

# TRANSPORTATION DEMAND MANAGEMENT QUICK GUIDE:

An Introduction to Transportation Demand  
Management (TDM) Strategies and Plan Development



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September 2016

# TRANSPORTATION DEMAND MANAGEMENT QUICK GUIDE

This Quick Guide is intended to help organizations with the following:

- Understand the definition of Transportation Demand Management (TDM)
- Determine if and why they should be interested in managing travel demand
- Explaining why changing travel behavior is so challenging and understanding the major factors affecting their ability to change behavior
- Provide a broad range of TDM strategies to test in order to develop or enhance their TDM program
- Understand the benefits to reducing travel demand
- Lay the framework for developing a TDM program
- Provide resources for more detailed research and explanation of TDM related measures and their outcomes

## WHAT IS TDM?

Transportation Demand Management (TDM), sometimes referred to as Travel Demand Management, is a transportation industry standard term that refers to a body of actions that seek “to manage the demand for travel by drive-alone private car, rather than catering for that demand, or managing the road system.” In simple terms, TDM provides people with a variety of mobility options (other than driving alone) to reduce vehicle miles traveled (VMT) and gain environmental, conservation, and sustainability benefits – generally without large infrastructure investments. Measures are directed at increasing vehicle occupancy, shifting travel mode or time of travel, or reducing the need for travel. Much of the time, the focus is to reduce vehicular demand during peak morning and afternoon commute periods, but TDM measures have benefits that extend to off peak and special event travel times as well.

TDM actions, or measures, come in many shapes and forms, but are primarily broken out into the following categories:



**Employer or Institutional Support Actions**



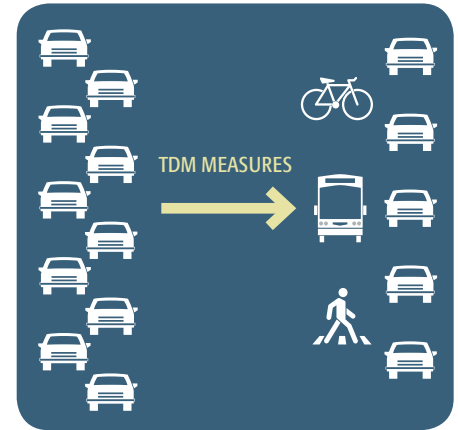
**Financial Incentives or Disincentives**



**Alternative Work Arrangements**



**Local and Regional Infrastructure and Policy**



Advances in technology and mobile applications have rapidly been occurring over recent years. These technologies have improved information distribution and access to alternative forms of transportation through the ability to use algorithms to match riders with each other, communicate real time location of transportation modes and provide comprehensive travel information in one place. This is an aspect of the TDM industry that is rapidly evolving and will undoubtedly continue to enhance and integrate TDM measures into the way we all move around. Additionally, the advent of what is being referred to as “Mobility as a Service” concepts incorporate commute trip reduction, mobility data aggregation, private transit, taxi-like services (Uber/Lyft), ridesharing, car sharing, bike sharing, personal rapid transit and more are advancing rapidly.

TDM methods have traditionally emphasized program information, encouragement and incentives provided by local or regional organizations and have extended to the private sector; however, as congestion increases throughout the U.S., a stronger focus on infrastructure is entering the conversation. This focus on infrastructure (e.g. bike and pedestrian paths, transit enhancements, and even a stronger mix of land use types and densities), referred to loosely as TDM+ is gaining steam as being a critical element to influence travel behavior and provide people with realistic alternatives to driving alone.

## TDM Measures

### Traditional TDM



Programs & Subsidies

### TDM+



Infrastructure



Land Use

## WHO SHOULD BE INTERESTED IN MANAGING TRAVEL DEMAND?

TDM measures can be implemented and managed by many different types of organizations, from state, regional, and local agencies, to Universities, to independent office buildings. In most places across the country, the local Metropolitan Planning Organization (MPO) provides subsidies and support services for local communities through funding from the Federal Government. There are, however, many other groups and organizations that play a role in creating travel demand, therefore, having an inherent interest in managing our transportation infrastructure efficiently. Organizations chose to implement TDM measures for various reasons. If your organization deals with any of the following, you may be interested in exploring developing or expanding your TDM offerings:

