuter rail/BRT  
                              |               |               | ▪ Car sharing  
                              |               |               | ▪ Park & ride lots            |
| Travel Demand Management (TDM) | X           | X             | ▪ Transit/alternative modes marketing  
                              |               |               | ▪ Transit/carpool/vanpool subsidies  
                              |               |               | ▪ Alternative work schedules/telework/work-at-home |
| Improve facilities        | X           |               | ▪ HOV/HOT lanes  
                              |               |               | ▪ Roadway widening  
                              |               |               | ▪ Intersection improvements   |


4.3 Using the CMS Project Work Products in the Preparation of Corridor Deficiency Plans

The CMS Project work products can also be used in the preparation of corridor deficiency plans to identify improvements for both existing deficient corridors and long-term deficient corridors, as shown in Table 4. As shown, both types of deficiency plans can potentially involve the CMS
Toolbox and the TRO Framework work products, with the Trip Reduction Guidelines applicable only to long-term deficiency plans, with the focus on new development review. The examples given provide references as to what strategies or areas of the specific CMS Project work products apply to the various types of deficiency plans (existing and long-term).

### Table 4

Application of the CMS Project Work Products in the Preparation of Corridor Deficiency Plans

<table>
<thead>
<tr>
<th>Deficiency Plan Types</th>
<th>CMS Toolbox</th>
<th>TRO Framework</th>
<th>Trip Reduction Guidelines</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan for Improving Existing Deficient Corridors</td>
<td>X</td>
<td>X</td>
<td></td>
<td>▪ Provide alternative mitigation improvements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>▪ Implement a local TRO</td>
</tr>
<tr>
<td>Long-term Plan for Improving Deficient Corridors</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>▪ Implement land use strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>▪ Refine local TRO</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>▪ Embrace and apply Supplemental TIS Guidelines for new developments</td>
</tr>
</tbody>
</table>


The CMS Project work products can also be used to support other transportation planning applications, such as local traffic management, transportation and land use planning, and related “smart growth” strategies. The CMS Project work products are presented to local jurisdictions for their benefit, and individual jurisdictions can use the work products at their discretion.

### 5.0 Summary of Key Conclusions and Recommendations

The CMS Project work products, as presented in the appendices of this document, are intended for the benefit and use of the local jurisdictions in the San Diego region. It is recognized that many of the congestion mitigation strategies presented in the CMS Toolbox have yet to be implemented locally, with resulting skepticism regarding their real benefits and effectiveness. However, as congestion increases, the possibility of solely expanding roadway capacity will diminish, and alternative strategies may become more applicable and viable. The CMS Project work products are intended to provide preliminary steps towards greater regional embracement of a broader set of congestion mitigation strategies and methods. It should be noted and acknowledged that there will be ample room for enhancement and refinement of the work products as their application within the region expands.
In order to assure that the CMS Project work products remain relevant to the San Diego region, and to ensure continued enhancement and refinement of the work products, the following recommendations are provided:

- Local jurisdictions should promote the application of congestion mitigation strategies consistent with local conditions and financial resources.

- As congestion mitigation strategies are implemented, local jurisdictions should require monitoring as recommended in the TRO Framework and the Trip Reduction Guidelines, either as a condition of approval, a requirement of TRO compliance, or as a part of an on-going local traffic monitoring program.

- SANDAG should support on-going monitoring of the trip reduction effectiveness of congestion mitigation strategies throughout the region, and the development of a database of regional effectiveness based on local applications. This database should be used to support or refine the CMS Toolbox, as necessary.

- All three CMS Research Project work products should be updated on an ongoing basis based on local implementation, traffic monitoring, and new research into congestion mitigation strategies.

As the local database of congestion mitigation strategy effectiveness develops, it can be anticipated that the likelihood of the congestion mitigation strategy implementation will increase as well, providing the San Diego region with another source of traffic congestion relief.
1.0 Introduction to the CMS Toolbox

1.1 CMS Toolbox Purpose and Objectives

The Congestion Mitigation Strategies (CMS) Toolbox provides a set of strategies for use by local jurisdictions within the region in addressing transportation system congestion. The intent is to provide and promote increased consideration of a variety of useful tools (e.g. methods, options, and programs) to combat traffic congestion. One of the key objectives of the CMS Toolbox is to broaden the range of mitigation options beyond “traditional” capital improvements and promote non-capital strategies such as travel demand and parking management, as well as promote transit oriented strategies and increased use of pedestrian and bicycle facilities.

This document is not intended to be an exhaustive list of all available congestion mitigation strategies nor a list of required strategies for all local jurisdictions to implement; rather, it is meant as a starting point upon which additional information can and should be added. All strategies, associated trip reduction factors, and implementation guidelines presented in this CMS Toolbox are advisory and use or application is voluntary based on localized conditions; local agencies are not required to utilize them.

It must be recognized that no one tool or strategy has been or will be universally effective in mitigating traffic congestion. By providing a toolbox approach, the objective is to offer a variety of strategies and approaches for use in preparing deficiency plans and mitigating traffic impacts associated with new development throughout the region.

1.2 Category of Strategies

The congestion mitigation strategies contained in the CMS Toolbox have been grouped into categories of similar strategies as follows:

- **Transit Strategies** — Enhanced public transportation services or facilities, including paratransit as well as conventional fixed route operations. Transit marketing and ridership incentives are included in this category.
- **Land use Strategies** — The use of land planning or related policies used to reduce the number or length of auto trips, especially during peak travel hours. Increasing urban densities and promotion of mixed-use development types are included in this category.
- **Travel Demand Management (TDM)** — The use of incentives or disincentives to influence the behavior of travelers, in particular to reduce the number of single occupant vehicle trips. Because roadway congestion occurs primarily during peak commute hours, most TDM programs focus on commuters and their employers. Promotion of flexible work schedules, employee carpooling, and transit use are examples of TDM strategies.
- **Transportation System Management (TSM)** — Includes various measures to mitigate traffic congestion by improving the efficiency of the existing transportation system. Freeway ramp metering and improved intersection signal operations are examples of strategies in this category.
- **Capital Strategies** — Includes the implementation of capital improvements such as roadway or transit facilities. Roadway widening and transit center development are example of capital strategies.

Table 1 shows how all the congestion mitigation strategies contained within the five categories discussed above support one or more of the following key congestion mitigation objectives:

- **Increasing the Transportation System Capacity** – This includes the addition of vehicle-carrying capacity to a roadway or freeway facility, improving and increasing the capacity of an intersection, or increasing the person-carrying capacity of a transit system.

- **Improving the Transportation System Performance** – This includes enhancements to the roadway and signal systems, enhancements to public transit operations, improvements or enhancements to the transit vehicles, and other efforts aimed at improving the performance of a transportation system.

- **Effecting a Mode Shift Away From Drive Alone** – This refers to any strategy or program that results in a decrease in single occupancy vehicle (SOV) trips on a roadway system, through a resulting increase in transit, bicycle, pedestrian, or high occupancy vehicle (HOV) trips.

- **Shifting Trips to Other Time Periods** – This includes strategies that seek to control peak hour traffic flow, either though restrictions, tolls and charges, or other measures.

- **Vehicle Trip Reductions** – This includes strategies that seek to reduce total trip generation or total vehicle trips on a facility, through mixed-use development, on-site facilities, or through regional or local Trip Reduction Ordinances (TRO) and programs. This objective is related to changes in average vehicle ridership (AVR) and vehicle miles traveled (VMT).

### Table 1

<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
<th>Strategy</th>
<th>Increasing the Transportation System Capacity</th>
<th>Improving the Transportation System Performance</th>
<th>Effecting a Mode Shift Away From Drive Alone</th>
<th>Shifting Trips to Other Time Periods</th>
<th>Vehicle Trip Reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit</td>
<td>1-1</td>
<td>Access to Light Rail / Commuter Rail / Bus Rapid Transit (BRT)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td>1-2</td>
<td>Transit System/Service Expansion • Local • Express</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td>1-3</td>
<td>System/Service Operational Improvements • Increased Service Frequency • Decreased Travel Time</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td>1-4</td>
<td>Subscription Services</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td>1-5</td>
<td>Car Sharing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td>1-6</td>
<td>Station Amenities &amp; Public Transit Facility Improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land use</td>
<td>2-1</td>
<td>Development Along Transit Corridors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land use</td>
<td>2-2</td>
<td>Development Around Transit Nodes</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land use</td>
<td>2-3</td>
<td>Mixed-use Developments</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>No.</td>
<td>Strategy</td>
<td>Increasing the Transportation System Capacity</td>
<td>Improving the Transportation System Performance</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
<td>Shifting Trips to Other Time Periods</td>
<td>Vehicle Trip Reductions</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Land use</strong></td>
<td>2-4</td>
<td>Locally Serving Commercial</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-5</td>
<td>Interconnected Street Networks &amp; Pedestrian Facilities</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Travel Demand Management (TDM)</strong></td>
<td>3-1</td>
<td>On-Site Child Care / Cafeteria / Deli / Gym / Fitness Facilities</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>3-2</td>
<td>Transit / Alternative Modes Marketing</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-3</td>
<td>Trip Reduction Programs &amp; Ordinances</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-4</td>
<td>Transportation Management Associations</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>3-5</td>
<td>Bicycle / Pedestrian Allowances</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-6</td>
<td>Distributed &amp; Remote Work Centers / Video Conferencing</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-7</td>
<td>Alternative Work Schedules / Telework / Work-at-Home</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-8</td>
<td>Carpool / Vanpool / Transit Programs</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-9</td>
<td>Carpool / Vanpool Subsidies</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-10</td>
<td>Parking Restrictions / Reduced Minimums and Maximums / Area-Wide Caps</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-11</td>
<td>Parking Charges &amp; Carpool / Vanpool Preferential Parking</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-12</td>
<td>Transit Pass Subsidies</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-13</td>
<td>Guaranteed Ride Home Program</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Traffic Systems Management (TSM)</strong></td>
<td>4-1</td>
<td>Improved Traffic Control Devices</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-2</td>
<td>Local Traffic Management (Monitoring and Control) &amp; Arterial Monitoring</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-3</td>
<td>Special Event Management</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Traffic Systems Management (TSM) (Continued)</strong></td>
<td>4-4</td>
<td>Incident Management</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-5</td>
<td>Commercial Vehicle Restrictions</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>Advanced Traveler Information</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-7</td>
<td>Value/Congestion Pricing</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-8</td>
<td>Peak Period On-Street Parking Restrictions</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Capital</strong></td>
<td>5-1</td>
<td>Park &amp; Ride Lots (Transit)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-2</td>
<td>HOV / HOT Lanes / Access</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-3</td>
<td>Roadway Widening</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-4</td>
<td>Intersection Improvements</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-5</td>
<td>Bicycle Facilities</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-6</td>
<td>Pedestrian Facilities</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-7</td>
<td>Bus Priority Treatments on Surface Streets</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-8</td>
<td>Grade Separation / Urban Interchange</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key:
X – Supports Congestion Mitigation Objective
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Transit Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td>Description:</td>
<td>Strategy includes various actions and activities aimed at providing enhanced access to transit stations, such as:</td>
</tr>
<tr>
<td></td>
<td>• Special fixed route or demand responsive transit services connecting neighborhoods or employment centers to rail stations, generally located within a 5 mile radius of a transit station. This could include a station car to transport riders to the station.</td>
</tr>
<tr>
<td></td>
<td>• New/improved pedestrian facilities connecting neighborhoods or employment centers to rail stations, generally located within ¼ mile of a transit station. An example is the pedestrian corridors linking some of the Trolley stations in Mission Valley to the adjacent residential and retail centers.</td>
</tr>
<tr>
<td>Effectiveness:</td>
<td><strong>Unit of Measure</strong> Reduction in vehicle trips.</td>
</tr>
<tr>
<td></td>
<td><strong>Direct Travel Effect</strong> Reduction of up to 5% of work trips and up to 2% of non-work trips per residential DU within ¼ mile of transit service/access.</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>High; applicable particularly to San Diego Trolley stations with limited or no parking and Coaster stations with limited local bus connections. Also applicable in areas where major employment/activity center is beyond walking distance (typically &lt; 1/4 mile) of rail station.</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
<td>• Coordination with local transit agency and operator of transit services.</td>
</tr>
<tr>
<td></td>
<td>• Ongoing source of operating funds will be important.</td>
</tr>
</tbody>
</table>
### 1-1 Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)
(Continued)

**Related Strategies:**
- Transit System/Service Expansion
- Subscription services
- Bicycle/Pedestrian Facilities
- All TDM Strategies
- Transit Pass Subsidy
- Transit/Alternative Mode Marketing
- Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps
- Bus Priority Treatments on Surface Streets

**Estimated Costs:**
Capital - Low to Moderate, depending on extent of service and improvement.
Operating – Ongoing with an average cost per revenue mile of $4.00 for fixed route, and cost per revenue hour of $35.00 for demand responsive.
### Strategy: Transit System/Service Expansion

**Category:** Transit Strategies

**Congestion Mitigation Objective:** Increasing the Transportation System Capacity and Effecting a Mode Shift Away From Drive Alone

**Description:** In contrast to strategy 1-1 which improves access to transit, this strategy includes provisions of a range of new transit services or systems, including:

- **Local Services** – Frequent service between major destinations and/or activity centers, commonly using small to medium vehicles. No stops or few stops between endpoints. Appropriate for distances of one to three miles. This can include LRT or BRT transit service expansion. In some cases the local service can be designed to serve a particular demographic, such as senior shuttle service.

- **Circulation / Feeder Services** – Vehicles (usually rubber-tired) collect and distribute passengers within a large destination area or activity center, providing a convenient substitute for short auto trips. Successful circulator systems can also reduce on-site parking needs. Also includes fixed-guideway systems in airports and downtowns (Detroit, Jacksonville, Miami) and a number of activity centers (Las Colinas in Irving, Texas). This can include LRT or BRT transit service expansion, as well as community shuttle services.

- **Line Haul Services** – These routes operate along primary arterials providing longer distance services usually between communities.

- **Express Services** - A wide range of services geared toward commuters, operating primarily or exclusively during peak periods. Examples include commuter rail, conventional express bus with pick-up at park-and-ride lots and express bus with limited local circulation at one end of route. This can include Coaster service expansion.

**Effectiveness:** (Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Unit of Measure**

Reduction in vehicle trips.

**Direct Travel Effect**

Calculated ridership and resulting mode shifts.

**Regional Applicability:**

High; strong local support for transit. Includes possible service expansions providing new coverage. This strategy is very applicable to the Regional Transit Vision as defined in SANDAG’s Mobility 2030 Plan.

**Implementation Requirements:**

- Coordination with local transit agency and operator of transit services.
- Ongoing source of operating funds will be important.
## 1-2 Transit System/Service Expansion (Continued)

### References:
- ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997.

### Related Strategies:
- Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)
- Subscription Services
- Station Amenities & Public Transit Facility Improvements
- All TDM Strategies
- Transit Pass Subsidy
- Transit/Alternative Mode Marketing
- Park & Ride Lots
- Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps
- HOV/HOT Lanes/Access
- Bus Priority Treatments on Surface Streets

### Estimated Costs:
- Capital - Varies depending on type of service expansion.
- Operating - Ongoing with an average cost per revenue mile of $5.00.
<table>
<thead>
<tr>
<th><strong>Strategy:</strong></th>
<th>Transit System/Service Operational Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category:</strong></td>
<td>Transit Strategies</td>
</tr>
<tr>
<td><strong>Congestion Mitigation Objective:</strong></td>
<td>Increasing the Transportation System Capacity, Improving the Transportation System Performance, and Effecting a Mode Shift Away From Drive Alone</td>
</tr>
</tbody>
</table>

**Description:**
Strategy includes various actions and activities aimed at improving the effectiveness and efficiency of existing transit lines or services, such as:
- Increased service frequencies along existing routes (reduced headway)
- Increase span of service (time and days of operation)
- Routing modifications
- Schedule coordination and timed transfers
- Operations monitoring and maintenance improvements
- Implementation of Bus Priority Treatments

The primary focus of these strategies is to increase ridership through more frequent and efficient service levels.

**Unit of Measure**
Reduction in Vehicle Trips

**Effectiveness:**
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Direct Travel Effect**
Generally accepted elasticity of demand for service charges specifies a 0.5% ridership increase per 1.0% frequency increase translates to approximate 0.4% decrease in associated vehicle trips: a 4% to 6% decrease in vehicle trips is equal to about a 10% to 15% increase in ridership, respectively.
- Riverside, CA experienced an average annual 15% growth rate in ridership with service and operational improvements
- Bus ridership increased 12% in Miami with new express service operations and timed transfers
- Metro Rapid experienced 15 – 20% increase in ridership with introduction of limited stop and more frequent services

**Regional Applicability:**
High; extensive regional and local transit network. Consistent with the regional transit vision. Major constraint will be increased operating funding requirements.

**Implementation Requirements:**
- Coordination with local transit agencies and transit operators.
- Additional enhancement of service effectiveness will require Bus Priority Treatments (5-7) to improve travel speeds and service reliability.
- When increasing service frequency and/or span of service, ongoing sources of operating funds will be important.
### 1-3 Transit System/Service Operational Improvements
(Continued)

• LACMTA – Metro Rapid ridership statistics  
• ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997. |
| --- | --- |
| Related Strategies: | • Transit/System Service Expansion  
• Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)  
• Transit Service Amenities and Facility Improvements  
• Transit/Alternative Modes Marketing  
• Park & Ride Lots  
• Bus Priority Treatments on Surface Streets  
• Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps  
• HOV/HOT Lanes/Access |
| Estimated Costs: | Capital - Varies, depending upon type and extent of service.  
Operating - Ongoing with an average cost per revenue mile of $5.00. |
### Strategy: Subscription Services

**Category:** Transit Strategies

**Congestion Mitigation Objective:** Increasing the Transportation System Capacity and Effecting a Mode Shift Away From Drive Alone

**Description:** Charter bus service organized by an employer (or group of employers) for commuting employees. Charter services pick up employees at major transit centers and/or Park and Rides to fulfill one leg of their commute trip. Buses may be chartered from private companies, or service may be purchased from the public transit agency. In some cases, employers may subsidize a public bus route that primarily serves their employees, but is still open to the public. This could include van services, such as the Cloud Nine van service in the San Diego region, that could be chartered or purchased by an employer or group of employers.

Similarly, charter bus services can be organized and offered by residential complexes to provide access to and from major transit centers or local job centers.

This strategy differs from standard shuttle service in that the bus or van service is specifically chartered by an employer or group of employers, and does not serve other customers.

**Effectiveness:**

*Unit of Measure*
Reduction in vehicle trips.

*Direct Travel Effect*
Reduction of 0.2 vehicle trips per employee offered service.

**Regional Applicability:** Medium; applicable to large employers, or for employment clusters such as a business park or central business district.

Charter service offered by private services is currently in use for long distance commute between Downtown San Diego and Riverside County (Temecula, Murrieta) and at a small number of major employers (UCSD). Coordination with RideLink could identify origin/destination pairs needing greater capacity than vanpools.

