

Integrating Transportation Demand Management Into the Planning and Development Process

a reference for cities

prepared in partnership with HNTB



Acknowledgements

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1. Transportation Demand Management (TDM) and San Diego Region Jurisdictions

The San Diego region has grown rapidly over the last 40 years with a population increase of nearly 60 percent. According to the 2050 Regional Growth Forecast, the population will continue to grow by an additional 33 percent reaching 4.4 million residents in the next 40 years. Meeting the transportation needs of this growing population requires a comprehensive and multimodal approach. Some solutions include capital projects like new rail infrastructure, High Occupancy Vehicle (HOV) lanes, managed lanes, and bicycle network improvements. Other solutions include enhanced or increased public transit services such as Bus Rapid Transit, trolley, and commuter rail. While these projects require considerable time and resources to plan and implement, programs and services that reduce or manage travel demand (Transportation Demand Management or TDM) are cost effective, flexible, and can be executed in shorter time frames. While TDM will not eliminate the need for new transportation infrastructure or services, it does contribute to the effective and efficient use of the region's transportation infrastructure.

Defining TDM: TDM refers to a variety of strategies that change travel behavior (how, when, and where people travel) in order to improve transportation system efficiency and achieve key regional objectives, such as reduced traffic congestion, increased safety and mobility, and energy conservation and emission reductions (Victoria Transport Policy Institute). Typical TDM programs reduce Single Occupant Vehicle (SOV) trips through ridesharing initiatives such as carpooling and vanpooling; alternative work schedules and teleworking; and the use of transit, biking, and walking to work. However, TDM strategies should not be limited to just commute trips. TDM strategies, programs, and plans are most effective when considered for all trips and at all geographic levels--from a specific site, to a neighborhood, city, and regional or state levels – creating a comprehensive and coordinated approach.

TDM is a key component of the San Diego 2050 Regional Transportation Plan (2050 RTP) and its Sustainable Communities Strategy (SCS) as a way to ease traffic congestion and reduce air pollution, while improving the commute for thousands of San Diego region residents. TDM programs play a critical role in achieving regional Greenhouse Gas (GHG) emissions to state-mandated levels and are incorporated into SCS, a required element of the 2050 RTP, per California Senate Bill 375. The SCS details how integrated land use and transportation planning will lead to lower GHG emissions and a more sustainable future for the San Diego region.

TDM is a key component of the 2050 Regional Transportation Plan and Sustainable Communities Strategy as a cost-effective means for easing traffic congestion and reducing air pollution, while improving the commute for thousands of San Diego region residents.

iCommute is the TDM program for the San Diego region. iCommute programs encourage and incentivize sustainable transportation choices by providing free online ridematching services, a regional vanpool program, transit support, bicycle encouragement programs, the Guaranteed Ride Home program, and SchoolPool. Participation by commuters and employers in TDM programs is voluntary in the San Diego region. In the early 1990s, TDM regulations in the San Diego region required employer trip reduction plans. These regulations were enacted when the federal government designated the region's air quality as "severe." In 1995, the federal government re-classified the region's air quality designation from "severe" to "serious," and the TDM regulations were rescinded.

In a voluntary environment, commuters base their travel choices on a desire to save time and money, reduce stress, improve the environment and their health, and other considerations. Employers offer TDM benefits that are easy to

implement and make business sense by helping to attract and retain employees and reduce overhead costs. Without regulatory tools, the iCommute TDM strategy is to address these personal and business motivations with targeted outreach, education and public awareness campaigns combined with the resources and incentives needed to change travel behavior.

iCommute's partnerships with employers have proven to be the most effective method for promoting alternative travel choices among the region's commuters. This is partly because TDM programs can be tailored to the transportation needs of employees at their specific place of work. iCommute's initial outreach and education efforts have focused on the region's largest employers and they have partnered with over 170 employers to promote TDM and develop customized commute programs that meet employer and employee needs. To further assist employers, iCommute developed a comprehensive Commuter Benefit Program Starter Kit that outlines a simple, three-step process to help employers identify their commute needs, design a custom program, and roll it out to their employees. The kit includes sample policies, forms, tax deduction information, commuter program descriptions, and examples of best practices from other companies and agencies. It also includes advice and sample materials for how to market a commuter program to employees. iCommute staff is available to work one-on-one with employers to provide the technical assistance they may need, such as surveying for employee travel preferences, mapping employee commute routes, and developing a customized plan that makes business sense. These employer resources are envisioned to work together with the TDM strategies that are presented in this reference study.

Role of Local Governments in TDM: Local governments play a critical role in TDM planning and implementation. Land use, urban design, and parking policies are all under the jurisdiction of local governments and are essential in influencing travel choice and demand. Efficient land use and urban design can reduce the need for auto travel for daily trips, and appropriate parking supply and pricing can encourage the use of alternative modes of transportation.

Local jurisdictions in the San Diego region are in a unique position to implement a broad range of TDM strategies at many different points in the development process. While the state and region can enact legislation and set broad policies, local governments have the ability to guide the implementation of TDM strategies through the planning process using short and long-range plans, and can implement TDM strategies through development agreements, zoning, policies, and ordinances.

Jurisdictions are becoming increasingly aware of the link between travel choices and land use patterns and policies. They are recognizing that an individual traveler's mode choice - be it auto, carpool, vanpool, transit, walking, or biking - is significantly influenced by how communities are designed and developed. As such, the following chapters identify how TDM strategies can be proactively incorporated into the planning and land development process, influencing localized land use patterns and site development to better manage and reduce auto travel demand and particularly SOV travel. The study also outlines and gives examples of supportive policies that encourage non-SOV trips through the development process.

To support TDM goals laid out in the 2050 RTP and SCS, iCommute has developed this guidance to provide SANDAG member agencies (policy makers, planners, traffic engineers, and land development proposal reviewers) with:

- Case studies and resources for integrating TDM throughout the various land development stages from long-range planning to site development
- Recommendations for managing, monitoring, and evaluating the effectiveness of TDM strategies

This guide will define the value of TDM programs, describe how TDM can be integrated into many jurisdictional plans, identify how a wide range of strategies can be applied at different stages of the development process, and discuss the

important but often overlooked task of monitoring the implementation and success of TDM strategies and policies. Additionally, **Appendix C** provides recommendations and resources for promoting and encouraging voluntary public participation in TDM programs outside of the planning and development process.

2. Why TDM?

TDM strategies address key regional policy objectives related to quality of travel, livability, and sustainability. At the regional level, the SANDAG iCommute program coordinates a number of programs that increase the number of people who carpool, vanpool, use transit, bike, and walk to work, as well as providing information on telework and alternative work schedules. However, for TDM to be truly effective, it must be supported by land use policies and neighborhood design that reduce the need to drive for daily tasks. Including TDM in the municipal planning and development process offers a broad range of economic, environmental, and public health benefits to local governments, their citizens and businesses:

TDM maximizes returns on infrastructure spending and reduces the need for new or widened roads – TDM is a cost-effective way to build capacity in a community’s transportation system by expanding participation in alternative modes (carpools, vanpools, transit, biking, walking, and teleworking) instead of widening or building new roads, which are costly to construct and maintain.

TDM reduces parking demand – TDM incorporated into development reduces SOV auto trips and the need for parking, reducing the cost and burden for jurisdictions and developers to provide more parking capacity.

TDM helps to meet environmental and air quality goals - TDM improves air quality by encouraging alternatives to the SOV, reducing congestion, and corresponding vehicle related emissions. TDM can help to preserve green space by reducing the amount of land needed for roads and parking facilities. TDM can reduce storm water management costs by encouraging more efficient land use patterns (Victoria Transport Policy Institute).

TDM is adaptable and dynamic – TDM can be customized for specific events, neighborhoods, corridors, work sites, and time frames. Unlike new infrastructure, TDM programs can easily adapt and respond to economic and population changes.

TDM provides benefits to the public:

- **Reduced costs for commuters.** TDM is not only cost effective for local governments but access to low-cost commuting alternatives can cut individual transportation costs by half or more. A 2011 report issued by the U.S. Census Bureau estimates that individuals who ride public transportation in urban areas can save on average \$778 per month (U.S. Census Bureau).¹ Financial incentives for ridesharing are available to reduce costs through the

According to the 2008 Seattle Urban Mobility Plan (City of Seattle Department of Transportation), the City of Bellevue, WA was able to reduce the drive alone commute rate in downtown Bellevue by 30 percent between 1990 and 2000, due to their implementation of TDM strategies as required by the State’s Commute Trip Reduction Act (Washington State Department of Transportation).

¹ Based on the national average gas and parking rates in June 2010.

SANDAG iCommuter program, and employers are allowed to offer payroll tax savings for transportation assistance up to \$135 a month per employee for transit passes or vanpool vouchers.

- **Reduced costs for businesses.** Pre-tax programs offer savings to employers as well as employees. Transit subsidies can be deducted as a business expense. When funds are removed from paychecks before taxes are applied, employers save on payroll taxes.
- **Saves time.** Carpools and vanpools can get commuters to work and back faster than driving alone by using HOV lanes and HOV bypass facilities.
- **Improves public health.** Biking or walking to work or transit increases physical activity, and reduced vehicle emissions improve air quality.
- **Benefits employers and employees.** Research demonstrates that adding commuter benefits to employees' compensation is a low-cost benefit that can help to attract and retain employees, and increase employee productivity. TDM can reduce employer overhead costs too. Teleworking and alternative work schedules reduce office space requirements and parking demand, and many companies are finding that it costs less to pay employees not to drive than it does to provide them with free or cheap parking spaces. Offering cash to employees who choose not to drive alone to work can amount to significant reductions in parking acquisition and maintenance costs.
- **Encourages sustainable development.** TDM contributes to Leadership in Environmental and Energy Design (LEED) certification.
- **TDM increases safety.** Reduced traffic congestion and complete streets can make roadways safer for all users, including bicyclists and pedestrians.

TDM works at the scale of an individual, but has significant impact across a community – if just one solo driver with a 20 mile round-trip commute left their car at home and took transit one day per week all year, that change could result in a reduction of 1,040 annual vehicle miles traveled and nearly 1,000 pounds of CO₂ (Federal Highway Administration).

3. How TDM Fits into the Local Planning Process

While SANDAG provides the regional framework to connect our land use to our transportation system, local governments regulate land use, development, and parking— all of which are key factors in determining travel choice. The planning and development processes are key points at which TDM can be introduced – influencing how people travel to and from a new development from the day it opens (European Platform on Mobility Management). Therefore maximum benefits are achieved when both transportation efficient development (mixed use development that supports the use of alternative modes) and TDM strategies are planned and implemented comprehensively at the local level.

General plans that encourage transit oriented development patterns and bicycle networks are best supported by design guidelines that require pedestrian consideration at intersections and parking policies that minimize free parking in business districts.

Broad TDM policies and goals are sometimes included in a local government's long-range transportation plans, but TDM is not generally integrated throughout the local planning process and comprehensive implementation of TDM strategies can fall short of desired outcomes. This section will identify opportunities for local governments to incorporate TDM into all stages of the planning process with case studies from around the world, highlighted throughout. These experiences will help illustrate how a multi-layered approach to planning provides the largest impact. For example, general plans that encourage transit oriented development patterns and bicycle networks are best supported by design guidelines that require pedestrian consideration at intersections and parking policies that minimize free parking in business districts.

The strategies discussed in this and other sections in this report are potential resources for jurisdictions in the San Diego region. The general descriptions of various TDM measures provided in this section and TDM strategies shown in Chapter 4 demonstrate how other jurisdictions within the United States and internationally have successfully used TDM to further their goals. Nationally, the powers granted to regulate and administer development and transportation infrastructure vary widely by jurisdiction. In some locations, counties have the authorities granted cities, so a reference to Arlington County, VA, or Montgomery County, MD (both good TDM examples), should not preclude a jurisdiction in the San Diego area from considering or using similar approaches.

Long Range Plans:

Long range planning activities guide future growth, affect how transportation and land use are integrated, and influence the perceived success or benefit of locating infrastructure or development in particular areas. Incorporating TDM into long range plans is the first step in the integration of TDM into the many levels of jurisdictional plans. It includes identifying the desired location and form of future land development and the planning and ultimately financing of transportation infrastructure. The general alignment of transit lines and the balance and mix of commercial and residential development are often determined in these plans, and begin to set the scene for effective SOV alternatives in later stages of the planning and implementation processes.

Types of Long-Range Plans

There are a number of different long range plans where TDM policies and direction can be provided including General Plans and Climate Action Plans.

General Plans: Broad TDM goals and policies can be included in the transportation/mobility/circulation element of the General Plan by encouraging complete streets (roadways that are designed for all users to include transit, cyclists, pedestrians, and Americans with Disabilities Act compliance [National Complete Streets Coalition]), as well as in the land use element by encouraging the types of development (Transit Oriented Development and Smart Growth) that promote multimodal versus auto-oriented communities².

