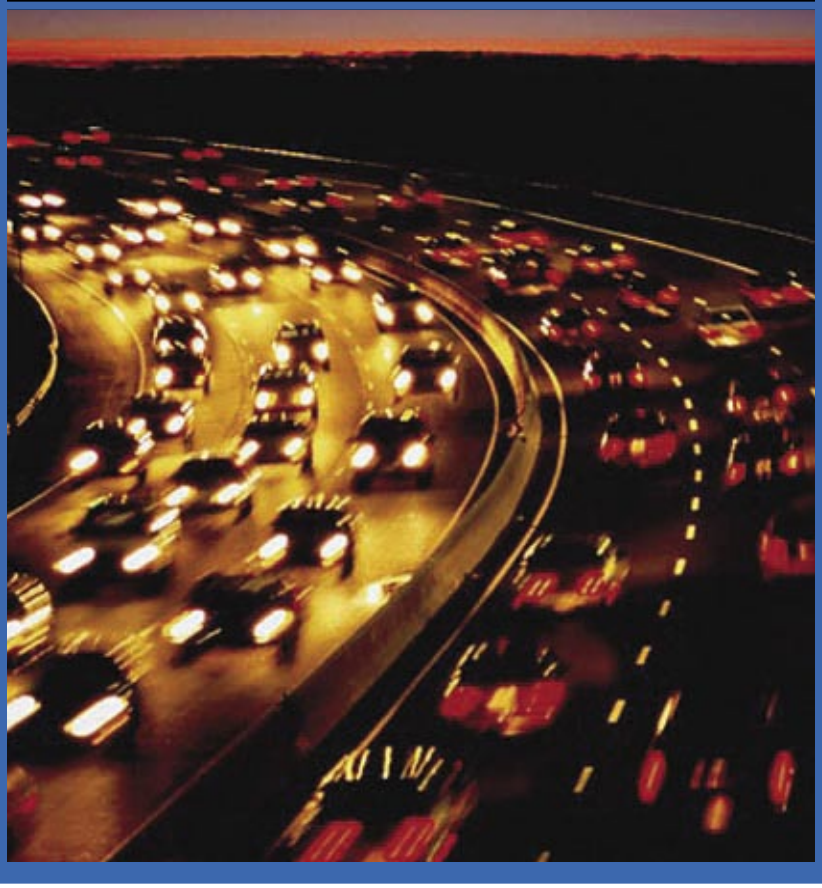
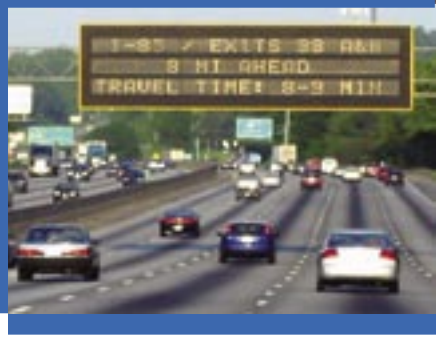





# MITIGATING **TRAFFIC CONGESTION**

## THE ROLE OF DEMAND-SIDE STRATEGIES

U.S. Department of Transportation
**Federal Highway Administration**

# MITIGATING **TRAFFIC CONGESTION**

## THE ROLE OF DEMAND-SIDE STRATEGIES


**BY**

**The Association for Commuter Transportation**

**WITH**

URBANTRANS CONSULTANTS

**AND**

PB PARSONS BRINCKERHOFF

ESTC


**IN PARTNERSHIP WITH:**

U.S. Department of Transportation
**Federal Highway Administration**

**OCTOBER 2004**

# ACKNOWLEDGEMENTS


**PRINCIPLE AUTHORS**

Kevin Luten
*UrbanTrans Consultants*
Katherine Binning
*Parsons Brinckerhoff*
Deborah Driver
*UrbanTrans Consultants*
Tanisha Hall
*UrbanTrans Consultants*
Eric Schreffler
*ESTC*

**WITH CONTRIBUTIONS FROM**

Stuart Anderson, *UrbanTrans Consultants*
Fox Chung, *UrbanTrans Consultants*
Joddie Gray, *UrbanTrans Consultants*
Justin Schor, *UrbanTrans Consultants*
David Ungemah, *UrbanTrans Consultants*
Tad Widby, *Parsons Brinckerhoff*
Tammy Wisco, *Parsons Brinckerhoff*


**FOR ADDITIONAL INFORMATION:**


Association for Commuter Transportation
PO Box 15542
Washington, DC 20003-0542
202.393.3497 • 678.244.4151 (fax)
act@act-hq.com
www.actweb.org

# FORWARD

## Note From the Director
## Office of Transportation Management, Office of Operations
## Federal Highway Administration

As we advance further into the 21st Century, strategies to manage demand will be more critical to better transportation operations and system performance than strategies to increase capacity (supply) of facilities. The inability to easily and quickly add new infrastructure, coupled with the growth in passenger and freight travel, have led to the need for transportation system managers and operators to pay more attention to managing demand.

The original concepts of demand management took root in the 1970s and 1980s from legitimate desires to provide alternatives to single occupancy commuter travel – to save energy, improve air quality, and reduce peak-period congestion. Today, the need to manage travel demand has broadened to encompass the desire to optimize transportation system performance for both commute and non-commute types of trips, and during both recurring as well as non-recurring events.

Growth in population, number of vehicles and the number of travelers, freight, and development has affected travel demand and re-shaped travel patterns. Managing travel demand now occurs at shopping malls, tourist sites, employment areas, or special events, such as the Olympics. The need to manage demand can occur in the middle of the day, during weekends, or evenings. Demand–side approaches are needed to help address transportation issues created by growth and the variability in demand for use of the system.

In this light, the Federal Highway Administration's Office of Transportation Management is pleased to present this new report on demand-side strategies and the important role that it plays in 21st Century transportation operations. This report builds upon previous work done on travel demand management in the early 1990's to present a newer, more contemporary, perspective on what managing demand in the 21st Century really means.

Given the greater need to manage demand under a broader set of situations and conditions, as well as the influence of information and the technologies to deliver it, the concept of demand management in the 21st Century takes on a broader and more relevant meaning. Managing demand in the 21st Century goes beyond just encouraging travelers to change their travel mode from driving alone to a carpool, vanpool, public transit vehicle, or other alternative. Managing travel demand today is about providing travelers, regardless of whether they drive alone or not, with informed choices of travel route, time, and location – not just travel mode.

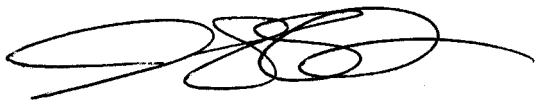
Information and the technology to deliver it to travelers are beginning to have a significant impact on managing demand for both commute and non-commute situations. Real-time information systems can now let travelers make better decisions about how they travel (mode), when they travel (time), which route they travel (route), and whether they travel at

all. Real-time traveler information systems are also critical to managing significant shifts in demand that occur as a result of special events, tourist activity, incidents and emergencies, schools, shopping centers, recreation areas, medical facilities, weather problems, and reconstruction projects. In the 21st Century, the need to deliver information to help manage transportation demand will grow and be further supported by intelligent transportation systems (ITS) technologies.

The FHWA Office of Operations has a two-pronged action agenda of awareness and guidance to evolve the thinking of managing demand to a more 21st Century perspective. This report is a significant step in that direction.

To learn more, visit our website at: www.ops.fhwa.dot.gov

We look forward to working with organizations, public agencies, and interest groups to advance the ideas presented in this publication.



Jeffrey Lindley
Director
Office of Transportation Management, FHWA

# TABLE OF CONTENTS

TABLE OF CONTENTS

# INTRODUCTION

Traffic congestion is slowing America down. In cities large and small, from the east coast to the west coast, traffic congestion is steadily getting worse each year. A larger percentage of the nation's roadway network is congested, more severely and for longer portions of each day, than ever before. In 1982, the average person living in one of the country's 75 largest cities faced seven hours of travel delay per year. By 2001, that figure had shot to 26 hours of delay per year, and the most severely congested periods of the day – once known as the "rush hour" – stretched to cover nearly six hours of each day. By 2001, the severity of peak-period congestion also intensified, with the average "rush hour" trip taking nearly 40% longer than the same trip at other times of the day (TTI, 2003).

The impacts of traffic congestion are far-reaching – impacting individuals, families, businesses and communities. The Texas Transportation Institute (TTI), at Texas A&M University, calculates that the country's "congestion invoice" amounted to nearly $70 billion in 2001 – the byproduct of 3.5 billion hours of delay and 5.7 billion gallons of excess fuel consumed in congestion-related delays. These costs directly affect individuals and families, as people spend more time and money stuck in traffic. For most American households, transportation costs now account for 18% of total household expenditures. Only shelter represents a larger portion of expenditures, at 19%. The impacts on lower-income families are even more severe. For households earning between $12,000 and $23,000 per year, transportation expenses consume one in every four dollars spent (STPP, 2000).

Recognizing the growing burden of traffic congestion and the importance of efficient access and mobility, community leaders and transportation planners are actively working on transportation improvements to alleviate traffic congestion. Much needed roadway, bridge, and transit infrastructure projects – considered transportation "supply" or "capacity" enhancements – are underway across the country to mitigate travel delays and accommodate future growth needs.

As urban areas mature, however, opportunities for further investments in transportation infrastructure are often limited. Urban transportation corridors increasingly lack the physical space to accommodate more lanes. In some areas, communities voice concerns that impacts to private rights-of-way or sensitive environments outweigh the potential benefits of expanding facilities. Many areas simply lack the funds needed to pay for major roadway or transit projects. Competition for limited federal and state funds is intense, and even where needed infrastructure projects are in the planning or construction stages, project completion can still be years away.

Effectively tackling traffic congestion increasingly means employing all available strategies. New infrastructure projects – from roads to bridges to transit facilities – remain a core element of comprehensive transportation improvement programs.

Supplementing these "supply-side" investments are a broad array of "demand-side" strategies intended to make existing transportation facilities work better. Demand-side strategies are designed to better balance people's need to travel a particular route at a particular time with the capacity of available facilities to efficiently handle this demand. Many people have attended a sporting event or a concert where everyone tries to leave the same place at the same time. While in the extreme, this is a perfect example of where travel demand exceeds available supply – and severe traffic congestion often results. The focus of demand-side strategies is to provide people with enhanced travel choices – from choices in travel mode (such as driving, using transit or bicycling), to choices in travel route and trip departure-time – and to provide incentives and information for people to make informed travel choices. For example, many sports and concert venues provide incentives for people to arrive a little early or stay a little late, essentially spreading the "peak" of the demand to travel to/from the building, reducing traffic congestion, and improving the visitor's overall experience.

This contemporary understanding of demand-side strategies is broader in scope than prior, more traditional views of transportation demand management – or TDM. To some, the realm of demand management applications is limited primarily to encouraging alternatives to single-occupant vehicle travel for the commute to work. In practice, however, this narrow view is no longer consistent with the broad applications of demand-side strategies currently underway across the country. Today's applications are not only limited to facilitating shifts in travel mode – they also address shifts in travel routes and travel departure-times (for all travelers, including single-occupant vehicle drivers). Today's applications also extend beyond a focus on commute trips. At national parks, sports stadiums, university campuses, and other diverse destinations, transportation and facility managers are implementing demand-side strategies as part of coordinated efforts to reduce congestion. On bridges, and along corridors undergoing roadway reconstruction programs, demand-side strategies are helping travelers avoid congestion by utilizing alternative travel routes, travel times and/or travel modes – or by reducing the need for some trips altogether by facilitating work from home options a few days a month.