**Implementation Requirements:**
- Reliable source of operating funds.
- Employer interest and support.

**References:**
- Livermore Amador Valley Transit Authority (Primetime Bus Service).
- San Joaquin Regional Transit District (Interregional Subscription Bus).
<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Transit Pass Subsidy</td>
</tr>
<tr>
<td>• Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)</td>
</tr>
<tr>
<td>• Car Sharing</td>
</tr>
<tr>
<td>• Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps</td>
</tr>
<tr>
<td>• HOV/HOT Lanes/Access</td>
</tr>
<tr>
<td>• Park &amp; Ride Lots</td>
</tr>
<tr>
<td>• Transit/Alternative Modes Marketing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital – Low.</td>
</tr>
<tr>
<td>Operating – Full or high cost recovery from subscription fare revenue. Any operating subsidies required would be ongoing.</td>
</tr>
<tr>
<td>Strategy:</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Category:</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
</tr>
</tbody>
</table>

**Description:**

Short term car leasing, or car sharing, is a new mobility service that allows users to check out an automobile on demand as a supplement to public transportation. Rather than own one or more private automobile(s), car sharing members have access to a fleet of shared vehicles. Participants only pay for the time they use the vehicle, while maintenance, insurance, and gas are covered by the car sharing organization. These vehicles can be used by residents for errands, and assist commuters in making connection between Commuter Rail/BRT stations and their place of employment. Car sharing organizations such as Zipcar and FlexCar have established successful programs in Portland, Seattle, and Washington D.C, and are expanding operations throughout the United States. FlexCar recently opened up a San Diego based operation.

This concept can be applied to new developments whereby people buying/renting agree not to own a car. Car ownership is not prohibited for residents, however it can be discouraged through parking charges, a lack of available on-street parking, or by the availability of alternative transportation options such as transit, carpooling, and car sharing programs. Parking requirements for the development can be reduced as an incentive to providing car sharing opportunities. In some cases, reductions in parking requirements can help developers pencil out affordable and inclusionary housing projects.

**Effectiveness:**

(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Unit of Measure**

Reduction in vehicle trips.

**Direct Travel Effect**

Reduction of up to 2.0 Vehicle Trips per DU Participating

**Regional Applicability:**

Med:
- Could be effective in areas with higher residential densities and good transit services.
- FlexCar in operation in downtown San Diego.
- More effective when packaged with transit privileges through a Mobility Pass program (A program in which a single transit pass can be used to pay for a variety of transit services).

**Implementation Requirements:**

- Service and maintenance management for vehicles.
- City ordinance/ modification to parking requirements.
- Organized program with interested participants.

**References:**

- San Diego FlexCar Program Information.
1-5 Car Sharing (Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps</td>
<td></td>
</tr>
<tr>
<td>• Transit/System Service Expansion</td>
<td></td>
</tr>
<tr>
<td>• All TDM strategies</td>
<td></td>
</tr>
<tr>
<td>• Transit Pass Subsidy</td>
<td></td>
</tr>
<tr>
<td>Low; maintenance and operating costs are offset by program fees.</td>
<td></td>
</tr>
<tr>
<td>Strategy:</td>
<td>Service Amenities &amp; Public Transit Facility Improvement</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Category:</td>
<td>Transit Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
</tbody>
</table>
| Description: | Strategy includes various actions and activities designed to enhance the transit patron’s experience and convenience as well as the reliability of transfers. Examples include:  
- Improved ticketing facilities (easier to use/faster)  
- Improved station boarding facilities, platform benches/waiting areas, restrooms, etc.  
- Improved parking facilities, enhanced security or closed-caption television (CCTV)  
- Vending facilities  
- Improved lighting  
- Policing  
- Emergency call boxes  
- Real time information |
| Unit of Measure | Reduction in vehicle trips. |
| Effectiveness: (Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J) | Direct Travel Effect: Varies depending on nature of improvement. Service amenities and station improvements have demonstrated effects of increasing transit use when included as part of broad regional programs. It is important to identify the potential ridership increase in order to determine the potential vehicle trip reductions.  
Additional Supporting Information: Studies have indicated that the trip time associated with waiting for or transferring to a transit vehicle is perceived to be two to three times as onerous as the actual travel time. Anything that can be done to enhance this experience will have a positive effect on attracting ridership. |
| Regional Applicability: | High; extensive transit network provides opportunities for added amenities and facility enhancements. |
| Implementation Requirements: | Coordination with local transit agencies.  
Market research. |
| References: | ITE. A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility.  
1997.  
US Dept. of Transportation, FHWA. Traveler Response To Transportation System Changes. 1981. |
### 1-6 Service Amenities & Public Transit Facility Improvement
(Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Transit/System Service Expansion</td>
</tr>
<tr>
<td>• System/Service Operational Improvements</td>
</tr>
<tr>
<td>• Access to Light Rail/Commuter Rail/BRT</td>
</tr>
<tr>
<td>• Transit/Alternative Modes Marketing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varies.</td>
</tr>
<tr>
<td>Strategy:</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Category:</td>
</tr>
<tr>
<td>Congestion</td>
</tr>
<tr>
<td>Mitigation</td>
</tr>
<tr>
<td>Objective:</td>
</tr>
</tbody>
</table>

**Description:**
This strategy consists of efforts to intensify or develop land uses within walking distance of a transit corridor. The strategy would typically be implemented through new development, infill and redevelopment. It is typically applied to areas within a half-mile radius of transit stations or within a quarter mile of major transit corridors.

Example implementation measures include:
- Minimum density standards/Reduction or elimination of maximum density allowances.
- Maximum parking allowances/Reduction or elimination of minimum parking requirements.
- Density bonuses.
- Housing Incentive Programs (cash payment per new bedroom near transit)
- Integration into the community planning processes and specific plans (encourage Transit Oriented Development).
- Urban growth boundaries
- Revised street standards.
- Transfer of development rights.
- Reduced setback and lot size requirements.

**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
For projects within ¼ mile of a designated transit corridor:
- Residential: up to a 5% Vehicle Trip Reduction
- Commercial/Retail: up to a 7% Vehicle Trip Reduction

**Effectiveness:**
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)
- Land use density is an important factor in determining the potential transit ridership increase, and therefore must be accounted for in the calculations of effectiveness. The ITE Trip Generation Handbook, 6th Edition, contains a methodology for determining trip generation rates based on land use densities.
- Research has indicated that transit use can triple for every doubling of land use density.
- Availability and accessibility of transit services near mixed land uses has been shown to increase transit ridership by almost 4%.
- Arlington County, Virginia (an urban county in the Washington DC metropolitan area with 95% of office space and 67% of retail space is within walking distance to transit) has realized a 40% reduction in vehicle trips to work compared to the average regional rate.
### 2-1 Development Along Transit Corridors

**Regional Applicability:**
Moderate to high; community resistance to increased densities could be a factor (Public planning process is critical to gain acceptance). This strategy is consistent with smart growth strategies and the City of San Diego City of Villages concept and the Regional Transit Vision.

**Implementation Requirements:**
- Frequent transit service (as defined by the local agency) must be available or planned within ¼ mile of development.
- Opportunities for infill, redevelopment, or greenbelt development along corridor.
- City/regional planning and zoning that allows/encourages mixed-use and medium to high densities along transit corridor.
- Specific plans for target areas along corridor.
- Transit use increases as the land use densities increase, the densities and associated ridership estimates must be accounted for based on available data.

**References:**
- Cervero, R. America's Suburban Centers: The Land use-Transportation Link. 1989.
- Harvey, G. Relation of Residential Density to VMT per Residency: Oakland. 1990.

**Related Strategies:**
- All Land use Strategies
- Car Sharing
- Transit System/Service Expansion
- Transit Pass Subsidy (Integrated to encourage transit usage)

**Estimated Costs:**
Varies depending upon application; costs are part-in-parcel to the development process.
<table>
<thead>
<tr>
<th>Strategy: Development Around Transit Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category: Land use Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective: Effecting a Mode Shift Away From Drive Alone</td>
</tr>
</tbody>
</table>

**Description:**
This strategy consists of efforts to intensify land uses around existing or planned high-capacity transit stations. It would be implemented through new development, infill and redevelopment, and should incorporate direct and convenient pedestrian linkages. It is typically applied to areas within a half-mile radius of transit stations or within a quarter mile of major transit corridors.

Example implementation measures include: Minimum density standards/Reduction or elimination of maximum density allowances, maximum parking allowances/Reduction or elimination of minimum parking requirements, density bonuses, Housing Incentive Programs (cash payment per new bedroom near transit), integrated into the community planning processes and specific plans (encourage Transit Oriented Development), urban growth boundaries, revised street standards, transfer of development rights, and reduced setback and lot size requirements.

**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
For projects within ½ mile of a designated transit node:
- **Residential:** up to a 10% Vehicle Trip Reduction
- **Commercial/Retail:** up to a 15% Vehicle Trip Reduction

**Additional Supporting Information**
Land use density is an important factor in determining the potential transit ridership increase, and therefore must be accounted for in the calculations of effectiveness. The ITE Trip Generation Handbook, 6th Edition, contains a methodology for determining trip generation rates based on land use densities.

**Regional Applicability:**
Moderate to high; consistent with smart growth strategies.
2-2 Development Around Transit Node
(Continued)

Implementation Requirements:
- Opportunities for redevelopment/infill development around station.
- City/regional planning and zoning that allows/encourages mixed-use and medium to high densities around transit corridor.
- Specific plans for station areas.
- Cooperation between transit operator and surrounding land owner (e.g. the local jurisdiction).
- Transit use increases as the land use densities increase, the densities and associated ridership estimates must be accounted for based on available data.

References:
- www.ci.mtnview.ca.us (website explains their Transit Oriented Development strategies and includes examples of four station area precise plans).

Related Strategies:
- All Land use Strategies
- All Transit Strategies

Estimated Costs: Varies depending upon application
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Mixed-use Developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Land use Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Vehicle Trip Reductions</td>
</tr>
</tbody>
</table>

- **Description:**
  This strategy encourages the location of compatible land uses within walking distance of each other (i.e. residential and commercial/retail uses). Mixed-use development typically results in a higher level of walking, as well as a greater potential for transit use, compared to single-use developments.

  In addition to many of the implementation measures listed under Transit Corridors and Station Areas, examples of implementation measures include:
  - Mixed-use zoning code
  - Shared parking standards

- **Unit of Measure**
  Reduction in Vehicle Trips.

- **Direct Travel Effect**
  For Mixed-use developments:
  - Residential (Minimum 15% Commercial): up to a 5% Vehicle Trip Reduction
  - Commercial/Retail (30% Residential): up to a 7% Vehicle Trip Reduction

- **Effectiveness:**
  (Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

  - Land use density is an important factor in determining the potential transit ridership increase, and therefore must be accounted for in the calculations of effectiveness. The ITE Trip Generation Manual, 5th Edition, contains a methodology for determining trip generation rates based on land use densities.
  - In Washington County, Oregon, the Land use, Transportation and Air-quality (LUTRAQ) program suggested a 22.5% reduction in SOV work-trips, an 18% reduction in highway congestion, and a 21% increase in access to employment locations with Mixed-use Developments.

- **Regional Applicability:**
  High:
  - Number of successful local mixed-use projects in Uptown.
  - Consistent with smart growth strategies and the City of Villages concept.
  - New applications tend to be larger-scale development projects

- **Implementation Requirements:**
  - Zoning that allows and encourages mixed-use.
  - Mixed-use developments should be planned and promoted on a regional level.
  - Parking zoning that allows shared parking.
  - Mixed-use design standards to support pedestrian environment.
  - Transit use increases as the land use densities increase, the densities and associated ridership estimates must be accounted for based on available data.
<p>| | 1000 Friends of Oregon. <strong>Making the Connection.</strong> A Summary of the LUTRAQ Project, Portland, OR. 1997. |
| | Los Angeles County Metropolitan Transportation Authority. <strong>Congestion Management Program.</strong> 2002. |
| Related Strategies: | Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps |
| | Car Sharing |
| | All TDM Strategies |
| | All Land use Strategies |
| Estimated Costs: | Varies depending upon application |</p>
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Locally Serving Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Land use Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Vehicle Trip Reductions</td>
</tr>
<tr>
<td>Description:</td>
<td>This strategy encourages the location of locally serving commercial retail land uses near residential land uses. This strategy would increase trip-serving opportunities within walking and bicycling distance of residential locations. In order to be effective, the locally serving commercial should have pedestrian, bicycle, and transit friendly design elements.</td>
</tr>
<tr>
<td>Effectiveness:</td>
<td><strong>Unit of Measure</strong> Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td></td>
<td><strong>Direct Travel Effect</strong> Up to a 4.5% vehicle trip reduction per 20% increase in share of retail &amp; commercial floor area for the entire development.</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>High:</td>
</tr>
<tr>
<td></td>
<td>• Consistent with smart growth strategies and the City of Villages concept.</td>
</tr>
<tr>
<td></td>
<td>• Many local agencies and recent developments have expressed an interest in mixed-use, high density developments that include locally serving commercial.</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
<td>• Zoning that allows locally serving commercial</td>
</tr>
<tr>
<td></td>
<td>• Pedestrian, bicycle, and transit friendly design elements.</td>
</tr>
<tr>
<td></td>
<td>• Transit use increases as the land use densities increase, the densities and associated ridership estimates must be accounted for based on available data.</td>
</tr>
<tr>
<td></td>
<td>• Kara Kockelman. Travel Behavior as a Function of Accessibility, Land use Mixing, and Land use Balance: Evidence from the San Francisco Bay Area. 1996.</td>
</tr>
<tr>
<td>Related Strategies:</td>
<td>• Mixed-use Developments</td>
</tr>
<tr>
<td></td>
<td>• On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities</td>
</tr>
<tr>
<td>Estimated Costs:</td>
<td>Varies depending upon application</td>
</tr>
<tr>
<td>Strategy:</td>
<td>Interconnected Street Networks &amp; Pedestrian Facilities</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Category:</td>
<td>Land use Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Vehicle Trip Reductions</td>
</tr>
</tbody>
</table>
| Description:                 | This strategy provides more direct routes for motor vehicles as well as pedestrians and bicycles. By providing a denser network of local streets and additional connections between adjacent developments, barriers created by wide arterial streets with fast-moving traffic and infrequent intersections are reduced. Example implementation measures include:  
  • Revised roadway standards  
  • Minimum walkability standards |
| Unit of Measure               | Reduction in Vehicle Trips.                            |
| Direct Travel Effect          | Up to a 2.5% Vehicle Trip Reduction (Estimated)       |
| Additional Supporting Information |  
  • 25% fewer auto trips per household in traditional vs. suburban neighborhoods.  
  • 43% reduction in vehicle-miles of travel in traditional neighborhoods vs. suburban neighborhoods.  
  • The volume of pedestrian trips is three times higher in urban sites with small street blocks and continuous sidewalks than in suburban sites with large blocks and discontinuous sidewalks. |
| Regional Applicability:       | Moderate:  
  • Difficult to implement in existing built-out areas.  
  • New developments are trying to implement this (Bressi Ranch, 4S Ranch, etc.). |
| Implementation Requirements: |  
  • Available right-of-way.  
  • Land use plans and zoning requirements.  
  • Adhere to local street design standards and local fire codes.  
  • Regional planning of interconnected street networks and pedestrian facilities is desired.  
  • Transit use increases as the land use densities increase, the densities and associated ridership estimates must be accounted for based on available data. |
|---|---|
| Related Strategies: | All Land Use Strategies  
All Capital Strategies  
All Transit Strategies |
| Estimated Costs: | Varies depending on application |
### Strategy: On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities

#### Category: Travel Demand Management (TDM) Strategies

#### Congestion Mitigation Objective:
Vehicle Trip Reductions

#### Description:
The provision of on-site support facilities can be important in complementing the use of alternative modes (such as transit, carpools/vanpool) by eliminating some of the reasons that employees typically find a use for their vehicles during the daytime. Notable facility types include:

- On-site childcare
- Cafeteria/deli/and supporting food services
- Fitness and activity centers

These facilities should be located within walking distance of all employers that would take credit for the facility.

It should be noted that this strategy is most useful when combined with financial incentive strategies such as transit pass subsidies. In addition, use of the facilities can be promoted by providing financial incentives such as gym membership or childcare subsidies. The costs of membership at the facilities should be reasonably affordable to the employees at the site or made so through subsidies.

#### Effectiveness:

**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
Up to a 2.5% Vehicle Trip Reduction for Associated Developments.

**Additional Supporting Information**
The availability of convenient on-site facilities was shown to have the potential to reduce SOV trips by 2.8% (Cambridge Systematics, 1994).

#### Regional Applicability:
Moderate to High:
- Most applicable to large employment or residential concentrations
- Some mode of commuter supporting transit access is desirable.

#### Implementation Requirements:
- The facilities should be sized to serve the commercial or residential centers.
- Supporting TDM, transit, and other trip reduction measures are essential, especially in terms of access to alternative modes to the SOV.
- Provision for these facilities should be made early in the project planning/site design process.
### 3-1 On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities

**(Continued)**

<table>
<thead>
<tr>
<th>References:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Los Angeles County Metropolitan Transportation Authority. <em>Congestion Management Program</em>, 2002.</td>
</tr>
<tr>
<td>• ITE. <em>A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility</em>, 1997.</td>
</tr>
<tr>
<td>• Cambridge Systematics, Inc. The Effects of Land use and Travel Demand Management Strategies on Commuting Behavior, USDOT, DOT-95-06. 1994.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All TDM Strategies</td>
</tr>
<tr>
<td>• All Transit Strategies</td>
</tr>
<tr>
<td>• Locally Serving Commercial</td>
</tr>
<tr>
<td>• Mixed-use Developments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Costs are site-specific and would be determined during project development.</td>
</tr>
<tr>
<td>• Operational costs could be offset by revenue generated by the facility.</td>
</tr>
</tbody>
</table>
### Strategy: Transit/Alternative Modes Marketing

**Category:** Travel Demand Management (TDM) Strategies

**Congestion Mitigation Objective:** Effecting a Mode Shift Away From Drive Alone and Vehicle Trip Reductions

**Description:** Marketing alternative modes and transit is primarily a supporting strategy that will serve to create synergy with either regional TDM or employer-specific TDM efforts. Any TDM program must contain a marketing component that will (ITE 1993):

- Target the specific characteristics and attitudes of the employees or target customers,
- Be highly visible and continuous, and
- Clearly identify subsidies, prizes, or rewards for participating in the TDM program.

Marketing programs should make employees or customers aware of the cost savings possible to them through participating in the TDM program. Existing TDM programs in Atlanta and Florida have been most effective in increasing participation by marketing the cost and time savings benefits of HOV lane use, rather than promoting the air quality benefits of ridesharing. (URS, 2002)

**Effectiveness:**

(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

- **Unit of Measure**
  - N/A
- **Direct Travel Effect**
  - N/A

**Additional Supporting Information**

This strategy has no independent effectiveness, and should be implemented in support of other TDM strategies.

**Regional Applicability:**

- **High:**
  - This strategy is applicable throughout the region when applied in conjunction with other TDM strategies.
  - Marketing efforts should be focused on target audiences which have access to alternative modes and participate who can participate in a TDM program either as part of a neighborhood or at an employer.
### 3-2 Transit/Alternative Modes Marketing (Continued)

**Implementation Requirements:**
- This strategy must be implemented in conjunction with other TDM strategies. It should be seen as a requirement of a TDM program implemented by employers.
- Marketing efforts should make use of available marketing materials and resources through the SANDAG RideLink program and transit marketing materials.
- A marketing strategy as part of a TDM program should at minimum address:
  - Defining the target market and their characteristics
  - Form of the marketing program
  - Continuation
  - Funding

**References:**
- ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997.

**Related Strategies:**
Marketing is a crucial component in implementing any TDM strategy or organized program, and it relates to all of the TDM and transit strategies.

**Estimated Costs:**
Low to moderate; specific costs will vary by program, but a study by Seattle Metro in 1989 indicated that marketing programs for established TDM efforts ranged from $10,000 to $55,000 per year for employers with less than 1,000 employees to $18,000 to $100,000+ per year for employers with over 1,000 employees. In a study prepared for the Denver Regional Council of Governments, marketing efforts (where they were undertaken) comprised 5% to 32% of the overall TDM program costs.
### Strategy: Trip Reduction Programs & Ordinances

**Category:** Travel Demand Management (TDM) Strategies  

**Congestion Mitigation Objective:** Vehicle Trip Reductions

#### Description:

A trip reduction program is an organized and funded effort focused on implementing a series of trip reduction strategies. It can be initiated from three basic causes:

- **Regional incentives** – Where a regional agency such as SANDAG prepares a TDM program oriented around incentives for local agencies, employers, or individual to change their travel behavior to reduce vehicle trips and/or vehicle miles traveled.