Case Study – General Plans

General Plan, San Diego, CA: The Mobility Element of the City of San Diego’s General Plan includes a section that is dedicated to TDM (Section E). The plan lays out eight broad TDM policies that cover the following topics:

- a. marketing and promotion of TDM to employers and employees
- b. development and design standards that are conducive to alternative transportation
- c. the provision of TDM programs and amenities such as car and bike sharing

General Plan, San Francisco, CA: The City of San Francisco’s Transportation Element recognizes that successful TDM program implementation requires partnerships between the public and private sectors and outlines low cost strategies that will benefit both public and private entities. Understanding that support from the business community is critical to TDM success, a key objective of the TDM portion of their transportation element is to “Develop and implement programs in the public and private sectors, which will support congestion management and air quality objectives, maintain mobility and enhance business vitality at minimum cost”.

Climate Action Plans: A Climate Action Plan includes specific policy recommendations and actions that a local government will use to address climate change and reduce GHG emissions. TDM strategies can assist with meeting climate change goals by identifying cost effective transportation solutions that support reductions in vehicle miles traveled and related emissions.

² Assembly Bill 1358, the California Complete Streets Act of 2008, requires cities and counties to include complete streets policies as part of their general plans so that roadways are designed to safely accommodate all users

Case Study – Climate Action Plan

Climate Action Plan, Menlo Park, CA: The transportation section of the Menlo Park Climate Action Plan highlights a variety of comprehensive TDM Strategies to include:

- TDM requirements for new developments
- Commuter benefit programs for City employees
- Employer supported shuttle system that serves as a first and last mile solution to transit
- Outreach and education programs for employers and employees

Mid-Range Plans:

Mid-range plans can include Specific or Master Plans, Corridor Plans, Parking Management Plans, and TDM Plans. This is an opportunity for local agencies, who are the arbiters and implementers of area and site specific plans, to develop innovative ways to incorporate TDM into developments.

Types of Mid-Range Plans

Specific Plans or Master Plans: A Specific or Master Plan establishes a link between implementing policies of the general plan and the individual development proposals in a defined area. It provides development direction from the type, location, and intensity of uses to the design and capacity of infrastructure; from the resources used to finance public improvements to the design guidelines of a subdivision (State of California). TDM measures can be integrated into specific plans to mitigate traffic impacts associated with new development, to reduce parking requirements, and provide transportation choices for tenants and residents.

Case Study – Specific Plan

Transit Village Area Plan, Boulder, CO: This plan describes the city's vision for the development of a 160-acre Transit Village. The goal of the TDM program for the Transit Village is 55 to 70 percent of all trips made by alternative mode. Chapter 5 provides a framework for the Transit Village TDM program which is based on four core elements:

- Parking Control
- Active Promotion of Transportation Options
- Sustainable Program Funding
- Performance Standards and Monitoring

Corridor Plans: A community's roadway corridors provide the economic and social connections within and between neighborhoods and communities. The manner in which these corridors are planned and designed can create places that offer convenient travel and a source of community pride, or can result in a place that becomes congested with traffic.

Developing a corridor plan prior to the design of road improvements provides a vision for an entire corridor (i.e. the roadway facilities, neighborhoods along the road, and the interface areas between the neighborhood and the roadway). The value of a corridor plan is that it provides communities with a tool that integrates and balances mobility planning with local goals for land use and community character (Florida Atlantic University Center for Urban and Environmental Solutions).

Case Study – Corridor Plan

East Riverside Corridor Master Plan, Austin, TX: The City of Austin developed a Corridor Plan for East Riverside Drive, an important commercial corridor from downtown Austin to the Bergstrom International Airport. The plan established a vision for transforming an auto-oriented corridor into a multimodal corridor that accommodates all users and makes transportation alternatives a viable choice.

Parking Management Plans: The location, availability, and cost of parking are key factors in an individual's decision to drive, take transit, walk, bike, or rideshare. Jurisdictions can use Parking Management Plans to identify strategies for regulating public parking and/or parking requirements for new and redeveloped properties. Considerable research has been completed that shows that parking availability and pricing strongly correlate with auto use – “Ninety-nine percent of all automobile trips end in free parking” (1990 Nationwide Personal Transportation Survey). This finding was more recently demonstrated locally in a SANDAG public opinion survey conducted as part of the 2050 RTP and SCS–47 percent of survey respondents who currently drive alone to work and have free parking (88 percent of all work trip commuters) indicated that they would change their commute travel mode based on a \$10 per day parking charge (SANDAG/True North Research). Parking Management Plans are therefore a very valuable component in an overall approach to managing transportation demand.

Case Study – Parking Management Plan

Ann Arbor Downtown Development Authority Public Parking & Transportation Demand Management Strategies Plan, Ann Arbor, MI: This plan was developed to gain greater efficiency from Ann Arbor's public parking system by spreading demand and encouraging greater use of alternative transportation modes. The plan accomplishes this through on-street parking pricing that reflects and responds to parking demand while at the same time expanding and promoting transportation options.

Parking Management, Claremont, CA: The City of Claremont secured funding for a 477 space parking facility that includes preferential parking for transit users and carpoolers. The city used a combination of local and Federal Transit Administration (FTA) funds. This suburban community is developing a transit-oriented village consisting of 35 acres, that includes over 200 new high-rise residential units with reduced parking requirements and over 150,000 square feet of retail, commercial and office space. The parking structure will be used to consolidate parking, reduce surface parking, support transit oriented development and the Claremont Intermodal Regional Transportation Center. Parking is prioritized for transit users and retail customers.

Municipal TDM Plans: A Municipal TDM Plan outlines specific goals and policies for reducing SOV trips and their impacts. These plans expand upon the broad TDM goals and policies laid out in the general plan and identify specific programs, projects, and funding for implementation. TDM plans typically establish vehicle trip reduction goals for specific land uses and outline actions for attaining those goals.

Case Study – Municipal TDM Plan

Transportation Demand Management Plan, Rockville, MD: The City of Rockville Traffic and Transportation Division identified the need for a five-year TDM Plan to prioritize TDM projects funded through their TDM fund. The City of Rockville collects a fee from developers to be used specifically for the City of Rockville TDM fund. As established in individual TDM agreements with developer applicants, the fee is \$0.10 per square foot for commercial and retail developments and \$60 per unit for residential development for a ten-year period. The plan establishes vehicle trip reduction goals for specific land uses and prioritizes actions for attaining those goals.

Short Range Plans:

Short-range plans as they pertain to TDM typically seek to influence drivers' behavior for a shorter duration of time to mitigate construction or event related traffic. However, these short-duration mitigation plans provide valuable opportunities for drivers to 'try-out' alternative travel modes and perhaps modify their long-term travel choices.

Types of Short-Range Plans:

TDM Plans for Construction Mitigation –TDM Plans developed for construction projects (often as part of agency required Transportation Management or Traffic Mitigation Plans for construction projects) provide mitigation strategies that inform commuters of construction activities and promote transportation alternatives during construction. These plans provide and promote a customizable range of travel choices. Construction mitigation related TDM efforts can help encourage changes in typical travel mode, which may be continued by individual travelers after the project is complete and they are comfortable using transit, ridesharing, walking, or biking.

Construction related TDM plans often include strategies to address the following (Houston-Galveston Area Council):

- **Commuter mode choice: services to encourage carpool, vanpool, enhanced transit, biking, walking**
- **When commuters work: flexible work schedules**
- **Where commuters work: teleworking**
- **What route commuters take: increased traveler information**

4. Implementation of TDM

Urban Design, Site Development and Parking

This section provides a discussion on the policies and programs that realize the TDM goals laid out in the planning process. The information in this section demonstrates how TDM strategies and measures can be integrated and encouraged through urban design, site development, and parking management.

Urban Design

Design Guidelines – Local jurisdictions develop design guidelines to coordinate the overall development of an area so that projects help each other succeed and result in a more livable and cohesive community. Design control measure can advance or transform districts, neighborhoods, or corridors as part of a larger policy or planning effort to promote multi-modal travel and integrate TDM features into building and community design. Design guidelines can encourage multimodal districts, corridors, Transit Oriented Development (TOD), or influence how individual buildings interact with the streetscape and the transportation network.

Case Study – Design Guidelines

Active Design Guidelines, New York, NY: The Active Design Guidelines collaboratively completed by four New York City Departments (Design & Construction, Health & Mental Hygiene, Transportation, and City Planning) presents design strategies that encourage active transportation (walking and biking to transit or work) and recreation for neighborhoods, streets and outdoor spaces. Key strategies include the following:

- Mixed land uses in city neighborhoods
- Improved access to transit and transit facilities
- Improved access to recreational facilities such as parks, plazas and open spaces
- Improved access to full-service grocery stores
- Accessible, pedestrian-friendly streets with high connectivity, traffic calming, landscaping and public amenities
- Facilitate biking for transportation and recreation through bicycle networks and infrastructure

Sustainable Building Policy, Seattle, WA: Seattle is one of the top cities in the nation for LEED facilities and the City of Seattle is one of the largest single owners of LEED facilities in the world. This achievement was spurred by the City's adoption of the Sustainable Building Policy in 2000, which called for new City-funded projects and renovations with over 5,000 sq. ft. of occupied space to achieve a Silver rating using the U.S. Green Building Council's (USGBC) LEED Green Building Rating System™.

Complete Streets– Complete Streets refers to design concepts and principles that focus more specifically on design of the street for all potential users – transit, bicyclists and pedestrians as well as cars. In the past, modes other than the auto may not have been prioritized and many performance measures of our roadways have focused on moving autos. Assembly Bill 1358, the California Complete Streets Act of 2008, requires cities and counties to include complete streets policies as part of their general plans so that roadways are designed to safely accommodate all users.

There is no singular design prescription for Complete Streets; each one is unique and responds to its community context. A complete street may include: sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more. A complete street in a rural area will look quite different from a complete street in a highly urban area, but both are designed to balance safety and convenience for everyone using the road (National Complete Streets Coalition).

Case Study – Complete Streets

Urban Street Design Guidelines, City of Charlotte, NC: With its award winning Urban Street Design Guidelines, Charlotte is using street design to shape its development patterns and provide residents and visitors with viable choices for how they move about the city. The guidelines include a six-step planning and design process that matches each street to the existing and emerging land use context. The process helps planners design streets that are sized appropriately for their neighborhood context and select streetscape elements that create an appealing environment and keep pedestrians, bicyclists, transit riders, and motorists safe.

Maricopa Association of Governments Complete Streets Guide, Phoenix, AZ: The Maricopa Association of Governments (MAG) has developed a resource to guide street design to “ensure that facilities for bicycles, pedestrians and transit are recognized as integral to a properly designed and functioning street.” The MAG Complete Streets Guide includes six steps to plan for complete streets: 1. Determining the Transportation Context, 2. Identify Current Transportation Modes and Facilities, 3. Identify the Complete Streets Gaps, 4. Determine Other Priorities, 5. Determine the Right-of-Way and Number of Lanes, and 6. Select Other Complete Street Elements. The guide also includes example outcomes, performance measures, strategies, and a list of potential local resources.



*The effect of applying Charlotte's **Urban Street Design Guidelines** creates an environment where pedestrians, cars, cyclists and transit coexist, and landscaping creates an aesthetically pleasing environment. Charlotte Department of Transportation, 2009*



*Facilities for pedestrians, transit users, and cyclists in Mesa, AZ
Maricopa Association of Governments Complete Streets, 2011 (photo credit Dan Burden)*

Site Development

Establishing the appropriate regulatory framework for including TDM in the development review process has been a question for many jurisdictions and a variety of creative methods have been successfully employed. Many local jurisdictions have codified the role of TDM in the site plan review process via trip reduction ordinances Because the land regulatory process

varies so widely among jurisdictions, each city must examine its own statutory process and define how to integrate the desired approaches into its own framework.

TDM goals also vary widely from jurisdiction to jurisdiction. Some agencies look at TDM as a traffic mitigation tool, others might be establishing goals for alternative modes of transportation, and still others might wish to use TDM to complement and reinforce their urban planning vision. Many jurisdictions have found that when they identify a need or the desire for TDM, they can find creative methods of accomplishing it within their specific development authority. As a preliminary step, local jurisdictions should consider establishing peak hour non-auto mode share goals in their land use plans or specific plans requiring or encouraging each development to meet or contribute toward those goals.

Often developers are willing to voluntarily apply TDM actions if they are provided some credit toward their development approval, or otherwise secure some benefit in the process. However the most successful TDM programs typically rely on continuing, enforceable ordinances. Stand-alone programs that depend on voluntary measures, while somewhat successful in reducing auto trips, tend to have less influence on the nature or type of the development in a community. In a voluntary environment TDM with no formal structure in place, strategies can be inconsistently incorporated into development applications and are not verified to ensure they are implemented as proposed. For example, in 2010 the District of Columbia recognized the need for a formal TDM program when it began attracting new residential, commercial and retail development with redevelopment occurring at an unprecedented pace. While highly beneficial in many respects, the development generated significant additional vehicular traffic. Their redevelopment permit process lacked a systematic approach and process for implementing TDM as a way of meeting the District's goals of reducing auto trips and accommodating travel through the complete transportation network. TDM was handled on a project-by-project basis, with limited opportunities for coordination among agencies. Based on national best practices and input received from stakeholders, they developed a plan to formalize and codify TDM into their development review process.