**LAKE TAHOE**, CALIFORNIA/NEVADA

*Mitigating Traffic Congestion: The Role of Demand-Side Strategies* articulates a framework for understanding contemporary efforts to manage demand and improve the performance and efficiency of transportation systems. The document provides extensive examples of programs already underway in a variety of application settings, including over 25 in-depth case studies from across the country.

The in-depth case studies illustrate a handful of the many applications of demand-side strategies in place today. The case studies attempt to highlight the diversity of programs, with an effort to find examples that also provided one or more measures of program effectiveness. A few highlights from the case studies include:

- **SBC Park** (formerly Pac Bell Park) in San Francisco – a 41,000 seat baseball stadium – forged an access plan that integrated excellent access to existing transportation facilities (roadways, bus and rail transit, ferry services, and an extensive sidewalk network) and a comprehensive transportation management plan. With only 5,000 dedicated parking spaces available, demand-side strategies to promote a variety of mode and route travel options, along with advanced transit ticket sales and an aggressive marketing program, were key to the stadium's success. The year the park opened, approximately 50% of baseball fans arrived in non-auto modes, over 100,000 advance-purchase transit tickets were sold, and the limited number of parking spaces were rarely full.

**SBC PARK**, SAN FRANCISCO

- **CH2M Hill** in Denver implemented a transportation program to improve the commute and enhance their employee recruitment and retention abilities. They designed an aggressive telework program with full-time and part-time telework options, and instituted a flextime program to better support a variety of commute options. CH2M Hill also designed the "Look Before You Leave" program, which encouraged all employees to check traffic conditions on a company intranet that centralized a variety of resources for current traffic conditions, roadway construction updates, etc. This resource encouraged employees to avoid the most congested travel routes and travel times whenever feasible. At this suburban work location, 17% of CH2M Hill employees use transit, carpool, bicycle, or telework. In 2002, the program reduced the number of miles driven by employees by over 115,000, and saved nearly 3,700 staff hours.

- **Lee County Bridges** crossing the Caloosahatchee River in southwest Florida are a major source of congestion and travel delay for the region. In 1997, County leaders implemented a variable pricing system for the bridge tolls which incorporated a discount for travelers crossing the bridges just before and just after the peak-periods (when using the electronic toll collection system). A 1999 survey found that this demand-side pricing system encouraged 7% of users to shift their travel patterns to cross the bridges during the discounted, non-peak hours of the day.

**LEE COUNTY TOLL BRIDGES**, FLORIDA

A full understanding of demand-side strategies must recognize the reasonable limits of these applications. Demand-side strategies should not be considered total solutions to regional traffic congestion problems. Rather, they should more often be implemented as part of an integrated set of solutions that balance supply-side infrastructure investments and demand-side strategies. Demand-side strategies can be relatively easy to implement in a shorter timeframe, within a more constrained budget, than capital improvements. As such, supply-side and demand-side approaches can prove complementary – with demand-side efforts taking on an asset management role by maximizing the performance and extending the life of existing roadways. Successful demand management programs often leverage the synergistic results of many demand-side strategies working together – essentially producing the cumulative results of a number of small percentage improvements.

Demand-side strategies are ultimately about choice and balance. Expanding the array of mode, route and departure-time choices available – supported by robust real-time traveler information, incentives, and other resources – allows each person to choose the options that work best for them regarding when they travel, the mode and route they use to get there, or whether they travel at all.

## What's Inside?

Mitigating Traffic Congestion outlines a framework for understanding the full scope of demand-side strategies, and provides a wealth of case studies, both brief and in-depth, that illustrate where and how these strategies are already underway. The document is organized around these primary five sections:

**The Demand-Side Framework** – The broad framework for understanding demand-side strategies, their impact on traveler choices, and the varied settings where they are applied.

**Summary of Case Study Experience** – A review of the case studies collected and key lessons learned from the case study exploration.

**Conclusions & Future Developments** – A summary of concluding thoughts from the publication as a whole and highlights of important future developments.

**Additional Resources & References** – A collection of organizations, publications and internet resources, along with citations from this publication.

**The Case Studies** – In-depth case studies of over 25 examples of demand-side programs underway across the country.

# THE DEMAND-SIDE FRAMEWORK

this section outlines a framework for understanding demand-side strategies, their impact on traveler choices, and the varied settings where they are applied

In order to better understand the scope of demand-side strategies, the following section presents a framework outlining three primary areas for discussion of demand-side strategies: the variety of available action strategies, the realm of targeted traveler choices, and the variety of program applications.

The basic framework for how these concepts work together is presented in Figure 1. Essentially, in considering demand management programs:

> *A variety of **demand-side strategies** are implemented in order to impact the **travel choices** of individuals and organizations, in the context of a wide array of **application settings**.*

Further detail on each of these three areas is provided below, and illustrated in Figure 2 on the following page.

**Demand-Side Strategies.** These are the actual strategies designed and implemented by organizations with a role to play in mitigating traffic congestion, including state/regional/local governments, employers, special event managers, and many others. Organizations frequently tailor packages of both general strategies and targeted strategies to facilitate the most appropriate blend of efficient traveler choices.

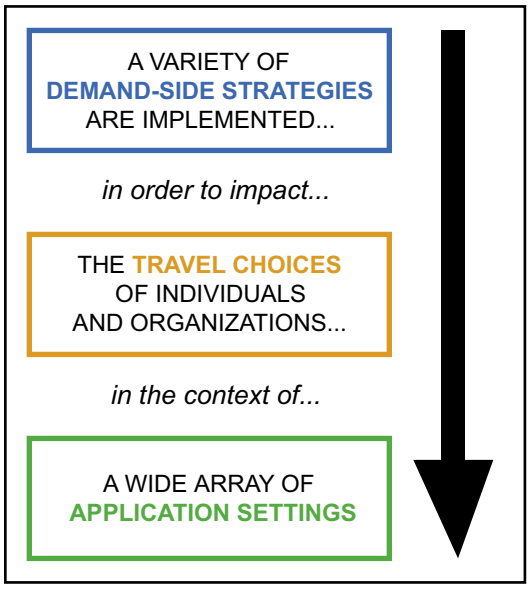



**FIGURE 1:** THE THREE CORE ELEMENTS OF DEMAND-SIDE STRATEGIES

**Traveler Choices.** These are the key travel choices made by individuals and organizations that collectively impact the efficiency and performance of the transportation system. Elements include both day-to-day choices about travel mode, departure-time, and travel route, as well trip reduction choices (i.e., telework) and more fundamental residential and business location choices.

**Application Settings.** Demand-side strategies impacting traveler choices are tailored for a wide range of different application settings, each addressing different trip types or travel market segments. Examples are shown in Figure 2, along with some of the case studies included in this document.

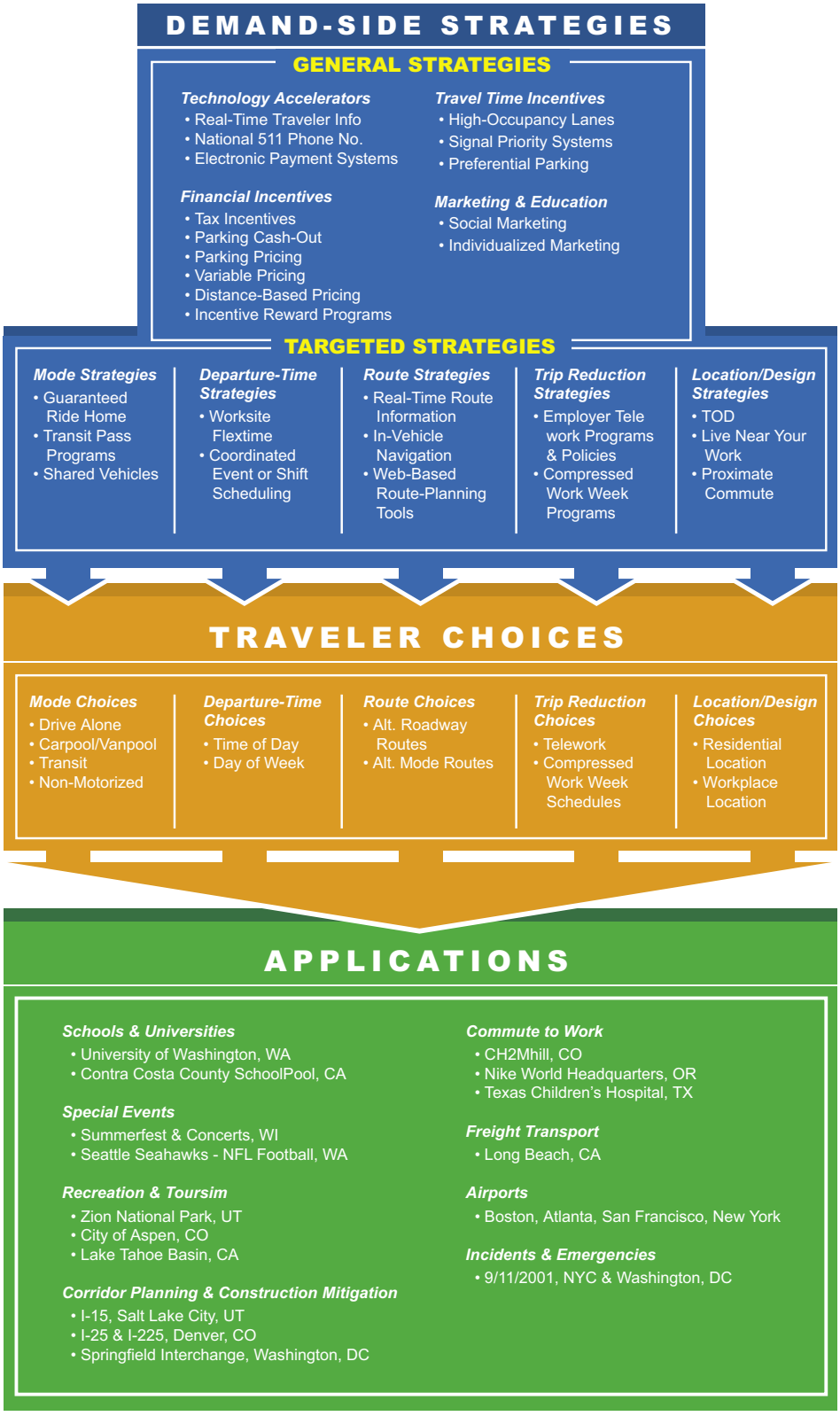



**FIGURE 2:** THE THREE CORE ELEMENTS OF DEMAND-SIDE STRATEGIES

## DEMAND-SIDE STRATEGIES

this section describes the scope of programs and policies implemented by organizations to impact the demand for travel


These are the on-the-ground strategies designed and implemented by organizations with a role to play in mitigating traffic congestion, including state/regional/local governments, transportation management associations, non-profit transportation services providers, transit agencies, employers, special event managers, property managers, and many others. Action strategies can include "general" strategies that have a broad impact on a variety of travel choices. For example, financial incentives can be used to impact travel choices in a variety of ways. In addition to the general strategies available, there are also many "targeted" strategies that focus on a specific travel choice. For example, implementation of workplace "flextime" policies is a demand-side strategy specifically targeting travel departure-time choices. Organizations designing and implementing demand-side strategies frequently tailor appropriate packages of both general and targeted action strategies to facilitate the most appropriate blend of traveler choices.