- **Local ordinance** – Local cities can form and adopt a TDM program through an ordinance that places certain voluntary or mandatory requirements on developers, employers, or other trip generating groups.

- **Developer requirements** – Developers can be required to prepare a TDM program as mitigation for impacts their project will develop.

The various strategies listed in this CMS Toolbox can be grouped and organized to create a TDM program.

Programs are most effectively implemented at the employer level, although they are often supported by regional agency or Transportation Management Association (TMA) efforts. Trip reduction programs allow employers to track the effectiveness of their efforts and take credit for trip reduction efforts.

Typically, these programs have been promoted by air quality improvement efforts and requirements, although some innovative approaches have been seen. For example, Arlington, Virginia requires developments to review the potential need for trip reduction programs as part of their site review process. Recent regional TDM programs such as those in Atlanta and Florida have successfully focused on the benefits to the individual employee in terms of money and time saved as opposed to the somewhat indirect benefits of air quality and traffic congestion.
### 3-3 Trip Reduction Programs & Ordinances (Continued)

**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
N/A

**Additional Supporting Information**
The effectiveness of a TDM program and ordinance is a function of the specific strategies implemented. Reference should be made to the appropriate strategies in this CMS Toolbox. The effectiveness of any TDM program is influenced by:
- Whether it is voluntary or involuntary
- The type and extent of TDM strategies being implemented
- Level of financial incentives offered to participants
- Extent of marketing efforts undertaken
- Establishing clear, logical and attainable goals
- Transparent integration of the local and regional program
- Collection good baseline data and ongoing monitoring program effectiveness
- Maintain data collection standards for overall program evaluation
- Good level of local agency cooperation and communication with employers

**Regional Applicability:**
High; TDM programs and ordinances are applicable throughout San Diego County, but are likely to be most effective when centered around major employment and residential areas with reasonable access to alternative modes such as transit. The San Diego RideLink program can assist employers in developing TDM programs, as well as supporting certain mode shift alternatives. As part of the SANDAG CMS Project, a model TDM program and ordinance that can be used as a template for developing specific TDM programs and ordinances has been prepared.

**Implementation Requirements:**
- The TDM program must contain strategies that are supportable. For example, a transit subsidy is of little use where transit access does not exist.
- The TDM requires local jurisdictional and private sector support.
- The TDM program must identify:
  - Description of the target participants and their characteristics
  - Summary of supporting land use and alternative mode (transit, carpool parking, etc.) infrastructure and services
  - Description of strategies, including the type and extent of incentives to be offered
  - Description of the marketing efforts and schedule on which marketing will conducted
  - Methods for monitoring participation and effectiveness of the program

**References:**

**Related Strategies:**
- All TDM and Transit strategies.

**Estimated Costs:**
Low – Development of the program itself can be relatively inexpensive, but it must be supported with other strategies to be effective.
### Strategy: Transportation Management Associations (TMA)

#### Category:
Travel Demand Management (TDM) Strategies

#### Congestion Mitigation Objective:
Effecting a Mode Shift Away From Drive Alone, Shifting Trips to Other Time Periods, and Vehicle Trip Reductions

#### Description:
A TMA is a formal or informal organization established by agencies, interested stakeholders, and/or employers to support the implementation, coordination, and marketing of TDM efforts. These organizations usually involve a few specialists that support employers in developing trip reduction programs, providing materials to employees, and providing updates on regional programs and efforts. Typical activities undertaken by a TMA include, but are not necessarily limited to:

- Forum for promoting expansion and accessibility to alternative modes to the SOV such as HOV facilities, transit services, bike/pedestrian improvements, etc
- Support the development and operation of TDM programs for employers and/or community groups
- Provide expertise to employers in developing TDM programs or obtaining support services
- Assist members of the TMA monitor the effectiveness of their trip reduction measures

Often times, employers can view TMAs as their input or forum into the wider regional consideration of TDM. TMAs can follow the latest regional and state legislative issues and requirements to provide members with frequent updates on items that may be of interest to them.

#### Unit of Measure
Reduction in Vehicle Trips.

#### Effectiveness:
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Direct Travel Effect**
N/A

**Additional Supporting Information**
TMAs are a method for organizing and implementing TDM programs. They can be highly effective when supported by a dedicated coordinator and proper incentives. The Contra Costa Centre Association in California reported a 14% reduction in SOV trips from 1987 to 1995 with the formation of the TMA. The Warner Center TMO in Los Angeles reported a 15% reduction in SOV trips from 1,987 to 995, a 12% increase in carpooling, a 1.7% increase in vanpooling, a 2.4% increase in transit, and a 44% increase in bicycling and walking.

#### Regional Applicability:
Low; no TMAs currently in San Diego County. TMAs are a coordinating feature and must be supported by real incentives and/or requirements on employers if they are to be funded by employers.
### 3-4 Transportation Management Associations (TMA) (Continued)

**Implementation Requirements:**

For TMAs to be effective the following conditions should be met in the area the TMA will be active:

- There must be supporting public policy through TDM programs and ordinances.
- The potential business members must perceive a benefit to pooling their resources in order to deal with TDM requirements or the implementation of programs.
- Their must be buy-in by businesses that TDM program activities are important to preserving the economic vitality of the area, as well as promoting quality of life for the community.
- The TMA must be staffed by people that support the effectiveness of TDM programs and have experience in implementing TDM programs.
- There must be sense of serious transportation problems that impact the ability of “businesses to do business.”

TMAs may be most applicable when a community views its needs in terms of resolving transportation problems through TDM as being unique or separate from the wider regional goals that may be addressed through existing regional programs. Any TMA implemented should draw upon available regional resources for support such as RideLink and tailor these resources to the specific needs of its members.

**References:**

ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997.

**Related Strategies:**

All TDM Strategies

**Estimated Costs:**

Varies depending on the level of support provided to fund the TMA and the size of the staff.
## Strategy: Bicycle/Pedestrian Allowances

**Category:** Travel Demand Management (TDM) Strategies

**Congestion Mitigation Objective:** Effecting a Mode Shift Away From Drive Alone and Vehicle Trip Reductions

### Description:
The strategy offers financial incentives to employees that walk or bicycle to work as opposed to using a single occupant vehicle. Generally the incentive would be offered through an employer or a TMA. Financial incentives have been shown to have the strongest influence relative to all TDM measures in impacting travel behavior.

An example of this strategy is being implemented in the San Francisco and surrounding Bay Area, where employees receive cash payment for using bicycle and pedestrian modes to commute to work.

### Effectiveness:
**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
Reduction of up to 2 daily vehicle trips per participant.

**Additional Supporting Information**
A 2.7% reduction in the drive alone mode split when the San Francisco program was implemented. The lack of even a small connection in the bicycle or pedestrian network to/from work can significantly reduce the effectiveness of this strategy.

### Regional Applicability:
Low; this strategy can be applied throughout the region where concentrations of residential areas exist in proximity to employment areas, and where good continuous bicycle/pedestrian facilities exist.

### Implementation Requirements:
- The facility or employer taking credit for this strategy should be able to demonstrate:
  - Adequate bike facilities (including racks, lockers, etc.).
  - Safe and continuous bicycle paths or routes from major residential areas to the place of employment.
  - A reasonable proximity for bicycle or pedestrian travel from residential areas to the place of employment.
  - Ability of some percentage of employees to bike or walk to work given their job requirements (equipment, vehicle needs, etc.)
- The facility should offer lockers and shower facilities.
- The employer should indicate how they will monitor the frequency and number of employees using the bike/walk modes.
- This strategy is most effective when applied in conjunction with other TDM strategies as part of an overall program effort, and should not be considered effective on its own.
|---|---|
| Related Strategies: | • Bicycle Facilities  
• Pedestrian Facilities  
• On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities  
• Transit/Alternative Modes Marketing  
• Trip Reduction Programs & Ordinances  
• Transportation Management Associations |
<p>| Estimated Costs: | Low; payments are generally very modest, in the range of $2 per day for current programs. |</p>
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Distributed &amp; Remote Work Centers/Video Conferencing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Travel Demand Management (TDM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation</td>
<td>Shifting Trips to Other Time Periods and Vehicle Trip Reductions</td>
</tr>
<tr>
<td>Objective:</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>These work facilities are located outside of the major commute corridors to reduce the number of trips through congested corridors. The benefits include reduced employee travel times, reduced latency, etc. The benefits to employees can be significant when the travel time savings and quality of life issues are considered. Commercial developments would include a video conferencing facility as part of their services. Video conferencing is being increasingly adopted by companies to limit travel expenses, and can be particularly effective with companies that have several offices throughout Southern California. This strategy impacts interregional travel, and trips to/from the airports, and is not effective with day-to-day commute trips.</td>
</tr>
<tr>
<td>Effectiveness:</td>
<td></td>
</tr>
<tr>
<td>Unit of Measure</td>
<td>Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td>(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)</td>
<td>Direct Travel Effect Calculate: The change in commute trip length divided by the average work trip length, multiplied by the number of participating employees equals the vehicle trip reduction.</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>Low; San Diego does not have predominante directional commuter flows. Therefore, distributed work centers are less likely to be widely effective in the region.</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
<td>These strategies are very particular to the specific site or situation where they are implemented. Where an employer or facility intends to take credit for these strategies, it should be able to show information on employee location, VMT reductions, and monitoring methods. For specific credit to be given for video conferencing facilities, the employer should be able to note which other facilities they typically interact with that have video conferencing capabilities as well as the number of trips they are likely to save on an average daily basis.</td>
</tr>
</tbody>
</table>
### 3-6 Distributed & Remote Work Centers/Video Conferencing (Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Trip Reduction Programs &amp; Ordinances</td>
</tr>
<tr>
<td>• Transportation Management Associations</td>
</tr>
<tr>
<td>• Alternative Work Schedules/Telework/Work-at-Home</td>
</tr>
<tr>
<td>• Parking Charges &amp; Restrictions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net costs are low to non-existent. Most major employers that have implemented remote work sites have experience overall cost savings in terms of rental costs, parking charges, wages, etc.</td>
</tr>
</tbody>
</table>
### Strategy: Alternative Work Schedules/Telework/Work-at-Home

**Category:** Travel Demand Management (TDM) Strategies

**Congestion Mitigation Objective:** Shifting Trips to Other Time Periods and Vehicle Trip Reductions

**Description:** Employers either pre-schedule or allow flexibly shifts in employee’s arrival and departure times to avoid the worst parts of the commute traffic. This benefits both the employee who can avoid time lost in congestion and the employer who can make more effective use of their work force. Typically alternative work schedules allow for a 9 hour/day with alternating Fridays off, or 10 hour/days with every Friday off.

Telework and working at home has gained increasing popularity in the last five years both in terms of providing employees with enhanced flexibility and reducing trips. Many factors promote telework, including the availability of high-speed communications to individual residences, increasing congestion, and the enhanced management and information systems being developed by many companies.

A majority of telework is typically done by managerial and professional staff. There are certain occupational fields, which do not lend themselves to telework. Most employers will only allow telework a certain percentage of the work week; one or two days per week, for example although the use of telework is growing as an attractive option for employees and employers.

**Effectiveness:**

**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
Alternative Work Schedules: Up to a 15% reduction in each participating employee’s average peak hour vehicle trips, based on the participating employee’s schedule change.

Telework: 20% reduction in peak hour vehicle trips per participating employee (can vary depending on the program).

**Regional Applicability:**
High; particularly effective to new development and existing employers in Sorrento Valley, Kearny Mesa, and the I-15 corridor which experience significant peak period congestion and serve as major employment centers. The greater the level of peak congestion, the more effective and viable this strategy becomes.

San Diego is frequently referred to as the nation’s most “wired” city due to the extent of high-speed communications and Internet connections. Widespread availability of the necessary communications to support working at home. In addition, San Diego has a large bio-tech/technology industry that may be well suited to telework at least during portions of the work week.
### 3-7 Alternative Work Schedules/Telework/Work-at-Home (Continued)

**Implementation Requirements:**

In order for telework to be effective, employers should be able to display high-level management support, clearly defined telework policies, suitable job tasks, revised supervisory procedures, and on-going monitoring.

This strategy is best applied by a moderate to large employer, and sometimes requires changes in operational practices.

**References:**

- ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997.

**Related Strategies:**

- Trip Reduction Programs & Ordinances
- Transportation Management Associations
- Alternative Work Schedules/Telework/Work-at-Home
- Parking Charges & Carpool/Vanpool Preferential Parking

**Estimated Costs:**

Low; employers often pick up the costs of high speed communications, extra phone lines, software, and computer equipment for employees that will telecommute a significant amount; previous studies have shown an annual per employee cost in the range of $258 to $970.
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Carpool/Vanpool/Transit Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Travel Demand Management (TDM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td>Description:</td>
<td>A well established traditional TDM program, carpooling and vanpooling are broadly accepted strategies. They are best implemented by moderate to large employers with centralized facilities, although closely located groups of smaller employers can also provide effective implementation. SANDAG’s RideLink program supports employer efforts for carpool and vanpool setup and coordination, but no specific requirements exist. Typically, employers provide equipment and insurance for vanpool programs, whereas carpool efforts are often less formal. Programs are often supported by incentive efforts. For example, San Luis Obispo Rideshare offers gift certificates for people riding vanpools a certain number of times, etc. A major method of promoting carpool/vanpools is the cost savings available to employees. A 1990 COMSIS Corporation study indicated the average one-way cost of an SOV trip for a typical 10-mile work trip at $6.75, while the same cost for a 12 person vanpool trip was $0.56, and a 2-3 person carpool trip was $4.04. For employers where restricted parking conditions exist, vanpools can save money by reducing the need for new parking spaces (estimated at $3,930 per space in 1989).</td>
</tr>
<tr>
<td>Effectiveness:</td>
<td><strong>Unit of Measure</strong> Reduction in Vehicle Trips. <strong>Direct Travel Effect</strong> 3% to 5% Vehicle Trip Reduction <strong>Additional Supporting Information</strong> Low; on a case-by-case basis, but collectively can provide more substantial benefits. Area-wide carpool programs can reduce up to 3% of the commuter traffic (ITE 1993). Employer-based carpool programs can reduce trips by up to 20% (ITE 1993).</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>High; vanpool and carpool programs are applicable throughout the region given: • Increasing levels of congestion • Availability of HOV lanes and facilities • Availability of the SANDAG RideLink program to support vanpool/carpool implementation, on-going coordination, and subsidies.</td>
</tr>
</tbody>
</table>
### 3-8 Carpool/Vanpool/Transit Programs (Continued)

<table>
<thead>
<tr>
<th>Implementation Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Employers must indicate the number and capacity of vanpool vehicles they will provide.</td>
</tr>
<tr>
<td>• Employers should be able to indicate vanpool pick-off and drop-off areas in terms of zip codes for employee homes and work sites.</td>
</tr>
<tr>
<td>• Employers should indicate what role vanpools/carpool will play in their approach to TDM, including marketing/subsidies, etc.</td>
</tr>
<tr>
<td>• Employers must make use of either RideLink or propose their own coordinated services.</td>
</tr>
<tr>
<td>• Employers should be able to display a written commitment to financially supporting their vanpool program.</td>
</tr>
<tr>
<td>• Employers may collectively organize to provide vanpool/carpool options.</td>
</tr>
<tr>
<td>• The largest facilities tend to have the highest levels of effectiveness when a comprehensive program is implemented.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>References:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ITE. A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility. 1997.</td>
</tr>
<tr>
<td>• Caltrans. “Ridesharing as a Cost Effective Solution to California’s Transportation Challenges”. 1996.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities</td>
</tr>
<tr>
<td>• Transit/Alternative Modes Marketing</td>
</tr>
<tr>
<td>• Trip Reduction Programs &amp; Ordinances</td>
</tr>
<tr>
<td>• Transportation Management Associations</td>
</tr>
<tr>
<td>• Carpool/Vanpool Subsidies</td>
</tr>
<tr>
<td>• Parking Charges &amp; Carpool/Vanpool Preferential Parking</td>
</tr>
<tr>
<td>• Car Sharing</td>
</tr>
<tr>
<td>• Guaranteed Ride Home Program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low to moderate; costs are balanced between monthly charges to employees and the employer contribution. Use of RideLink regional resources and subsidies may offer cost savings.</td>
</tr>
<tr>
<td>Strategy: Carpool/Vanpool Subsidies</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Category: Travel Demand Management (TDM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective: Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td>Description: Employers provide financial incentives to employees that carpool or vanpool. These incentives would typically be in the range of average monthly parking charges. In cases where employers subsidize parking, the subsidies could exceed the parking subsidy in order to encourage alternative commuting modes to SOVs. Other incentives such as gifts, gift certificates, gas cards, and other “prizes” can provide support for vanpool/carpool programs. According to current federal law, up to $100/month in vanpool subsidies is a tax-free benefit.</td>
</tr>
<tr>
<td>Effectiveness: (Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J) Unit of Measure Reduction in Vehicle Trips. If Subsidy Level is: Then Trip Reduction is:</td>
</tr>
<tr>
<td>&lt;25% of total cost</td>
</tr>
<tr>
<td>50% of total cost</td>
</tr>
<tr>
<td>75% of total cost</td>
</tr>
<tr>
<td>100% of total cost</td>
</tr>
<tr>
<td>Additional Supporting Information A 3.3% reduction in SOV mode share has been demonstrated (ITE 1997).</td>
</tr>
<tr>
<td>Regional Applicability: Low; this strategy is best suited to major employment centers or larger single company employment facilities. Also, corridor where HOV facilities exist can substantial enhance the synergistic effects of carpool/vanpool-related strategies.</td>
</tr>
<tr>
<td>Implementation Requirements: • The subsidies should be part of a TDM program, and should be implemented with closely supporting measures. • Employers must monitor the distribution of their subsidies and the effectiveness of their carpool/vanpool program. • Subsidies must be implemented as part of a coordinated carpool/vanpool program to be effective. • Employers must market their subsidies and make them clear to potential participants.</td>
</tr>
</tbody>
</table>
### 3-9 Carpool/Vanpool Subsidies
(Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities</td>
</tr>
<tr>
<td>• Transit/Alternative Modes Marketing</td>
</tr>
<tr>
<td>• Trip Reduction Programs &amp; Ordinances</td>
</tr>
<tr>
<td>• Transportation Management Associations</td>
</tr>
<tr>
<td>• Carpool/Vanpool/Transit Programs</td>
</tr>
<tr>
<td>• Parking Charges &amp; Carpool/Vanpool Preferential Parking</td>
</tr>
<tr>
<td>• Car Sharing</td>
</tr>
<tr>
<td>• Guaranteed Ride Home Program</td>
</tr>
<tr>
<td>• Transit Pass Subsidy</td>
</tr>
</tbody>
</table>

**Estimated Costs:** Low; subsidies range on the order of $20-$40 per month per employee participating in the program.
<table>
<thead>
<tr>
<th>Strategy: Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category: Travel Demand Management (TDM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective: Effecting a Mode Shift Away From Drive Alone and Vehicle Trip Reductions</td>
</tr>
</tbody>
</table>

**Description:**
Numerous studies have shown parking availability and cost is the leading factor in impacting travel behavior and promoting shifts from SOV to HOV/transit modes. Reduced parking requirements can often be seen as a beneficial trade-off for developers that undertake TDM programs or provide enhanced alternative modes. Parking restrictions and caps need to be carefully dealt with in relation to the available parking supply in the area, and should only be considered where high levels of transit service exist.