- Concern of parking infrastructure costs (capital and long-term maintenance)
- Concern of your carbon footprint
- Limited parking supply and rising parking costs
- Need for future expansion with limited space
- Traffic congestion

While most organizations can participate in the TDM conversation, the following groups are typically those with the largest ability to distribute and coordinate TDM offerings and have a well-defined TDM program:



**Governmental Agencies (States, Metropolitan Planning Organizations (MPOs), Cities and Counties)**



**Quasi-Public/Private Governmental Agencies (Community Improvement Districts [CIDs], Business Improvement Districts [BIDs], Downtown Development Authorities [DDAs] and Transportation Management Associations [TMAs])**



**Colleges and Universities**



**Healthcare Systems**



**Business Parks and Corporate Campuses**



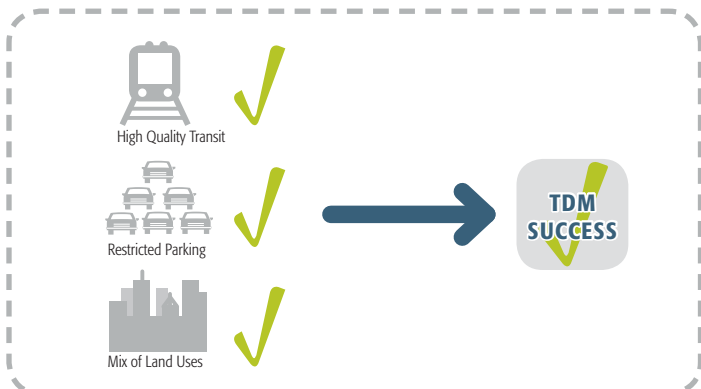
**Special Districts or Areas with Concentrated Employment and Communications (Sports Districts, Resort Areas, Airports, etc.)**

## CHANGING TRAVEL BEHAVIOR AND FACTORS AFFECTING TDM MEASURE EFFECTIVENESS

There are several factors that inherently predetermine how much success an organization can have when it comes to shifting the travel behaviors of its employees, students, or other constituents. These primarily are:

- Local and Regional Transit Availability
- Presence of Restricted Parking
- Adjacent land uses on-site or within ¼ mile
  - Shopping
  - Restaurants
  - Banks
  - Childcare

A site located in an area with convenient transit, restricted parking and a mix of land uses will most likely have lower single-occupant-vehicle travel than a site without; likely without even extending additional TDM offerings to employees or students. While this is the case, there are a multitude of strategies with various investment requirements that can be deployed, to affect travel behaviors. The list of TDM strategies provided in the following section provides a range of options for creating a package of measures customized for the local context of the site.



## BENEFITS OF REDUCING TRAVEL DEMAND

The benefits of reducing dependence on the automobile are extensive, not only to an organization, but for the larger community as a whole. They can be described in the following categories.



### Transportation System Benefits

- Reduced traffic congestion, resulting in time savings
- Multiple transportation options, enhancing overall access, convenience and mobility equity



### Social Benefits

- Improved quality of life in communities with transportation options (walkable and bikeable) More opportunities for spontaneous social interactions and connectedness to community
- Reduced community fragmentation and safety issues caused by wide, high-speed roads
- Allowing aging population to remain in community and retain independence



### Environmental Benefits

- Reduced dependence on fossil fuels and reductions in greenhouse gas emissions
- Improved air quality
- Reduced congestion and energy consumption
- Improved water quality (reduced polluting emissions and fluid leaks)
- Reduced heat dome effect (reduced need for paved surfaces)



### Health and Safety Benefits

- Fitness benefits of active transportation (biking and walking)
- Health benefits of improved air quality
- Stress reduction



### Economic and Financial Benefits

- Reduced costs of car ownership and maintenance
- Reduced cost of parking
- Reduced cost of expensive regional vehicular infrastructure that yield lower return on investment than transit investments
- Attracting individuals that value a multi-modal environment, individuals that represent much of the work force
- Reduced cost of healthcare (over the long-term)

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## TDM STRATEGIES, EFFECTIVENESS AND RELATIVE COSTS

The following table provides a list of actions aimed to impact traveler behavior by reducing the number of single-occupant vehicle trips. The table also provides guidance on each strategy's ability to influence behavior (a factor known as the Employee Vehicle Trip Reduction (VTR) Impact), as well as relative cost.