When TDM supporting amenities are provided within developments, it becomes much easier for tenants to change their transportation choice. For example, when office buildings offer showers and secure bike parking they will see an increase in walking and biking. Carpooling and vanpooling increase when priority parking spaces are set aside for HOVs.

While regulations and requirements are included in the most successful TDM programs, education about the benefits of TDM and encouragement to participate in TDM programs is integral to maximizing TDM's success. Providing credible research into the value of TDM, as well as assisting in the marketing of these programs to prospective tenants and owners helps convert the interest in quality of life improvements into an economic incentive for developers to provide TDM programs (Government of the District of Columbia Department of Transportation).

Trip Reduction Ordinances

Trip Reduction Ordinances (TROs) require developers, employers, and/or building managers to provide amenities and or incentives that encourage occupants or employees to use alternative modes of transportation. Ordinances implemented by jurisdictions take many different forms but often require a certain reduction in trips with rewards and penalties set for achievement or nonattainment of goals. Trip reduction plans are required as part of the building permit process and establish various strategies or building design elements that will reduce auto trips and encourage alternative modes. This can include a variety of site amenities such as:

- Secure bicycle parking (racks, lockers or bike station)

- Showers and lockers
- Site design that facilitates transit use, walking and cycling. This includes transit stops, bike and pedestrian pathways, landscaping, benches and awnings, lighting, etc.
- Off-site amenities such as sidewalk improvements, bike network improvements, transit station improvements improved transit service, transit shelters, roadway and streetscape improvements, intersection improvements, etc.
- On-site amenities that reduce the need to drive by requiring or encouraging a mix of uses (cafes, drug stores, groceries, banks, post office, services, gyms and childcare) into major developments so workers don't need to use cars during the day.
- Parking Maximums
- Unbundled parking
- Priority parking for HOVs
- Market rate parking

Table 1 also provides a comprehensive list of TDM strategies that can be applied to developments and/or for consideration as California Environmental Quality Act mitigation measures for projects.

Case Study – Trip Reduction Ordinance

Parking and Transportation Demand Management Ordinance, Cambridge, MA: Cambridge Municipal Code reduces vehicle trips and traffic congestion in the city by requiring Parking and Transportation Demand Management (PTDM) plans for commercial projects that propose parking. The ordinance calls for a SOV mode-share commitment of 10 percent below the 1990 Census Journey to Work data for the project location. The PTDM plans must include a comprehensive set of TDM measures and annual monitoring and reporting to the City is mandatory. According to the City, the ordinance has contributed to a 24 percent reduction in VMT and contributed to a reduction in 38 million vehicle miles in 2011. Sixty-two percent of the monitored projects in 2011 met their mode-split commitments for 2011. The City offers technical assistance for non-compliant projects to identify and promote additional TDM measures that reduce SOV travel. This mutually cooperative process has avoided the use of enforcement provisions contained within the PTDM ordinance. A copy of the ordinance is provided in Appendix C.

Bikes in Buildings, New York, NY: The Bikes in Buildings Program aims to increase bicycle commuting by providing cyclists with secure parking during the workday. The program is based on the Bicycle Access to Office Buildings Law, which requires commercial office buildings to allow cyclists to bring bicycles into their offices by elevator, upon request, or provide alternate bicycle parking facilities in lieu of elevator access.

Development Agreements

When TDM supporting amenities are provided within developments, it becomes much easier for tenants to change their transportation choice. For example, when office buildings offer showers and secure bike parking they will see an increase in walking and biking. Carpooling and vanpooling increase when priority parking spaces are set aside for HOVs. Amenities supporting TDM can be identified either specifically for the site or can be off-site. Off-site examples include providing bus shelters, intersection improvements that improve pedestrian safety, or even the construction, or contribution to construction, of new bikeways that would serve residents and commuters in the area of the development. Off-site improvements are often identified as part of an overall area transportation plan, so that improvements provided by the developer are coordinated and meet local and regional needs.

The best time to ensure that features like these are included in developments is before construction, when a permit is being negotiated. Most jurisdictions that have had success with developer sponsored TDM programs as part of their land development process have found a written development agreement to be an essential element of their success. In addition, formal definition of the credits given for specific types of improvements (e.g. reduction in auto trips) must be defined and incorporated into the development review process or the jurisdiction's TDM guidelines. This documentation reduces the likelihood of prolonged negotiations and fosters equal and commensurate improvements for individual developments. The agreement, which is part of the development approval conditions, could include items such as the following:

- What specific TDM strategies are to be implemented, when they will start, and how long they will be operated
- Who will be responsible for funding and operating the programs once the development is built and/or occupied (if the developer often is selling the property after it is built)
- What is the expected outcome of the TDM program in terms of vehicle trips reduced
- How is the outcome to be measured
- If reports on TDM actions are to be provided, how frequently, and to whom
- What is the penalty for non-achievement of program goals or failure to continue TDM programs?

Development agreements are more widely supported and easier to negotiate when developers receive something in return, such as waiving certain requirements for a license or permit approval. For example, incentives such as bid preferences, density bonuses, exemptions, and streamlined processes can have a significant financial benefit for the developer and cost nothing to the local government. For example, Walton County, FL allows housing developers to add more units to their developments in exchange for constructing greenway corridors, bike path connectors, and sidewalks. Bethesda, MD expedites the plan review for developments that provide open space, public art, and sidewalks. Minneapolis, MN reduces minimum parking requirements for non-residential buildings in exchange for bicycle parking spots (Public Health Law and Policy).

The development agreement should outline what the developer is obtaining as a benefit from operating the program (such as mitigation of traffic at nearby intersections or reduced parking requirements). Research has shown the following approaches for incentivizing TDM to be effective:

- Provide developers with TDM credits, in the form of "peak hour auto trips reduced" for defined actions. For example a bus shelter is worth three auto trips, or participation in a carshare program is worth two auto trips.
- Allow for TDM actions to reduce the site trip generation, so the trips are not reflected in the traffic impact analysis for the proposed development.

- Use a multimodal level of service for intersections, where pedestrian and bicycle use is factored into an overall analysis of the location.

Case Study – Development Agreements

Development Agreement, Saanich, British Columbia, Canada: The District of Saanich worked with several partners to build TDM measures into the innovative Short Street redevelopment project. The developer received reduced parking requirement in exchange for providing new residents with a transit pass for one year, a carshare vehicle with membership for each unit, and secure underground bicycle storage.

Local Area Transportation Review (LATR) Guidelines, Montgomery County, MD: Montgomery County has a long history of successfully using TDM actions to reduce peak hour auto trips in their development review process. Their LATR Guidelines provide specific actions for a developer “entering into a legally-binding agreement with the Planning Board and Montgomery County DOT to mitigate the impact of all or a part of their site-generated trips within the policy area where the site is located.” Each TDM agreement is for 12 years and normally has a gradually decreasing surety credit to assure program implementation and continuance.

Defining Development Agreements - The question of how to define agreements between land developers (or development applicants) and the local government is one that can be challenging to local governments. The following ideas have proven to be manageable and successful in other locations:

- The TDM outcomes and specific strategies offered by the developer and accepted by the city should become part of the “conditions of approval” for the development. With this approach TDM actions are as valid as any other aspect, and should be treated just like physical transportation improvements or site design. The best conditions are outcome related (number of vehicles entering the building in the morning peak hour, for example). Note that with this approach the TDM program “goes with the land” so if the property is sold the new owners have the same requirements. This is critical to keeping the programs going over time.
- After the land development is approved, a separate contract is written between the developer and the approving agency, and perhaps including a third group, like a TMA, who might be providing monitoring. This contract can include aspects such as:
 - The expected outcomes and phasing of the TDM program. The new development cannot be expected to achieve all goals in the first year as the building is occupied, but all physical changes (bus stops, bike racks) should be required before the building opens. Progress on the TDM strategies ideally begins with the first tenants or occupants.
 - How long the program is to be operated. Most agreements do not require programs to be maintained without an ending date.
 - What monitoring data is to be provided by the developer or assignees, when it is due, and the receiving entity.
 - If independent monitoring and validation is to be conducted, assuring developer provided data is accurate. This validation should be done by (or for) the City or other monitoring agency, with the costs paid by the developer.

- o What actions are to be taken by the developer if the performance goals are not met. Often some grace period is provided after the monitoring shows the performance is substandard, but a showing of progress is essential over time from the perspective of the City.
- o One valuable aspect of the approval or contracts has been a bond or letter of credit from the developer held by the monitoring agency in an amount sufficient to operate the programs if the developer should default or fail over time to achieve the goals. This is the most difficult of these guidelines to achieve, yet is the most effective way to keep the developer or other assignees focused on achieving the TDM goals. The bond or credit can be decreased over time, as the program progresses.

Residential developments - While many jurisdictions apply TDM requirements only to commercial developments, residential developments should not be eliminated from the development agreement process. TDM strategies to be considered for residential developments are primarily influenced by the location and its proximity to facilities for alternative modes of transportation. Planned or new residential communities can use parking maximums rather than minimums; provide on-site parking for carsharing programs; offer bikesharing and bicycle parking, and amenities or facilities for pedestrians.

Case Study– Residential Communities

Santa Clara Valley Transportation Annual Pass Program, Santa Clara, CA: Residential communities such as condominiums, apartments, townhouses, homeowner associations, and community associations are able to purchase transit passes for their residents at a discounted price, similar to those available to employers. The use of these passes reduces the user-paid costs for a transit pass, increases transit ridership, and results in a lower demand for parking.

Parking Requirement Reduction – Carsharing, San Francisco, CA: The San Francisco Planning Department granted a variance to construct the 141-unit Symphony Towers apartments with only 51 spaces (rather than the required 141) in part due to the commitment for two parking spaces dedicated to carsharing and the use of unbundled parking costs (parking spaces are rented separately from the unit).

Employer Commute Trip Reduction Programs

TROs in some jurisdictions require employers with more than a certain number of employees to make a good faith effort to encourage employees to reduce automobile commute trips. These public and private employers are required to develop trip reduction plans for their work site. Commute trip reduction plans serve as agreements between the city and the employer for establishing employee trip reduction targets and identifying various strategies to help achieve those targets over a certain time frame. In certain instances, employers that fail to make such an effort may be fined. Examples of the types of programs that can be offered by employers can include:

- Maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees
- Designating an Employee Transportation Coordinator

- Commuter information center (bulletin board, kiosk, website) and a link to the SANDAG iCommute program on their intranet
- Preparing a parking management plan that includes charging employees market rate for SOV parking and providing reserved or free spaces for registered carpools or vanpools
- Parking Cash Out program
- On-site carsharing vehicle(s) or bikesharing
- Flexible or alternative work hours
- Telework program
- Transit, carpool, and vanpool subsidies
- Secure bicycle parking, showers and locker facilities
- Pre-tax deduction for transit or vanpool fares and bicycle commute costs

Table 1 provides a comprehensive listing of TDM measures that can be applied at the work site.

Case Study – Employer Trip Reduction Ordinance

Transportation Management Ordinance - Santa Monica, CA: Transportation Management Ordinance 1604 was enacted by the City in 1990 in an effort to reduce traffic congestion and improve air quality. The ordinance affects employers with ten employees or more and focuses on reducing the number of employee commute trips generated by Santa Monica employers. Employers with 10 - 49 employees provide each of their employees with information about ridesharing, educating their employees about air quality issues and alternatives to driving alone to work. Employers of 50 or more employees further encourage and entice employees to rideshare by implementing a variety of incentives and strategies. A yearly employee survey tracks each employer's progress in reducing drive alone trips.

Mandatory Parking Cash Out

The City of Santa Monica is the only city in the nation to implement a mandatory Parking Cash Out Program. Parking Cash Out, or AB2109, is a State law requiring employers of fifty or more employees who lease their parking, and subsidize any part of their employee parking to offer their employees the opportunity to give up their parking space and rideshare to work instead. In return for giving up their parking space, the employer pays the employee the cost of the parking space. The ordinance summary is provided in Appendix D

For ease of administration, mandatory TROs often apply only to large developments and employers (those with at least 50 or 100 employees at a worksite) although this limits their effectiveness since the majority of employees in most business districts work for smaller companies. To address this issue, smaller employers or groups of employers can form a Transportation Management Association (TMA) to provide and manage TDM services in a particular location. TMAs are non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, mall, medical center, business district or industrial park. They are generally public-private partnerships, consisting primarily of area businesses with local government support.

TMA's provide an institutional framework for TDM Programs and services. They are usually more cost effective than programs managed by individual businesses. TMA's allow small employers to provide trip reduction services comparable to those offered by large companies. They avoid problems that may be associated with government run TDM programs, since they are managed and funded primarily by members. (Victoria Transport Policy Institute).

Case Study – Transportation Management Association

Commuter Connection – Minneapolis, MN: The Downtown Minneapolis TMA, and Commuter Connection, advocates for and promotes a sustainable transit and transportation system that supports a vital and growing downtown Minneapolis. The TMA, created by the City Council in 1991, is public-private non-profit partnership of the City of Minneapolis and downtown business community. TMA members represent various business and public sectors and are approved by City Council. Commuter Connection is program of the Downtown Minneapolis TMA that provides TDM services to commuters, employers and property managers.