Additionally, there is ample evidence that higher density neighborhoods and lower-income communities have lower auto ownership rates. For this reason, various jurisdictions throughout California and the United States have allowed reduced parking requirements for transit-oriented developments or higher-density mixed-use developments.

**Effectiveness:**
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Unit of Measure**
Reduction in Vehicle Trips.

**Direct Travel Effect**
Reduction of up to 2 vehicle trips per parking space affected.

**Additional Supporting Information**
In Portland, Oregon, a 5% to 10% reduction in SOV trips was demonstrated.

**Regional Applicability:**
Moderate; parking caps, reduced minimums, and parking restrictions typically are applied only to the central business district (CBD) and transit-oriented development.

**Implementation Requirements:**
- This strategy is best enacted as part of a broader city TDM ordinance or parking management program.
- Regional parking restrictions, reduced minimums/maximums, and area-wide caps are preferred.
- Prior to implementing parking restrictions, caps, or minimums for an independent facility or site, it should be shown that:
  - The actions would be consistent with existing or planned practice in the area.
  - Existing and future parking demand have been assessed, and given the likely mode split should be sufficient.
### 3-10 Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps
(Continued)

<table>
<thead>
<tr>
<th>References:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ITE. <em>A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility</em>, 1997.</td>
</tr>
<tr>
<td>• Portland State University Study. 1995.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All Land use Strategies</td>
</tr>
<tr>
<td>• Transit Pass Subsidy</td>
</tr>
<tr>
<td>• Transit/Alternative Modes Marketing</td>
</tr>
<tr>
<td>• Trip Reduction Programs &amp; Ordinances</td>
</tr>
<tr>
<td>• Transportation Management Associations</td>
</tr>
<tr>
<td>• Carpool/Vanpool/Transit Programs</td>
</tr>
<tr>
<td>• Carpool/Vanpool Subsidies</td>
</tr>
<tr>
<td>• Car Sharing</td>
</tr>
<tr>
<td>• Guaranteed Ride Home Program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low to moderate, depending on program components.</td>
</tr>
<tr>
<td>Strategy: Parking Charges &amp; Carpool/Vanpool Preferential Parking</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Congestion Mitigation Objective:</strong> Effecting a Mode Shift Away From Drive Alone and Vehicle Trip Reductions</td>
</tr>
</tbody>
</table>

**Description:**

| **Parking Charges** | Charging for parking is generally instituted to offset the costs of developing and maintaining parking structure or lots, and also generate revenue particularly in downtown or very dense urban environments. The best contrast is downtown San Diego where employees face parking charges in the range of $80-$200 per month versus Kearny Mesa where parking is free to employees. This strategy entails charging for parking where it was previously free or not subsidizing employees for third party parking lot charges. This strategy is most effective in areas of strong transit service. Lack of free parking is a strong incentive for mode shifts, especially if supported by transit fare subsidies. |
| **Preferential Parking** | Carpools and vanpools are offered parking spaces closer to facility entrances by major employers, or parking is paid for carpools and vanpools. Strategy is best suited for larger employers. |

**Effectiveness:**

| **Unit of Measure** | Reduction in Vehicle Trips. |
| **Direct Travel Effect** | A maximum reduction of 1 vehicle trip per day per parking space affected |

**Regional Applicability:** Low; limited opportunities. Charging for or removing subsidies for parking would be most effective in Downtown San Diego, North University City, and other dense employment areas with limited parking.

**Implementation Requirements:**

- Facilities taking credit for parking charges should be able to show that they are in a market that generally charges for parking, and that their rates will be at market levels for that area.
- Employers may not gain credit for parking charges where:
  - Their trip generation rates already reflect parking charges, or
  - They subsidize parking either in part or full.
- Carpool/vanpool parking should be marked and near the main entrance to the facility with sufficient spaces available to support number of carpool/vanpool vehicle being estimated.

**References:**

### 3-11 Parking Charges & Carpool/Vanpool Preferential Parking (Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities</td>
<td></td>
</tr>
<tr>
<td>• Transit/Alternative Modes Marketing</td>
<td></td>
</tr>
<tr>
<td>• Trip Reduction Programs &amp; Ordinances</td>
<td></td>
</tr>
<tr>
<td>• Transportation Management Associations</td>
<td></td>
</tr>
<tr>
<td>• Carpool/Vanpool/Transit Programs</td>
<td></td>
</tr>
<tr>
<td>• Carpool/Vanpool Subsidies</td>
<td></td>
</tr>
<tr>
<td>• Car Sharing</td>
<td></td>
</tr>
<tr>
<td>• Guaranteed Ride Home Program</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
<th>Low; can be a source of revenue, unless the company subsidizes parking charges. Charging retail customers for parking (without validation) is generally not viable.</th>
</tr>
</thead>
</table>
### Strategy: Transit Pass Subsidies

**Category:** Travel Demand Management (TDM) Strategies

**Congestion Mitigation Objective:** Effecting a Mode Shift Away From Drive Alone

**Description:**
Employer subsidizes all or part of the cost of monthly transit passes for employees. Used in many cities. Examples include Portland’s “PASSport”, San Jose’s “Ecopass”, Denver RTD’s “EcoPass”, and Phoenix Valley Metro’s “BusCard Plus.” The latter uses a computerized system that charges employers only for the trips employees actually take. According to current federal law, up to $100/month in transit subsidies is a tax-free benefit. The Denver EcoPass program offers passes to local residents at a reduced price, with the requirement that a certain number of passes are purchased each year.

Similar to the concept of subsidies is the Mobility Pass Program. With a Mobility Pass Program, the local transit agency and SANDAG offer employers and residential complexes the ability to buy transit passes at a bulk discount. The employer/residential owner pays the transit agency a flat rate (based on a per employee/year fee). For the employer, the program’s cost can be offset by federal tax benefits that accrue to both employer and employee. Passes can be coordinated with management of large apartment/residential complexes adjacent to major transit lines. The passes can be included for all residents with pass-through fees added to the Home Owner’s Association/complex dues.

SANDAG will be expanding San Diego’s existing “Eco-pass” program to create a new ‘Mobility Pass’ which will offer card-holders access to car sharing vehicles (1-5) and guaranteed ride home services (3-13), as well as unlimited transit access. The new Mobility Pass will provide participants seamless access to a full network of alternative transportation opportunities, maximizing the convenience of public transit resources. The new Mobility Passes will also be sold as a discounted bulk package.

**Effectiveness:**
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

<table>
<thead>
<tr>
<th>Subsidy Level</th>
<th>Trip Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25% of total transit pass cost</td>
<td>0.2 Vehicle Trips/Participating Employee</td>
</tr>
<tr>
<td>50% of total transit pass cost</td>
<td>0.5 Vehicle Trips/Participating Employee</td>
</tr>
<tr>
<td>75% of total transit pass cost</td>
<td>1.0 Vehicle Trips/Participating Employee</td>
</tr>
<tr>
<td>100% of total transit pass cost</td>
<td>2.0 Vehicle Trips/Participating Employee</td>
</tr>
</tbody>
</table>

**Additional Supporting Information**
Participating employee to be calculated by the proponent.
### 3-12 Transit Pass Subsidies (Continued)

**Regional Applicability:**
High; especially valuable as an incentive in regions like San Diego that have extensive transit services, multiple modes of public transit, and varying fare structures.

This program can help employers meet trip reduction goals of a regional TDM program or ordinance as well as help developers mitigate traffic impacts created by new residential/employment projects.

**Implementation Requirements:**
- Availability of good transit services.
- Committed employers and/or residential owners
- Development ordinance requirements

**References:**
Los Angeles County Metropolitan Transportation Authority. *Congestion Management Program*, 2002

**Related Strategies:**
- Transit/System Service Expansion
- System/Service Operational Improvements
- Subscription Services
- All TDM Strategies
- Car sharing (Integrated)
- Guaranteed Ride Home Program (Integrated)

**Estimated Costs:**
Generally low, especially with Mobility Pass and similar programs.
<table>
<thead>
<tr>
<th>Strategy: Guaranteed Ride Home Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category: Travel Demand Management (TDM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective: Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td>Description: To encourage carpooling, vanpooling and transit use, employers or the regional agency offer a guaranteed (free) ride home if an employee must leave early because of an emergency, or work late unexpectedly. In some cases the benefit is unlimited; in others it is restricted to a specific number of trips per year per employee. For example, the SANDAG RideLink Guaranteed Ride Home (GRH) program currently offers a maximum of 3 rides per year. Typically, the employer or regional agency contracts with a private taxicab company.</td>
</tr>
<tr>
<td>Effectiveness: Not applicable as a stand alone TDM measure; could augment other CMS strategies such as the Transit Pass/Mobility Pass Subsidy. Studies have shown that a Guaranteed Ride Home program contributes to the mode choice decision of 2% to 5% of commuters who decide to use ridesharing.</td>
</tr>
<tr>
<td>Regional Applicability: High; currently offered by SANDAG’s RideLink program for a maximum of 3 rides per year. Can include taxi voucher or rental car voucher. Most effective when employee travels long distances to work. Essential to an effective employer travel reduction program.</td>
</tr>
<tr>
<td>Implementation Requirements: • Coordination with SANDAG RideLink program • Information dissemination • Carpool transit program • Works as a supporting strategy to strong regional or employer ridshare program</td>
</tr>
<tr>
<td>References: Alameda County Congestion Management Agency (CMA) Guaranteed Ride Home (GRH) Program.</td>
</tr>
<tr>
<td>Related Strategies: • Trip Reduction Programs &amp; Ordinances • Carpool/Vanpool/Transit Programs</td>
</tr>
<tr>
<td>Estimated Costs: Low; existing program already in place.</td>
</tr>
<tr>
<td>Strategy:</td>
</tr>
<tr>
<td>Category:</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
</tr>
</tbody>
</table>
| Description: | Traffic Signal Coordination  
Many techniques are available for traffic signal coordination, including time-based coordination techniques and direct traffic-signal interconnection. Traffic signal coordination is used to increase average through traffic speeds on major arterials. Currently, traffic signal coordination is typically achieved by traffic signal interconnection. Regional and inter-agency coordination of traffic signals can improve travel times on major regional roadways.  

Adaptive Signal Control  
More advanced techniques of traffic signal coordination attempt to modify the coordination of many signals to prevailing traffic conditions in real-time. All techniques rely on traffic-detection equipment and a central computer monitoring station that uses the collected data to optimize traffic signal coordination and timings to provide more efficient cycle-lengths and green-times.  

Traffic Signal Improvements  
Regular maintenance, review, and updates are needed for traffic signals, as traffic volume conditions can often change over time. Even minor adjustments to traffic signal timing plans can improve overall signal operations and reduce congestion and delays at intersections. Modifications to traffic signal phasing may be useful, such as the modification of protected left-turn phasing to protected/permitted phasing or vice versa.  

Advances in technology have resulted in improvements to traffic signal controller technology. The newest traffic signal controllers have the ability to store a multitude of timing plans and timing options, for improved traffic signal operations.  

Traffic Sign Improvements  
Improved road signage can reduce uncertainty of drivers and thereby reduce congestion on roadways. The intent of any improvements to road signs is to provide better information to the vehicle’s driver. The proper placement of traffic signs is important in order to convey the sign’s message. Signage can be used to restrict vehicle parking in parking lanes during peak commuting periods, thereby adding an additional travel lane. This technique is called “peak period on-street parking restrictions” and is in use throughout downtown San Diego. |
| Effectiveness: | Unit of Measure  
Reduction in Delay per Vehicle.  

Direct Travel Effect  
Up to a 10% reduction in delay per vehicle, calculated based on specific improvement. |

(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)
### 4-1 Improved Traffic Control Devices (Continued)

| Regional Applicability: | High:  
|:------------------------|--------------------------------------------------|
|                         | • Many jurisdictions have implemented traffic signal coordination.  
|                         | • Recent Caltrans projects to improve freeway signage.  
|                         | • Advances in technology have made advanced traffic signal improvements more feasible.  
|                         | • Wireless technology is available.  
| Implementation Requirements: | • A system of sub-regional Traffic Management Centers is recommended  
|                         | • Adequate right-of-way  
|                         | • Modern traffic signal equipment  
|                         | • Difficult for areas with unusual traffic patterns  
|                         | • Coordination and Adaptive Signal Control require the installation of permanent hardware for traffic signal interconnection  
|                         | • Multi-agency communication and coordination  
| References: | • ITE. A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility. 1997.  
|                         | • Dey, Fitzsimons, Morris, and Ng. Adaptive Traffic Signal Interconnect in Menlo Park and Sunnyvale, CA.  
| Related Strategies: | • Intersection Improvements  
|                         | • Local Traffic Management (Monitoring and Control) & Arterial Monitoring  
|                         | • Advanced Traveler Information  
| Estimated Costs: | Low; however, costs could increase dramatically if additional right-of-way is required. Approximately $5,000 to $20,000 per intersection location.  

### Local Traffic Management (Monitoring and Control) & Arterial Monitoring

**Category:** Traffic Systems Management (TSM) Strategies

**Congestion Mitigation Objective:** Improving the Transportation System Performance

**Description:**
This strategy encompasses a broad range of technologies and techniques used to monitor and manage traffic conditions in local municipalities. Some of the technologies used for traffic surveillance include video systems, close-circuit television (CCTV) systems, inductive loop vehicle detectors, or other vehicular detection systems. The purpose of traffic surveillance is to provide real-time information about traffic conditions including volume, speed, and occupancy data.

The traffic data obtained from the various surveillance systems can be used to determine appropriate control techniques. Control techniques and technologies include variable and changeable message signs, highway advisory radio (HAR), local media coverage, and enforcement.

The technologies of monitoring and control can be used to route traffic around areas of intense congestion, or to control heavy volumes of traffic entering or leaving major urban centers.

**Effectiveness:**

<table>
<thead>
<tr>
<th>Unit of Measure</th>
<th>Reduction in Delay per Vehicle.</th>
</tr>
</thead>
</table>

**Regional Applicability:**

- Some monitoring and control systems are already in use in the San Diego region.
- Advances in technology have made monitoring and control systems more feasible.
- Wireless technology is available.

**Implementation Requirements:**

- A system of sub-regional Traffic Management Centers is recommended
- Proper identification of surveillance equipment
- Variable message signs
- Freeway Service Patrols, similar to those used by Caltrans to travel regional state roadways and provide assistance to vehicles requiring service
- Multi-agency coordination and communication

**References:**

<table>
<thead>
<tr>
<th>4-2 Local Traffic Management (Monitoring and Control) &amp; Arterial Monitoring (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Related Strategies:</strong></td>
</tr>
<tr>
<td>• Improved Traffic Control Devices</td>
</tr>
<tr>
<td>• All TSM Strategies</td>
</tr>
<tr>
<td>• All TDM Strategies</td>
</tr>
<tr>
<td><strong>Estimated Costs:</strong></td>
</tr>
<tr>
<td>Moderate; $25,000 to $100,000 per intersection location. High operating and maintenance costs through the life of the system, vary depending on the system.</td>
</tr>
</tbody>
</table>
### Strategy: Special Event Management

#### Category:
Traffic Systems Management (TSM) Strategies

#### Congestion Mitigation Objective:
Improving the Transportation System Performance

#### Description:
These strategies include traffic management for large events such as sporting events or concerts. Although the concepts of special event management have been around for a number of years, recent advances in communications and other technologies have resulted in new management strategies and methods.

Additional strategies are in use around the world for the management of traffic at sporting events and other large gatherings. Many of these strategies focus on improved communications between various multi-jurisdictional agencies, using real-time communication and monitoring technologies. Involvement and enforcement by local agency staff is imperative to manage special event traffic, and many jurisdictions now require detailed traffic management plans to be produced and reviewed prior to approval of large traffic-generating events. These strategies also involved large-scale public information campaigns, planning of alternative routes, careful planning of decision points for locations where traffic may choose alternate routes to avoid congestion, and a technique called “contra-flow” for highways is in use in states around the US. In a contra-flow situation, traffic is routed in one direction using both the inbound and outbound lanes of the highways. This results in a doubling of the highway capacity, but requires major coordination, communication, and planning by the governing agencies.

#### Effectiveness:

**Unit of Measure**
Reduction in Delay per Vehicle.

**Direct Travel Effect**
8% to 16% reduction in delay per vehicle, valid only during the event and applicable only to vehicles affected by the management or on affected roadways.

#### Regional Applicability:
High:
- Strategic and administrative concerns, difficulty in cross-agency and jurisdictional coordination.
- Special event management is in use in San Diego at sporting events, concerts, and other large gatherings.
- Advances in technology have made surveillance and control systems more feasible.
- Wireless technology is available.
- Event Transportation Management Plan for the Downtown Ballpark is currently being developed in San Diego.

#### Implementation Requirements:
- Proper identification of surveillance equipment
- Variable message signs
- Freeway Service Patrols, similar to those used by Caltrans to travel regional state roadways and provide assistance to vehicles requiring service
- Multi-agency coordination and communication is required
## 4-3 Special Event Management (Continued)

### References:
- ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997.

### Related Strategies:
- Local Traffic Management (Monitoring and Control) & Arterial Monitoring
- Incident Management

### Estimated Costs:
Varies by application; labor-intensive.
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Incident Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Traffic Systems Management (TSM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Improving the Transportation System Performance</td>
</tr>
</tbody>
</table>

**Description:**
For incident management strategies, many of the technologies and strategies of traffic surveillance are utilized, including CCTV systems. Also utilized are roving service patrols, ranging from State and local police forces to volunteer forces. Some incident management strategies have developed teams of on-call tow-trucks positioned at various locations throughout a roadway network, so that they may immediately respond to service calls or accidents. Other incident management strategies have deployed specially equipped vehicles with variable message signs and other warning devices to quickly respond to traffic accidents and help divert traffic away from the accident while it can be cleared. Other incident management techniques involve traveler information systems and roadside call-box installation programs. Incident management only minimizes the impact of an incident on surrounding traffic flows.

**Effectiveness:**
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Unit of Measure**
Reduction in Delay per Vehicle.

**Direct Travel Effect**
Up to a 7% reduction in delay per vehicle, for vehicles affected by the incident and traveling on roadways affected by the incident only.

**Regional Applicability:**
High:
- Strategic and administrative concerns, difficulty in cross-agency and jurisdictional coordination.
- Existing Caltrans Freeway Service Patrol.
- Special event management is in use in San Diego at sporting events, concerts, and other large gatherings.
- Advances in technology have made surveillance and control systems more feasible.
- Wireless technology is available.