### General Strategies

"General" demand-side strategies impact the full range of traveler choices – from mode choices to departure-time choices and route choices. Ranging from infrastructure investments like high-occupancy vehicle lanes and preferential parking spaces, to more programmatic investments like tax-based incentives, these broad-based, general strategies often work in conjunction with the targeted strategies described below. The full range of general demand-side strategies are described in greater detail in the sections below, and are organized in four primary categories:

- **Technology Accelerators**
- **Travel Time Incentives**
- **Financial Incentives**
- **Marketing & Education**

### Targeted Strategies

Often complementing the more broad-based, general demand-side strategies, an array of demand-side strategies are targeted to specific traveler choices – such as choices regarding travel mode or trip departure time. These targeted strategies are described in detail in the sections below, and are organized around the five primary categories of choices that affect overall transportation demand:

- **Mode Strategies**
- **Departure-Time Strategies**
- **Location/Design Strategies**
- **Route Strategies**
- **Trip Reduction Strategies**

## General Strategies

General demand-side strategies impact the full range of traveler choices – from mode choices to departure-time choices and route choices.

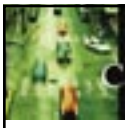
### Technology Accelerators

Advances in technology are quickly accelerating the ability of transportation organizations to implement effective demand-side strategies. Significant investments in intelligent transportation system (ITS) infrastructure throughout the country are yielding increasingly precise, real-time information about transportation conditions (i.e., current traffic congestion, transit vehicle locations and wait times, etc.), and increasingly user-friendly and robust pre-trip travel planning tools – all of which are making it easier for travelers to make smart transportation mode, route, and departure-time choices. Additionally, rapid advancements in broadband and wireless internet connectivity are making trip reduction strategies, like telework and e-commerce, viable for larger segments of society. While ITS hardware and software technologies will continue to improve – demand-side strategies play a critical role ensuring that advances in transportation information technology translate into more efficient mode, route, and departure-time choices by the users of the transportation system. By developing partnerships with employers, property developers and managers, residential districts, transportation providers and others, organizations that design demand-side programs can ensure full integration of technology accelerators and other complementary demand-side strategies (i.e., financial incentives, travel-time incentives, etc.). Specific technology applications accelerating the scope of demand-side strategies include:

- **Real-Time Traveler Information**
  The expanded deployment of intelligent transportation system infrastructure and networks, such as road sensors and video cameras, means that accurate, real-time information about traffic congestion, parking availability, transit arrival times, and more are now available to more and more travelers around the country. Real-time traveler information can be provided through a wide variety of communications mediums, including: (1) websites, (2) telephone systems, (3) wireless devices (cell phones, pagers, PDAs, etc.), (4) information kiosks, (5) variable message signs on roadways, at transit stops, and in parking lots, and (6) in-vehicle navigation systems. In order to reach more people before they make travel decisions, transportation organizations are working with a variety of partners to integrate such real-time traveler information resources into corporate intranets at the workplace, building lobbies and elevators, and residential developments through "internet communities."

By providing better information about current travel conditions, transportation agencies and their partners allow people to make travel mode, route and time choices that best match their individual travel needs. Real-time travel information evaluations show that – armed with real-time travel information – a significant number of travelers alter their original route, departure-time, and even mode choices, reducing the demand for already congested facilities and maximizing the use of underutilized alternatives.

FAST FACTS: According to a 2001-2002 survey of real-time travel information users, 68% of users in Pittsburgh and 86% of users in Philadelphia changed their original travel route, while 47% of users in Pittsburgh and 66% of users in Philadelphia changed their original time of travel as a result of the traffic information. The effect on mode choice was less noticeable, 6% in Pittsburgh and 2% in Philadelphia changed their mode of transportation based on the information provided. (Fekpe, 2003)



## Case Study Examples

**REAL-TIME TRANSIT INFORMATION – REHOBOTH BEACH, DE.** Summertime parking and traffic problems in the beach town area around Rehoboth Beach, Delaware, are addressed with seasonal bus services including a park-and-ride Beach Bus. Electronic signs placed at the Rehoboth Park-n-Ride, the Rehoboth Boardwalk, and Dewey Beach's Ruddertown complex, provide both scrolling text messages and AVL-based bus arrival time predictions (NextBus, 2002). In the season following installation, "ridership increased over 13 percent from the year before. No additional service hours or miles were operated…" (Hickox, 2002). This notable response pertains to a recreation and tourist oriented rider clientele, and the electronic sign placement may have had an advertising as well as informational effect. (TCRP, 2003)

**REAL-TIME TRANSIT & PARKING INFORMATION – ACADIA NATIONAL PARK, ME.** The Acadia National Park, in Maine, is visited by an increasing number of people each year, exceeding 2.5 million annually in 2002. In 2001-2002, a partnership between the U.S. Departments of Transportation and Interior, Acadia National Park, and the State of Maine, implemented several real-time traveler information systems to provide more timely and accurate information to visitors regarding the Acadia's Island Explorer free shuttle bus service and on-site parking availability. Components included (1) real-time bus departure electronic message signs, (2) automated on-board "next-stop" announcements on each Island Explorer bus, and (3) real-time parking information made available by website, telephone, and parking status signs.

A visitor survey, conducted near the end of 2002, revealed the following shifts in transportation choices and preferences among park visitors:

- Real-time parking information impacted decisions visitors made about travel in the park. Of visitors using the parking information, 43% changed the time they visited a destination and 38% changed destinations based on the information.
- Visitors strongly believed in the benefits of the Island Explorer's real-time bus departure signs and the on-board bus announcements. Over 80% found that these technologies made it easier to get around and 69-80% visitors believed they helped to save time.
- Visitors using the electronic bus departure signs and on-board announcements reported that the technologies helped them decide to use the Island Explorer bus (80% and 67%, respectively). 44% of the users of the real time parking information said it helped them decide to use the Island Explorer bus.

(Battelle, 2003)

- **National 511 Phone Number**
  During the 1990s, a variety of organizations established hundreds of travel information telephone numbers across the country to provide real-time and other transportation information. In 1999, the U.S. Department of Transportation petitioned the Federal Communications Commission for a three-digit dialing code to make it easier for consumers to access these travel information services – using the same, simple phone number nationwide. The FCC assigned the "511" number on July 21, 2000. In early 2004, 511 was available in over 20 states/regions, providing users access to advanced traveler information services.

DID YOU KNOW? By January 2004, the 511 system was available to almost 57 million Americans (19.4%), in over 20 states/regions. In January 2004, 1.8 million calls were placed to the 511 system, with an average length of 1 minute and 46 seconds (for a total of over 3.2 million minutes of call time in the month). (Resource511, 2004)

- **Integrated Electronic Payment Systems**
  Electronic Payment Systems (EPS) allow travelers to pay for transportation services electronically. The advancement of EPS technologies is allowing more widespread – and more integrated – application of electronic payment options for transit, parking, roadway tolls, and other fee-based transportation services. Integrated EPS technologies – from the "smart card" fare payment systems with imbedded microprocessors in each card to the Radio Frequency Identification (RFID) systems at many toll plazas – are quickly reducing many of the barriers to seamless transportation across travel modes and between different transportation providers. EPS technology can allow for seamless payment, with a single fare payment media, across a variety of modes (bus, rail, ferry, etc.), and on a variety of transportation service providers within the same region. Transit agencies and other providers are also exploring adding retail purchase options to fare payment smart cards, allowing transit users convenient purchase of retail goods and services in and around transit stations and stops. In each case, technological advances are enabling more efficient and convenient travel choices.


**INTEGRATED ELECTRONIC FARE PAYMENT – WASHINGTON, DC.** The Washington Metropolitan Transportation Authority's (WMATA) SmarTrip program was the first public transportation system in the U.S. to adopt smart cards, launching a pilot program in 1999. In June, 2002, WMATA sold its 250,000th SmarTrip permanent rechargeable plastic smart card which holds up to $200.00 in fare value. One third of WMATA Metrorail riders use SmarTrip cards regularly. SmarTrip will be expanded to parking, bus transit, and other regional rail service over a total of 17 transit systems. (APTA, 2003)

DID YOU KNOW? Smart card electronic fare payment systems are now in use by transit agencies in over ten regions of the U.S., including Washington, DC; Atlanta, GA Los Angeles, CA; San Francisco, CA; Orlando, FL; Minneapolis, MN; and others. (APTA).

## Financial Measures

Transportation expenses are a major factor in the travel choices people make everyday. In fact, for the average American household, transportation costs represent 18 percent of total household expenditures (STPP, 2000). As such, a wide range of demand-side strategies are oriented around using financial incentives and targeted pricing systems to encourage efficient travel choices.

- **Tax Incentives**
  The Federal tax code allows employers to provide tax-free transit, vanpool, and parking benefits to their employees. The employer and employee save on taxes, since neither pays federal income or payroll taxes on these benefits. Called "qualified transportation fringe" benefits in the Internal Revenue Code, Section 132(f), these tax incentives are often referred to as "Commuter Choice tax benefits" or simply "commuter benefits." For tax year 2004, transit and vanpool expenses up to $100 per month ($1,200 per year) and qualified parking expenses up to $195 per month ($2,340 per year) are tax-free. The monthly tax-free limits are subject to annual adjustments, indexed to inflation (see www.commuterchoice.com for continually up-to-date information). Providing commuter tax benefits to employees can save payroll taxes for employers. Because the value of the benefit paid to employees is considered a tax-free transportation fringe benefit and not wage or salary compensation, the cost of the benefit is eligible as a business expense and payroll taxes do not apply. There are three primary ways employers can structure the benefit:

  Employer-Paid Transportation Benefits. Employers can pay for their employees to commute by transit or vanpool, up to a limit of $100/month (subject to annual change). With this arrangement, employees get up to $100 in a tax-free transportation benefit. Employers get a tax deduction for the expense and enjoy savings on payroll-related taxes. Employers have found that providing transportation benefits offers significant savings over offering the equivalent dollar value to employees in the form of a salary increase. Employers can also pay for the cost of parking for employees, up to a limit of $195/month (this limit is subject to annual change).

  Employee-Paid, Pre-Tax Transportation Benefits. Employers can allow employees to set aside up to $100/month of pre-tax income to pay for transit or vanpooling (subject to annual change). Employers save money overall since the amount set aside is not subject to payroll taxes. Employees save money, too, since the amount of an employee's salary set aside for transportation benefits is not subject to income or payroll taxes, up to the specified monthly limits.

  Shared-Cost Transportation Benefits. Employers can share the cost of transit or vanpool costs with employees—and everyone can receive valuable tax savings. With this approach, employers can provide a portion of the cost of taking transit or vanpooling as a tax-free benefit and allow the employee to set aside pre-tax income to pay for the remaining amount of the benefit (up to the specified limits).


**Q. Are additional tax incentive programs available to employers at the state level?**

A. Yes, several states have tax incentive programs to encourage employer participation in providing commuter benefits to their employees. For example, the Maryland Commuter Tax credit provides a 50 percent tax credit, up to $30 per employee per month, for provision of transit passes, vanpool benefits, and reimbursement for carpooling expenses. Other states offering tax incentives to employers include: Georgia, Minnesota, Delaware, Connecticut, Oregon, New Jersey. See the following U.S. EPA document for more information: www.bwc.gov/pdf/fedtax.pdf

FAST FACTS: Although 86 percent of American workers feel that commuter assistance benefits — such as discount transit passes, ride sharing boards, or parking benefits — are beneficial and useful, only 17 percent have access to such assistance through their employers. Eighty-six percent of employees who do not have commuter assistance typically drive alone to work, compared with only 71 percent who do have access to commuter assistance. Surveyed employees who have commuter assistance are almost eight times more likely to use public transportation such as the train, subway or bus than those employees who do not have assistance (15 percent versus 2 percent). (Xylo, 2001)

- **Parking Cash-Out**
  Employers can offer their employees the option to "cash out" of their existing parking space. For example, if Company A subsidizes parking for their employees at $60/month, a parking cash-out program would allow employees to choose from the following options: (1) keep the parking space worth $60/month, (2) give up the parking space and receive $60 extra each month in taxable salary, or (3) receive $60/month in tax-free transportation benefits to pay for transit or vanpooling. Cash-out programs often work best for employers that pay separately for parking and for organizations with parking shortages or demands to expand parking facilities.