Employer based TDM strategies have the potential to yield a significant reduction in employee vehicle trips. Research conducted by the Washington State Department of Transportation found that when employers start charging for parking that was previously subsidized, vehicle trips are reduced by 20-30 percent, and when employers provide a cash incentive and support for ridesharing (such as ride matching service and Guaranteed Ride Home), vehicle trips are reduced by nearly 25 percent (City of Seattle).

To support local jurisdictions and their businesses with trip reduction planning, the SANDAG iCommute program provides the technical support and resources necessary for assessing, developing, implementing and tracking the success of a commuter program.

Case Study – Commute Trip Reduction Law Implementation

Commute Trip Reduction Plan, Seattle, WA: Consistent with the 1991 Commute Trip Reduction Law adopted by the Washington State Legislature, the City of Seattle adopted a commute trip reduction plan into the Seattle Municipal Code. The commute trip reduction plan requires employers with 100 or more employees that report to a single site between the hours of 6 and 9 a.m. to develop, implement and promote programs that help employees reduce drive alone commute trips. An employer's program must include at least two TDM elements from a menu of TDM options provided by the city.

Employers must update and submit their plan to the City for review and approval every two years. This includes conducting a commuter survey to measure employees' drive alone rates. This mandatory program is coupled with education and encouragement programs to include "Way to Go, Seattle!" - a city sponsored source for programs, tools, and incentives for walking, biking, using transit, and carpooling.

Parking Strategies

Many jurisdictions have realized that the attractiveness of transit and ridesharing is indirectly proportional to the availability and cost of parking at a location. If vehicle parking is readily available and free, the incentives to use other modes is greatly reduced. Parking costs are typically hidden from drivers, who therefore see few, if any opportunities, to save on such costs. Nationally, over 90 percent of private employers subsidize employee parking, while only 6 percent subsidize transit making driving to work an easy choice (Greenberg). Subsidized and hidden parking costs can lead to a variety of problems including substantially higher development costs. For example, requiring minimum parking requirements for housing can increase development costs and reduce supply. Additionally, minimum use-based commercial and office parking requirements raise costs and hinder redevelopment.

Parking policies complement many TDM efforts, and normally have included incentives or disincentives for fewer spaces per unit of development (parking maximums rather than minimums), encourage shared parking among land uses (retail and office for example) and/or a fee per parking space. Managing parking helps to reduce the undesirable impacts of parking demand on traffic levels and the resulting impacts on community design and economic development. When free or inexpensive parking is offered, it leads to overuse, often by long-term or all-day parkers who occupy valuable spaces at the expense of short-term parkers, limiting access to retail businesses and service industries catering to short-term users. Management of parking prices and supply can help to ensure access to retail businesses, provide access for visitors to regional and neighborhood attractions, and support neighborhood vitality (City of Seattle).

Area Wide Parking Policy (Policy/Ordinance): Often parking policies are most successful when they are holistic and coupled with improved access to transportation alternatives. One well known global example of a comprehensive parking policy that had a direct impact on increased transit use and reduced vehicle miles traveled is Perth, Australia. Faced with increasing congestion on downtown streets and roadways leading to downtown, declining air quality, low active and public transportation rates, and reduced vibrancy in the downtown, Perth undertook a major change in their approach to the supply of parking in the downtown area, which was coupled with transit improvements. The primary components of Perth's parking policy included the restriction of long-term public parking to areas on the periphery of the downtown area, the licensing and subsequent collection of fees for all existing and new off and on-street parking spaces, and institution of parking limitations based on land area, not density. The following graphic shows the Pedestrian Priority Zone (in green) where both parking and access to parking was most restricted, the Short Stay Parking Zone (in tan) where short term public parking was permitted, and the General Parking Zone (in white) where both long and short-term parking was allowed, thus providing auto access to the downtown, but giving priority to pedestrians and cyclists in the downtown core that is serviced by both bus and rail transit.



Perth Parking Policy – Public Parking Zones, Presentation by Emmerson Richardson, SKM, October 2011

The changes in parking policy were instituted in conjunction with the provision of both new and free transit services in the downtown area. All revenue from the licensing of parking was used to fund both the new and the free transit service.

This considerable departure from the previous auto-centric approach accounted for a mode share shift from 50 percent auto and 35 percent transit to 35 percent auto and 50 percent transit. It also should be noted that the institution of the parking policy did not negatively affect business in the downtown area – during the same timeframe, employment grew by 30 percent (Richardson, E).

Parking Maximums, Unbundled Parking and Shared Parking: Establishing limits on the quantity of parking that can be provided for a given development promotes more efficient use of land, enhances urban form, and can encourage the use of alternative modes. Parking maximums can be linked with the availability of alternative modes to capture the accessibility of the existing transit infrastructure.

Unbundled parking refers to parking that is rented or sold separately, rather than automatically included with building space. The cost of parking for residential and commercial units is often passed on to the occupants indirectly through the rent or purchase price ("bundled") rather than directly through a separate charge. This means that tenants or owners are not able to purchase only as much parking as they need, and are not given the opportunity to save money by using fewer parking spaces. This is not only more equitable, but can also reduce the total amount of parking required for the building (Metropolitan Area Planning Council). Parking can be unbundled in several ways:

- Facility managers can unbundle parking when renting building space.

- Developers can make some or all parking optional when selling buildings. In some cases it may be easier to offer a discount to renters who use fewer than average parking spaces, rather than charging an additional fee. For example, an office or apartment might rent for \$1,000 per month with two “free” parking spaces, but renters who only use one space receive a \$75 monthly discount.
- Parking costs can be itemized in lease agreements to help renters understand the parking costs they bear, and to help them negotiate reductions (Victoria Transport Policy Institute).

Shared parking is based upon the concept of using the same parking spaces for two or more land uses at different times. Shared parking can significantly improve the economics of constructing new parking. Rather than one user per day, a facility may service and charge multiple users. Allowing for shared parking arrangements significantly reduces the amount of land devoted to parking, creating more opportunities for mixed use, creative site planning and landscaping. In addition to revisions to local zoning codes to enable shared parking, shared parking arrangements can be implemented through shared parking agreements between individual developers. In some cases, shared parking can be a formal or informal agreement among different peak users on different days. Some local jurisdictions incorporate language in local ordinances to permit shared parking. These jurisdictions allow shared parking to meet minimum parking requirements for uses located within the same lot or building and also permit off-site shared parking arrangements to meet on-site parking requirements for complementary uses within a defined area (Metropolitan Transportation Commission).

Case Study –Parking Policy

Downtown Parking Management Program, City of Ventura, CA: The City of Ventura manages on-street and off-street parking to achieve a 15 percent parking vacancy rate using metered parking. All funds collected are reinvested in downtown. In the first year of operation (September 2010 to September 2011), the program performed as follows:

- 502,220 pay station transactions and \$530,000 in pay station revenue
- \$198,000 in permit and parking structure parking revenue
- Currently generating an average of \$10,000 a month in net revenue to be used toward payment of program and additional improvements to the downtown
- The program is offsetting approximately \$500,000 in personnel costs that were previously funded by the General Fund
- 83 percent of merchants surveyed support the parking management program after implementation

Additionally, shared on-site parking between land uses with different periods of peak parking demand is permitted for all uses. Shared on-site parking is allowed to satisfy 100 percent of the minimum parking requirement for each use.

Maximum Parking Requirements, Portland, OR: The City of Portland, Oregon has established maximum parking requirements for new development in each central business district. Additionally, the City has also applied a parking maximum for development across the entire Portland metro area. Parking maximums are set based upon the availability of transit service. Lower maximums are set based upon a one-quarter mile walk from a frequently served bus stop or one-half mile walk from a transit station. The parking maximum in the central downtown core is 0.7 per 1,000 sq. ft.; up to 2.5 in adjacent business districts.

Demand-Based or Performance-Based Parking Pricing: Demand-based (or performance-based) parking utilizes a market-rate approach to manage the supply of parking in areas with high retail and service activity. This methodology uses parking occupancy and turnover data to set parking rates in a manner that drives demand patterns to achieve a clearly stated policy objective. The goal is to avoid the problem of cruising for parking spaces, which congests traffic and pollutes the air as drivers circle the block searching for an open space. Under this program parking rates at curbside meters respond to fluctuations in demand in an attempt to have at least one parking space available at any time on a given block. The right price for curbside parking is considered the lowest price that will leave parking space available on each block at all times (Shoup). Demand-based parking requires the city to set a target occupancy rate (typically around 85%) for the total number of on-street parking spaces, which helps regulate the parking price based on demand.

Demand-based parking initiatives are best supported when real-time parking information is available. Real-time parking uses parking sensors, installed in on-street parking spaces and/or in parking garages, to track when and where parking is available and the price for the available spaces. Sensor data is uploaded wirelessly to a data feed that makes the information available to the public via a website, smartphone applications, text message, etc. By checking parking

availability before leaving home, drivers will know where they can expect to find parking and how much it will cost (San Francisco Municipal Transportation Agency).

Case Study –Demand Based Parking

Demand Based Parking, Redwood City, CA: Redwood City changed their public parking approach to maintain the vibrancy of their downtown, while also accommodating new retail and recreational development in the downtown area. After an extensive study of existing parking conditions and issues, and review of potential parking options, Redwood City adopted a demand based parking approach. Based on initial findings, the downtown parking occupancy rate was set at 85 percent. Parking prices are adjusted to maintain 15 percent of the total parking supply available to parkers wishing to pay to park at an on-street meter. Additionally, the city removed all time limits on parking downtown, relying on market prices to control parking turn-over. Pay-by-space meter technology allows for payment using a smartphone. Parking meter revenue is used to fund downtown improvements.

Real-time Parking, San Francisco, CA: *SFpark* uses demand-responsive pricing to redistribute parking demand and reduce the need for circling and double-parking. In order to direct drivers toward parking, *SFpark* must know when and where spaces are available. Wireless sensors can perform this task in a way that was previously impossible, reporting availability space-by-space and minute-by-minute. The *SFpark* data feed allows real-time information to reach drivers directly. In addition to a parking availability map available on online, information on parking availability is distributed via a free *SFpark* iPhone app, Android app, the region's 511 phone system, text message, and electronic display signs at high-traffic locations in the City.

Developing Successful TDM Strategies and Programs

It takes a multi-tiered process to create successful TDM programs, and each geographic scale and planning level incorporates different actions and is implemented in different ways. Table 1 provides a summary of the range of plans and strategies that can help inform and guide the implementation of TDM at various levels. Column one in the table lists the types of plans that can guide and regulate growth and development from the site specific to the regional or state level. Implementation tools and mechanisms are the regulatory elements such as policies and ordinances necessary to be able to incorporate TDM strategies into the land development process. The next seven columns provide information on various TDM strategies, categorized by: land use management, transit, ridesharing, parking management, pricing, bicycle and pedestrian amenities, general support, and programs or services. The final column highlights performance measures. It can be observed that each category contemplates specific actions that can apply for each stage of the land development process; some of those TDM strategies require a coordinated effort between different geographic levels and therefore can be approached by different entities and key stakeholders simultaneously.