**Implementation Requirements:**
- Proper identification of surveillance equipment
- Variable message signs
- Freeway Service Patrols, similar to those used by Caltrans to travel regional state roadways and provide assistance to vehicles requiring service
- Multi-agency coordination and communication is required

**References:**
### 4-4 Incident Management (Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Local Traffic Management (Monitoring and Control) &amp; Arterial Monitoring</td>
</tr>
<tr>
<td>• Special Event Management</td>
</tr>
</tbody>
</table>

| Estimated Costs:                             | Varies by application; labor-intensive. |
### Strategy: Commercial Vehicle Restrictions

<table>
<thead>
<tr>
<th>Category:</th>
<th>Traffic Systems Management (TSM) Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Improving the Transportation System Performance</td>
</tr>
<tr>
<td>Description:</td>
<td>This strategy may be used to restrict the movement of commercial trucks and vehicles along certain roadways. The restrictions may be in the form of time of day restrictions, lane restrictions, or even prohibition of truck traffic along certain routes. The restrictions may limit vehicles by number of axles or gross weight. Restrictions should be carefully considered as to not interfere with goods movement and commercial industry in a region.</td>
</tr>
<tr>
<td>Effectiveness:</td>
<td><strong>Unit of Measure</strong></td>
</tr>
<tr>
<td></td>
<td>Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td></td>
<td><strong>Direct Travel Effect</strong></td>
</tr>
<tr>
<td></td>
<td>Estimated Truck Volume Affected by Restrictions multiplied by 2.5 Vehicles (Passenger Car Equivalent Factor) equals Vehicle Trip Reduction per Roadway with Restrictions</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>Low:</td>
</tr>
<tr>
<td></td>
<td>• May be useful on local freeways; it can restrict heavy vehicles during peak hours</td>
</tr>
<tr>
<td></td>
<td>• May also be useful at local ports of entry, to limit heavy vehicle traffic and associated inspections during peak periods</td>
</tr>
<tr>
<td></td>
<td>• Most goods movement occurs during off-peak times</td>
</tr>
<tr>
<td></td>
<td>• This strategy may increase off-peak heavy vehicle volumes</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
<td>• Coordination and communication with local freight carriers and trucking companies is imperative</td>
</tr>
<tr>
<td></td>
<td>• If commercial vehicle movement is restricted, alternate routes must be made available</td>
</tr>
<tr>
<td></td>
<td>• Multi-agency coordination and communication</td>
</tr>
<tr>
<td>Related Strategies:</td>
<td>• Improved Traffic Control Devices</td>
</tr>
<tr>
<td></td>
<td>• All TDM Strategies</td>
</tr>
<tr>
<td>Estimated Costs:</td>
<td>• Low; necessary signage is less than or equal to $10,000.</td>
</tr>
</tbody>
</table>
### Strategy: Advanced Traveler Information

**Category:** Traffic Systems Management (TSM) Strategies

**Congestion Mitigation Objective:** Improving the Transportation System Performance

**Description:**
This strategy involves the installation of signs or signals to notify drivers of traffic and roadway conditions far enough in advance that they can possibly modify their route. This strategy is similar to the surveillance and control strategy, and can be combined. In addition to signs and signals, this strategy can include variable message signs (VMS), telephone hotlines (i.e. California’s “511” line), or Highway Advisory Radio (HAR).

**Effectiveness:**
*(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)*

**Unit of Measure**
Reduction in Delay per Vehicle.

**Direct Travel Effect**
8% to 16% reduction in delay per vehicle on roadways with advanced traveler information systems.

**Regional Applicability:**
- High:
  - Existing systems in use throughout San Diego and California, however these systems could be upgraded and improved to provide coordinated traffic management.
  - Variable message signs along Friars Road provide notification of stadium events.
  - As local freeway system improves, advanced traveler information systems could help divert traffic during periods of heavy congestion.
  - Advances in technology have made control systems more feasible.
  - Wireless technology is available.
  - Caltrans Advanced Transportation Management System (ATMS) provides freeway VMS control, and many local cities are deploying similar programs and functionality for local streets.

**Implementation Requirements:**
- A system of sub-regional Traffic Management Centers is recommended
- Variable message signs
- Requires a Traffic Management Plan, a report documenting the estimated traffic control issues and methods for managing traffic
- Multi-agency coordination and communication

**References:**

**Related Strategies:**
- Local Traffic Management (Monitoring and Control) & Arterial Monitoring
- Special Event Management
- Incident Management
- Improved Traffic Control Devices

**Estimated Costs:**
Moderate to High
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Value/Congestion Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Traffic Systems Management (TSM) Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Improving the Transportation System Performance</td>
</tr>
</tbody>
</table>

**Description:**
The basic premise of this strategy is to charge road users for the privilege of using roadways. There are many applications of value and congestion pricing, ranging from tolls for the use of exclusive “express” lanes to tolls for entering congested urban centers.

**Value Pricing**
Value pricing is typically used in conjunction with High Occupancy Toll (HOT) lanes. When used for HOT lanes, value pricing will charge the road user a certain toll that varies according to congestion levels. The main concept of value pricing is that the road user is paying a toll for the time saved and increased travel speed associated with the HOT lanes, and that it is the ultimate decision of the user whether to pay the toll or not. Value pricing has been successfully applied in San Diego. On Interstate 15, HOT lanes offer SOV drivers the ability to escape the congested freeway mainlines by paying a toll that varies with congestion levels. Toll prices can vary from $0.50 to $8.00 depending on freeway congestion levels, and vary in 25-cent increments as often as every six minutes.

**Congestion Pricing**
The main concept of congestion pricing is that road users will pay for access to a congested area, and the toll level will fluctuate with the congestion levels. Under a congestion pricing system, roadway users are required to pay the toll to enter the congested area. The longest running application of congestion pricing exists in Singapore. Singapore has been using a congestion pricing system for all vehicles entering a restricted downtown zone since 1975.

<table>
<thead>
<tr>
<th>Effectiveness: (Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit of Measure</td>
</tr>
<tr>
<td>Direct Travel Effect</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional Applicability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>High:</td>
</tr>
<tr>
<td>• Existing HOT lanes on I-15 have value pricing</td>
</tr>
<tr>
<td>• Future HOV lanes, mainline, and Toll roads proposed throughout the region are candidates for value/congestion pricing</td>
</tr>
<tr>
<td>• Existing FasTrak system allows for ease of electronic toll collection</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>• Requires designated lanes or roadways separate from general use lanes</td>
</tr>
<tr>
<td>• Automatic toll collection devices are useful</td>
</tr>
<tr>
<td>• Permanent barriers to separate free-facilities from priced facilities</td>
</tr>
<tr>
<td>• Access plans and control measures</td>
</tr>
<tr>
<td>• Additional requirements vary depending on the goal of the value or congestion pricing program</td>
</tr>
<tr>
<td>• Multi-agency coordination and communication</td>
</tr>
<tr>
<td>References:</td>
</tr>
<tr>
<td>• ITE. <em>A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility</em>. 1997.</td>
</tr>
<tr>
<td>Related Strategies:</td>
</tr>
<tr>
<td>• HOV/HOT Lanes/Access</td>
</tr>
<tr>
<td>• Roadway Widening</td>
</tr>
<tr>
<td>Estimated Costs:</td>
</tr>
<tr>
<td>Varies depending on application. Consider:</td>
</tr>
<tr>
<td>• Capital costs</td>
</tr>
<tr>
<td>• Hardware/equipment costs</td>
</tr>
<tr>
<td><strong>Strategy:</strong></td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td><strong>Category:</strong></td>
</tr>
<tr>
<td><strong>Congestion Mitigation Objective:</strong></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
</tr>
</tbody>
</table>
| **Effectiveness:** | **Unit of Measure**  
Vehicles Per Hour Per Lane  
**Direct Travel Effect**  
Provides a maximum additional capacity of 1,800 vph/ln for the duration of the parking restrictions. Refer to the *Highway Capacity Manual 2000* for adjustment factors to lane capacity based on lane widths and shoulder conditions. |
| **Regional Applicability:** | Current on-street parking restrictions in place in downtown San Diego along major streets, primarily those that access the freeways. Most on-street parking restrictions occur during the AM and PM peak commute periods, typically for a two-hour period. |
| **Implementation Requirements:** | • Requires appropriate signage  
• Requires striped on-street parking lanes  
• Parking lane should be of sufficient width to accommodate through traffic (minimum of eight (8) foot width)  
• Best suited for areas with high directional peak hour flows  
• Monitoring and enforcement needed |
| **Related Strategies:** | • Roadway Widening  
• Improved Traffic Control Devices  
• Local Traffic Management (Monitoring and Control) & Arterial Monitoring  
• Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps |
<p>| <strong>Estimated Costs:</strong> | Low; costs for signage and enforcement are relatively low and depend on the extents of the restrictions. |</p>
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Park &amp; Ride Lots (Transit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Capital Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td>Objective:</td>
<td>Publicly owned or leased facilities providing parking for transit riders and carpoolers. Lots are often located at major transit stops and rail stations, and at major freeway locations. Some park-and-ride lots can be shared-use, providing parking for carpool vehicles and parking for adjacent retail, office, or commercial uses. Park-and-ride lots are an essential adjunct to suburban rail and express bus operations, as few riders live within walking distance and many have no convenient local transit connection. Park-and-ride lots can contribute to local traffic impacts, as many agencies view park-and-ride lots as trip generating facilities. Consult with the local agency prior to implementing this strategy to determine the localized trip generation characteristics of the park-and-ride lot and the associated traffic impacts.</td>
</tr>
<tr>
<td>Description:</td>
<td></td>
</tr>
<tr>
<td>Effectiveness:</td>
<td>Unit of Measure Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td></td>
<td>Direct Travel Effect Reduction of 2 vehicle trips per day per parking space.</td>
</tr>
<tr>
<td></td>
<td><strong>Additional Supporting Information</strong> Can be effective in encouraging carpooling and increasing transit ridership. However, low to moderate benefits to overall congestion. Can result in a 10% decrease in SOV traffic and a 10% increase in transit use (ITE 1997).</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>High:</td>
</tr>
<tr>
<td></td>
<td>• Caltrans operates a system of park-and-ride in conjunction with local freeway network.</td>
</tr>
<tr>
<td></td>
<td>• Park-and-ride lots at Coaster/Trolley stations.</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
<td>• Land area devoted to park-and-ride lots must be located appropriately and in proximity to major regional transit and/or roadway facilities.</td>
</tr>
<tr>
<td></td>
<td>• Provision of park-and-ride lots could be included as a condition of development approval.</td>
</tr>
<tr>
<td></td>
<td>• Special transit access (ingress and egress) may be incorporated into site design.</td>
</tr>
<tr>
<td></td>
<td>• Account for the trip generation characteristics and associated local traffic impacts of the park-and-ride lot.</td>
</tr>
</tbody>
</table>
## 5-1 Park & Ride Lots (Transit)
(Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bus Priority Treatments on Surface Streets</td>
</tr>
<tr>
<td>• Carpool/Vanpool/Transit Programs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low to moderate, depending on facility size, land values, passenger amenities, and other factors.</td>
</tr>
</tbody>
</table>
### Strategy: High Occupancy Vehicle (HOV)/High Occupancy Toll (HOT) Lanes / Access

<table>
<thead>
<tr>
<th>Category:</th>
<th>Capital Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective:</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
</tbody>
</table>

**Description:**

The concept and application of HOV lanes have been around for a number of years. In typical applications, highway lanes (separated or part of the main highway cross-section) have been designated for use by vehicles containing two or more passengers, designed to reduce the amount of Single Occupancy Vehicles (SOVs) on the roadway and thereby reduce overall congestion. Some HOV lanes may be limited to vehicles with three or more occupants. HOV lanes can also be implemented on local arterials, however HOV lanes are more efficient in areas with higher interchange spacing, as frequent ingress and egress of vehicles into and out of the HOV lanes can degrade the through traffic speed and therefore reduce the value of the HOV lanes as a congestion mitigation strategy. In recent years, the excess capacity of HOV lanes, especially during off-peak hours, has led to agencies offering “pay for use” privileges for SOVs. This concept has been called High Occupancy Toll, or HOT lanes.

A HOT lane is simply an HOV lane that SOV users can pay a toll for the privilege of use. Generally, the toll rate is a factor of the level of congestion on the highway and the level of HOV demand for the HOV lane(s). Since the purpose of the HOV lane is to provide a corridor of reduced congestion for people electing to carpool, it is desirable that the HOV lanes remain uncongested. Therefore, an agency will make the HOT lane use less desirable to SOVs by charging higher toll amounts.

Many agencies have constructed HOV/HOT lanes that are separate from the main highway, usually by a concrete barrier. To reduce construction costs and maximize efficiency, many agencies have elected to build a single set of HOV/HOT lanes that are reversible during periods of peak congestion. Therefore, if the AM peak hour is most congested in the inbound direction while the PM peak hour is most congested in the outbound direction, the HOV/HOT lanes are accessible and directed in the inbound direction during the AM peak hour and in the outbound direction during the PM peak hour.
### 5-2 High Occupancy Vehicle (HOV)/High Occupancy Toll (HOT) Lanes / Access

<table>
<thead>
<tr>
<th>Effectiveness: (Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit of Measure</strong></td>
</tr>
<tr>
<td>Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td><strong>Direct Travel Effect</strong></td>
</tr>
<tr>
<td>Up to a 10% increase in vehicle occupancy for vehicles using the facility; calculate the appropriate reduction in trips using local occupancy data.</td>
</tr>
<tr>
<td><strong>Additional Supporting Information</strong></td>
</tr>
<tr>
<td>- I-15 HOT lanes in San Diego serve 23% of peak volumes and yield timesavings of up to 20 minutes. (SANDAG)</td>
</tr>
<tr>
<td>- HOT lane facilities tend to benefit those with a high value of time.</td>
</tr>
<tr>
<td>- Potential to reduce travel on parallel arterials as regional facility is more efficiently utilized.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional Applicability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>High:</td>
</tr>
<tr>
<td>- HOV and HOT lanes currently in use in the San Diego Region and Orange County</td>
</tr>
<tr>
<td>- Demonstrated demand for HOV lanes</td>
</tr>
<tr>
<td>- The SANDAG Regional Transportation Plan calls for additional HOV lanes along I-5 and an extension of the I-15 HOT lanes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Exclusive lanes for HOV use</td>
</tr>
<tr>
<td>- Access control for HOV lanes</td>
</tr>
<tr>
<td>- Toll facilities for HOT lanes</td>
</tr>
<tr>
<td>- Barrier systems to restrict HOT lane access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>References:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Related Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Value/Congestion Pricing</td>
</tr>
<tr>
<td>- Roadway Widening</td>
</tr>
<tr>
<td>- All TDM Strategies</td>
</tr>
<tr>
<td>- Transit System/Service Expansion</td>
</tr>
<tr>
<td>- System/Service Operational Improvements</td>
</tr>
<tr>
<td>- Subscription Services</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- New HOV/HOT Lane Construction: $500,000 to $1,000,000 per lane per mile.</td>
</tr>
<tr>
<td>- Conversion of HOV to HOT lane: $250,000 to $500,000 per lane per mile.</td>
</tr>
<tr>
<td>- Construction cost influenced by the provision of physical barriers to divide SOV and HOV travel.</td>
</tr>
<tr>
<td>- Additional costs associated with control and operation of the HOT lanes varies by facility and should be accounted for.</td>
</tr>
<tr>
<td>Strategy:</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Category:</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
</tr>
<tr>
<td>Description:</td>
</tr>
<tr>
<td>Effectiveness:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Regional Applicability:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Implementation Requirements:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Related Strategies:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### 5-3 Roadway Widening
(Continued)

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High due to right-of-way requirements and environmental mitigation requirements.</td>
</tr>
<tr>
<td>• Public resistance can further increase costs.</td>
</tr>
<tr>
<td>• New arterial lanes construction cost (including R/W, utilities, traffic control, lighting and landscaping): $500,000 to 1,000,000 per mile.</td>
</tr>
<tr>
<td>Strategy: Intersection Improvements</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Congestion Mitigation Objective:</strong> Increasing the Transportation System Capacity</td>
</tr>
</tbody>
</table>
| **Description:** Similar to roadway widening, this strategy proposes the construction of additional turn and/or thru lanes at intersections. Also includes additional traffic control devices. Improvement strategies may include the implementation of new traffic signal timing plans, with such techniques as protected-permitted phasing and right-turn overlap phasing. Typically provides direct mitigation to solve impacts from adjacent or sub-regional development. Impact on community character must be considered when widening urban intersections. Intersection improvements can allow the incorporation of bus priority treatments/queue jumper bypass lanes. 

   This strategy also includes modern roundabouts as a means of improving intersection operations. Under the right circumstances, modern roundabouts can greatly increase intersection capacity while reducing vehicle delays. More information on the design and application of modern roundabouts can be found in the FHWA publication *Roundabouts: An Informational Guide*. |
| **Effectiveness:** Unit of Measure Reduction in delay per vehicle. 

   Direct Travel Effect State of the practice techniques; calculate the reduction in vehicle delay based on the specific improvements. 

   Additional Supporting Information

   - Generally high with proven ability to reduce delay. 
   - Can improve overall facility level of service (LOS) and reduce travel delay, thus improving person carrying capacity. |
| **Regional Applicability:** High; limited to the extent of widening which is acceptable. Public concerns about excessively wide intersections. |
| **Implementation Requirements:** 

   - Implementation may be funded by regional or local jurisdiction capital improvement programming 
   - Intersection widening often included as a condition of development approval 
   - Increasing use of Development Impact Fee (DIF) programs to fund construction of intersection improvements |
| **References:** 

   - ITE. *A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility*. 1997. 
5-4 Intersection Improvements
(Continued)

<table>
<thead>
<tr>
<th>Related Strategies:</th>
<th>Estimated Costs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Roadway Widening</td>
<td>• Varies depending upon application requirements and right-of-way constraints.</td>
</tr>
<tr>
<td>• Grade Separation/Urban Interchange</td>
<td>• Improvements to urban intersections can range from approximately $200,000 to $1,000,000 per location, including R/W, traffic control/utility modifications, lighting and landscaping.</td>
</tr>
<tr>
<td>• Bus Priority Treatments on Surface Streets</td>
<td></td>
</tr>
<tr>
<td>Strategy:</td>
<td>Bicycle Facilities</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Category:</td>
<td>Capital Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
</tbody>
</table>
| Description: | Bikeways (e.g., lanes, paths, trails), related amenities and bicycle parking. Facilities include:  
  - Class I - Bike Path (separate off-street facility)  
  - Class II - Bike Lane (on-street dedicated lane)  
  - Class III - Bike Route (on-street signing only) |
| Effectiveness: | **Unit of Measure**  
Reduction in Vehicle Trips.  
**Direct Travel Effect**  
Up to a 0.5% reduction in vehicle trips for land uses within ¼ mile of the facility.  
**Additional Supporting Information**  
Can be effective in encouraging bicycle utilization; however low impacts to overall congestion. |
| Regional Applicability: | High:  
  - Significant opportunity to provide extensive network of bicycle facilities building on current investment level.  
  - Many bike paths currently exist in the San Diego region.  
  - Major employers encourage bike to work by providing on-site bicycle facilities.  
  - Especially applicable to San Diego County with its mild year-round climate. |
| Implementation Requirements: | The development of a bicycle master plan should be included as part of a jurisdiction’s General Plan.  
  - Community improvements to be coordinated with regionally connected network. |
| Related Strategies: | • Roadway Widening  
  • Intersection Improvements |
| Estimated Costs: | • Low to High, depending on characteristics and extent of system and facilities.  
  Depends on low-cost “Bike Route” signs on unstriped local streets, designated bike lanes and signing provisions on local and arterial streets, and grade-separated crossings of major highway corridors.  
  • Cost to construct various bicycle facilities:  
    - Class I bike facility construction cost: $100,000 to $250,000 per mile.  
    - Class II bike facility construction cost: $50,000 to $100,000 per mile.  
    - Class III bike facility construction cost: $10,000 to $50,000 per mile. |
<table>
<thead>
<tr>
<th><strong>Strategy:</strong></th>
<th>Pedestrian Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category:</strong></td>
<td>Capital Strategies</td>
</tr>
<tr>
<td><strong>Congestion Mitigation Objective:</strong></td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Special designed pedestrian corridors connecting various land uses. Corridors can be designed to promote pedestrian use, by incorporating large walkable areas, clear lines of sight between specific uses, and landscaping or street furniture enhancements.</td>
</tr>
<tr>
<td><strong>Effectiveness:</strong></td>
<td><strong>Unit of Measure</strong></td>
</tr>
<tr>
<td></td>
<td>Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td></td>
<td><strong>Direct Travel Effect</strong></td>
</tr>
<tr>
<td></td>
<td>Up to a 0.5% reduction in vehicle trips for land uses within ¼ mile of the facility.</td>
</tr>
<tr>
<td><strong>Regional Applicability:</strong></td>
<td>High:</td>
</tr>
<tr>
<td></td>
<td>• Pedestrian facilities with enhanced design treatments are currently in operation in San Diego, such as the pedestrian corridors between the residential developments and commercial centers along Friars Road.</td>
</tr>
<tr>
<td></td>
<td>• Many new mixed-use developments include plans for large central walkways connecting the residential uses to the commercial and retail centers.</td>
</tr>
<tr>
<td></td>
<td>• SANDAG has a variety of resources for planning and implementing bicycle and pedestrian facilities.</td>
</tr>
<tr>
<td><strong>Implementation Requirements:</strong></td>
<td>• Corridors and facilities need to be designed to offer a clear line of sight between residential areas and commercial or retail centers.</td>
</tr>
<tr>
<td></td>
<td>• Facilities to link residential or commercial land uses with transit and other alternate travel modes.</td>
</tr>
<tr>
<td><strong>References:</strong></td>
<td>ITE. A Toolbox For Alleviating Traffic Congestion and Enhancing Mobility. 1997.</td>
</tr>
<tr>
<td><strong>Related Strategies:</strong></td>
<td>• Bicycle Facilities</td>
</tr>
<tr>
<td></td>
<td>• Development Around Transit Nodes</td>
</tr>
<tr>
<td></td>
<td>• Interconnected Street Networks &amp; Pedestrian Facilities</td>
</tr>
<tr>
<td><strong>Estimated Costs:</strong></td>
<td>Low to Medium:</td>
</tr>
<tr>
<td></td>
<td>• Cost to construct pedestrian corridor: $75,000 to $175,000 per mile.</td>
</tr>
<tr>
<td></td>
<td>• Additional costs associated with landscaping, street furniture, or additional sidewalk width should be accounted for as required.</td>
</tr>
</tbody>
</table>
### Congestion Mitigation Strategies