FAST FACTS: A 1997 study of eight parking cash out programs in California found that total vehicle trips declined by 17% after a parking cash out option was introduced at various urban and suburban worksites, as shown in Figure 3 below. (Shoup, 1997)

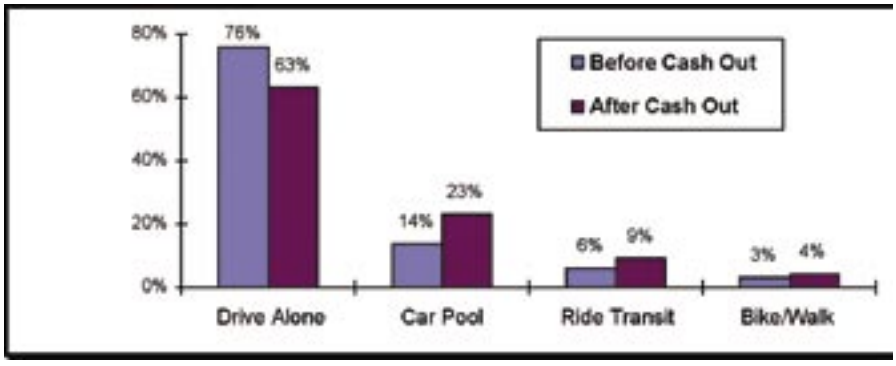
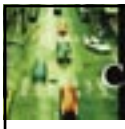



**FIGURE 3:** CASHING OUT IMPACTS ON COMMUTE MODE (SHOUP, 1997)

- **Parking Pricing**
  Parking pricing entails charging vehicles directly for use of a parking space, and is among the most powerful demand-side strategies. There is a cost (whether in land value, construction cost, maintenance cost, etc.) for all parking spaces. The question is whether these costs are subsidized by developers, property owners, property managers, or others – or whether, and how, these costs are charged directly, in full or in part, to those using the spaces. Well-crafted parking pricing strategies can impact the use of alternative travel modes, in particular where high-quality transit services are available. Variable parking pricing programs (see below for more detail on variable pricing), where parking prices are higher during more congested hours of the day or along more congested routes, assist in managing demand and encouraged the use of less-congested travel times and travel routes. Within particular parking lots, parking managers can discount certain parking spaces (preferably in priority locations, such as next to a building entrance) for use by those arriving in multi-occupant vehicles.

  FAST FACTS: Over 95 percent of commuters park for free at work in the US, and almost all of them drive alone (91 percent of total commuters). For 2002, this yielded an estimated commuter parking subsidy for off-street parking paid by the employer and/or developer of $36 billion. (Shoup, 2003)

- **Variable Pricing**
  Variable pricing changes the price structure of toll roads, bridges, parking lots, and other congested transportation facilities in order to provide incentives for using the facilities in uncongested times or by different modes. On variable priced toll roads, toll rates are structured such that higher prices are assessed based upon time of day concurrent with typical or even actual periods of congestion. Despite the nature of the program, tollway users will experience higher charges during the peak periods and lesser charges during off-peak or shoulder periods. The effect of variable pricing on toll facilities is to: 1) help divert some traffic from the peak period to the shoulders of the peak period, and, 2) provide a cost-based encouragement for the use of transportation options (such as transit and ridesharing). Shifts to either off-peak periods or other transportation options will likely reduce the overall congestion on the facility, and, reduce the need for additional capacity on the toll facilities.



**Case Study Examples**

**VARIABLE-PRICED TOLLS – LEE COUNTY, FL.** Lee County is using variable-priced tolls to mitigate congestion on two county bridges by spreading traffic away from the peak period "rush hour." In the "shoulders of the peak period" (6:30 – 7:00 am, 9:00 – 11:00 am, 2:00 – 4:00 pm, and 6:30 – 7:00 pm), patrons received a 50% discount on the bridge toll if they utilize the bridge's electronic toll collection system. According to a 1999 telephone survey, half of respondents indicated they always or sometimes considered the toll discounts prior to making a trip across the bridges. As a result of the program, use of the bridges increased in the off-peak times and decreased during the peak periods. Analysis indicated that the travelers who modified their travel plans were more likely to be retired or working part-time. The survey results indicated that commuters were less likely to modify their schedules as a result of variable pricing, and that the program appears to have a greater impact on shopping trips. (Burris, 2000)

FAST FACTS: Over forty-five projects in fifteen states have investigated and, in some cases, begun implementation of pricing programs. In Hudson County, NY, variable pricing on existing toll bridges increased transit usage and reduced peak-period traffic by 7 percent. On the New Jersey Turnpike, up to 15 percent of peak-period traffic was reduced by variable pricing. Variable tolls on the State Route 91 facility has increased three-or-more person carpools. (FHWA, 2004)

- **Distance-Based Pricing**
  Distance-based pricing involves shifting automobile expenses that are often fixed monthly or annual costs, such as automobile insurance or vehicle registration, to expenses that vary according to how much the vehicle is driven. Distance-based pricing strategies are designed to directly tie more types of automobile expenses (i.e., in addition to fuel expenses) to the number of miles driven. Distance-based pricing programs may include (1) pay-as-you-drive automobile insurance, (2) mileage-based vehicle registration fees, and (3) mileage-based vehicle purchase taxes.

DID YOU KNOW? Progressive Insurance became the first insurance company in the United States to offer mileage-based vehicle insurance when it initiated service in Texas in 1999. Not only does Progressive charge per mile, but the company also uses a Global Positioning Satellite (GPS) system to charge motorists more when they drive under higher risk conditions. In 2004, GMAC Insurance and OnStar teamed up to offer mileage-based insurance discounts to OnStar subscribers in four states. Under the new program, vehicle owners with active OnStar accounts may be able to save from 5 to 40 percent on their car insurance, depending upon where they fall within seven mileage categories. (OnStar, 2004)

- **Incentive Rewards Programs**
  Reward-based incentive programs use financial and recognition rewards to encourage travelers to try and to maintain efficient transportation choices. There are a wide variety of ways incentive reward programs are structured: (1) direct cash or gift certificate rewards offered to travelers for efficient travel choices, either on a regular basis or through periodic prize giveaways, (2) points-based systems for use of efficient travel choices, much like airline frequent flier programs, (3) extra time off of work, or similar workplace-based rewards, and (4) recognition of travelers or sponsoring organizations in newspaper ads, award ceremonies, etc. Reward-based incentive programs are sponsored by organizations at many different levels, from single-site employers to federal agencies. For example, the Best Workplaces for Commuters[SM] program, established by the U.S. Environ-


**INCENTIVE PROGRAMS – NIKE.** Nike, a footwear manufacturer headquartered in suburban Portland, has an extensive commuting program that includes two types of carpooling incentives. First, carpools have reserved parking areas until 10 AM. Second, carpoolers are eligible, along with all other non-single occupant vehicle commuters, for monthly and quarterly prize drawings. Prizes range from gift certificates in increments of $25, $50, of $100 for company store or local retailers to $400 for mountain bike purchase or "getaway" weekends. Nike's SOV rate in 1992 was 98%. Since moving WHQ and implementing the Nike Buck and TRAC programs, Nike's SOV rate has reduced to 78%. 10% of employees carpool, 2% bike, 5% use bus and rail and 5% use flextime.

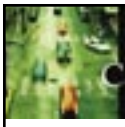
mental Protection Agency (EPA) and the U.S. Department of Transportation (DOT), publicly recognizes employers whose commuter benefits reach a National Standard of Excellence. EPA and DOT also recognize entities other than employers, such as business parks, downtown districts, or shopping malls, which provide and administer to each of the district's employees a commuter benefits program that meets the National Standard of Excellence. For more information, visit: www.bwc.gov.

## Travel Time Incentives

Increases in congestion levels around the country are creating longer and longer travel times. The average driver in the country's 75 largest cities experienced about 26 hours of travel delay due to congested driving conditions in 2001. In addition to an overall increase in average travel times, travel time "reliability" has also decreased, with crashes, vehicle breakdowns, weather, special events, construction and maintenance accounting for about 50 percent of all delay on the roads in 2001 (TTI, 2003). As such, a variety of demand-side strategies are oriented around providing travel time incentives to encourage efficient travel choices. These demand-side travel time incentives address both overall travel time savings and improved travel time reliability.

- **High-Occupancy Vehicle (HOV) Lanes**
  HOV lanes are exclusive roadways or lanes designated for high-occupancy vehicles, such as buses, vanpools, and carpools. The facilities may operate as HOV lanes full time or only during the peak periods. HOV lanes typically require minimum vehicle occupancy of two or more persons. However, in some locations, occupancy requirements have been increased to prevent congestion on the HOV lane. Support facilities, such as park and ride lots and transit centers with direct access to the HOV lane, are important system elements to increase facility use. HOV lanes may also be used to provide bypass lanes on entrance ramps with ramp meter signals. Keys to the success of lanes include location (areas of high congestion do better); enforcement; interagency coordination; synergy with parking policy, trip reduction ordinances, and transit and ridesharing programs; public and policy-maker support; and education and marketing. A related concept, high-occupancy toll lanes, or HOT lanes, allow single-occupant vehicles to utilize HOV lanes for a fee. HOT lanes can expand the range of travel choices available to all users and even help articulate the perceived "value" of HOV lanes to transit, vanpool, or carpool travelers able to use the same lanes at free or reduced rates. Revenues generated through fees paid by single-occupant vehicles on HOT lanes can also bolster ongoing funding for transit and ridesharing services along a HOT/HOV route.

FAST FACTS: There are more than 2,500 lane-miles of HOV facilities in the U.S. and Canada. This is expected to double within the next 25 years. One of the first HOV lanes, the I-10 HOV lane in southern California, known as the "El Monte Busway", was opened in 1973 as a dedicated busway and later opened to carpools of three or more people. In 2002, the single El Monte HOV lane carried more people than three regular general purpose lanes during peak periods, and, saved users an average of 20 minutes over the eleven mile distance. On average in southern California, HOV lane users saved more than half a minute per mile compared to the general purpose lanes. (CA DOT - District 7, 2003)




**BUS SIGNAL PRIORITY SYSTEMS – INTERNATIONAL EXPERIENCE.** "Transit signal priority (TSP) installations in England and France have shown a 6 to 42% reduction in transit travel time, with only 0.3 to 2.5% increases in auto travel time. In North America, Toronto, Edmonton, Charlotte, Portland, Chicago, and Los Angeles, among others, have installations in place. In Toronto, for example, average transit signal delay reductions of between 15 and 49% using TSP has justified expansion to over 300 signalized intersections (15% of total) along four bus and five streetcar routes, all in mixed traffic. Other TSP deployments include a 2-mile stretch in Cicero, IL on Cermak Road that is the site of an Illinois Department of Transportation demonstration using wire loops at 10 signalized intersections. Chicago Transit Authority and suburban PACE buses, using transponders and absolute TSP, realized an 8-minute trip time versus 12 minutes before TSP (a 33% reduction). In Los Angeles, two projects demonstrated application of TSP in conjunction with service restructuring (Metro Rapid) at approximately 100 signals along of each corridor (14-16 miles). Results indicated an average 8% decrease in overall bus running time, and a 35% reduction in bus delay at signalized intersections." (ITS America, 2002)

- **Transit / HOV Signal Priority Systems & Queue Jumps**
  Queues at either arterial intersections and/or ramp meters (signals that manage access to freeways from arterials) can significantly lengthen travel times for all travelers. When compounded with the need to make stops, signal delays often result in unacceptably long travel times for potential bus riders, carpools, and vanpools. Many metropolitan areas have implemented signal priority systems and queue jumps as one means of addressing signal delay for multi-occupancy vehicles, providing a significant improvement to travel time and/or travel time reliability for transit users, vanpoolers, or carpoolers. These demand-side strategies provide a travel time incentive for the use of high-occupancy travel modes – or the use of underutilized travel routes/times.