Table 1: TDM Strategies Matrix

Geography	Type of plan or measure	Implementation tool (mechanism)	TDM STRATEGIES							Performance Measures
			Land Use & Urban Design	Transit	Ridesharing	Parking Management	Pricing	Bicycle & Pedestrian	TDM programs and Program support	
Site/ Employer	<ul style="list-style-type: none"> TDM Site Plans Construction Mitigation Plans 	<ul style="list-style-type: none"> Transportation Management Association (TMA) Commuter Benefit Program Parking regulations Identify staff or TDM coordinator Complete Streets 	<ul style="list-style-type: none"> Site design that promotes and facilitates transit, walking and biking 	<ul style="list-style-type: none"> Provide transit facilities (such as shelters) Subsidize transit fares Provide transit information (maps, signage, real-time info, etc.) Provide shuttles from transit to worksite Support carsharing and other first and last mile measures Allow employee use of company vehicles for personal appointments/errands 	<ul style="list-style-type: none"> Preferred parking for carpools and vanpools Promote the regional ridesharing service Provide or subsidize vans and/or vanpooling Subsidize ridesharing Support carsharing Allow employee use of company vehicles for personal appointments/errands 	<ul style="list-style-type: none"> Reduce or eliminate free parking Include priority parking for carpools or vanpools Limit parking spaces on site (parking maximums) Implement Parking Cash Out Parking reservation system (Smart Parking – pay more for priority spots) Unbundle the price of parking 	<ul style="list-style-type: none"> Charge market rate for parking Parking Cash Out 	<ul style="list-style-type: none"> Site design that promotes walking and/or biking Provide showers and lockers at employment sites Provide secure bike parking Bicycle-sharing/loan programs 	<ul style="list-style-type: none"> Designate an employee transportation coordinator to promote and coordinate transit, ridesharing, walking and biking. Implement flex hours, telework and/or compressed work week options. Allow employees to relocate jobs to branch office nearest their homes. Provide pre-tax benefit for employees who use transit, vanpool, or bike to work. Promote /enhance the Guaranteed Ride Home program 	<ul style="list-style-type: none"> Parking and vehicle counts Average Vehicle Ridership (AVR) Vehicle Employee Ratio Number of equivalent SOV trips not made/reduced VMT reduced Parking revenue Transportation Management Association memberships
City	<ul style="list-style-type: none"> General Plan Specific Plans Master Plans Municipal TDM Plans Climate Action Plans Corridor Plans Parking Management Plans Bicycle and Pedestrian Plans Community and neighborhood plans 	<ul style="list-style-type: none"> Trip reduction policies and ordinances Parking policies and ordinances Complete Streets (AB 1358) Design Guidelines Development Agreements California Environmental Quality Act 	<ul style="list-style-type: none"> Urban design guidelines that promote and facilitate transit, walking, and biking Street design that accommodates all users (transit, bike, walking, ADA) Restricted automobile use in pedestrian oriented areas Growth Management Boundaries 	<ul style="list-style-type: none"> Transit priority signaling at intersections Transit only lanes or priority routes Improved accessibility to transit stops (safe bike and pedestrian connections) First mile and last mile solutions to transit Outreach and promotion Support the implementation of transit facilities (shelters, stations) 	<ul style="list-style-type: none"> Priority or preferred parking for carpools and vanpools Carsharing Park & Ride lots HOV lanes Managed lanes SchoolPool programs 	<ul style="list-style-type: none"> Supportive zoning requirements - parking maximums Shared parking between compatible land uses (office and restaurant/cinema) Priority public parking for carpool/vanpool Way-finding and guidance system to available parking Demand based or performance based pricing Restrict long-term/commuter parking to peripheral areas Unbundle the price of parking 	<ul style="list-style-type: none"> Congestion pricing on roadways or areas Variable market rate on-street parking pricing 	<ul style="list-style-type: none"> Plan and implement a bicycle and pedestrian network that is connected to regional and state facilities and that connects to transit Provide ample and secure bike parking Public awareness programs for bicyclists/ pedestrians Bikesharing program 	<ul style="list-style-type: none"> Promotion and outreach to major employers and the community Enforcement of TDM policies Form TMAs to achieve shared goals. 	<ul style="list-style-type: none"> Level of service (LOS) Mode split and mode shift Bicycle and pedestrian counts for commute and other trips Transit travel time reliability Public parking demand VMT SOV trip reduction
Region / State	<ul style="list-style-type: none"> Regional Transportation Plan and Sustainable Communities Strategy and its Urban Area Transit Strategy Regional Comprehensive Plan Climate Action Plan Regional Bicycle Plan 	<ul style="list-style-type: none"> Growth Management Complete Streets (AB 1358) California Parking Cash Out Law (SB 728)Smart Growth Incentive Program Active Transportation grant fund 	<ul style="list-style-type: none"> Smart Growth Tool Kit Growth Management Boundaries 	<ul style="list-style-type: none"> HOV lanes/transit only lanes/transit supportive infrastructure and facilities/managed lanes Safe Routes to Transit Traveler information Transit marketing programs 	<ul style="list-style-type: none"> Regional vanpool program Carpool Incentive Program Guaranteed Ride Home Free ridesharing service Multimodal Park & Ride lots Support carsharing programs 	<ul style="list-style-type: none"> Advanced traveler information systems 2050 RTP and SCS – Technical Appendix N of the Urban Area Transit Strategy 	<ul style="list-style-type: none"> Provision and support of HOT lanes/Dynamic pricing of roadway facilities and managed lanes 	<ul style="list-style-type: none"> Plan for and implement a regional/statewide bicycle network Public awareness programs for bicyclists and pedestrians Provide secure bike parking at key intermodal transit centers Bikesharing program 	<ul style="list-style-type: none"> iCommute services and programs SANDAG: Regional Intermodal Transportation Management Systems (TMS) Network Education and awareness campaigns for all modes 511 phone and 511ad.com 	<ul style="list-style-type: none"> Transit and roadway LOS LOS uniformity within a corridor or network Transit and roadway capacity available Transit usage Transit and auto travel times Mode split and mode shift Transit travel time reliability Regional or statewide VMT SOV trip reduction Non-motorized trip counts

5. Managing and Monitoring TDM

TDM policies and strategies must be planned, implemented, and monitored if they are to achieve maximum success.

TDM programs are often multi-layered, with activities occurring at the site, area, city/county, regional and state levels, ideally all working together. The local jurisdiction is typically in the best position to coordinate local TDM efforts and either has, or can obtain, the needed regulatory and policy tools. This section provides information on how a local jurisdiction is typically involved in managing and monitoring TDM programs.

Managing TDM Programs

Agencies that wish to most effectively use TDM strategies may want to identify a staff function related to managing and monitoring TDM programs. One or more staff, normally in the planning or development review office, would have duties such as:

- Identifying and championing adoption of regulations that provide specific guidance on using TDM strategies in the land development process.
- Developing agreement frameworks that land development applicants can use to propose TDM actions.
- Leading negotiations with development applicants and structuring mutually supportive agreements between the private sector and public agencies.
- City-wide data collection and compilation efforts.
- Monitoring implementation and achievement of the strategies after a development is approved and underway (unless a TMA is established for this function).

Local agencies typically bear the cost of enacting TDM policies and programs, but implementation costs are borne by the employer or developer. These programs can be very effective, especially if mandatory, because they legally require action. This position can be partially funded by development fees. For example the City of Rockville, MD collects a fee from developers to be used specifically for the City of Rockville TDM fund (Case Study – Municipal TDM Plan). The City of Ventura offsets personnel costs through parking fees (Case Study – Parking Policy). Alternatively the cost could be seen as a general jurisdictional cost to achieve broader city goals and a function that reduces other transportation expenditures over time.

For ease of administration, some jurisdictions choose to form a non-profit TMA to manage and monitor TDM initiatives. More information on TMAs and a case study are provided in Section 4 under Employer Commute Trip Reduction Programs

Measuring the Success of TDM Strategies & Programs

As with any investment, it is important to be able to demonstrate the impact of TDM initiatives. The ability to regularly monitor and evaluate TDM strategies helps local governments select the best strategies for addressing specific policy objectives and also to assist in setting relevant and realistic TDM goals. Demonstrating that the resources invested have provided measurable change is important for continued support and to ensure that the goals of the TDM plan or program are being met.

Measuring Success

One challenge in measuring the effect of TDM initiatives is that impacts are often more qualitative in nature. The cause-and-effect relationship between an initiative and the resulting change in travel behavior may be complicated by a number of other factors.

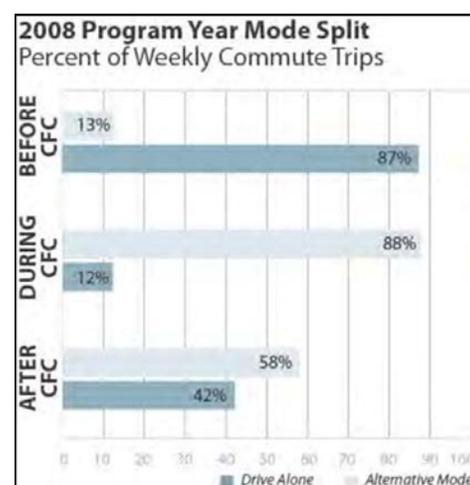
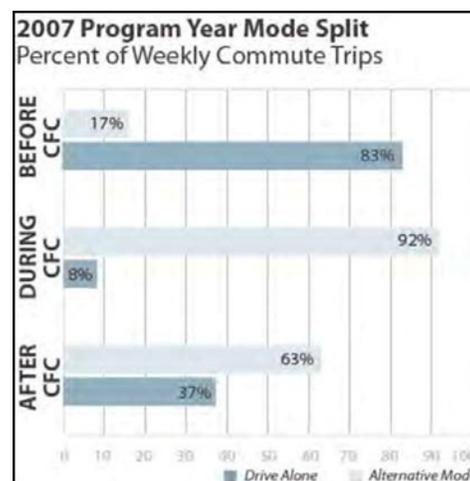
TDM initiatives that build awareness of travel options are important – but they impact personal attitudes (which are difficult to measure) and compete with many other factors that shape how individuals think (Transports Canada). However, using participant surveys (employers and employees) and measuring the change in travel behavior over time yields quantifiable and measurable results. For example, the Atlanta Cash for Commuters (CFC) program has conducted surveys of CFC participants at various times following their program participation to determine the percent of individuals that maintained their change from SOV use to alternative modes. By using participant surveys before, during, and after each yearly CFC program, the CFC was able to show that a significant number of participants maintained their use of alternative modes after program completion and the incentive of \$3 per day was no longer a factor (Gray).

Recent changes in the Highway Capacity Manual include more traditionally quantifiable performance measures, such as level of service for walking, bicycling, and transit, which can be used for before and after evaluation of targeted TDM strategies (New TRB Publication/Ryus, Vandehey, Elefteriadou, Dowling, Ostrom).

The listing below provides a number of performance indicators that can be used to evaluate and measure the success of TDM strategies and programs. Selection of the individual measure will depend on the TDM strategy being measured - some measures are more suitable to evaluating TDM strategies for either a particular time (such as peak hour) or geographic location (such as destination, district or region).

- *Awareness* – the portion of potential users who are aware of a program or service.
- *Participation* – the number of people who respond to an outreach effort or request to participate in a program.
- *Utilization* – the number of people who use a service or alternative mode.
- *Mode split* – the portion of travelers who use each transportation mode.
- *Mode shift* – the number or portion of SOV trips shifted to other modes.

Cash for Commuters 2007 and 2008 Program Results



(TDM Review, Winter 2012)

- *Average Vehicle Occupancy* - Number of people traveling in private vehicles divided by the number of private vehicle trips. This excludes transit vehicle users and walkers.
- *Average Vehicle Ridership (AVR)* - All person trips divided by the number of private vehicle trips. This includes transit vehicle users and walkers.
- *Vehicle Trips or Peak Period Vehicle Trips* - The total number of private vehicles arriving at a destination (often called "trip generation" by engineers).
- *Vehicle Trip Reduction* – the number or percentage of automobiles removed from traffic.
- *Vehicle Miles of Travel (VMT) Reduced* – the number of trips reduced multiplied by average trip length.
- *Energy and emission reductions* – these are calculated by multiplying VMT reductions by average vehicle energy consumption and emission rates.
- *Cost Per Unit of Reduction* – these measures of cost-effectiveness are calculated by dividing program costs by a unit of change. For example, the cost effectiveness of various TDM programs could be compared based on cents per trip reduced, or ton of air pollution emission reductions (Schreffler).

Given that ultimately an assessment of costs and funding opportunities will be needed, the cost effectiveness of TDM strategies also should be evaluated. One of the common evaluation measures is Benefit-Cost analysis, which divides the total program or project costs by total impacts or outcomes. The outcome of cost effectiveness can also be used comparatively to understand the relative value of TDM strategies versus other solution strategies. For example, the comparative cost of reducing vehicle demand as compared the cost of capacity improvements or expansion.

Case Study – Measuring the Effectiveness of TDM strategies

Pool Rewards, Commuter Connections, Washington D.C.: The Pool Rewards project by Commuter Connections was developed to encourage drive alone commuters to try carpooling in the Washington region. Eligible participants could earn \$2 per day (\$1 each way) for each day they carpoled to work. The program began as a three month pilot in 2010. The pilot resulted in a decrease in 298 daily auto trips based on logged passenger trips and a daily VMT reduction (based on participants' home and work locations) of 9,296 miles per day. According to a follow-up survey, 93 percent of participants continued carpooling after the pilot project ended. To demonstrate the cost effectiveness of the pilot, a Benefit-Cost analysis was done using the total program cost divided by the emissions reduction attributable to the program (Cost/tons per day of pollutant reduced).

Various tools, such as the Worksite Trip Reduction Model (WTRM) developed by the National Center for Transit Research and the Environmental Protection Agency (EPA) COMMUTER model, are currently available for estimating some of the benefits of several TDM and other emission reduction strategies. TRIMMS© is a spreadsheet application that estimates a more broad range of impacts and provides program cost-effectiveness measures for TDM initiatives. The EPA and National Center for Transit Research provides these modeling tools for free:

WTRM: <http://www.nctr.usf.edu/worksite/>

COMMUTER: http://www.epa.gov/otaq/stateresources/policy/pag_transp.htm#cp

TRIMMS: <http://www.trimms.com/>

Additionally, the SANDAG iCommute online system allows companies and jurisdictions to measure the impacts of TDM program. The TripTracker function provides the environmental and cost savings associated with TDM initiatives at the employer level, city level and regional level.

Table 2 provides additional information on practices from other jurisdictions for evaluating various strategies or programs and the results obtained – providing quantitative, qualitative, or anecdotal evidence of a correlation between implementation of a given strategy and achievement of TDM policy goals. Many of the examples incorporated in this matrix have been extracted from Metro 2040 Modal Targets Report-Evaluations of Potential Measures for Achieving Modal Targets.