**Final Report – Appendix A: CMS Toolbox**

<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Bus Priority Treatments on Surface Streets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Capital Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Effecting a Mode Shift Away From Drive Alone</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Reduces bus travel times and improves reliability through bus priority measures, such as: exclusive bus lanes, queue jumpers, and priority measures at signalized intersections. This strategy is a key component of Bus Rapid Transit with LRT-type stations.</td>
</tr>
<tr>
<td><strong>Effectiveness:</strong></td>
<td>(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)</td>
</tr>
<tr>
<td>Unit of Measure</td>
<td>Reduction in Vehicle Trips.</td>
</tr>
<tr>
<td><strong>Direct Travel Effect</strong></td>
<td>Up to a 0.5% ridership increase per 1.0% travel time decrease or reliability increase of the bus system.</td>
</tr>
<tr>
<td><strong>Additional Supporting Information</strong></td>
<td>Increased speed, together with service reliability, is the most effective way to increase transit ridership, short of major capital investments such as fixed-guideway systems.</td>
</tr>
<tr>
<td>Regional Applicability:</td>
<td>High:</td>
</tr>
<tr>
<td></td>
<td>• Increasing emphasis on transit systems improvements in San Diego region.</td>
</tr>
<tr>
<td></td>
<td>• Constant need to improve efficiency of system operations.</td>
</tr>
<tr>
<td></td>
<td>• Systems in operation in Los Angeles (Metro Rapid) and Boston (Silver Line).</td>
</tr>
<tr>
<td></td>
<td>• SANDAG’s Regional Transportation Plan includes future BRT routes in the San Diego Region.</td>
</tr>
<tr>
<td>Implementation Requirements:</td>
<td>Must be integrated with other roadway widening or intersection improvement projects</td>
</tr>
<tr>
<td></td>
<td>Development of bus priority treatments should be included as part of street master plan development process</td>
</tr>
<tr>
<td></td>
<td>Local improvements to be integrated into system-wide plan</td>
</tr>
<tr>
<td>Related Strategies:</td>
<td>Roadway Widening</td>
</tr>
<tr>
<td></td>
<td>Intersection Improvements.</td>
</tr>
<tr>
<td></td>
<td>Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)</td>
</tr>
<tr>
<td></td>
<td>Transit System/Service Expansion</td>
</tr>
<tr>
<td></td>
<td>System/Service Operational Improvements</td>
</tr>
<tr>
<td>5-7 Bus Priority Treatments on Surface Streets</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>(Continued)</td>
<td></td>
</tr>
</tbody>
</table>

**Estimated Costs:** Generally moderate to high; varies based on type and extent of application.
<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Grade Separation/Urban Interchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Capital Strategies</td>
</tr>
<tr>
<td>Congestion Mitigation Objective:</td>
<td>Improving the Transportation System Performance</td>
</tr>
</tbody>
</table>

**Description:**
This strategy proposes major improvements to intersections similar to freeway interchanges. This strategy is most useful on high volume major local arterials where substantial delay and congestion would occur under any type of control. By removing all conflicting movements from the intersection through grade separation, the through traffic on the major street suffers no delay.

The urban interchange, or Single Point Urban Interchange (SPUI), is an interchange design that reduces necessary right-of-way acquisitions by creating a grade separated intersection with a single traffic signal controlling all access points. By reducing the access points to the grade separated roadway to one location, overall congestion and delays are reduced.

**Effectiveness:**
(Also see the Trip Reduction Guidelines, 2002 CMP, Appendix J)

**Unit of Measure**
Reduction in Delay per Vehicle.

**Direct Travel Effect**
Calculate the reduction in delay per vehicle based on the specific improvements.

**Regional Applicability:**
Low:
- Limited local applications in the San Diego region.
- Caltrans has constructed a number of SPUI design treatments.
- Camino del Norte at Camino San Bernardo is an existing example of a grade separated diamond interchange in an urban environment.

**Implementation Requirements:**
- Grade separated interchange design treatments are typically recommended as a result of a General Plan or community plan circulation study.
- Grade separations are typically reserved for locations with high entering volumes.
- Issues related to cost, community character compatibility, view impacts, and pedestrian utilization must be carefully considered.

**References:**

**Related Strategies:**
- Roadway Widening
- Intersection Improvements
- Bus Priority Treatments on Surface Streets
### 5-8 Grade Separation/Urban Interchange (Continued)

<table>
<thead>
<tr>
<th>Estimated Costs:</th>
</tr>
</thead>
</table>
| • High costs due to extensive construction and right-of-way requirements.  
• Typical cost for a grade separated interchanges range from $10,000,000 to $30,000,000 depending on the selected design (diamond or SPUI) and other location or site related factors. |
Appendix B

The Trip Reduction Ordinance (TRO) Framework
1.0 Introduction to the Trip Reduction Ordinance (TRO) Framework

1.1 TRO Framework Purpose and Objectives

The Trip Reduction Ordinance (TRO) framework has been developed as a key component of the San Diego Association of Governments (SANDAG) Congestion Mitigation Strategies (CMS) Research Project, with the purpose of providing guidance for local agencies considering the creation of a TRO for their community and a framework that local jurisdictions can use as a reference in the development of a local TRO.

A TRO can be adopted by a local jurisdiction in order to manage vehicle travel and traffic congestion, and can be applied to local employers or developments. A TRO can include a variety of TDM programs to assist in the congestion mitigation goals of a local jurisdiction.

SANDAG currently sponsors a regional TDM program, and may expand this program in the future. For this reason, it is important that any future local TROs or TDM programs be developed in a manner that is consistent with regional congestion mitigation goals. SANDAG will be using the TRO framework as a tool to refine and further develop possible TDM programs for the region.

As traffic congestion increases throughout the San Diego region, regional and local TROs and/or associated TDM programs will be important tools vital to reduction of congestion. By developing and implementing local TROs that are consistent with the regional congestion mitigation goals, each local jurisdiction will contribute to reducing regional congestion, while also reducing congestion within their jurisdiction. A local TRO will also provide local jurisdictions with the means to require specific TDM improvements and/or programs for major traffic generators within their jurisdiction.

The TRO framework will provide methodologies for local jurisdictions considering the implementation of their own trip reduction programs through the adoption of a jurisdictional ordinance. Local jurisdictions are encouraged to review the TRO framework and use it as a reference to create a TRO specific to their local area and their local congestion mitigation needs.

Local TROs and/or associated TDM programs will also benefit commuters throughout the region. By developing and implementing local TROs that are consistent with the regional congestion mitigation goals, local and regional congestion will be reduced, and travel times may improve for all commuters. This will lead to reduced commuter stress and can improve the overall commute for all roadway users.

1.1 Step-wise Approach for Creating a Local TRO

There are several steps, or decisions, to consider when determining the type of trip reduction ordinance for implementation at the local jurisdictional level. A number of key factors need to be considered, including:

- Who should participate?
• What types of land uses should it be applied to?
• Should participation be voluntary or mandatory?
• What are reasonable trip reduction goals?
• How should the ordinance be developed?
• How are the requirements enforced and by whom?
• What types of supporting activities are necessary and available to ensure success?

A local jurisdiction can use the following steps to develop a comprehensive TRO to mitigate local traffic congestion. The decisions do not necessarily have to be made in the order proposed, however, many of the decisions build on each other, creating a comprehensive process.

**Step-wise Approach for Creating a Local TRO**

1. **Step 1: Establish Internal Local Contact/Lead Agency**
2. **Step 2: Consult with SANDAG TDM Staff**
3. **Step 3: Establish Advisory Committee**
4. **Step 4: Selection of Mandatory or Voluntary Trip Reduction Plan**
5. **Step 5: Establish Target Participants**
6. **Step 6: Establish Trip Reduction Goals**
7. **Step 7: Establish Program Requirements**
8. **Step 8: Establish Program Monitoring Component**
9. **Step 9: Establish Program Enforcement Policy**
10. **Step 10: Establish Program Incentives**
11. **Step 11: Define Program Support**
Two sample local TRO frameworks with various options have been prepared and are included in this appendix. These TRO frameworks were developed using the step-wise method outlined above and are intended to serve as a guide for local agencies who wish to develop their own local TRO. Each sample local TRO provides instructions for selection of various options to develop their own local TRO. In assessing the options within the sample TRO framework, a local jurisdiction should follow the step-wise process for TRO development, as described in the previous section.

The first TRO framework is a mandatory TRO that would apply to new developments with specified thresholds for applicability. Applicability requirements, conformance requirements, incentives, monitoring, and enforcement are aspects of the mandated TRO.

The second TRO framework presented is a voluntary TRO that applies to new and existing developments, and/or major traffic generators. The voluntary TRO framework also specifies thresholds for applicability; however, the applicable developments are encouraged to conform to requirements similar to the mandatory TRO through the use of incentives. The voluntary TRO framework outlines the associated applicability requirements, conformance requirements, incentives, monitoring, and enforcement aspects of the voluntary TRO.

Table 1 provides a comparison of the key elements of mandatory and voluntary TROs, with the former being more of a “stick” approach and the latter providing a “carrot” approach.

### Table 1
**Mandatory TRO Elements Vs. Voluntary TRO Elements**

<table>
<thead>
<tr>
<th>TRO Element</th>
<th>TRO Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mandatory</td>
</tr>
<tr>
<td></td>
<td>(The “Stick” Approach)</td>
</tr>
<tr>
<td><strong>Applicability</strong></td>
<td>New Development Only TDM Programs &amp; Design Options</td>
</tr>
<tr>
<td><strong>Requirements</strong></td>
<td>Establish Trip Reduction Goals, Select TDM Program &amp; Design Options</td>
</tr>
<tr>
<td><strong>Incentives</strong></td>
<td>Additional Reward for Compliance</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td>Surveys &amp; Reporting To Determine Compliance</td>
</tr>
<tr>
<td><strong>Violations</strong></td>
<td>Failure to Comply</td>
</tr>
<tr>
<td><strong>Enforcement</strong></td>
<td>Penalties (Start with Warnings, Progressively Harsher with Continued Violations)</td>
</tr>
</tbody>
</table>
Mandatory Trip Reduction Ordinance Framework

Chapter X

*This Trip Reduction Ordinance (TRO) framework contains a number of comments and directions to assist in comprehension and application. All comments and directions are written in bold italicized text, and should not be included in a local jurisdictions specific TRO.*

X.1. Title

Local Trip Reduction Ordinance (Mandatory)

X.2. Purpose

The purpose of this ordinance, recognizing that traffic congestion is increasing with growth of the region and that motor vehicles are the single greatest contributor to air pollution, is to improve air quality and reduce traffic congestion in the local jurisdiction by increasing alternates to single occupant vehicle usage and reducing overall motor vehicle travel for commute trips. This ordinance shall establish a program for reduction of work related trips by employees working for major employers. This program shall be mandatory for all new developments, and has the option to be voluntary for all existing employers and/or major traffic generators.

*This framework provides local jurisdictions the opportunity to select various elements of a TRO that they choose to implement within their local jurisdiction. Each local jurisdiction choosing to develop a specific local TRO for their jurisdiction should become familiar with the methodology for creating a local TRO, as specified in Working Paper Number 5. The methodology provides further information to assist in the creation of a local TRO specific to a jurisdiction’s needs.*

X.3. Definitions

*Alternate Mode* - any mode of commute transportation other than the single-occupancy motor vehicle.

*Carpool or Vanpool* - two (2) or more persons traveling in a light-duty vehicle (car, truck or van) to and/or from work.

*Commute Trip* - a trip taken by an employee to or from work.
Commuter Matching Service - any system, whether it uses computer or manual methods, which assists in matching employees for the purpose of sharing rides to reduce drive-alone travel.

Developer - the person or persons responsible for the planning, design and construction of an applicable development project. A developer may be responsible for implementing the provisions of this chapter as determined by the property owner.

Employer - a sole proprietor, partnership, corporation, unincorporated association, cooperative, joint venture, agency, department, district or other individual or entity, either public or private, that employs workers. See also "major employer" and "voluntary employer."

Existing Development - projects for which a development application has been deemed "complete" by the local jurisdiction, or for which an application for a building permit has been received prior to the issuance of the ordinance.

Major Employer - an employer who employs two hundred fifty (250) or more full-time equivalent employees at a work site during a twenty-four-hour period for at least six (6) months during the year.

Mode - the type of conveyance used in transportation, including single-occupancy motor vehicle, rideshare vehicle (carpool or vanpool), transit, bicycle, and walking.

Motor Vehicle - any vehicle propelled by a motor, including car, van, bus, motorcycle, and all other motorized vehicles.

New Development - Any new construction on previously undeveloped land, or expansion of existing structures above a threshold as determined by the local jurisdiction.

Preferential Parking - parking spaces designated or assigned, through use of a sign or painted space markings for carpool and vanpool vehicles carrying commuter passengers on a regular basis that are provided in a location more convenient to a place of employment than parking spaces provided for single occupant vehicles.

Public Agency - any political subdivision of this state and any board, commission or agency thereof.

Public Interest Group - any nonprofit group whose purpose is to further the welfare of the community.

RideLink - Regional Transportation Demand Management (TDM) program sponsored by SANDAG that provides a number of free services to employers and commuters in the San Diego region.

Ridesharing - transportation of more than one (1) person for commute purposes, in a motor vehicle, with or without the assistance of a commuter matching service.
Transit - a bus, train, trolley or other public conveyance system.

Transportation Coordinator - a person designated by an employer, property manager or transportation management association as the lead person in developing and implementing a travel reduction plan.

Transportation Demand Management (TDM) - the alteration of travel behavior - usually on the part of commuters - through programs of incentives, services, and policies. TDM addresses alternatives to single occupant vehicles such as carpooling and vanpooling, and changes in work schedules that move trips out of the peak period or eliminate them altogether (as is the case in telecommuting or compressed work weeks).

Vanpool - See "Carpool or vanpool".

Vehicle Miles Traveled (VMT) - the number of miles traveled by motor vehicle for commuter trips.

Vehicle Occupancy - the number of occupants in a motor vehicle, including the driver.

Work Site - a building or any grouping of buildings located within the city which are on physically contiguous parcels of land or on parcels separated solely by private or public roadways or right-of-way, and which are owned, leased or operated by the same employer.

X.4 Abbreviations

CAP - Commuter Assistance Program
ETC - Employer Transportation Coordinator
TRO - Trip Reduction Ordinance
TRP - Trip Reduction Program
SANDAG - San Diego Association of Governments
SOV – Single Occupant Vehicle
VMT - Vehicle Miles Traveled
X.5 Applicability

Mandatory Options (For New Development Only):

A local jurisdiction should select one or both of the two following options:

☐ Program Based: Employers and/or developers are required to provide ongoing promotion of TDM programs or strategies.

☐ Design Based: Developers are required to incorporate TDM measures into the project design.

PROGRAM BASED - For mandatory programs that will be required with ongoing use and operation of a proposed development, a local jurisdiction should choose one of the following options:

☐ Mandatory Participation Based on Employment Size: Prior to approval of any new development that will create an employment demand for 250+ or more employees, the applicant must make provision for, at a minimum, the applicable transportation demand management and trip reduction measures listed in X.6.

☐ Mandatory Participation Based on Size of Development: Prior to the approval of any new development that will exceed 25,000 gross square feet, the applicant must make provision for, at a minimum, the applicable transportation demand management and trip reduction measures listed in X.6.

☐ Mandatory Participation Based on Vehicle Trip Generation: Prior to the approval of any new development that is expected to create more than 100 SOV trips in any one hour period, the applicant must make provision for, at a minimum, the applicable transportation demand management and trip reduction measures listed in X.6.

DESIGN BASED - For mandatory physical design improvements that will be required prior to issuance of occupancy permits, a local jurisdiction should choose one of the following options:

☐ Mandatory Participation for New Development: Prior to the issuance of occupancy permits for any new development, the applicant must make provision for, at a minimum, the applicable transportation demand management and trip reduction measures listed in X.6.

☐ Mandatory Participation Based on Size of Development: Prior to the issuance of occupancy permits for any new development that will exceed the following thresholds, the applicant must make provision for, at a minimum, the applicable improvements as specified:
• New development 25,000+ gross square feet: The developer shall provide the improvements specified in Section X.6.

• New development 50,000+ gross square feet: The developer shall provide the improvements specified in Section X.6.

• New development 100,000+ gross square feet: The developer shall provide the improvements specified in Section X.6.

In addition to a mandatory component, a local jurisdiction may choose to select an additional voluntary component for existing developments:

Voluntary Option (For Existing Development Only):

☐ Voluntary Participation: Existing developments will be encouraged to establish a transportation demand management program at their worksite on a voluntary basis based on the applicable transportation demand management and trip reduction measures listed in X.6.

X.6 Requirements for Employers and/or Developers

The following section provides eligibility requirements for both PROGRAM BASED and DESIGN BASED applications. The eligibility requirements for PROGRAM BASED applications are listed on Page A-6, and the eligibility requirements for DESIGN BASED applications are listed on Page A-8. The local jurisdiction should select the appropriate requirements for the application(s) they have selected.

For developments that satisfy the applicability listed in Section X.5, the following components will be required elements of a Travel Reduction Plan:

For PROGRAM BASED applications, a local jurisdiction should select one of the following requirement options:

☐ The employer and/or developer shall establish the following trip reduction goals:

   Year 1: 2% reduction of VMT/employee (reduction bases on original baseline survey).

   Year 2: 4% reduction of VMT/employee (reduction bases on original baseline survey).

   Year 3: 6% reduction of VMT/employee (reduction bases on original baseline survey).

   Future goals to be determined each year as the program continues.
The employer and/or developer shall establish the following trip reduction goals:

Year 1: 2% SOV trip reduction of employees commutes (reduction bases on original baseline survey).

Year 2: 4% SOV trip reduction of employee commutes (reduction bases on original baseline survey).

Year 3: 6% SOV trip reduction of employee commutes (reductions based on original baseline survey).

Future goals to be determined each year as the program continues.