  FAST FACTS: The Minnesota Department of Transportation conducted a study to evaluate the effectiveness of its extensive ramp metering system, including shutting the system down. The study showed that ramp metering decreased total travel time by 24% in heavy congestion and 46% in typical traffic. Without HOV bypass lanes, ramp metering imposes a delay on buses and carpools. With HOV bypass lanes, overall travel time delay can be reduced by up to 62% in heavy congestion due to 1) reduction of freeway traffic due to ramp metering, and, 2) no travel time delay on the ramps. (MN DOT, 2002)

- **Preferential Parking**
  This strategy reserves priority parking spaces within a parking lot for those arriving by carpool or vanpool, or even those arriving during less-congested times of the day. "Preferred" parking could include (1) covered parking that protects people and cars from the weather, (2) an assigned parking space near the building entrance, (3) a level-one spot in a multistory parking garage, or (4) priority position on a parking space waiting list. Although designating preferred parking areas is most effective where parking demand meets or exceeds supply, many travelers with abundant parking still enjoy parking closer to the building or in a designated parking space.

FAST FACTS: The City of Aspen, Colorado, provides a variety of demand-side transportation strategies to preserve the physical environment and to control future traffic impacts on the community. In order to encourage carpooling, vehicles with more than three people entering the downtown area can stop at a kiosk and receive a Carpool Parking Permit that allows that vehicle to park in a designated area free of charge all day. In 2001, approximately 16,000 daily permits were issued. Coupled with the high-occupancy vehicle lanes, the distribution of these permits is one of the most successful incentives to rideshare.

## Marketing & Education

A critical element of successful demand-side strategies is often a well-designed and executed marketing and education program. Even in communities where high-quality transportation mode, route and time choices are currently available, travelers who remain unaware that these choices exist, or unconvinced that these choices are viable and/or reliable, even modest shifts in travel behavior and transportation efficiency are unlikely. Transportation marketing programs, at their most basic level, are designed to do one of three things: (1) increase awareness of available transportation choices, (2) encourage travelers to try new, more efficient travel choices for the first time, or (3) increase or maintain the frequency that people utilize more efficient travel modes, routes or times. Educational programs are designed to make travelers more aware of available transportation choices, and more aware of the specific facts related to travel choices – such as travel costs for different travel modes, travel times at different departure times, etc. Several specific strategies are emerging at the forefront of demand-side marketing and education strategies:

- **Social Marketing**
  Social marketing campaigns are increasingly being used by organizations around the country to encourage voluntary, socially-beneficial behavior change. "Social marketing is the use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behavior for the benefit of individuals, groups, or society as a whole" (Kotler, 2002). Using techniques similar to marketing commercial goods and services, various organizations have used social marketing techniques to encourage environmentally-friendly landscaping techniques, increase the use of seat belts and child safety seats, promote safe bicycling and the use of bike helmets, and champion enhanced exercise and physical activity. Similar approaches are increasingly being used to encourage voluntary changes in travel behavior, from reducing the number of trips made by single-occupant automobile to encouraging travel at off-peak travel times.

FAST FACTS: In 1993, North Carolina launched the "Click It or Ticket" campaign to increase seat belt use throughout the state. A social marketing campaign touted the benefits of seat belt use in conjunction with communicating a $25 fine for violations (fine revenues went to local schools). Before the campaign, only 65% of North Carolinians used seat belts. By 2000, seat belt use had jumped to 84%, among the highest rates in the nation. Highway fatalities and injuries were cut by 14%, and statewide, auto insurance rates fell. The U.S. Department of Transportation called the campaign a "model for the nation," and it has since been replicated by states across the country. (Kotler, 2002)

- **Individualized Marketing**
  Individualized marketing – sometimes referred to as dialogue marketing – focuses marketing efforts and financial resources on a targeted group of individuals or households, working on a one-to-one level to provide tailored information about available transportation choices and small incentives to encourage individuals to try new options. In April 2004, the Federal Transit Administration (FTA) selected four communities for a pilot individualized transit marketing project: Bellingham, WA; Cleveland, OH; Sacramento, CA; Triangle Park, NC. "The FTA's pilot project is based on personalized, individual marketing of potential commuters who might consider using public transit, but need more information. Transit agencies in the pilot communities first identify a neighborhood (approximately 600 households) with existing transit service and those residents are contacted in writing to determine if they are interested in learning more about travel options. Interested residents are then contacted by phone to determine if they would like information on transit, bicycling or walking. The outreach continues until residents have enough information to ensure their comfort level with trying different modes of transportation. In a few cases, bus operators make 'home visits' to personally discuss public transportation routes and options with residents." (FTA, 2004)

FAST FACTS: A UITP (International Public Transportation Association) project conducted in Europe, as well as larger scale individualized marketing programs in Australia, resulted in significant increases in transit ridership. The pilot project in Europe resulted in a 10 percent reduction in car usage in the targeted area, while the large-scale individualized marketing efforts in Australia yielded up to 14 percent reductions. The first U.S. pilot project in Portland, Oregon, reduced car travel by 8 percent in the first area selected for the pilot, and resulted in a 27 percent increase in travel by carpool, vanpool, transit, bicycling and walking in that same area. (FTA, 2004; Australian TravelSmart, www.dpi.wa.gov.au/travelsmart/)

## Targeted Strategies

Often complementing the more broad-based, general demand-side strategies, an array of demand-side strategies are targeted to specific traveler choices – such as choices regarding travel mode or trip departure time. These targeted strategies are described in detail in the section below, and are organized around the five primary categories of choices that affect overall transportation demand.

- **Mode Strategies**
- **Departure-Time Strategies**
- **Location / Design Strategies**
- **Route Strategies**
- **Trip-Reduction Strategies**

### Mode Strategies

The following demand-side strategies specifically target the choices of travel mode, from driving alone to bicycling to using transit:

- **Guaranteed Ride Home**
  Guaranteed Ride Home (GRH) programs, sometimes called emergency ride home programs, provide those who do not drive into work, or other supported destination, with

a free ride home in cases of emergencies, unplanned overtime, or other unexpected issues. Rides are often provided by taxi, but GRH can also be supported through rental cars, company fleet vehicles, or other alternatives. Often sponsored by local/regional governments, or by employers, GRH programs provide a back-up travel option to prevent travelers using alternative travel modes from being stranded at their destination.

FAST FACTS: In a 2003, survey the Artery Business Committee Transportation Management Association in Boston found that seven percent of commuters who used to drive alone switched to transit once they found out that there was a GRH service available. Metropolitan Washington's Council of Governments (MWCOG) GRH program is listed as a transportation control measure in the area's state implementation plan (SIP). MWCOG estimates that by 2005, its GRH program will eliminate 0.76 tons per day of NOX, at a cost of $8,800 per ton of NOX reduced. (Todreas, 2004)

- **Transit Pass Programs**
  Transit pass programs provide subsidized or free passes to travelers for the use on community transit and/or regional rail, bus, ferry or shuttle transit services. Free transit passes provide an incentive for "first time" users to try using transit and simplify the fare payment process..

FAST FACTS: When employees in downtown Ann Arbor, Michigan were provided a discounted or free transit pass (depending on the level of employer involvement), the estimated effect was a 9.2% increase in daily bus trips and a 3.5% daily decrease in the number of private vehicles coming into downtown between 2000 and 2001. (White, 2002)

- **Shared Vehicles**
  Shared vehicles provide a flexible option to travelers who rely primarily on non-motorized and public transit travel, yet at times require a vehicle for special trips, such as grocery shopping or trips to rural areas, or to get from the transit station to their final destination. Shared vehicle concepts include:

  - Car Sharing: Member based programs offer 24 hour access to a fleet of vehicles (cars, vans, trucks) within a city or neighborhood. Vehicles are reserved and used for just a few hours or up to a week. Most programs offer vehicles at an hourly and mileage based rate, with prices including gas, insurance, parking and maintenance. Several vehicles are generally located at convenient locations throughout the city
  - Station Cars: Similar to the car sharing concept; small, low emission vehicles are available at transit stations, helping people get from the train to their final destination, used daily for the commute or on an as needed basis.

FAST FACTS: According to researchers at the University of California at Berkeley tracking City CarShare, a San Francisco Bay area car-sharing organization, 30 percent of users have sold one or more of their privately owned vehicles and City CarShare is saving 13,000 miles of vehicle travel, 720 gallons of gasoline, and 20,000 pounds of carbon dioxide emissions in the Bay area. (City CarShare, 2004)

## Departure-Time Strategies

The following demand-side strategies specifically target trip departure-time choices:

- **Worksite Flextime**
  Worksite flextime allows employees to set their own arrival and departure time to/from work – within established time boundaries agreed to by their employer. This strategy can influence travel in several ways. In congested areas, it may encourage employees to avoid the most congested travel times, reducing the demand on roadway and/or transit systems during peak-demand periods. Furthermore, flextime programs often provide employees with the schedule flexibility sometimes needed to coordinate carpools and vanpools.

  FAST FACTS: From a Federal Transit Administration report on the potential impacts of flextime programs on peak-period traffic demand: "At Bishop Ranch in California, flextime policies [were] successful in shifting employee arrival times to earlier periods. A survey of 14,800 employees between 1988 and 1990 showed the percent of employees starting work before 7:00 a.m. increased from eight to 17 percent, and the percent starting work after 9:00 a.m. increased from one to 9 percent. Departure peaking also has been reduced. The percentage of workers leaving before 4:00 p.m. increased from 12 to 17 percent. The employer flextime programs were instituted as part of a broad demand management program for the area, as well as a local trip reduction ordinance encouraging reduction of peak hour vehicle trips." (FTA, 1992)

- **Coordinated Event or Shift Scheduling**
  Scheduling the coordination and staggering of traffic to reduce the number of vehicles arriving and leaving a site at one time. This can apply to event venues, specific worksites or office parks with severe traffic congestion.

  FAST FACTS: Near downtown Milwaukee, Summerfest, an annual, eleven-day outdoor music festival, attracts approximately 100,000 patrons per day and over 1 million annually. Since parking on-site is limited near the venue, alternative means of providing transportation and informing festival visitors with traffic, alternative route and parking information were essential. Local ridership data for Year 2000 showed that approximately 25% of the total attendance used bus transportation.

## Route Strategies

Travelers making day-to-day decisions regarding available travel routes generally use a combination of information resources to determine the quickest, or most reliable, route option. Many commuters listen to television and radio reports of traffic conditions. Others explore real-time, web-based travel-speed maps. Some simply pursue alternate routes when their normal route is unusually congested. The role of demand-side route strategies is to get the most accurate, timely information on travel conditions to people before they end up on congested facilities – allowing them to select less-congested routes and avoid "adding to the problem" by using already congested routes. Demand-side route strategies can apply to roadway, transit and other travel route alternatives.