Table 2: TDM Strategies Evaluation Matrix

Evaluated Strategies		Location	Program/ Mechanism	Results	Evaluation Method
Land Use Management	Transportation Efficient Development	San Francisco, CA	Study investigates the effects of transportation efficient design principles on both non-work and commuting travel by comparing modal splits between two distinctly different neighborhoods (Cervero R., Radisch C.).	Residents of the mixed-use, gridded neighborhood made 15 percent fewer auto trips and 22 percent more walking trips than the suburban style neighborhood. In the mixed-use, gridded neighborhood, 29 percent of those surveyed drove alone to work. In the suburban style neighborhood, 51 percent drove alone to work.	Surveys to determine mode split.
	Growth Management	Vancouver, Canada	As a deliberate transportation strategy, Vancouver increased housing capacity in the downtown area to reduce commuting times and congestion, in what became known as the “living-first strategy” (City of Seattle. Department of Transportation.).	From 1991 to 2002, the number of residents living downtown increased by 62 percent to 76,000, but car trips into downtown remained essentially constant. In 1994, walking and cycling trips made up 20% of all daily trips into the downtown and together made up the third-highest used mode behind auto and transit trips: by 1999, walking and cycling trips made up 35 percent of all daily trips and are now the most frequently used mode.	Surveys to determine mode shift.
	Parking and TDM Ordinance	Cambridge, MA	The Parking and Transportation Demand Management (PTDM) Ordinance passed in November 1998. The ordinance looks at how much traffic a new project will generate and then attempts to estimate how much more traffic would have been generated without the PTDM ordinance. Ordinance requires limiting traffic increases to a maximum of that number, minus ten percent (City of Cambridge).	61 companies/institutions covering 35,000 employees/students; 38 million VMT reduced (24%); developers are using their TDM measures as an employee recruitment perk and to attract wider retail clientele.	Annual monitoring and reporting by developers to City: employee and/or patron mode split; biennial counts of parking occupancy.
	Mandatory Employer Based TDM Plans	Minneapolis/ St. Paul	Evaluation of TDM Plans for office buildings (Spack Consulting). The purpose of this study was to objectively study the traffic and parking characteristics of office buildings in the Minneapolis Metropolitan Area who are actively implementing TDM Plans.	On average, TDM plans led to a 30 percent reduction in traffic generation rates and a 10 percent reduction in required parking stalls	Trip generation and parking counts during peak hours.

Evaluated Strategies		Location	Program/ Mechanism	Results	Evaluation Method
Transit	Subsidized Transit Pass	University of Washington	In order to manage parking and traffic congestion on campus, University of Washington has set up the U-PASS, which provides faculty, staff and students with a variety of low-cost transportation options—from buses, commuter train service and light rail, to vanpooling and discounted impromptu carpooling (University of Washington).	In 2010 U-PASS members were more than three times as likely as those without a U-PASS to be transit users (80% and 25% respectively). Use of U-PASS for Metro fares has remained very high (90%) and stable since the survey was implemented in 1996.	Survey designed to collect information on mode shift; transit utilization; carpool parking; U-PASS utilization.
	Transit Marketing and Promotion	Alameda, CA	TravelChoice is an innovative program to reduce driving and congestion while promoting healthy physical activity. TravelChoice used targeted outreach tactics to connect interested residents with information and incentives to add more walking, bicycle riding, public transit, and carpooling into their daily routines (City of Seattle. Department of Transportation.).	Drive-alone trips were reduced 14 percent, primarily due to a 34 percent increase in transit usage and a 5 percent increase in carpooling.	Survey data on travel mode.
	Transit Marketing and Promotion	Government of Western Australia, Perth, Aus.	TravelSmart™ is “a social marketing program that identifies individuals who want to change the way they travel, motivates them to think about their travel options and provides them with information about how to use transit, bike, walk, or carpool for some of their trips.” (Socialdata Australia Pty. Ltd)	The pilot program achieved a 10 percent reduction in car travel and a 21 percent increase in public transit use.	Travel diaries and surveys.
	Carsharing	San Francisco, CA	Study looks at the effects of the Carshare program on vehicle ownership and VMT (Cervero R., Tsai Y.).	Two thirds of participants avoided purchasing another car, resulting in an average member VMT reduction of 47 percent.	Survey of Carshare members.

Evaluated Strategies		Location	Program/ Mechanism	Results	Evaluation Method/ Monitoring
Parking Management	Parking Pricing	Redwood City, CA	Used demand based meter rates to increase parking availability and improve parking space turn-over (City of Seattle. Department of Transportation.).	Since March 2007, the City successfully maintains an average 18 percent availability meter rate and average parking stay of 72 minutes among downtown spaces that were previously always full all the time.	Parking occupancy and turnover.
	Parking Generation – Traffic Generation	Perth, Australia	Perth Parking Policy introduced in 1999: Maximum levels of private parking based on land area; long term public parking restricted to peripheral areas; all parking bays (other than residential) licensed; license fees applied to off and on-street bays (Richardson).	Trends since policy introduced (1999-2010): 10 percent reduction in parking bays; major increase in parking price; change in mode share for access to city (1990: car driver 50%, transit 35% / 2005-2010: car driver 35%, transit 50%). Employment with the city core grew by 30 percent, transit more than doubled and car access reduced. Also footpaths have been widened and there is less delay for pedestrians.	Quantify before and after parking rates, number of parking bays, change in vehicle and transit ridership mode share.
	Congestion Pricing Area-Wide Value Pricing Projects	Singapore, Norway, United Kingdom (London), Germany (Stuttgart)	Relieve congestion during peak periods, in part through mode shift (John E. Evans IV, Kiran U. Bhatt, and Katherine F. Turnbull).	Singapore, mode shift of up to 30 percent for buses and 11 percent for carpools. In Trondheim, Norway, transit mode share increased by about 7 percent. In London, transit in peak periods increased by 14 percent. In Stuttgart, Germany, one-year simulation resulted in 5 – 15 percent mode shift to transit.	Changes in mode share measured using combination of data related to: Vehicle and/or passenger counts taken over time and survey data.
Pricing	Bike Parking	London, England	Survey of 348 London students about mode choice after the installation of bicycle parking racks (Transport for London).	61 percent of school cyclists (i.e. those who had cycled to school within the past month) said the new cycle racks have encouraged them to cycle to school more often.	Survey to quantify before and after bicycle trips to school.
Bike / Pedestrians	Promotional Programs –Ten Toe Express	City of Portland Transportation Options	Ten Toe Express is a city-sponsored initiative designed to encourage walking trips (City of Portland Office of Transportation).	More than half of the respondents reported taking more than one new trip per week by walking instead of driving. Of new walking trips, 16 percent were for shopping, 22 percent for errands, and 13 percent to a friend's house.	Travel journals and surveys. Individual trip patterns.

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Appendices

A. Resources

In addition to the identified and referenced national and international TDM plans, programs, and strategies discussed and sources presented in the Works Cites section, there are a number of regional resources and references available for use by local agencies and TDM professionals. While the list is not comprehensive, it does provide a starting point for research and documentation of the various TDM and TDM related plans and guidelines.

Program Support

2050 Regional Transportation Plan and Sustainable Communities Strategy -The 2050 RTP lays out a plan for investing an estimated \$214 billion in local, state, and federal transportation funds expected to come into the region over the next 40 years. The largest proportion of the funds will go toward transit, which will receive 36 percent of the funds in the first 10 years, with 34 percent going to highway improvements (largely for the addition of HOV lanes to existing freeway corridors), and 21 percent to local roads and streets. The percentage dedicated to transit will grow each decade, up to 44 percent from 2021 to 2030, 47 percent in the third decade, and 57 percent in the last decade of the plan.

Along with the 2050 RTP, the Board adopted the Sustainable Communities Strategy (SCS). The SCS details how the region will reduce greenhouse gas emissions to state-mandated levels over time. The inclusion of the SCS is required by Senate Bill 375, and the San Diego region is the first in California to produce a regional transportation plan with an SCS.

The 2050 RTP includes plans for additional planning resources to support local jurisdictions with TDM related planning and implementation to include an Early Action Plan for active transportation projects, Complete Streets Guidelines, a Safe Routes to Transit Study and First and Last Mile Solutions to Transit studies and pilot projects.

Menu of Policy Options to Support the Transit Network (Technical Appendix N of the Urban Area Transit Strategy in the 2050 RTP and SCS) - This technical report of the Urban Area Transit Strategy identifies a “menu” of policies and strategies that influence transit ridership and mode share. The menu is organized into three categories: parking, land use, and funding. The report also includes information on transit fares, services, and facilities to help maximize the effectiveness of the region’s transit network.

- **2050 RTP and SCS**
<http://www.sandag.org/2050rtp>
- **Urban Area Transit Strategy**
<http://www.sandag.org/uploads/2050RTP/F2050RTPTA7.pdf>

Healthy Communities Atlas –The purpose of the Atlas is to compile, visualize and analyze conditions related to health and wellness in the San Diego Region. Existing data were used to develop health-related indicators at the Census block group level. A GIS tool accompanies the Atlas to allow local jurisdictions to perform customized queries and geographic analysis. The Atlas Map and GIS tool can be used to identify areas that already support health and areas that need further investment in infrastructure, programs and policies.

- **Healthy Communities Atlas**
http://www.sandag.org/uploads/projectid/projectid_381_14233.pdf

Regional Commuter Assistance Program

iCommute – iCommuteSD.com is the San Diego Regional TDM program and the gateway to commute choices and resources in the region. The program is managed by SANDAG as part of the regional 511 transportation information program. iCommute assists commuters and employers by providing free carpool and ridematching services, a subsidized

vanpool program, transit promotion, regional support for bicycling, the Guaranteed Ride Home program, SchoolPool ridematching services for parents, and technical support for employers and agencies to establish a commuter benefit programs. iCommute offers an Employer Starter Kit to assist with developing a commuter policy and benefit program. iCommute staff works directly with employers to launch and grow their commuter program. iCommute staff also provides jurisdictions with technical support on TDM planning and policy development.

iCommute:

<http://www.iCommuteSD.com>

Parking Tools

Trip Generation for Smart Growth and Parking Strategies for Smart Growth provide planning tools for the San Diego Region to identify trip generation rates and parking demand associated with smart growth developments. Trip Generation for Smart Growth is accompanied by an interactive Excel spreadsheet tool designed to assist users in calculating trip reduction rates for individual smart growth developments or smart growth planning areas. The spreadsheet can be fully completed with data (by the user), or data can be provided by SANDAG Service Bureau for a fee.

- **Trip Generation for Smart Growth:**
http://www.sandag.org/uploads/publicationid/publicationid_1500_11604.pdf
- **Parking Strategies for Smart Growth:**
http://www.sandag.org/uploads/publicationid/publicationid_1499_11603.pdf
- **Smart Growth Trip Generation Spreadsheet Tool:**
http://www.sandag.org/uploads/projectid/projectid_378_11605.xls

Land Use Tools

The SANDAG Smart Growth Concept Map and Smart Growth Visualization Tool use an interactive map for planners to locate smart growth areas around the region, view photos of existing smart growth projects in these locations (where available), and answer questions such as how the map will be used, how it was prepared, and how it will be updated. Visual simulations of smart growth are also available and illustrate how communities could be transformed by smart growth development and transit-friendly designs.

- **Smart Growth Concept Map and Smart Growth Visualization Tools:**
<http://www.sandag.org/index.asp?projectid=296&fuseaction=projects.detail>

Design Guidelines

There are a number of design guidelines available to local agencies to review as part of their refinements or updates to existing planning and design guideline documents. The design guideline documents provide examples of the various design topics, using text, photos, sketches, and criteria for consideration. For example, chapter 7 of the Regional Bicycle Plan presents bicycle facility design guidelines and a best practices manual to serve as a guide for planners, engineers, and designers.

- **Planning and Designing for Pedestrians - Model Guidelines for the San Diego Region:**
http://www.sandag.org/uploads/publicationid/publicationid_713_3269.pdf
- **Smart Growth Design Guidelines:**
<http://www.sandag.org/index.asp?projectid=344&fuseaction=projects.detail>

- **The Regional Bicycle Plan:**

http://www.sandag.org/uploads/projectid/projectid_353_10862.pdf

Funding Opportunities for Capital and Planning Projects

Smart Growth Incentive Program: The *TransNet* Smart Growth Incentive Program (SGIP) funds transportation and transportation-related infrastructure improvements and planning efforts that support smart growth development. The SGIP awards two percent of the annual *TransNet* revenues (approximately \$4.8 million in FY 2009) from 2008-2048 to local governments through a competitive grant program to support projects that will help better coordinate transportation and land use in the San Diego Region. The *TransNet* Smart Growth Incentive Program operates on a biennial funding cycle.

- **SGIP Guidelines and Information:**

<http://www.sandag.org/index.asp?projectid=340&fuseaction=projects.detail>

Active Transportation Grant Program (Formerly the TDA and *TransNet* Bicycle and Pedestrian Projects Grant Program): The SANDAG Board of Directors allocates funds under the Transportation Development Act (TDA) and *TransNet* local sales tax program to support bicycle and pedestrian transportation projects in the San Diego Region through a competitive process on an annual basis.