The employer and/or developer shall establish the goal of a 5% overall reduction in VMT/employee (reduction bases on original baseline survey).

The employer and/or developer shall make a good faith effort to reduce the number of SOV trips traveled by employees.

The employer and/or developer shall make a good faith effort to reduce the average VMT/employee.

In each year of the program, the employer/development shall be required to comply with the following:

**For PROGRAM BASED applications, a local jurisdiction should select one of the following survey and reporting options:**

- Participation in a survey and reporting effort as directed by the local jurisdiction in order to establish a baseline and evaluate annual impacts.
  
a. Achievement of goals will be based on employee survey. An 80% participation rate is required of each worksite. Incomplete surveys short of 80% will be counted at the rate of one (1) SOV per percentage below 80%.
  
b. The baseline for participation in alternative modes of transportation shall be based on the total number of employees.

- Preparation of a Travel Reduction Plan for submittal to the local jurisdiction annually. Plan should be submitted within eight (8) weeks of receiving results from baseline survey and every 12 months thereafter. Plan will include:
  
  *If the above option is selected choose one or more from the following from the following options:*
  
  - Designation of an ETC.
Calculation of Target goals, as determined by number of employees and baseline survey.

A description of employee information programs and other trip reduction measures which have been completed in the previous year.

A description of trip reduction measures to be taken in the upcoming year.

A local jurisdiction may choose one or more of the following strategies to include for PROGRAM BASED applications:

- A commuter matching service in coordination with RideLink, which facilitates carpool and vanpool matching for employees.
- Guaranteed Ride Home Program beyond RideLink’s existing program
- Provisions of Vans for Vanpools
- Carpool/Vanpool Subsidies beyond those offered by SANDAG
- Use of Company Vehicles for Vanpools/Shuttle Services
- Transit Subsidies
- Use of Pre-Tax Salary Deduction to Pay for Transit and Vanpool Expenses
- Preferential Parking for Carpools and Vanpools
- Provide Bike Racks, Lockers and Showers for Bicyclists.
- Transit / Alternative Modes Marketing (i.e. Kiosks, Bulletin Boards)
- Parking Cash-out Program
- Free Parking for Carpools / Vanpools
- Car Sharing Services
- Incentives to Employees for Living Closer to Work
- Shuttle Program
- Promotional Programs for Employees Using Alternative Modes

For DESIGN BASED applications, a local jurisdiction should select the following requirement option:
The employer and/or developer is required to provide the improvements as specified:

A local jurisdiction may choose one or more of the following improvements to include for DESIGN BASED applications. If the requirements specified in section X.5 are based on the size of the development, the improvements selected should differ for the sizes of development, with the largest-sized developments requiring the most extensive improvements:

- Transit / Alternative Modes Marketing (i.e. Kiosks, Bulletin Boards)
- Parking Charges & Carpool / Vanpool Preferential Parking
- Parking Restrictions / Reduced Minimums and Maximums / Area-Wide Caps
- Bicycle Facilities - Bike Racks, Lockers and Showers for Bicyclists
- Passenger loading/unloading zones for carpools/vanpools
- Pedestrian Facilities
- Station Amenities & Public Transit Facility Improvements
- Provide Bike Racks, Lockers and Showers for Bicyclists
- On-Site Child Care / Cafeteria / Deli / Gym / Fitness Facilities
- Park & Ride Lots (for transit or carpool / vanpool)

X.7 Incentives

SANDAG, RideLink and local jurisdictions will provide support to compliant developments and employers. This will include housing of commuter assistance programs such as Guaranteed Ride Home, ridematch services, employer outreach, and other commuter services. Other incentives to developments/employers who meet goals and requirements will include:

A local jurisdiction may choose one or more of the following options:

- Streamlining of Permit Process: New developments will be given priority to receive building permits.
Parking Reduction: Those who meet requirements (both new and existing developments) will be allowed a parking reduction of one space per reduced SOV. i.e.: one (1) Alternate mode user = one (1) less parking space required by development.

Density Bonus: Those who meet requirements (both new and existing developments) will be allowed to modify the local zoning requirements specific to densities or floor-area rations (FAR).

Employer Subsidy Assistance: Those who meet requirements will be given financial assistance of a pre-determined amount to assist with setting up commute alternative programs or the monitoring of on-going TDM programs.

Credit for Existing TDM Programs (for Existing Developments Only): For existing developments with TDM programs currently in operation, the local jurisdiction may credit the existing development. The credit may be in the form of exclusion from requirements, provision of additional monetary support for continued program operation, or additional measures to recognize and reinforce successful existing TDM programs.

Reductions in Local Fees or Taxes: Those who meet requirements will be given specified reductions in local fees or taxes, based on participation level. The local fees could include, but are not limited to: franchise fees for local utilities and end-users, property taxes.

X.8 Monitoring

For the purposes of determining whether applicable developments are complying with the provisions of the TRO, the local jurisdiction shall monitor compliance in a manner it deems appropriate and reasonable.

If a PROGRAM BASED application is selected, a local jurisdiction should choose one of the following options:

- The local agency will review the employer’s and/or developer’s submitted Trip Reduction Plan on an annual basis.
- The local agency will review the employer’s and/or developer’s trip reduction procedures in response to complaints.
- An independent survey performed by a third party entity will review the employer’s and/or developer’s submitted Trip Reduction Plan.
- 14 day program review period will be performed annually by the local jurisdiction for an employer’s and/or developer’s trip reduction program.
If a DESIGN BASED application is selected, a local jurisdiction should choose the following option:

- The local agency shall verify that required improvements, as specified in section X.6, have been installed prior to the issuance of occupancy permits for new development.

### X.9 Violations

The following constitute violations:

If a PROGRAM BASED application is selected, a jurisdiction should select one or more of the following violation options:

- Failure to comply to requirements set in X.6 by date of DATE/MONTH/YEAR.
- Failure to make a good faith effort to comply.
- Failure to revise an unacceptable Trip Reduction Plan.

If a DESIGN BASED application is selected, a jurisdiction should select one or more of the following violation options:

- Failure to comply to requirements set in X.6 prior to project completion.
- Failure to make a good faith effort to comply.

### X.10 Enforcement

The employers and or developments that satisfy the applicability listed in Section X.5 must submit a Travel Reduction Plan, including the required items listed in X.6 to the monitoring agency by DATE/MONTH of each year proceeding issuance of the ordinance. All who fail to comply to the requirements according to the monitoring agency will be subject to the following:

If a PROGRAM BASED application is selected, a local jurisdiction should choose one or more of the following enforcement options:

- Written notice issued by jurisdiction to the CEO or highest ranking officer that development/employer is in violation of ordinance. Notice will include a statement of the corrective action required to be taken, and require that corrected action be taken by a given date.
- Fine of $100 per employee.
Penalty of $100 per working day for first violation. Subsequent violations will be $250 per working day for each violation.

Penalties will begin to accrue 15 working days following the official date of first compliance goal deadline.

Submittal of a Transportation Reduction Plan that includes future plans to meet goals in upcoming year.

No affected employer with an approved program which has made a good faith effort will be held liable for failure to reach goal.

If a DESIGN BASED application is selected, a local jurisdiction should choose the following enforcement options:

Occupancy permits for new development will not be issued.
Voluntary Trip Reduction Ordinance Framework
Chapter X

This Trip Reduction Ordinance (TRO) framework contains a number of comments and directions to assist in comprehension and application. All comments and directions are written in bold italicized text, and should not be included in a local jurisdictions specific TRO.

X.1. Title

Local Trip Reduction Ordinance (Voluntary)

X.2. Purpose

The purpose of this ordinance, recognizing that traffic congestion is increasing with growth of the region and that motor vehicles are the single greatest contributor to air pollution, is to improve air quality and reduce traffic congestion in the local jurisdiction by increasing alternates to single occupant vehicle usage and reducing overall motor vehicle travel for commute trips. This ordinance shall establish a program for reduction of work related trips by employees working for major employers. This program shall be voluntary for all new and/or existing developments and existing public and/or private employers and/or major traffic generators. By conforming to the requirements set forth in this ordinance, participants will be eligible for incentives.

This framework provides local jurisdictions the opportunity to select various elements of a TRO that they choose to implement within their local jurisdiction. Each local jurisdiction choosing to develop a specific local TRO for their jurisdiction should become familiar with the methodology for creating a local TRO, as specified in Working Paper Number 5. The methodology provides further information to assist in the creation of a local TRO specific to a jurisdiction’s needs.

X.3. Definitions

Alternate Mode - any mode of commute transportation other than the single-occupancy motor vehicle.

Carpool or Vanpool - two (2) or more persons traveling in a light-duty vehicle (car, truck or van) to and/or from work.
**Commute Trip** - a trip taken by an employee to or from work.

**Commuter Matching Service** - any system, whether it uses computer or manual methods, which assists in matching employees for the purpose of sharing rides to reduce drive-alone travel.

**Developer** - the person or persons responsible for the planning, design and construction of an applicable development project. A developer may be responsible for implementing the provisions of this chapter as determined by the property owner.

**Employer** - a sole proprietor, partnership, corporation, unincorporated association, cooperative, joint venture, agency, department, district or other individual or entity, either public or private, that employs workers. See also "major employer" and "voluntary employer."

**Existing Development** - projects for which a development application has been deemed "complete" by the local jurisdiction, or for which an application for a building permit has been received prior to the issuance of the ordinance.

**Major Employer** - an employer who employs two hundred fifty (250) or more full-time equivalent employees at a work site during a twenty-four-hour period for at least six (6) months during the year.

**Mode** - the type of conveyance used in transportation, including single-occupancy motor vehicle, rideshare vehicle (carpool or vanpool), transit, bicycle, and walking.

**Motor Vehicle** - any vehicle propelled by a motor, including car, van, bus, motorcycle, and all other motorized vehicles.

**New Development** – Any new construction on previously undeveloped land, or expansion of existing structures above a threshold as determined by the local jurisdiction.

**Preferential Parking** - parking spaces designated or assigned, through use of a sign or painted space markings for carpool and vanpool vehicles carrying commuter passengers on a regular basis that are provided in a location more convenient to a place of employment than parking spaces provided for single occupant vehicles.

**Public Agency** - any political subdivision of this state and any board, commission or agency thereof.

**Public Interest Group** - any nonprofit group whose purpose is to further the welfare of the community.

**RideLink** – Regional Transportation Demand Management (TDM) program sponsored by SANDAG that provides a number of free services to employers and commuters in the San Diego region.
Ridesharing - transportation of more than one (1) person for commute purposes, in a motor vehicle, with or without the assistance of a commuter matching service.

Transit - a bus, train, trolley or other public conveyance system.

Transportation Coordinator - a person designated by an employer, property manager or transportation management association as the lead person in developing and implementing a travel reduction plan.

Transportation Demand Management (TDM) - the alteration of travel behavior - usually on the part of commuters - through programs of incentives, services, and policies. TDM addresses alternatives to single occupant vehicles such as carpooling and vanpooling, and changes in work schedules that move trips out of the peak period or eliminate them altogether (as is the case in telecommuting or compressed work weeks).

Vanpool - See "Carpool or vanpool".

Vehicle Miles Traveled (VMT) - the number of miles traveled by motor vehicle for commuter trips.

Vehicle Occupancy - the number of occupants in a motor vehicle, including the driver.

Work Site - a building or any grouping of buildings located within the city which are on physically contiguous parcels of land or on parcels separated solely by private or public roadways or right-of-way, and which are owned, leased or operated by the same employer.

X.4 Abbreviations

CAP - Commuter Assistance Program
ETC - Employer Transportation Coordinator
TRO - Trip Reduction Ordinance
TRP - Trip Reduction Program
SANDAG - San Diego Association of Governments
SOV – Single Occupant Vehicle
VMT - Vehicle Miles Traveled

X.5 Applicability
Voluntary Options (For New and Existing Developments):

A local jurisdiction should select one or both of the two following options:

- **Program Based:** To be eligible for incentives listed in section X.7, employers and/or developers are required to provide ongoing promotion of TDM programs or strategies.

- **Design Based:** To be eligible for incentives listed in section X.7, developers are required to incorporate TDM measures into the project design.

**PROGRAM BASED - To be eligible for incentives listed in section X.7, a local jurisdiction should choose one of the following options for programs that will be required with ongoing use and operation of a proposed development:**

- **Voluntary Participation Based on Employment Size:** Developments with an employment demand for 250+ or more employees will be required to make provision for the applicable transportation demand management and trip reduction measures listed in X.6.

- **Voluntary Participation Based on Size of Development:** Developments that exceed 25,000 gross square feet will be required to make provision for the applicable transportation demand management and trip reduction measures listed in X.6.

- **Voluntary Participation Based on Vehicle Trip Generation:** Developments that create more than 100 SOV trips in any one hour period will be required to make provision for the applicable transportation demand management and trip reduction measures listed in X.6.

**DESIGN BASED - To be eligible for incentives listed in section X.7, a local jurisdiction should choose one of the following options for physical design improvements that will be required prior occupancy:**

- **Voluntary Participation for New Development:** New developments will be encouraged to make provision for the applicable transportation demand management and trip reduction measures listed in X.6.

- **Voluntary Participation Based on Size of Development:** New developments that will exceed the following thresholds will be encouraged to make provision for the applicable improvements as specified:
  
  - New development 25,000+ gross square feet: The developer shall provide the improvements specified in Section X.6.
  
  - New development 50,000+ gross square feet: The developer shall provide the improvements specified in Section X.6.
• New development 100,000+ gross square feet: The developer shall provide the improvements specified in Section X.6.

X.6 Requirements for Employers and/or Developers

The following section provides eligibility requirements for both PROGRAM BASED and DESIGN BASED applications that will offer incentives. The eligibility requirements for PROGRAM BASED applications are listed on Page A-5, and the eligibility requirements for DESIGN BASED applications are listed on Page A-8. The local jurisdiction should select the appropriate requirements for the application(s) they have selected.

To be eligible for incentives listed in section X.7, the following components will be required elements of a Travel Reduction Plan for developments that satisfy the applicability listed in Section X.5:

For PROGRAM BASED applications that will offer incentives, a local jurisdiction should select one of the following requirement options:

☐ The employer and/or developer will be required to establish the following trip reduction goals:

  Year 1: 2% reduction of VMT/employee (reduction bases on original baseline survey).

  Year 2: 4% reduction of VMT/employee (reduction bases on original baseline survey).

  Year 3: 6% reduction of VMT/employee (reduction bases on original baseline survey).

  Future goals to be determined each year as the program continues.

☐ The employer and/or developer will be required to establish the following trip reduction goals:

  Year 1: 2% SOV trip reduction of employees commutes (reduction bases on original baseline survey).

  Year 2: 4% SOV trip reduction of employee commutes (reduction bases on original baseline survey).

  Year 3: 6% SOV trip reduction of employee commutes (reductions based on original baseline survey).

  Future goals to be determined each year as the program continues.
The employer and/or developer will be required to establish the goal of a 5% overall reduction in VMT/employee (reduction bases on original baseline survey).

The employer and/or developer will be required to make a good faith effort to reduce the number of SOV trips traveled by employees.

The employer and/or developer will be required to make a good faith effort to reduce the average VMT/employee.

To be eligible for incentives listed in section X.7, the employer/development will be required to comply with the following in each year of the program:

For PROGRAM BASED applications, a local jurisdiction should select one of the following survey and reporting options:

- Participation in a survey and reporting effort as directed by the local jurisdiction in order to establish a baseline and evaluate annual impacts.
  
  c. Achievement of goals will be based on employee survey. An 80% participation rate is required of each worksite. Incomplete surveys short of 80% will be counted at the rate of one (1) SOV per percentage below 80%.
  
  d. The baseline for participation in alternative modes of transportation shall be based on the total number of employees.

- Preparation of a Travel Reduction Plan for submittal to the local jurisdiction annually. Plan should be submitted within eight (8) weeks of receiving results from baseline survey and every 12 months thereafter. Plan will include:
  
  If the above option is selected choose one or more from the following from the following options:
    
    - Designation of an ETC.
    
    - Calculation of Target goals, as determined by number of employees and baseline survey.
    
    - A description of employee information programs and other trip reduction measures which have been completed in the previous year.
    
    - A description of trip reduction measures to be taken in the upcoming year.
A local jurisdiction may choose one or more of the following strategies to include for PROGRAM BASED applications that will offer incentives:

- A commuter matching service in coordination with RideLink, which facilitates carpool and vanpool matching for employees.
- Guaranteed Ride Home Program beyond RideLink’s existing program
- Provisions of Vans for Vanpools
- Carpool/Vanpool Subsidies
- Use of Company Vehicles for Vanpools/Shuttle Services
- Transit Subsidies
- Use of Pre-Tax Salary Deduction to Pay for Transit and Vanpool Expenses
- Preferential Parking for Carpools and Vanpools
- Provide Bike Racks, Lockers and Showers for Bicyclists.
- Transit / Alternative Modes Marketing (i.e. Kiosks, Bulletin Boards)
- Parking Cash-out Program
- Free Parking for Carpools / Vanpools
- Car Sharing Services
- Incentives to Employees for Living Closer to Work
- Shuttle Program
- Promotional Programs for Employees Using Alternative Modes

For DESIGN BASED applications that will offer incentives, a local jurisdiction should select the following requirement option:

- The employer and/or developer will be encouraged to provide the improvements as specified:

A local jurisdiction may choose one or more of the following improvements to include for DESIGN BASED applications that will offer incentives. If the requirements specified in section X.5 are based on the size of the development, the improvements selected should differ for the sizes of development, with the largest-sized developments requiring the most extensive improvements:
Congestion Mitigation Strategies
Final Report – Appendix B: TRO Framework

- Transit / Alternative Modes Marketing (i.e. Kiosks, Bulletin Boards)
- Parking Charges & Carpool / Vanpool Preferential Parking
- Parking Restrictions / Reduced Minimums and Maximums / Area-Wide Caps
- Bicycle Facilities - Bike Racks, Lockers and Showers for Bicyclists
- Passenger loading/unloading zones for carpools/vanpools
- Pedestrian Facilities
- Station Amenities & Public Transit Facility Improvements
- Provide Bike Racks, Lockers and Showers for Bicyclists
- On-Site Child Care / Cafeteria / Deli / Gym / Fitness Facilities
- Park & Ride Lots (for transit or carpool / vanpool)

X.7 Incentives

SANDAG, RideLink and local jurisdictions will provide support to eligible developments and employers. This will include housing of commuter assistance programs such as Guaranteed Ride Home, ridematch services, employer outreach, and other commuter services. Other incentives to developments/employers who meet goals and requirements will include:

A local jurisdiction may choose one or more of the following options:

- **Streamlining of Permit Process**: New developments will be given priority to receive building permits.

- **Varying from Minimum Parking Requirements**: Those who meet TDM requirements (both new and existing developments) will be allowed a parking reduction of one space per reduced SOV (up to a threshold established by the local jurisdiction). i.e. one (1) Alternate mode user = one (1) less parking space required by development.

- **Density Bonus**: Those who meet requirements (both new and existing developments) will be allowed to modify the local zoning requirements specific to densities or floor-area rations (FAR).
Employer Subsidy Assistance: Those who meet requirements will be given financial assistance of a pre-determined amount to assist with setting up commute alternative programs or the monitoring of on-going TDM programs.

Credit for Existing TDM Programs (for Existing Developments Only): For existing developments with TDM programs currently in operation, the local jurisdiction may credit the existing development. The credit may be in the form of exclusion from requirements, provision of additional monetary support for continued program operation, or additional measures to recognize and reinforce successful existing TDM programs.

Reductions in Local Fees or Taxes: Those who meet requirements will be given specified reductions in local fees or taxes, based on participation level. The local fees could include, but are not limited to: franchise fees for local utilities and end-users, property taxes.