TDM Strategy		Description	Propensity to Affect Behavior	Relative Cost to Implement
Employer or Institutional Support Actions				
Transportation Coordinator		Professional located at Transportation Management Association (TMA), employment site, or university campus that provides personalized trip planning and assistance to commuters.	High	Moderate
On-Site Services/Amenities		Provided on-site or within convenient walking distance	High	High
		Childcare, Gym/Recreational Facilities, Dining/Food Service, Grocery, Post Office, etc.		
Employer-Assisted Transit Service				
Peak Period Shuttles		Shuttle operations during peak commute periods, typically connecting the site with regional transit or off-site parking. Typically contracted to a transit/shuttle provider, depending on available resources.	High	High
Mid-Day Shuttles		Shuttles operating during mid-day periods in order to provide mid-day transportation for individuals that do not drive to work/school. Typically contracted to a transit/shuttle provider, depending on available resources.	High	High
Car Sharing		Providing company/institutional vehicles or car rentals on site to facilitate primarily mid-day travel for individuals that do not drive to work/school.	High	Moderate
On-Site Mobility Concierge (Commuter Info Center)		Conveniently located and visible professional(s) and/or kiosk(s) providing and/or educating on traveler information tools, including intelligent transportation systems, mobile and social applications, wayfinding tools, and other methods for promoting non-SOV modes.	Moderate	Moderate
TDM Branding and Marketing		A well-known and recognized brand and outreach program, particularly if TDM strategies and programs are housed under the same institution or as part of a collaborative, heightening awareness and providing opportunities to educate residents and commuters about travel options.	Moderate	Low
New Hire Orientation		Orientation to take place prior to hiring or starting school (if possible) to educate new employee or student of alternative transportation options and costs. Aimed to influence decision on where to live, how to travel to school or work, or make other decisions regarding travel options.	Moderate	Low
Multi-Modal Navigation Tools		Mobile apps allowing users access to wayfinding resources and other multi-modal navigation tools.	Moderate	Moderate
Address Security Concerns		Improve security by investing in strategically located cameras, security guards and other measures.	Moderate	Moderate
Rideshare Matching Services	Carpool	Puts compatible commuters in touch with one another to enable commute-related ridesharing. Employers/institutions are at a particular advantage to encourage and match commuter carpools and vanpools, since the work destination is a commonality.	Moderate	Low
	Vanpool		Low	Low
Fairs/Promotions		Periodic events held in public spaces to highlight TDM offerings.	Low	Low
Guaranteed Ride Home		Backup ride home to employees/students who do not drive alone to work/school that have a sudden need to return home or work late. Typically provided through vouchers and/or reimbursement up to a designated number of times per period.	Low	Low
Preferential Parking		Premier parking designated to rideshare users (carpool or vanpool), particularly in areas where parking is limited, or where having a reserved spot close to the entrance can be a great advantage over other available parking.	Low	Low
Bicycle Storage, Lockers, Changing Facilities and Showers		Conveniently located, covered and secure facilities.	Low	Moderate
Lobby Amenities		Umbrellas, rain jackets and other items to facilitate midday walking trips during inclement weather.	Low	Low
Bicycle Loan Programs		Locating bicycles conveniently on site to allow employees/students to reduce the need for certain mid-day trips via vehicle. Easy access to a bicycle can aid trip making to other on-site locations or nearby commercial/retail opportunities by alternative mode.	Low	Moderate
Site Design				
Alternative mode options visibility		Site design that focuses visibility and convenience of using alternative modes of travel by showcasing options in easily accessible and high volume areas.	Low	Moderate
Passenger loading areas		Sites that accommodate passenger loading zones, such as taxi and Uber, increasing in importance due to the popularity of app based on-demand ride share.	Low	Moderate
Alternative Work Arrangements				
Telecommuting		Arrangement for employees to work at remote locations one or more days per week rather than commuting to the work site. Technology plays an important role in telecommuting, since many employees will need to maintain a virtual connection with the worksite in order to access necessary information and/or people.	High	Moderate
Flexible Work Hours		Allow employees a degree of freedom to choose their clock-in/clock-out times. Core hours can be required in order to maintain a certain amount of the work-day when face-to-face interactions, collaborations, and meetings can be scheduled without conflicting with flexible start and end times.	Moderate	Low
Staggered Work Hours		Good for large facilities, where work schedules are otherwise very regular, and can cause long lines to arrive and depart from the facility. Individual groups may be assigned to fixed times that they arrive and depart, typically over a 1-3 hour period	Moderate	Low
Compressed Work Week		Allow employees to work fewer days per week, or over a two-week period, by increasing the number of hours worked per day. Common schedules are 9/80, where employees work 9 hours per day, and get the 10th day off, and 10/80, where employees work 10 hours per day and get the 5th day off.	Moderate	Low