- **Real-Time Travel Route Information**
  More and more areas around the country are launching real-time travel route information resources for area travelers. Using web-based maps, en route variable message signs, wireless updates to mobile devices, and other communications mediums – travelers are better able to make the most efficient route choice, and better able to make that choice before they end on a congested roadway or transit facility. Real-time, web-based traffic maps, like the Georgia Navigator system shown in Figure 4, often use a color-coded system to display travel speeds, warning indicators to show current incident locations, and hotlinks to connect users to live camera images of existing traffic conditions (where available). Organizations implementing comprehensive demand-side strategies are working with employers, property developers and managers, and others to integrate these real-time tools into corporate intranets, lobby kiosks, and others medium – in order to ensure that people can access this information conveniently.


**FIGURE 4:** GEORGIA NAVIGATOR REAL-TIME TRAFFIC MAP. www.georgia-navigator.com

DID YOU KNOW? The Utah Department of Transportation's CommuterLink, a real-time, web-based traveler information system that was operational for the 2002 Salt Lake Winter Olympics, is based on the Georgia Department of Transportation's Navigator system – which was used during the 1996 Summer Olympic Games.

- **In-Vehicle Navigation Systems**
  In-vehicle navigation systems are currently available in a variety of automobiles currently on the market for sale, lease and rent. These systems generally provide drivers with route guidance, vehicle position, and regional points of interest information. Historically, in-vehicle systems have relied on static data about travel times for each road segment to calculate the shortest travel time from where the vehicle is located to a point the driver inputs as the destination. As the collection and dissemination of real-time travel information – and the availability and affordability of regional broadband wireless networks – both improve, in-vehicle navigation systems will be able to provide drivers of private automobiles and transit vehicles real-time route guidance. Such guidance will encourage travelers to take advantage of underutilized travel routes and avoid non-recurring congestion caused by incidents and other emergencies.

FAST FACTS: Telecommunications companies are launching region-wide, broadband wireless services in cities around the country. The expansion of region-wide broadband wireless will expand the capacity to deliver real-time traffic data and other information to vehicles moving throughout a region. Telecommunications companies initiated service in Washington, DC, and San Diego, CA, in 2003. Service will expand to other major metropolitan areas throughout 2004 and 2005. (Baig, 2004)

- **Web-Based Route-Planning Tools**
  A variety of companies provide web-based travel route planning tools for roadway trips, and an increasing number of transit agencies are offering similar services for transit riders. These tools allow users to enter trip start and end locations (along with desired departure times or en route services, in some instances), and process recommended travel routes and forecast travel times. As these tools evolve, multi-modal travel route planning and the capacity for using real-time travel information to suggest less-congested alternate routes or modes is likely to emerge.

## Trip Reduction Strategies

The following demand-side strategies are designed to reduce the need for some trips altogether:

- **Employer Telework Programs & Policies**

Employers establish telework programs and policies at the worksite in a wide variety of ways – from structured, formally-implemented telework programs and policies to more informal telework arrangements established between individual employees and their direct supervisors. In many areas, transportation organizations – from metropolitan planning organizations to transportation management associations – have well-established telework support programs to assist employers in setting up appropriate telework systems and policies.

FAST FACTS: In a 2001-2002 employee survey, AT&T found that "AT&T teleworkers again reported that they gain about an extra hour of productive time each day at home, adding up to at least an estimated $65M in business benefit each year... Teleworkers appear to get more accomplished not only because of time saved by not commuting - that is, increased productivity on a per teleworker or per workday basis - but also because of increased productivity per unit hour. The ability to focus and manage time is critical for knowledge workers, and little distractions in the office add up to big costs in productive time." (Roitz, 2002)

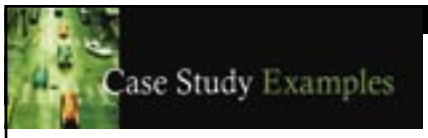
- **Employer Compressed Work Week Programs & Policies**
  Employers in a variety of setting establish compressed work week programs, offering employees the option to work the same number of work hours in fewer days per week, or per pay period. Development of compressed work week programs and policies involves a variety of partners, including company management and human resources staff, employee labor unions, and regional transportation organizations.

FAST FACTS: A 1991 study of compressed work week programs in Ventura County, CA, reports that the program was associated with a decline in single-occupant vehicle trips to work, from 82 percent to 77 percent. (Freas, 1991)

## Location / Design Strategies

The location of land uses in a community – from homes, to businesses, to retail establishments –directly impacts transportation demand. Over time, as cities evolve, changes in land use development patterns lead to changes in trip-making patterns. In some areas, urban growth has led to increases in trip lengths and growth in the average number of vehicle trips per day. In other areas, a variety of land use location and design strategies have led to reductions in trip lengths and vehicle trip generation – contributing to congestion mitigation advances (R.H. Pratt Consultant, 2003). Communities, businesses, and individuals make land use location and design decisions based on a wide range of economic, social, environmental, and other factors. Transportation accessibility is also a factor in many of these decisions, and a variety of location/design demand-side strategies are available. Several specific programs are described below. A more extensive discussion of the impacts of land use and site design strategies on travel patterns is available from the Transportation Research Board: Traveler Response to Transportation System Changes: Chapter 15 Land Use and Site Design (R.H. Pratt Consultant, 2003).

- **Live Near Transit Mortgage Incentives**
  Live near transit programs offer mortgage incentives to encourage residential location near transit facilities. The programs recognize that household transportation expenses can be lower for residences well served by public transportation, and allow homebuyers to use these transportation savings as additional borrower income in qualifying for a home mortgage. For example, Fannie Mae sponsors the Smart Commute InitiativeTM in pilot cities across the country. In several of the pilot cities, the Smart Commute Initiative involves partnerships with regional planning organizations, transit agencies, and private companies to provide complementary services supporting the use of public transportation (i.e., discounted transit passes, shared-car membership programs, etc.). Fannie Mae also supports the Location Efficient Mortgage® program in four pilot cities nationally.




**WASHINGTON REGIONAL SMART COMMUTE INITIATIVE.** In Washington, DC, the Smart Commute Initiative offers mortgage incentives to households locating within one-quarter mile of a public bus stop or one-half mile of a public rail station. Through the program, participating lenders will add a portion of the potential transportation savings to borrowers' qualifying income - an addition of $200 per month for one wage-earner households and $250 per month for two wage-earner households (a potential increase in home-buying power for a typical purchaser of a median-priced home of approximately $10,000). Participants also receive discounts on transit passes and lifetime membership in the Flexcar shared-car program. (www.mwcog.org/planning/smart_commute/index.html)

- **Live Near Work Incentive Programs**
  Live near work programs provide incentives for employees to live near their place of employment. Examples include down payment assistance, location efficient mortgages and rent subsidies. By providing housing close to employment, this program can lower the costs of commuting, lessen the pressure on infrastructure, and generate more pedestrian traffic in business districts.

DID YOU KNOW? In 1997 Maryland's General Assembly adopted a series of growth management programs, one of which was the Live Near Your Work Program. The City of Baltimore pioneered the program and continues to partner with area "Live Near Your Work Employers" to provide $2,000 cash grants to home buyers for down payment and/or settlement expenses. (www.livebaltimore.com/homebuy/lnyw.html)

- **Proximate Commute**
  This program involves voluntary, coordinated relocation of eligible employees who work for multi-site employers to the work branch locations closest to their home, reducing commute distances. Rather than having employees commute to distant locations, their employers help them arrange job swaps and transfers to company sites closer to home. In the mid-1990s, the Washington State Department of Transportation worked with Key Bank on a proximate commute demonstration project. A total of 500 Key Bank employees – from 30 individual branches in three counties – were found to be eligible for the program. An initial review found that 83% of the employees lived closer to an average of 10 different branches than the branch where they were presently employed. 85 of the 500 employees enrolled in the program. The result was a 65% reduction in miles traveled. (Giery, 2003)

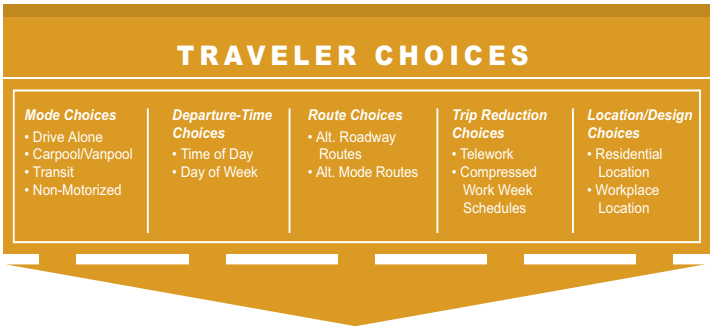
FAST FACTS: In 2002, Boeing undertook a pilot project to itemize the jobs and home addresses of 10,000 of its non-union workers to determine if some could transfer to a plant closer to home. Preliminary research showed that 53 percent, or 42,475, of its workers share a job description with a plant that is closer to their residence. Boeing found that if those employees could be moved, it would reduce commute-related travel by 168 million miles annually, equating to 8 million gallons of gas and 5,000 tons of emissions each year. (Seattle Post-Intelligencer, 2002)

- **Transit-Oriented & Pedestrian-Oriented Design, Mixed-Use**
  A wide range of urban form and design strategies can enhance opportunities for the use of public transit, ridesharing, bicycling, and walking. Focusing a mix of land uses – such as employment, housing, restaurants, services (banking, day care, etc.), retail, and more – in well-designed, pedestrian-friendly developments and/or near transit connections can reduce the demand for vehicle travel and reduce trip distances. A 2002 study in California demonstrated that transit-oriented developments (TODs) can yield 20 to 40 percent higher ridership at an individual transit station for both work and non-work trips, and can increase overall regional transit ridership by up to 5 percent. (Parsons Brinckerhoff).

FAST FACTS: An assessment of the impact of different degrees of land use mix on travel patterns in 57 suburban activity centers found that centers with some on-site housing had 3 to 5% more transit, bike and walk commute trips. Additionally, for each additional 10% of commercial/retail floor space in the activity center, transit and ridesharing increased by 3%.

# TRAVELER CHOICES

an outline of the range of traveler choices impacted by demand-side strategies




## Traveler Choices

Strategies implemented as part of a demand-side program are designed to facilitate efficient traveler choices.

Individual travelers, families, and businesses all make important decisions that collectively impact traffic congestion. These decisions include day-to-day travel choices, such as travel mode, departure-time, and travel route. They also include decisions to eliminate some travel altogether – for example, by working from home a few days a month or by using internet-based technologies to preclude the need to physically travel to a store, library, or other destination. Finally, individuals and organizations make important decisions about the location of their residence or business – often factoring in transportation-related considerations such as commute to work travel times or ease of access to public transportation services.

This section provides additional detail on five primary traveler choices:

1. **Mode Choices**
2. **Departure-Time Choices**
3. **Route Choices**
4. **Trip Reduction Choices**
5. **Origin / Destination Location Choices**

## Mode Choices… "What travel mode will I use for my trip?"

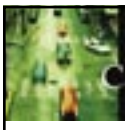
Demand-side strategies target improvements to the availability and viability of real transportation mode alternatives for a full range of travelers, from school-age children through seniors, and for a full range of trip types, from the trip to work to the trip to the corner store. By enhancing the availability of a range of travel mode choices, travelers can select the most appropriate or efficient option for each trip. In many situations, the flexibility and convenience of the single-occupant automobile is the best option. However, for many trips, other mode choices can prove less expensive, less stressful or more predictable.

### The Range of Mode Choices:

- **Single-Occupant Vehicle (SOV)**
  A single individual driving an automobile or motorized cycle with no other passengers.