- **Active Transportation Grant Program Guidelines and Information**

<http://www.sandag.org/index.asp?projectid=354&fuseaction=projects.detail>

B. Participating in TDM Outside of the Planning and Development Process

iCommute provides free assistance and tools to help jurisdictions design and implement a customized TDM program that can be implemented at the agency and community levels.

Commuter policies and benefit programs: A commuter benefit program provides agency employees with an array of alternative commute choices, as well as incentives for using them. It starts by bundling together various commuting-related programs relevant to the needs of your agency and employees, and then including them in your overall benefits package. Most will save your employees money, reduce stress, and help improve the environment.

A commuter program stands side-by-side with your agency's health benefits, helping to attract and retain talented staff, as well as improve overall employee satisfaction. Your custom plan could include everything from helping connect employees who want to carpool or vanpool with one another, to offering flexible work schedules and telework options, to providing free or reduced-cost transit passes. Some of the programs are offered free by SANDAG. Others are inexpensive or come with subsidies. For example, SANDAG provides a \$400 per month subsidy for qualifying vanpools, a Guaranteed Ride Home program, and a Carpool Incentive Program.

The Commuter Benefit Starter Kit for Employers, available through iCommute, provides your agency with the tools to get started, including an overview of your options, sample policies, promotional materials, and tax benefit information. Additionally iCommute staff is available to assist agencies with developing and implementing the programs that meet your needs.

The iCommute online system offers employees free and convenient ridematching and trip tracking tools. The site also allows your agency to create customized incentive programs for rideshare participants. Its convenient reporting feature details how many of your employees are participating and measures the individual's and agencies' financial and environmental savings.

TDM in the community: There are many ways that agencies can educate the public and encourage alternatives to driving alone in their communities:

- Provide information on commuting resources. Install a kiosk with information on commute alternatives and provide information on Web sites and newsletters. Include links to iCommutesd.com.
- Encourage large employers to participate in iCommute programs and services. Provide businesses and business organizations, such as Chambers of Commerce, with information on iCommute.
- Participate in and promote annual regional events and campaigns that encourage commute alternatives to driving alone such as Bike to Work Month, Dump the Pump, Rideshare Week, and Walk and Bike to School Day.
- Promote and encourage participation in the regional SchoolPool program. SchoolPool is a free and secure online ridematching service for parents of children who attend the same school anywhere in the San Diego Region. SchoolPool is coordinated by iCommute and is a resource for schools and districts that have lost transportation resources.

Case Study – City Sponsored TDM Programs

Agency sponsored commuter benefit program, City of Escondido, CA: According to a 2009 survey of employers conducted by SANDAG, the City of Escondido offers a commuter program that includes subsidized transit passes, preferred parking spots for car- or vanpool, bike racks, showers on-site, teleworking, and flexible work schedules.

TDM in the community – In Motion, King County, WA: In Motion programs have been rolled out in ten neighborhoods in King County. Residents register and pledge to eliminate a set number of drive-alone trips each week by using some other mode. The participants log the trips they make by taking the bus, walking, bicycling, or carpooling instead of driving alone. Registrants earn points for each SOV trip saved, and win prizes such as gift certificates to neighborhood businesses or vouchers for use toward transit fare. All registrants receive information, maps, and free bus tickets to encourage trying new travel modes to explore their community.

C. Sample Trip Reduction Ordinance – Cambridge, MA

Chapter 10.18 - PARKING AND TRANSPORTATION DEMAND MANAGEMENT PLANNING; PARKING SPACE REGISTRATION

Sections:

[10.18.010 - Purpose](#)

[10.18.020 - Definitions](#)

[10.18.030 - PTDM Planning Officer](#)

[10.18.040 - Registration of All Parking Spaces](#)

[10.18.050 - Parking and Transportation Demand Management Plans](#)

[10.18.060 - Reduction in Minimum Parking and Maximum Distance Requirements](#)

[10.18.070 - Requirements Applicable to Small Projects](#)

[10.18.080 - Enforcement](#)

[10.18.090 - Evaluation](#)

10.18.010 - Purpose

(a) It is the purpose of this Chapter to regulate and control atmospheric pollution from motor vehicles by formalizing parking and transportation demand management planning, programs, and coordination which have been ongoing for a number of years. This Chapter will reduce vehicle trips and traffic congestion within the City, thereby promoting public health, safety, and welfare and protecting the environment. This Chapter requires parking and transportation demand management (PTDM) plans for commercial parking facilities and other types of non-residential parking facilities over a specified size as set forth in 10.18.050 and 10.18.070. This Chapter also establishes a process whereby City officials will be able to track the number, use and location of off-street parking spaces in the City.

(b) A Parking and Transportation Demand Management Planning Officer will be designated by the City Manager with the responsibility for reviewing, conditioning, approving and/or denying PTDM plans. Any project subject to the requirements of this Chapter shall not be qualified to receive a permit from the Planning Board, a commercial parking permit from the Commercial Parking Control Committee, a special permit or variance from the Board of Zoning Appeal, a building permit from the Commissioner of Inspectional Services, a certificate of occupancy from the Commissioner of Inspectional Services, or an operating license from the License Commission absent written approval of its PTDM plan from the PTDM Planning Officer or evidence of registration of its parking spaces with the Department of Traffic, Parking, and Transportation.

(1211, Added, 11/16/1998)

10.18.020 - Definitions

"Commercial Parking Space" means a parking space available for use by the general public at any time for a fee. The term shall not include (i) parking spaces which are owned or operated by a commercial entity whose primary business is other than the operation of parking facilities, for the exclusive use of its lessees, employees, patrons, customers, clients, patients, guests or residents but which are not available for use by the general public; (ii) parking spaces restricted for the use of the residents of a specific residential building or group of buildings; (iii) spaces located on public streets; or (iv) spaces located at a park-and-ride facility operated in conjunction with the Massachusetts Bay Transportation Authority.

"Commercial Parking Facility" means a parking facility owned or operated by a commercial entity whose primary business is the operation of a parking facility and at which there are at least five (5) Commercial Parking Spaces.

"Commercial Parking Permit" means a (i) permit issued under chapter 10.16 of the Cambridge Municipal Code, authorizing the use of a designated number of parking spaces at a specified location as Commercial Parking Spaces; (ii) a permit or approval issued prior to the effective date of this Chapter pursuant to the Procedures, Criteria, and Memorandum of Agreement dated November 15, 1984; (iii) a Controlled Parking Facility Permit that expressly authorizes use of the parking facility for Commercial Parking Spaces; or (iv) a letter from the Director confirming the number of spaces at a specified location that were in existence and being used as Commercial Parking Spaces as of October 15, 1973.

"Controlled Parking Facility Permit" (CPFP) means a permit issued by the Director prior to the effective date of this Chapter, which authorized the construction or operation of a parking space or the construction, operation, or modification of a parking facility.

"Determination of Exclusion" means a determination made by the Director that a parking facility or a parking space did not require a controlled parking facility permit.

"Director" means Director of the Cambridge Department of Traffic, Parking, and Transportation.

"Effective Date" means November 16, 1998, the original date of final adoption of this Chapter of the Cambridge Municipal Code.

"Existing Parking Facility" shall mean a parking facility for which (i) a certificate of occupancy was issued by the Commissioner of Inspectional Services; (ii) an operating license was issued by the License Commission; or (iii) the Director issued a letter confirming the number of spaces at that location which spaces were in existence and being used as commercial parking spaces as of October 15, 1973 (a "Director's Letter").

"New Project" means a project to construct or operate parking spaces within a new facility or an existing parking facility which will cause such facility to have a net increase in the number of spaces for which a certificate of occupancy, operating license, variance, special permit, or Director's Letter has not been issued as of the effective date of this Chapter and which is not a park-and-ride facility operated in conjunction with the Massachusetts Bay Transportation Authority.

"Parking Facility" means any lot, garage, building or structure or combination or portion thereof, on or in which motor vehicles are parked, except any such facility used in association with or by a municipal police or fire station, and in the case of university or college campuses, the stock of parking spaces maintained within the City by the university or college which supports university or college activities within the City.

"Person" means and includes a corporation, firm, partnership, association, executor, administrator, guardian, trustee, agent, organization, any state, regional or political subdivision, agency, department, authority or board, and any other group acting as a unit, as well as a natural person.

"Planning Officer" means the City official responsible for PTDM plan reviews.

"PTDM" means Parking and Transportation Demand Management.

"Small Project" means a project to construct or operate five (5) to nineteen (19) non-commercial, non-residential parking spaces within a new facility or an existing parking facility which will cause such Facility to have a net increase in the number of spaces for which a certificate of occupancy, operating license, variance, special permit, or Director's Letter has not been issued as of the effective date of this Chapter. To qualify as a Small Project, the total number of non-commercial, non-residential parking spaces at the parking facility must remain at or below nineteen (19).

(Ord. 1287, Amended, 09/12/2005; 1252, Amended, 09/24/2001; 1211, Added, 11/16/1998)

10.18.030 - PTDM Planning Officer.

Within thirty (30) days of the effective date of this Chapter, the City Manager shall designate a Parking and Transportation Demand Management Planning Officer who shall have responsibility for reviewing, conditioning, approving, and/or denying PTDM plans and who shall report to the City Manager. Said officer shall be a Cambridge resident within six months of employment in this position. Prior to rendering his/her determination(s), the Planning Officer shall consult with the PTDM plan applicant, the Director and the Assistant City Manager for Community Development.

(1211, Added, 11/16/1998)

10.18.040 - Registration of All Parking Spaces.

(a) No person shall build, expand, or reconfigure a parking facility for non-residential parking spaces resulting in a net increase in the number of parking spaces or a change in the use of such spaces based on the categories of use listed below at paragraphs b(v) and (vi), without first submitting a parking registration form to, and obtaining acceptance from, the Director.

(b) The registration form shall be prepared by the Director and shall be available at the offices of the Department of Traffic, Parking and Transportation. The form will require the following information:

- (i) Name and address of parking facility owner;
- (ii) Name and address of parking facility operator;
- (iii) Address of parking facility;
- (iv) Total number of existing parking spaces;
- (v) Number of existing parking spaces in each of the following categories:
 - Residential
 - Commercial
 - Non-commercial
 - Customer
 - Employee
 - Patient
 - Student
 - Client
 - Guest
- (vi) Number of parking spaces proposed to be added to the parking facility in each of the following categories:
 - Residential
 - Commercial
 - Non-commercial
 - Customer
 - Employee
 - Patient
 - Student
 - Client
 - Guest
- (vii) Identification of any existing parking permits for the parking facility; and
- (viii) Explanation of any enforcement actions against the parking facility.

(c) The Director shall accept or return a registration form to the registrant with a request for additional information within thirty (30) days after the form was filed.

(d) The License Commission shall not issue a license and the Commissioner of Inspectional Services shall not issue a building permit or certificate of occupancy for a parking facility subject to this section without evidence (i) that the registration form has been accepted by the Director; and (ii) if required, that the facility has a PTDM Plan approved by the Planning Officer.

(1252, Amended, 09/24/2001; 1211, Added, 11/16/1998)

10.18.050 - Parking and Transportation Demand Management Plans

(a) No person shall build, expand, or operate a parking facility subject to the Parking and Transportation Demand Management (PTDM) Plan requirements of this Chapter absent a PTDM Plan approved by the Planning Officer.

(b) The PTDM requirements of this Chapter shall apply to each of the following:

- (i) Any commercial parking facility for which a certificate of occupancy or operating license, variance or special

permit was not obtained prior to the effective date of this chapter;

(ii) An existing commercial parking facility at which the number of parking spaces is increased after the effective date of this chapter;

(iii) Any parking facility at which the use of existing or permitted parking spaces is changed to commercial use after the effective date of this chapter;

(iv) Any new project to build or create by change of use twenty or more non-residential parking spaces; and

(v) Any new project to expand an existing parking facility resulting in a total number of non-residential parking spaces of twenty (20) or more.

(c) The PTDM Plan shall be designed to minimize the amount of parking demand associated with the project and reduce single-occupant vehicle trips in and around Cambridge. The PTDM Plan shall be based on the following facts, projections and commitments:

(i) Facts and Projections:

- Nature of development and property use;
- Proximity of project to public transit and other non-Single-Occupant Vehicle facilities;
- Availability of and accessibility to offsite parking spaces which could serve the project;
- Number of employees and their likely place of origin; and
- Type and number of patrons/users of proposed parking supply and their likely place of origin.
- Number of vehicle trips expected to be generated by the project and description of measures to reduce associated traffic impacts on Cambridge streets; and
- Other factors published by the Planning Officer.

(ii) Commitments:

- Commitment to work with the Cambridge Office of Work Force Development;
- Commitment to implement vehicle trip reduction measures including some or all of the following:

Subsidized MBTA passes and other incentives; shuttle services; ride-sharing services; bicycle and pedestrian facilities; flexible working hours; preferential parking for Low Emission Vehicles/Zero Emission Vehicles/bicycles/carpools/vanpools (Note: this list is not meant to preclude implementation of other types of vehicle trip reduction measures). This commitment must be accompanied by a detailed description of the measures proposed to be implemented; and

Commitment to establish and make reasonable efforts to achieve a specified, numeric reduction (or percent reduction) in single-occupant vehicle trips in and around Cambridge. The percent reduction will be based on PTDM practices successfully implemented in reasonably comparable environments and as identified in professional and academic literature and based on analysis of existing trip reduction measures in Cambridge.