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TDM STRATEGY	DESCRIPTION	PROPENSITY TO AFFECT BEHAVIOR	RELATIVE COST TO IMPLEMENT
<b>FINANCIAL INCENTIVES OF DISINCENTIVE</b>			
Transit Subsidies	Reduced cost of transit by offering prepaid or discounted transit passes to employees/students who agree to commute primarily by transit. Cost sharing can be done in various ways including employer/university subsidized, transit agency subsidized, shared cost partnerships or variations of each. Federal tax law allows employees to receive a transit subsidy without incurring tax liability for the benefit and some states also offer the employer a tax credit	High	Moderate
<b>Parking Supply and Pricing</b>			
Restricted Parking	The use of restricting certain users from using parking in order to reduce the amount of parking needed. For example, Freshmen at a university or new hires at an employment site.	High	High Cost Savings (doesn't cost employer/university)
Parking Fees	Charging for parking. This is one of the most effective ways at affecting travel behavior. The financial cost of providing parking is very high, and often not known by users. Passing along the cost of parking can both educate users of the true cost of driving and impact their decisions .	High	High Revenue
Unbundled parking	Requiring users of parking to pay the costs directly, as opposed to sharing the costs indirectly with others through increased rents and tax subsidies.	High	Moderate Revenue
HOV Parking Discounts	Reduced or free parking for carpool or vanpoolers.	Moderate	Low
Parking Cash Out	Provide an option for employees and/or students to exchange the privilege of a free parking space for the cash equivalent, which they may then be used flexibly to defray the cost of other transportation options including transit, walking or biking.	Moderate	Moderate
Time off with Pay	Offer additional paid time off for participating in an alternative commute program.	Moderate	Moderate
Reduced Healthcare Premiums	Employer/institute subsidized healthcare premiums for those that take transit, walk or bike to work.	Moderate	Moderate
Living Allowances	Housing vouchers for those choosing to live within transit accessible/walking/biking distance to work/school, and chose not to drive.	Moderate	High
Vanpool Program/ Subsidies	Employers/universities can consider a start-up (empty seat) subsidy to support a vanpool during its formative stage to keep costs down for initial riders. They can additionally offer short-term promotional or long-term fare subsidies, as well as driver subsidies to help promote ridership	Low	Low
Carpool Incentives/ Subsidies	Offering subsidies (either employer/university or MPO rewards pass-throughs) to riders who chose to carpool. Coupling this with ridematching services and preferred parking can be an attractive option for individuals.	Low	Low
Bike/Walk Subsidy	Subsidies such as a show allowance can provide an added incentive to walk for individuals living within walking proximity to work/university.	Low	Low
In-Kind Incentives (in lieu of cash)	Free or discounted products or services may be given in lieu of cash. For example, carpoolers and vanpoolers might receive gas or oil changes, transit riders might receive transit passes, walkers could be provided with shoes, and bicyclists might receive bicycle accessories. etc.	Low	Low
Transportation Allowances	Provide a sum of money that can be used at the employee's discretion toward the cost of his/her chosen commute option. The amount is not necessarily related to the employer's cost for parking.	Low	Moderate
Company Recognition (Gaming Theory)	Non-financial based rewards programs that promote alternative transportation options through public announcement of individual performance.	Low	Low
<b>LOCAL AND REGIONAL INFRASTRUCTURE AND POLICY</b>			
Local Land Use Changes	Requiring a mix of complementary land uses near employment centers and universities in order to allow for needed commerce to occur via transit, bicycle and pedestrian related trips. Emphasis of available/affordable housing near employment sites.	High	High
Public transportation improvements	Improving public transportation infrastructure, such as subway entrances, bus stops and routes.	High	High
Transportation Management Association (TMA)	Associations of public and private entities concerned with traffic congestion and transportation issues in specific geographic areas. TMAs use funds collected to increase the use of ridesharing and other commuting options that reduce traffic congestion and improve air quality. TMAs may also advocate with local governments on behalf of membership.	High	High
Road Pricing/Tolls/ Congestion Pricing	Road pricing tolls during peak hours. Usually done by regional and state agencies to manage large transportation systems during peak congested times.	High	High
Road Space Rationing	Road space rationing by restricting travel based on license plate number, at certain times and places. Rarely done in the U.S., but experimented with in places like Europe.	High	High
Time, Distance and Place Pricing (TDP)	Road users are charged based on when, where and how much they drive. Some transportation experts believe TDP pricing is an integral part of the next generation in transportation demand management.	High	High
Carbon Taxes	Special taxes based on fuel carbon content intended to encourage energy conservation and climate change emission reductions.	High	Low
Fuel Taxes	Increasing fuel taxes to achieve TDM objectives.	Moderate	Low
Pay-As-You-Drive Insurance	Converting vehicle insurance premiums into distance-based fees.	Moderate	Low
Community Bicycle and pedestrian infrastructure	Providing active transportation facilities including bike lanes and multi-use trails to connect employment centers/universities with housing and commercial land uses.	Moderate	High
Traffic Calming	Implement traffic calming measures throughout community to reduced vehicular speeds and encourage safe travel by bicycle and walking.	Moderate	High
On-Demand Ridesharing	Is growing through the use of social networking and telecommunications. Mobile apps such as Zimride, Lyft and Uber provide platforms for drivers to connect with people who need a ride.	Moderate	Low