FAST FACTS: The country's share of commuters driving alone increased by just over 3% from 1990 to 2000 (from 73.19% to 76.31%). From the 2000 U.S. Census, the District of Columbia (40%), New York (56%), Hawaii (67%), and Alaska (69%) remain the four jurisdictions with the lowest drive alone rates. Alabama (85%), Michigan (84%), and Ohio (84%) have the highest drive alone rates. (2000 U.S. Census)

- **Carpool**
  Two or more people sharing a ride in a private vehicle. Carpooling is the most common and flexible way for travelers to share a ride, and often occurs between family members, friends, or co-workers. More informal than a vanpool and more flexible than public transit, carpools generally have two or more passengers who live in the same neighborhood, or along the same route, using a private vehicle to travel to common or nearby destinations. Carpooling often appeals most to people traveling at least ten miles or whose trip takes over 20-30 minutes.



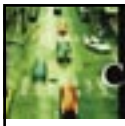
**Case Study Examples**

**VANPOOLING - PUGET SOUND, WA.** Six large, medium and small transit agencies in the Puget Sound region include vanpool service as an integral part of their total service package. In January 2004, King County Metro operated 663 vanpool and 60 vanshare vans, Community Transit ran 210 , Pierce Transit ran 228 , Kitsap Transit ran 89, Intercity Transit ran 77, and Island Transit ran 43. In the Puget Sound area, vanpooling has achieved a 2% market share of the overall commuter market. Among commuters who travel 20+ miles each way, vanpooling has reached a 7% market share. King County Metro's VanShare program provides service to bridge the gap between the commuter and a public transportation hub or terminal (rail station, Park & Ride lot and ferry dock). The agencies specifically look to vanpooling to meet demand in hard-to-serve suburban markets. For more information on vanpooling in the Puget Sound region, contact Syd Pawlowski at King County Metro, 206-684-1535, syd.pawlowski@metrokc.gov.

- **Vanpool**
  A group of seven or more people sharing a ride in a prearranged vehicle. With one or two vanpool participants typically serving as regular drivers, vanpools provide non-stop, point-to-point service. The van's ownership and operating costs are usually paid for by the van riders on a monthly basis. Vanpools typically serve trips of 15 miles or more. Many transportation agencies complement fixed-route bus and rail transit with vanpool services to provide attractive door-to-door travel options for otherwise difficult to serve trips (i.e., suburb-to-suburb trips, trips to low-density office markets, and trips to/from smaller towns or outlying communities).

FAST FACTS: While the average fare paid by bus passengers in 2001 was $0.74 per unlinked trip, vanpool passengers paid an average of $2.06. As a result, transit operators in the Puget Sound region achieve an 85% farebox recovery of capital and operating costs for their vanpool programs. In 39 cities reporting data on more than one mode to the National Transit Database (NTD) in 2001, vanpools had the lowest cost-per-passenger and cost-per-revenue-mile expense to transportation agencies. (APTA, NTD)

- **Public Transportation**
  Rail, bus, shuttle or ferry transportation services provided to the general public, utilizing a paid driver and administered by public transportation agencies or private-sector companies. Services may operate along a fixed-route on a set schedule, or may utilize more flexible routing and scheduling options. Public transportation services provide critical, high-capacity access to dense-urban areas (allowing for intensified land use development without increased congestion), offer needed transportation services to those without access or unable to drive (including child and the elderly populations), and are increasingly vital to the success of special events (from major events like the Olympic Games, to recurring events like baseball games or concerts). In an effort to preserve high-value environments and enhance visitors experience, public transportation is now a key element of overall mobility and access planning at many of the nation's parks, including Acadia and Zion National Parks.



**Case Study Examples**

**CHICAGO, IL.** The City of Chicago has joined forces with the Chicagoland Bicycle Federation to teach motorists and bicyclists to better share city streets. Along with an ad campaign to show motorists how to share the road, they'll send bicycling ambassadors out to the streets to speak face-to-face with members of the public.

www.biketraffic.org/

**USA.** In 2003, 500,000 students, parents and community leaders in cities across America joined millions of walkers worldwide to participate in International Walk to School Day.

www.iwalktoschool.org/

FAST FACTS: Public transportation ridership has increased over 21 percent in the last six years (1998-2003), faster than highway or air travel. Every $1 invested in public transportation projects generates $6 in local economic activity, and supports approximately 47,500 jobs. Public transportation is a $32 billion industry that employs more than 350,000 people. (APTA, 2004)

- **Non-Motorized (Walk, Bike, Skate)**
  Includes walking, bicycling, skating or any other mode of non-motorized travel. Often complements other modes of travel. For example, most public transportation trips begin or end with a walking trip, and many users bicycle to/from transit stops. A safe and convenient environment for pedestrians can dramatically increase the number of people walking to offices, stores, or schools during the day. Walking then enables sharing a ride or taking the bus as a realistic travel alternatives.

DID YOU KNOW? In 2000, the bicycle industry generated $5.89 billion in sales. Each year, nearly one billion trips are made by bicycle, and over 40 million American adults ride a bike at least once a month. Bicycling and walking represent 7% of all trips made nationally, yet accounts for 13% of all traffic-related fatalities in the country. (America Bikes, 2003). More than half of the American public (55%) says it would like to walk more throughout the day either for exercise or to get to specific places. When thinking about deciding where to live, having sidewalks and places to take walks for exercise or fun is important to nearly eight in ten Americans (79%), and "very" important to four in ten (44%). Having areas to walk in the neighborhood rates third on a list of seven items asked in the survey, behind feeling safe from crime and the quality of the public schools. (STPP, 2001)

## **Departure-Time Choices…** "What time-of-day or day-of-week will I depart for my trip?"

Beyond day-to-day choices about travel mode, travelers also make regular decisions about the time of day, or even day of week, to depart on their trip. Travelers often adjust their travel schedules to avoid rush-hour traffic congestion, to work around childcare or school schedules, or to take advantage of reduced roadway, bridge or transit off-peak pricing discounts. Demand-side strategies use a variety of approaches to facilitate utilization of less-congested travel times, mitigating the length and duration of congested peak periods ("spreading the peak"). The enhanced use of real-time travel information increasingly allows travelers to avoid non-recurring traffic incidents by shifting trips to an earlier or later time.

### The Range of Departure-Time Choices:

- **Time of Day**
  Shifting trip departure-times away from congested times of day, to avoid non-recurring traffic congestion resulting from a traffic incident, to avoid traffic congestion caused by weather, or for individual scheduling needs.

  FAST FACTS: The extra time needed for rush hour travel has tripled over two decades. According to the Texas Transportation Institute's (TTI) 2003 Urban Mobility Report, the national average Travel Time Index for 2001 was 1.39 (meaning a rush hour trip took 39 percent longer than a non-rush hour trip). The national average in 1982 was only 1.13, a 26% increase in travel time for a rush hour trip versus a non-rush hour trip. This increasing "rush hour penalty" creates a growing incentive for travelers to take advantage of less congested travel times. (TTI, 2003)

- **Day of Week**
  Shifting trips to less-congested days of the week. In addition to more common "rush hour" times of the day in many urban areas, congested travel conditions in some communities are more frequently linked to certain days of the week. For example, travel to recreation or tourism destinations can be plagued with peak-direction congestion on Friday afternoons and Saturday mornings, followed by congestion in the reverse direction on Sunday afternoons. US 50 over the Chesapeake Bay Bridge, Highway 99 to the Whistler Blackcomb ski area, Route 6 to the Cape Cod National Seashore, and I-70 to Colorado's many ski areas all exhibit this day-of-week congestion.


**Q. Do demand-side operations programs require people to change their travel patterns?**

A. Absolutely not. These programs simply aim to provide travelers with the broadest range of efficient travel choices, the best information on the choices available and how to use them, and balanced financial incentives for the most efficient alternatives.

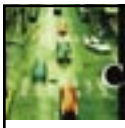
## Route Choices… "Which route will I use for the trip?"

Many travelers have several routes available to travel between Point A and Point B. Travelers wisely choose routes that get them where they need to go (including en route stops) based on experience over time that informs them of the most efficient route choices. Some travelers choose the fastest routes, while others choose routes with less-hectic or safer travel conditions. Other travelers alter travel routes from day-to-day as the result of changing travel needs (i.e., trip chaining) or as the result of non-recurring travel delays caused by traffic incidents, roadway construction, or even weather. The collective route choices made by travelers in a region affect the performance of the transportation network ("too many people using the same route at the same time"). Demand-side programs provide travelers with advanced, real-time transportation information in a variety of formats, facilitating traveler utilization of excess roadway capacity on less-congested travel routes, and limiting the magnitude and duration of both recurring and non-recurring travel delays. These strategies can also focus on shifting travel away from residential or other sensitive routes, and can shift demand away from routes with construction related delays.

### The Range of Route Choices:

- **Alternative Roadway Routes**
  Shifting the roadway route utilized to travel between destinations, in order to avoid congested facilities and travel on routes with available capacity. Travelers may utilize a variety of traveler information tools – such as real-time traffic information available on websites or en route variable message signs – to determine the best available routes.

- **Alternative Mode Routes**
  Shifting the transit routes utilized in order to avoid system delays or other issues, or shifting the travel mode used (into transit, bike, walk, etc.) in response to delays on roadway systems.



### Case Study Examples

**ROUTE CHOICES – CAPE COD NATIONAL SEASHORE.** Of the five million annual visitors to the Cape Cod National Seashore today, one-half arrive during a ten-week period in the months of June-August. The type and duration of tourist visits has changed over the past forty years. The two-week to a full month stay that was usual in the 1960s and 1970s has been replaced by shorter trips, usually a two to three day weekend. In order to address the long-range transportation needs of the area, planners developed the Long-Range 25-Year Plan for Alternative Transportation Systems – including transit enhancements and development of intelligent transportation systems to provide both pre-trip and en route travel information services. From the plan: "Pre-trip information can assist a driver map a route, gather information on current roadway conditions, and identify detours around planned construction. Transit users can identify transit routes, schedules, fares, and connections… En-Route Driver Information systems provide real-time information to travelers who have commenced a trip. Information on delays, accidents, weather conditions, and emergency situations can be communicated to the traveling public. Route guidance systems can identify alternative routes that are available to by-pass delays." (Volpe, 2003)

## **Trip Reduction Choices…** "What are my options to reduce the need for some trips?"

The demand for travel is based on the need of customers to move between two points for some purpose, whether to get to work or to the store. "Trip reduction" choices explore alternative ways to "connect" origins and destinations, using technology and other advancements to eliminate the original need for some trips altogether. As an example, "teleworking" connects people to their jobs through the information superhighway, rather than the local interstate highway.

### The Range of Trip Reduction Choices:

- **Telework**
  Simply defined, teleworking is working at home or another off-site location, full- or part-time. While employees may be hooked up to the main office via a sophisticated computer network, it's possible to telework with as little as a pen, paper and phone. Jobs are more portable than they once were. Teleworking is increasingly used by employers to reduce the demand for office space and parking space. Additionally, teleworking is often used as a recruiting and retention tool. Across the country, part-time teleworking is on the rise, while trends suggest a gradual decline in the number of people working full-time from home. A 2003 survey by The Dieringer Research Group reported that 23.5 million Americans telework at least one day per month, a growth of 40 percent since 2001. The report found that 42 percent of these employee teleworkers work from home at least one day per week, and 22 percent of the employees work at home daily or nearly every day. (Dieringer, 2003)

  FAST FACTS: 21% of working Americans teleworked in 2001. 58.8% of teleworkers say they work longer hours because they work at home. (ITAC, 2001)

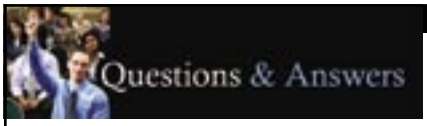
- **Compressed Work-Week Schedules**
  In a compressed work week, employees complete their required number of work hours in fewer-than-normal days per week (or per pay period). This arrangement allows employees to have one day off each week or one day off every other week, depending upon which type of compressed work week program preferred. The two most popular compressed work week schedules are the 4/40 and 9/80 programs, although other variations also exist. These options are described below:

  - 4/40 Program. Employees work four 10-hour days each week, with the fifth day off. To ensure five-day coverage, some employers have half the company take Mondays off and half take Fridays off.
  - 9/80 Program. Employees work 80 hours in nine days, with the 10th day off. This schedule usually translates to eight 9-hour days and one 8-hour day (this shorter day is often the Friday that the employee works). In a company with two major work groups, each group might take off alternating Fridays.