Each PTDM Plan shall identify the total number of existing and proposed parking spaces at the facility and specify how many existing and proposed spaces fall within each of the following categories (explain how many spaces are used for multiple purposes):

- Residential
- Commercial
- Non-commercial
- Customer
- Employee
- Patient

- Student
- Client
- Guest

Where the parking facility includes or proposes a combination of commercial and non-commercial parking spaces, the Plan shall specify how the parking facility will prevent commercial use of the non-commercial parking spaces.

Each PTDM Plan shall contain the following certification signed by an authorized corporate officer:

"I hereby certify that a commercial parking permit has been obtained for each space being used for commercial parking. None of the other existing or proposed parking spaces at this parking facility have been or will be available as commercial parking spaces until a commercial parking permit therefor has been obtained."

(d) The Planning Officer shall review, condition, approve and/or deny the PTDM Plan based on the above-listed facts, projections, and commitments. The Planning Officer shall issue his/her decision in writing within 60 days of receipt of the proposed PTDM Plan. The required time limit for action by the Planning Officer may be extended by written agreement between the proponent and the Planning Officer. Failure by the Planning Officer to take final action within said sixty (60) days or extended time, if applicable, shall be deemed to be approval of the proposed PTDM plan. If the project proponent elects to make a request pursuant to 10.18.060, the decision of the Planning Officer shall be expanded to include a recommendation about whether offsite parking should be allowed at distances greater than those allowed in the Zoning Ordinance and/or whether fewer parking spaces than the minimum required in the Zoning Ordinance should be allowed. Decisions of the Planning Officer may be appealed by the project proponent to a review committee composed of the City Manager, or his designee, and two other City staff members designated by the City Manager none of whom may have participated in the initial review of the Plan.

(e) The Planning Officer shall also make available sample PTDM plans which a project proponent may adapt for their project, such to approval by the Planning Officer.

(f) No permit, commercial parking permit, special permit, variance, building permit, certificate of occupancy, or operating license shall be issued for any project subject to 10.18.050 by the Planning Board, Commercial Parking Control Committee, Board of Zoning Appeal, Commissioner of Inspectional Services, or License Commission absent a written decision indicating approval from the Planning Officer of the project proponent's PTDM Plan. Any such permit or license shall be consistent with, and may incorporate as a condition, the decision of the Planning Officer and shall include written notice of the requirements of 10.18.050 (g) and (h), below. Nothing in this ordinance shall be construed to limit the power of the Planning Board or Board of Zoning Appeal to grant variances from or special permits under the provisions of the Zoning Ordinance. No project proponent shall be required by the Planning Officer to seek such relief under the Cambridge Zoning Ordinance.

(g) Approvals issued by the Planning Officer shall be automatically transferrable by and among private parties, provided that the proposed new owner (the "Transferee") shall continue to operate under the existing PTDM Plan and shall submit to the Planning Officer within thirty (30) days of the title transfer a certification that the existing PTDM plan will remain in effect. The certification shall be submitted on a form issued by the Planning Officer and shall certify that such Transferee commits to implement the existing PTDM plan, as approved; and acknowledges that failure to implement the plan is subject to the enforcement provisions of this Chapter. Where such certification is submitted, the approved plan shall remain in effect as to the Transferee. The Transferee may elect instead to and consult with the Planning Officer within thirty (30) days of title transfer regarding appropriate revisions to the existing plan. Based on such consultation, the Planning Officer may require information from the Transferee concerning proposed changes in use of the parking facility and associated buildings and the relevant facts and projections regarding the proposed changes. Within thirty (30) days of receipt of such information, the Planning Officer may issue a written approval of the revised plan and obligations to the Transferee or the Planning Officer may require submittal of a new PTDM Plan from the Transferee for review, condition, approval and/or denial. Until such time as a new or revised plan has been approved, the existing PTDM plan shall remain in effect.

(h) Each PTDM Plan approval issued by the Planning Officer shall contain, at a minimum, the following conditions:

- (i) The parking facility owner and operator each commit to implement all elements of the PTDM Plan, as approved, including annual reporting requirements, and to maintain records describing implementation of the Plan;
- (ii) The City shall have the right to inspect the parking facility and audit PTDM implementation records; and

(iii) The parking facility owner and operator each commit to notify and consult with the Planning Officer thirty (30) days prior to any change in ownership, use or operation of the facility.

(1252, Amended, 09/24/2001; 1211, Added, 11/16/1998)

10.18.060 - Reduction in Minimum Parking and Maximum Distance Requirements

(a) A project proponent may elect to request that the Planning Officer include as an element of its PTDM Plan a plan for fewer parking spaces than the minimum set forth in the Zoning Ordinance. Upon the written request of the project proponent, based on an evaluation of the facts, projections, and commitments listed at 10.18.050 (c), the Planning Officer may make a written recommendation about the maximum number of parking spaces for the project. This recommendation shall remain subject to review and approval by the Planning Board or Board of Zoning Appeal as appropriate.

(b) A project proponent may elect to request that the Planning Officer include as an element of its PTDM Plan a plan for utilizing off-site parking spaces that are farther from the project site than the maximum distance requirements set forth in the Zoning Ordinance. Upon the written request of the project proponent, based on an evaluation of the facts, projections, and commitments listed at 10.18.050 (c), the Planning Officer may make a written recommendation about how many parking spaces serving the project may be appropriately located at an off-site location and at what distance from the project site. This recommendation shall remain subject to review and approval by the Planning Board or Board of Zoning Appeal as appropriate.

(1211, Added, 11/16/1998)

10.18.070 - Requirements Applicable to Small Projects

The owner or operator of each Small Project shall implement at least three (3) PTDM measures and maintain records of such implementation. A list of acceptable types of measures may be obtained from the Traffic, Parking and Transportation Department, the Inspectional Services Department, the Community Development Department, or the License Commission. The Planning Officer shall create and periodically update this list, which shall include: T-pass subsidies; bicycle parking; changing facilities; carpools/vanpools; financial incentives not to drive alone; or other similar measures.

(1252, Amended, 09/24/2001; 1121, Added, 11/16/1998)

10.18.080 - Enforcement

(a) The Director shall enforce the provisions of this Chapter. If the Director has reason to believe that any provision of this Chapter is being violated, the Director shall investigate the possible violation. If after investigation the Director determines that any provision of this Chapter is being violated, s/he shall provide a first written notice of violation to the person charged with the violation, or the duly authorized representative thereof, of the determination of violation and shall order that the violation cease within thirty (30) days of the issuance of the first written notice. If the violation is not cured within the thirty (30) days after issuance of the determination of violation, the Director may proceed to assess the fines established in this chapter as well as any other remedies available to the city. In addition to all other remedies, if the violation has not ceased within thirty (30) days after the first written notice, then the Director may order shutdown of the parking facility. Second or subsequent written notices to a facility for the same violation shall be immediately effective and shall not provide the thirty (30) day opportunity to cure contained in the first written notice. A determination and order of the Director may be appealed to the City Manager by the person charged with the violation within thirty (30) days of issuance of the Director's determination and order.

(b) In addition to other remedies available to the City, any person who builds or modifies a parking facility without complying with the provisions of this Chapter shall be subject to a fine of up to \$10.00 per day per parking space for every day that such parking space was operated without a registration accepted by the Director or without a PTDM Plan approval issued by the Planning Officer or in non-compliance with an approved PTDM Plan. On a determination, after investigation, by the Director that this Chapter is being violated, and the exhaustion of any appeal to the City Manager in accordance with (a) above, the Director shall take steps to enforce this chapter by causing complaint to be made before the district court and/or by applying for an injunction in the superior court.

(c) In addition to other remedies available to the City, a determination that a facility is operating in violation of the provisions of this Chapter shall be ground for revocation by the Director of the facility's parking permit or other form of approval.

(d) The Planning Officer shall have independent authority to inspect a parking facility and audit its records to determine whether it is in compliance with its PTDM Plan. The Planning Officer shall issue a finding of non-compliance in writing and provide copies to the parking facility owner and operator and to the Director.

(1211, Added, 11/16/1998)

10.18.090 - Evaluation

The PTDM Planning Officer shall prepare a report annually on the status and effectiveness of the implementation of this Ordinance.

(1300, Amended, 09/11/2006; 1252, Amended, 09/24/2001; 1211, Added, 11/16/1998)

D. Sample Employer Trip Reduction Ordinance – Santa Monica

TRANSPORTATION MANAGEMENT ORDINANCE 1604 - SUMMARY

The City of Santa Monica's Transportation Management Ordinance #1604 was enacted by the City in 1990 in an effort to reduce traffic congestion and improve air quality. The Ordinance affects employers with ten employees or more and focuses on reducing the number of employee commute trips generated by Santa Monica employers.

Employer Requirements:

Employers are required to submit annual transportation plans to the City. Employers are notified by mail each year before their plan due date and provided with all necessary plan forms.

Employers of 10 - 49 employees are required to attend a City-sponsored workshop and submit a worksite Transportation Plan (WTP) to the City each year. The WTP outlines how the employer will provide all employees with ridesharing information.

Employers of 50 employees or more are required to designate a certified Employee Transportation Coordinator (ETC) and submit an annual Emission Reduction Plan which implements one of the following options:

Employee Trip Reduction Plan This option is an incentive-based plan which focuses on reducing employee trips to and from the worksite. Employers must survey their employees to establish commute patterns for the morning (6:00 a.m. to 10:00 a.m.) and for the evening (3:00 p.m. to 7:00 p.m.). A 75% employee response rate is required. After surveying and establishing an Average Vehicle Ridership (the number of employees per car that arrives at the worksite), employers choose the incentives and marketing strategies that will encourage their employees to rideshare to and from work rather than drive alone. Employers must submit a plan that they believe will result in an AVR of 1.5 employees per vehicle.

Emission Reduction Plan (ERP) Mobile Source Emission Reduction Credits (MSERC) Employers may purchase Mobile Source Emission Reduction Credits from a certified Broker in lieu of an ETRP. Employers may survey employees to determine their Average Vehicle Ridership (AVR) and purchase MSERCs to bridge the shortfall between their AVR and their target AVR of 1.5 or not survey and purchase MSERCs for an AVR of 1.0

Average Vehicle Ridership (AVR):

AVR is a measure of persons per vehicle calculated by dividing the number of employees arriving or departing the worksite by the number of vehicles used to commute to and from the worksite. AVR is calculated using information about employee commute patterns collected over a one-week survey period. The AVR attainment goal is 1.5 persons per vehicle for the morning commute period (6:00 a.m. to 10:00 a.m.) And the evening commute period (3:00 p.m. to 7:00 p.m.)

Certified Training Requirements

Employers of 10 to 49 employees will be notified by mail to attend a City-sponsored training workshop. Each employer must attend one initial training workshop.

Employers of 50 to 249 employees must designate an employee to attend a workshop provided by a City-certified trainer.

Employers of 250 or more employees must receive certification by the South Coast Air Quality Management District. Training dates and registration information is available at: <http://www.aqmd.gov/trans/training.html>

Consultants:

Employers may hire a City-approved consultant to act as the Employee Transportation Coordinator. Contact the City's Transportation Management Office for a list of City-approved consultants.

Annual Transportation Impact Fees: Employers are required to pay a per employee fee. For purposes of calculating fees, the following employees are considered exempt:

Part-time employees working fewer than 4 hours per week

- Temporary employees.
- Contract employees
- Seasonal employees.
- Employees who are based in Santa Monica but report to other worksites outside of the City

Employers of 10-49 employees pay a specific fee per employee.

Employers of 50 or more employees fees: Employers who meet and maintain an AVR of 1.50 for the morning and evening windows receive a fee discount of 40 to 60 percent.

Employers of 50 or more employees filing an MSERC plan pay a specific fee.

Multi-site Employers:

Employers with more than one worksite located within the City of Santa Monica may file one multi-site Emission Reduction Plan or Worksite Transportation Plan.

Employers of 250 or more with one worksite in the City of Santa Monica and one or more worksites of over 250 employees located outside of Santa Monica but within the South Coast Air Basin may choose to comply with the City's Ordinance 1604 or the South Coast Air Quality Management District's Rule 2202. Employers choosing to comply with Rule 2202 must file an exemption with the City.

Parking Cash Out

Employers who fall under the purview of AB2109 (Parking Cash Out), must implement a parking cash out plan as part of their Emission Reduction Plan. Employers who fail to do so will have their Emission Reduction Plan disapproved.

Enforcement

Employers who do not comply with the requirements of the Transportation Management Ordinance will be subject to the following enforcement:

The first violation of a plan year will result in a warning notice. Each subsequent violation in a plan year will result in a violation notice. A violation notice carries a fine of \$5.00 per employee per day and possible revocation of a City of Santa Monica business license.

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