## PUTTING TOGETHER A PROGRAM

TDM programs vary in all sizes, shapes and forms; from a robust statewide program, to a few incentives provided by an individual property owner. All programs do, however, share commonalities regarding the thought process used to develop the program.

### Step 1: Determine a Management Structure

- Define an organizational structure with committed leadership
- Develop a staffing plan to administer the TDM strategies to be deployed
- Define key stakeholders to periodically engage in overall direction of program

### Step 2: Identify a Budget

- Determine funding sources and outline how monies can be spent
- Develop a budget with flexibility to increase over time as measures prove to be effective

### Step 3: Develop Goals and Objectives

- Identify current challenges and issues that need to be addressed
- Determine objectives of the program, who will be targeted and what outcomes are expected

### Step 4: Set Performance Metrics

- Set metrics that will be evaluated on an ongoing basis (e.g. number of people enrolled in program, reduction in parking pass sales, etc.)

### Step 5: Develop a Brand and Marketing Protocol

- Develop a brand that represents the goals and objectives of the plan
- Develop marketing and PR protocols that advertise the program on an ongoing basis
- Develop a website to serve as the central location for information regarding the program

### Step 6: Develop and Implement TDM Strategies

- Develop a series of phased strategies gathered from ideas presented in this Quick Guide
- TDM programs are ever evolving, develop a list of strategies that enhance each other and can be phased in and out based on their level of success

### Step 7: Create an Annual Monitoring Program

- Conduct a yearly survey (at a minimum) to poll attitudes from program users of program offerings and new ideas
- Document program performance against performance metrics
- Define strategies to enhance the program based on feedback and data



## ADDITIONAL RESOURCES AND RELEVANT ORGANIZATIONS

The information presented in this Quick Guide was compiled from multiple sources, primarily taken from TCRP Report 95: Chapter 19 "Employer and Institutional TDM Strategies: Traveler Response to Transportation System Changes" (Transportation Research Board, 2010). There are many other organizations that provide extensive resources, documentation and tools to evaluate TDM measures, including the following:

- Association for Commuter Transportation (<http://actweb.org/>)
- Center for Urban Transportation Research (CUTR) at the University of South Florida (<http://www.cutr.usf.edu/>)
- Mobility Lab, Arlington, VA (<http://mobilitylab.org/>)
- U.S. DOT Federal Highway Administration (<http://www.fhwa.dot.gov/>)
- Victoria Transport Policy Institute (<http://www.vtpi.org/>)
- Wikipedia ([https://en.wikipedia.org/wiki/Transportation\\_demand\\_management](https://en.wikipedia.org/wiki/Transportation_demand_management))

## LET US HELP

Putting together a TDM program can seem daunting. Let us help you develop a plan tailored to your organization.

Contact Jeffrey Smith at [jeffrey.smith@kimley-horn.com](mailto:jeffrey.smith@kimley-horn.com) to get started.