X.8 Monitoring

For the purposes of determining whether applicable developments are in compliance with the conditions set forth by the TRO for receiving incentives, the local jurisdiction shall monitor compliance in a manner it deems appropriate and reasonable.

If a PROGAM BASED application that will offer incentives is selected, a local jurisdiction should choose one of the following options:

- The local agency will review the employer’s and/or developer’s submitted Trip Reduction Plan on an annual basis.
- The local agency will review the employer’s and/or developer’s trip reduction procedures in response to complaints.
- An independent survey performed by a third party entity will review the employer’s and/or developer’s submitted Trip Reduction Plan.
- A 14 day program review period will be performed annually by the local jurisdiction for an employer’s and/or developer’s trip reduction program.

If a DESIGN BASED application is selected that will offer incentives, a local jurisdiction should choose the following option:

- The local agency shall verify that required improvements, as specified in section X.6, have been installed prior to occupancy of the new development.
X.9 Violations

The following constitute violations:

If a PROGRAM BASED application that will offer incentives is selected, a jurisdiction should select one or more of the following violation options:

- Failure to comply to eligibility requirements set in X.6.
- Failure to make a good faith effort to comply to eligibility requirements set in X.6.
- Failure to revise an unacceptable Trip Reduction Plan.

If a DESIGN BASED application that will offer incentives is selected, a jurisdiction should select one or more of the following violation options:

- Failure to comply to eligibility requirements set in X.6 prior to project completion.
- Failure to make a good faith effort to comply to eligibility requirements set in X.6.

X.10 Enforcement

Participating employers and or developments that wish to take advantage of the incentives listed in section X.7 and satisfy the applicability listed in Section X.5 will be encouraged to submit a Travel Reduction Plan, including the items listed in X.6 to the monitoring agency by DATE/MONTH of each year proceeding issuance of the ordinance. All who fail to comply to the requirements according to the monitoring agency will be subject to the following:

A local jurisdiction should choose one or more of the following enforcement options:

- Written notice issued by jurisdiction to the CEO or highest ranking officer that development/employer is in violation of ordinance. Notice will include a statement of the corrective action required to be taken, and require that corrected action be taken by a given date.
- Ineligibility for incentives specified in section X.7.
- The employer or developer will be required to return any incentive in “like form”.
Appendix C
The Trip Reduction Guidelines
TRIP REDUCTION GUIDELINES
FOR PROJECTS THAT INCORPORATE TRANSIT, LAND USE, AND TRO/TDM STRATEGIES

The following sections provide methodologies and specific guidelines for incorporating the strategies listed below into the traffic impact assessment process and estimating effectiveness in terms of associated trip reduction potential. Any trip reductions accounted for in the traffic assessment process are subject to ultimate final approval by the lead agency. Three categories of congestion mitigation strategies are most applicable: Land Use and Development Related Strategies, Transit Service and Operational Enhancement Strategies, and Travel Demand Management Programs. The CMS Toolbox contains a number of strategies for congestion mitigation within these categories as listed below:

- **Land Use and Development Related Strategies**
  - Development Along Transit Corridors
  - Development Around Transit Nodes
  - Mixed-use Developments
  - Locally Serving Commercial
  - On-Site Child Care/Cafeteria/Deli/Gym/Fitness Facilities

- **Transit Service and Operational Enhancement Strategies**
  - Transit System/Service Expansion
  - System/Service Operational Improvements
  - Subscription Services
  - Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT)
  - Station Amenities & Public Transit Facility Improvements

- **Travel Demand Management (TDM) Programs**
  - Bicycle/Pedestrian Allowances
  - Distributed & Remote Work Centers/Video Conferencing
  - Alternative Work Schedules/Telework/Work-at-Home
  - Carpool/Vanpool/Transit Program(s)
  - Carpool/Vanpool Subsidies
  - Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps
  - Parking Charges & Carpool/Vanpool Preferential Parking
  - Transit Pass Subsidies

**Development Near Transit Stations and Transit Corridors:**

The CMS Toolbox lists a number of congestion mitigation strategies applicable to developments near transit nodes or corridors and provides a range of effectiveness in terms of estimated
vehicle trip reductions for each. The process outlined below should be used to identify and document the effectiveness of a particular strategy as applied to a proposed development project. The estimated vehicle trip reductions should not exceed the ranges listed (from the CMS Toolbox), unless appropriate documentation suggests otherwise.

**Applicable Strategies:**

- Development Along Transit Corridors (*CMS Toolbox Range of Effectiveness*: up to 5% vehicle trip reduction for residential developments or up to 7% for commercial developments)
- Development Around Transit Nodes (*CMS Toolbox Range of Effectiveness*: up to 10% vehicle trip reduction for residential developments or up to 15% for commercial developments)

**Methodology for Determining Effectiveness:**

1. The project applicant should consult with SANDAG to discuss the proposed project and how it relates to transit. Through coordination with local transit agencies, SANDAG will provide guidance and information regarding specific transit recommendations for the proposed development.

   This initial coordination will be important, in that the general achievability of the transit ridership estimates for the proposed development and all associated transit improvements should be identified and agreed upon by SANDAG, the project proponents, and the local jurisdiction(s) prior to the submission of the traffic impact study to the lead agency. Any trip reductions accounted for in the traffic assessment process are subject to ultimate final approval by the lead agency.

2. Identify the transit station, transit node, or transit corridor stop(s) serving the proposed project and determine the walking distance to the development.

   The development access points must be within ¼ mile walking distance of a transit corridor, transit station, or transit node to qualify for trip reductions.

   a. “Transit Corridors” are defined by SANDAG or the local jurisdiction and have service frequency and service area requirements. Consult the respective local jurisdiction or SANDAG for details.

   b. “Transit Stations” and “Transit Nodes” are defined as points of access for a number of transit routes and/or modes where transit services are frequent (on the order of 15 to 30 minute headways with daily operation), daily boardings during peak periods are relatively high (75 riders per hour), local and regional transit routes intersect, and/or the station represents a major regional transportation transfer facility (serving multiple modes such as bus, rail, and BRT).

3. Identify the transit services that serve (or will be serving) the development:
a. Identify the existing transit system, service, schedule, route, and associated service frequencies.

b. Identify the future transit system, service, schedule, route, and any future improvement assumptions. The completion of all assumed improvements in the appropriate time frame must be assured.

4. Identify the extent to which the proposed project incorporates transit-oriented development (TOD) design features.

5. Identify the extent to which the development is fully accessible to transit and that clearly defined pedestrian travel paths exist and/or are proposed. The pedestrian travel paths should be clearly visible and directly link the development access points to the transit corridor stop(s), transit station, or transit node, with minimum conflicts with roadways and parking lots.

6. Estimate the resulting transit ridership for the proposed development.
   a. Transit ridership will vary by location, mode, and extent of transit services. The suggested method for estimating transit ridership for a proposed development depends on the project size, as discussed below:
      i. If the proposed project will generate 2,400 or fewer daily vehicle trips or 200 or fewer peak hour vehicle trips, the following method should be used:

      *Trip Segmentation or Ratio Method:* Application of person-trip generation rates to the proposed development with documented mode splits (i.e. percent auto, percent transit, and percent other transportation mode), or a review of the transit mode shares at other similar types of development. Ratios or suitable factors can be derived for application to proposed development.

      ii. If the proposed project will generate more than 2,400 daily vehicle trips or more than 200 peak hour vehicle trips, the following method should be used:

      *Application of Regional Transportation Model:* For projects of this size, the CMP requires application of a computerized model for traffic forecasting, and this model should also include estimated transit mode-share for the proposed project. The SANDAG Regional Travel Demand Forecasting model should be used as the base for this effort, however, the lead agency may require alternative modeling methods.

   b. SANDAG or the local transit operating agency will provide transit statistics and related ridership data to assist in estimating ridership.
7. Calculate vehicle trip reductions based upon projected transit ridership. Use of acceptable vehicle occupancy factors can be used to translate estimated transit ridership to equivalent numbers of vehicle trips. Resulting vehicle trip reductions should be subtracted from the total standard trip generation for the proposed project, less any other applicable trip reductions. The traffic impact analysis for a proposed development should be based on the net trip generation for the proposed project.
   a. The process and all relevant assumptions should be documented.
   b. The documented trip reduction must be accepted and approved by the lead agency.

8. At its discretion the lead agency may require traffic monitoring as a condition of approval. The lead agency may require the project proponent to provide the specified monitoring, or may require the project proponent to provide the means to incorporate the project site or selected facilities into an existing monitoring program.

**Mixed-Use Developments:**

The CMS Toolbox lists a number of congestion mitigation strategies applicable to mixed-use developments and provides a range of effectiveness in terms of estimated vehicle trip reductions for each. The process outlined below should be used to identify and document the effectiveness of a particular strategy as applied to a proposed development. The estimated vehicle trip reductions should not exceed the ranges listed (from the CMS Toolbox), unless appropriate documentation suggests otherwise.

**Applicable Strategies:**

- Mixed-use Developments (*CMS Toolbox Range of Effectiveness*: up to 5% vehicle trip reduction for residential developments or up to 7% for commercial developments)
- Locally Serving Commercial (*CMS Toolbox Range of Effectiveness*: up to a 4.5% vehicle trip reduction per 20% increase in the share of retail & commercial floor area for the entire development)

**Methodology for Determining Effectiveness:**

1. Identify the applicability and extent of mixed-use development using the following guidelines:
   a. A “Residential Mixed-use” development with approximately 15% of the total project GFA consisting of commercial development.
   b. A “Commercial/Retail Mixed-use” development with approximately 30% of the total project GFA consisting of residential development.
   c. Single-use projects proposed as infill or redevelopment within 1/8 of a mile of an area for which the proposed project represents a mixed-use component of the area.

2. Identify the extent to which all land-uses on the proposed site individually, and the mixed-use area as a whole, are pedestrian accessible and oriented, and designed to encourage pedestrian use.
3. Reference and apply the methodology for determining trip generation rates for mixed-use developments as provided in the *ITE Trip Generation Handbook, 6th Edition*. The ITE methodology is based on land use densities and the interaction of vehicle trips to and from the various land uses within a mixed-use development.

   a. The graphic below displays the basic concept for calculating internal-capture reductions for mixed-use developments, as described in the ITE Trip Generation Handbook:

   ![Mixed-use Development Diagram]

   b. Based on the ITE Trip Generation Handbook methodology, the internal capture rates should be applied to each land use within a mixed-use development and the corresponding vehicle trip reductions are calculated by subtracting the appropriate trips to and from the associated land uses. The total vehicle trip reduction is the result of the total internal capture for the entire development.

4. The resulting vehicle trip reductions associated with mixed-use development are then subtracted from the total trip generation for the proposed project. The traffic impact analysis should be based on the net trip generation for the proposed project.

   a. The process and all relevant assumptions should be documented.

   b. The documented trip reduction must be accepted and approved by the lead agency.

   The lead agency, at its discretion, may not allow trip reductions above a certain threshold (i.e. no trip reductions over 10% of the total project trip generation). The lead agency may, however, allow the full trip reduction to be applied in determining required project mitigation measures for significant impacts. Any trip reductions accounted for in the traffic assessment process are subject to ultimate final approval by the lead agency.

5. At its discretion the lead agency may require traffic monitoring as a condition of approval. The lead agency may require the project proponent to provide the specified
monitoring, or may require the project proponent to provide the means to incorporate the project site or selected facilities into an existing monitoring program.

**Transit Service and Operational Enhancement Strategies:**

The CMS Toolbox lists a number of congestion mitigation strategies applicable to transit service and operational improvements and provides a range of effectiveness in terms of estimated vehicle trip reductions for each. The process outlined below should be used to identify and document the effectiveness of a particular strategy as applied to a proposed development project. The estimated vehicle trip reductions should not exceed the lead agency approved ranges or the ranges listed (from the CMS Toolbox), unless appropriate documentation suggests otherwise.

**Applicable Strategies:**

- Transit System/Service Expansion (*CMS Toolbox Range of Effectiveness*: calculated based on ridership estimates)
- System/Service Operational Improvements (*CMS Toolbox Range of Effectiveness*: calculated based on ridership estimates)
- Subscription Services (*CMS Toolbox Range of Effectiveness*: reduction of up to 0.2 vehicle trips per employee offered service)
- Access to Light Rail/Commuter Rail/Bus Rapid Transit (BRT) (*CMS Toolbox Range of Effectiveness*: reduction of up to 5% of work trips and 2% of non-work trips per residential DU within ¼ mile of transit service/access)
- Station Amenities & Public Transit Facility Improvements (*CMS Toolbox Range of Effectiveness*: calculated based on ridership estimates)

**Methodology for Determining Effectiveness:**

1. The project applicant should consult with SANDAG to discuss the proposed project and how it relates to transit. Through coordination with local transit agencies, SANDAG will provide guidance and information regarding specific transit recommendations for the proposed development.

   This initial coordination will be important, in that the general achievability of the transit ridership estimates for the proposed development and all associated transit improvements should be identified and agreed upon by SANDAG, the project proponents, and the local jurisdiction(s) prior to the submission of the traffic impact study to the lead agency. Any trip reductions accounted for in the traffic assessment process are subject to ultimate final approval by the lead agency.

2. Identify the transit services that serve (or will be serving) the development:
   a. Identify the existing transit system, service, schedule, route, and associated service frequencies.
   b. Identify the future transit system, service, schedule, route, and any future improvement assumptions, including those proposed specific to the project. The
completion of all assumed improvements in the appropriate time frame must be assured.

3. Identify the extent to which the development is fully accessible to transit and that clearly defined pedestrian travel paths exist and/or are proposed. The pedestrian travel paths should be clearly visible and directly link the development access points to the transit services, with minimum conflicts with roadways and parking lots.

4. Estimate the resulting transit ridership for the proposed development.
   a. Transit ridership will vary by location, mode, and extent of transit services. The suggested method for estimating transit ridership for a proposed development depends on the project size, as discussed below:
      i. If the proposed project will generate 2,400 or fewer daily vehicle trips or 200 or fewer peak hour vehicle trips, the following method should be used:

         *Elasticity Equations or Ratio Method:* Use of documented equations that indicate the resulting change in ridership associated with a specific change in service parameters (Typical service parameters include: service frequencies, travel speeds, fares, and accessibility), or a review of the transit mode shares at other similar types of development. Ratios or suitable factors can be derived for application to proposed development.

      ii. If the proposed project will generate more than 2,400 daily vehicle trips or more than 200 peak hour vehicle trips, the following method should be used:

         *Application of Regional Transportation Model:* For projects of this size, the CMP requires application of a computerized model for traffic forecasting, and this model should also include estimated transit mode-share for the proposed project. The SANDAG Regional Model should be used as the base for this effort, however, the lead agency may require alternative modeling methods.

   b. SANDAG or the local transit operating agency will provide transit statistics and related ridership data to assist in estimating ridership.

5. Calculate vehicle trip reductions based upon projected transit ridership. Use of acceptable vehicle occupancy factors can be used to translate estimated transit ridership to equivalent numbers of vehicle trips. Resulting vehicle trip reductions should be subtracted from the total standard trip generation for the proposed project, less any other applicable trip reductions. The traffic impact analysis for a proposed development should be based on the net trip generation for the proposed project.
   a. The process and all relevant assumptions should be documented.
b. The documented trip reduction must be accepted and approved by the lead agency.

6. At its discretion the lead agency may require traffic monitoring as a condition of approval. The lead agency may require the project proponent to provide the specified monitoring, or may require the project proponent to provide the means to incorporate the project site or selected facilities into an existing monitoring program.

**Travel Demand Management (TDM) Programs:**

The CMS Toolbox lists a number of congestion mitigation strategies applicable to TDM Programs and provides a range of effectiveness in terms of estimated vehicle trip reductions for each. The process outlined below should be used to identify and document the effectiveness of a particular strategy as applied to a proposed development. The estimated vehicle trip reductions should not exceed the ranges listed (from the CMS Toolbox), unless appropriate documentation suggests otherwise.

**Applicable Strategies:**

- **Bicycle/Pedestrian Allowances** (CMS Toolbox Range of Effectiveness: reduction of up to 2 daily vehicle trips per participant)
- **Distributed & Remote Work Centers/Video Conferencing** (CMS Toolbox Range of Effectiveness: calculated based on the change in commute trip length divided by the average work trip length, multiplied by the number of participating employees to equal the vehicle trip reduction)
- **Alternative Work Schedules/Telework/Work-at-Home** (CMS Toolbox Range of Effectiveness: up to a 15% reduction in each participating employee’s average peak hour vehicle trips, based on the participating employee’s schedule change)
- **Carpool/Vanpool/Transit Program(s)** (CMS Toolbox Range of Effectiveness: a 3% to 5% vehicle trip reduction)
- **Carpool/Vanpool Subsidies** (CMS Toolbox Range of Effectiveness: calculated based on subsidy level, from 0.2 to 2.0 vehicle trips reduced per participating employee)
- **Parking Restrictions/Reduced Minimums and Maximums/Area-Wide Caps** (CMS Toolbox Range of Effectiveness: reduction of up to 2 vehicle trips per parking space affected)
- **Parking Charges & Carpool/Vanpool Preferential Parking** (CMS Toolbox Range of Effectiveness: a maximum reduction of 1 vehicle trip per day per parking space affected)
- **Transit Pass Subsidies** (CMS Toolbox Range of Effectiveness: calculated based on subsidy level, from 0.2 to 2.0 vehicle trips reduced per participating employee)
- **On-Site Child Care / Cafeteria / Deli / Gym / Fitness Facilities** (CMS Toolbox Range of Effectiveness: up to a 2.5% vehicle trip reduction for associated developments)

**Methodology for Determining Effectiveness:**

1. Consult the local jurisdiction to determine if a local Trip Reduction Ordinance (TRO) and/or associated TDM programs are in place. The local agency’s TRO should be consistent with the TRO Framework included in SANDAG’s CMP, and should have the
goal of reducing congestion within the local jurisdiction in a manner consistent with the congestion mitigation goals of the region.

The selected strategies or TDM programs must be consistent with the local jurisdiction’s TRO and must conform to all requirements set forth in the local jurisdiction’s TRO.

If a local TRO and/or associated TDM programs are not currently in place, the applicant is encouraged to work with the local jurisdiction and SANDAG to develop a project specific trip reduction plan that conforms to SANDAG’s CMP. The applicant and local jurisdiction should refer to the TRO Framework included in SANDAG’s CMP for guidance in developing and implementing a local TRO and associated TDM programs. The project specific trip reduction plan shall include the necessary applicability requirements, enforcement requirements, incentives, and monitoring components as identified in the TRO Framework.

2. Identify the extent of program participation. The effectiveness of TDM strategies is generally directly related to the number of participants.
   a. The participants can be estimated based on employment or occupancy forecasts, as well as data from existing TDM programs.
   b. If the number of participants cannot be estimated, then no trip reduction should be given for the TDM program or strategy.

3. Document the general achievability of the estimated vehicle trip reductions and estimated number of participants of the TDM program or strategy for the proposed development. Meet with and coordinate review by the lead agency and the local jurisdiction(s) prior to the submission of the traffic impact study to the lead agency.

4. Calculate the resulting vehicle trip reductions associated with TDM programs are then subtracted from the total standard trip generation for the proposed project. The traffic impact analysis should be based on the net trip generation for the proposed project.
   a. The process and all relevant assumptions should be documented.
   b. The documented trip reduction must be accepted and approved by the lead agency. Any trip reductions accounted for in the traffic assessment process are subject to ultimate final approval by the lead agency.

5. At its discretion the lead agency may require traffic monitoring as a condition of approval. The lead agency may require the project proponent to provide the specified monitoring, or may require the project proponent to provide the means to incorporate the project site or selected facilities into an existing monitoring program.