FAST FACTS: A 1995 study of 2,600 Southern California employees, conducted for the California Air Resources Board, found that "employees on compressed work week reduced their net number of trips by an average of 0.5 per week… The respondents using a 9/80 schedule drove an average of 13 fewer miles per week; those using a 4/40 schedule drove an average of 20 fewer miles per week." (Holmes, 1995)

## Origin / Destination Location Choices… "How do residential, business, shopping and other location choices impact my travel choices?"

While travel choices cover the range of alternatives about how and when to travel between an origin and destination (decisions that people make every day), individuals and businesses also make more fundamental choices about the actual location of these origins and destinations - and these "location choices" have a significant impact on the demand for transportation. People looking for a new home often consider the length and difficulty of their commute to work in their residential location choice. Companies often consider maximizing access to employee labor markets, or to central freight shipment locations, when making business location choices. Retail establishments often assess area consumer markets and ease of access to their retail location. Additionally, community land use design decisions can integrate a mix of land uses in one area, making it easier for people to access multiple destinations (work, shopping, day care, etc.) in a centralized area. All of these locations choices can have a significant impact on the number of trips people make, the length of these trips, and the viability of making these trips by a variety of travel modes (driving, transit, walking, etc.).




**Q. Do these travel choices, such as using transit or adjusting travel times, really work for everyone?**

A. No, but even shifting 5-10% of travelers to a different mode or time can have a significant impact on peak period congestion in certain locations. Many travelers in urban areas note that congestion is less severe when area schools are not in session – a prime example of how small shifts in travel patterns can affect overall congestion levels and delay.

### The Range of Origin / Destination Location Choices:

- **Residential Location**
  Decisions about residential location, with consideration given to ease of access to adjacent transportation facilities (roadways, transit stations/stops, bike paths, etc.) or to travel distances to key destinations (work, shopping, schools, etc.).

- **Business Location**
  Decisions about business location, with consideration given to ease of access to adjacent transportation facilities, proximity of employee residential locations and commute distances, ease and manner of access to potential customer markets, etc.

FAST FACTS: Quantitative assessments of jobs/housing balance at the sub-regional level have shown that a good balance of jobs and housing can be associated with average commuter trip lengths lower by seven to almost 30 percent, compared to where jobs and housing are out of balance (R.H. Pratt Consultant, 2003).

## APPLICATIONS

the application settings for demand-side strategies


Demand-side strategies facilitating efficient traveler choices are tailored for a wide range of different program applications, each addressing different trip types of travel market segments.

1. **Schools & Universities**
2. **Special Events**
3. **Recreation & Tourism Destinations**
4. **Transportation Corridor Planning & Construction Mitigation**
5. **Employer-Based Commute Programs**
6. **Airports**
7. **Incidents & Emergencies**
8. **Freight Transportation**

### Schools & Universities

Throughout the United States, driving children to school is as routine as the commute to work. While school bus systems exist for many school districts (particularly rural), they do not always fit student schedules (due to after school activities, etc.) or they are not even offered in some urban districts. Neighbors may form carpools for their children, however, without outside support or guidance, the reach of these carpools may be limited to groups of friends or neighbors that already know each other and that have children in the same school. "School Pool" programs are administered in many communities to share information with parents and assist in the connection of interested parties for sharing a ride. Not only do school pools reduce overall vehicle miles traveled, they also decrease congestion around the schools, which enhances safety and fosters an improved environment for children walking or bicycling to school. Often referred to "safe

routes to school," these programs are underway across the country, in cities of all sizes. The California Safe Routes to School Clearinghouse offers a range of resources and contacts for these efforts: www.4saferoutes.org.


**CONTRA COSTA COUNTY, CA.** The county-wide SchoolPool program has providing rideshare assistance and bus passes on local transit for five years.

**UNIVERSITY OF WASHINGTON.** The University created the "Universal Pass" which provides transportation options for a quarterly fee to faculty/staff.

In university or college settings, the physical space for parking and transportation infrastructure is often limited. By making transportation opportunities abundant and flexible in nature, students, faculty, and staff are encouraged to try and eventually rely on alternatives to single occupancy vehicles. Other programs may integrate on-campus housing as part of an integrated transportation and land use strategy designed to reduce travel distances or eliminate the need for some trips altogether. Disincentives, such as an aggressive parking fee structure, often play an integral role in encouraging more efficient travel choices.

## Special Events

Many communities recognize sizeable special events produce significant impacts to the transportation system. In order to curtail traffic disruptions and congestion related to events – whether they are summer festivals, sporting events or conventions – agency collaborations on traffic management plans are using available assets, including local transit and ITS infrastructure, to better manage demand. FHWA has developed a technical reference entitled *Managing Travel for Planned Special Events.* The reference is intended to serve as a stand-alone tool for transportation practitioners and includes successful case studies for a range of special event types.


**SUMMERFEST, WI.** The Wisconsin Department of Transportation demonstrated the effectiveness of "pre-planning" for large events, such as the Summerfest concert festival, attended by over one million people annually.

**SEATTLE SEAHAWKS, WA.** As a condition of project approval, the transportation management plan for Seahawks Stadium established goals to reduce personal vehicle trips. Based on 2002 results, mode split goals set forth in the plan have been surpassed.

King County, in Seattle, developed an internet-based resource for offering ridematching and other services for regional events. The website provides an updated list of upcoming special events, and facilitates ridesharing to the event locations. More information is available: www.rideshareonline.com/eventmatching/logonframepubevent.asp


**ZION NATIONAL PARK, UT.** In order to preserve the unique resources and recreational opportunities of Zion Canyon, the Park instituted a mandatory shuttle system during peak visitation. 75% of Zion's annual visitors utilize the shuttle system.

**ASPEN, CO.** In this city, the revenue generated from the paid parking program is directly reinvested into demand-side programs and allocated for future transit investments.

## Recreation & Tourism

Unique circumstances can lead to successful implementation of demand-side strategies at recreation and tourism destinations. Typical of the resort areas researched for this guide, maintaining environmental, natural, and aesthetic features of

the community are of necessary importance for the economic vitality of the area. As part of this guide, information has been collected on strategies to manage traffic that have been implemented in recreational and destination communities. Demand-side strategies typically focus on targeted travelers (i.e. employees, visitors, etc.) to reduce trips during congested travel times. Often demand-side programs are geared towards home-based work trips. However in an area where tourism and seasonal services occur, demand-side strategies might be particularly effective if targeted towards seasonal employees often priced out of living close to their employment center or visitors who are accustomed to paying for services and already expect a unique experience from visiting the area. The case studies highlighted in this guide describe a collection of programs undertaken by various sponsors (i.e. local jurisdictions, transit authority, non-profit organizations) as part of a collective effort for their community.

## Transportation Corridor Planning & Construction Mitigation

Planning and preliminary engineering of major corridor investment projects presents significant opportunities for the coordinated integration of demand-side programs. In more and more projects around the country, these programs are being developed as an integrated component of each "build" alternative assessed in the corridor planning process. There are three prime opportunities for integration of demand-side programs into the corridor planning and construction process:

1. **Project Phasing.** In corridors where major capital investments are selected as part of the "preferred alternative," the final implementation of these investments is often 5-10 years down the road. Demand-side programs often take much less time and money to implement, and can provide valuable transportation services in the early years of implementation. Systems management strategies can achieve near-term, incremental improvements to traffic flow. Demand-side measures can enhance available travel choices and establish key partnerships with corridor businesses.

2. **Construction Mitigation.** The (re)construction of major corridor infrastructure projects often takes many years to complete. During this time period, transportation capacity in the corridor is often degraded and access to businesses limited. Demand-side programs provide critical mitigation strategies to reduce the negative impacts of construction, including:
   - Providing traveler information regarding construction activities like ramp closures, and offering details and assistance on alternative travel modes, travel routes and travel times.
   - Working with corridor employers and other businesses to provide traveler information and to develop access alternatives, such as transit, vanpooling, flexible work hours or telework.
   - Working with transportation agencies to adjust existing transportation facilities and services, such as adding temporary HOV lanes or adding additional transit services.

3. **Complementing Build Alternatives.** Demand-side programs often play an important role as a complement to a build alternative, in two key ways:

**ATLANTA**, GEORGIA

A. Maximizing the utilization of build alternatives.Strategies implemented vary, based on the nature of the build alternative. For example:
   - For corridors adding HOV lanes, appropriate strategies might include partnerships with employers for promotion of transit and ridesharing, development of incentives, education and marketing of associated travel time and travel cost savings for HOV lane use, information on lane access times and locations, etc.
   - For corridors adding transit systems, appropriate strategies might include working with employers to improve connections to the transit stops/stations, development of transit pass programs, marketing and education of transit routes, stops and schedules, real-time transit schedule information, etc.

B. Providing enhanced travel choices for trip patterns not well served by the major investment. For example, construction of new general purpose lanes and a rail transit line along a north-south corridor may not provide significant benefits for east-west travel patterns in the area. Transportation management strategies can augment the major north-south investment with systems management strategies to improve traffic flow and demand-side programs to provide enhanced travel choices for east-west trips. These same programs also enhance access to major north-south investments.

## Employer-Based Commute Programs

As a travel market, work-related trips tend to reflect the highest percentage of peak-period trips made within a region. Typically, commute trips occur regularly and are sometimes easier to arrange for a consistent alternative to driving alone than other trip types. For this reason, many demand-side strategies are implemented through employer-based and work site specific programs that encourage employees to switch from driving alone to carpooling, vanpooling, or using some other alternate means of travel. Often programs deployed at a work site level encourage employees to ad-

### Case Study Examples

**T-REX – DENVER, CO.** For the Transportation Expansion Project (T-REX) in metropolitan Denver, Colorado, project sponsors have dedicated $3 million to the TransOptions program, a TDM-based construction mitigation program. (www.trexproject.com)

**US 101 – SAN LUIS OBISPO, CA.** As part of the reconstruction of US 101 in the Cuesta Grade in central California, the San Luis Obispo Council of Governments developed an integrated set of demand-side strategies to enhance mobility during the reconstruction period. The program included increased commuter bus service, special vanpool promotion and subsidies, and carpool incentives. An evaluation of the demand-side programs showed a reduction of about 300 cars per day from the highway, eliminating about 8,000 miles of daily vehicle travel. Average auto occupancy on the highway rose from 1.206 to 1.266. The evaluation showed that the carpool incentives were the most cost effective means among the three programs for removing cars from the highway.

just work schedules or even reevaluate the need to travel (i.e. telecommute). Regional demand-side programs also focus on commute trip reduction strategies that complement local transportation programs and facilities such as light rail, regional bus service, and rideshare programs. As an incentive, employers are typically eligible for tax benefits by providing certain qualifying transportation benefits.


**LONDON HEATHROW.** On a large scale, BAA's London Heathrow has invested in a sustainable future for public transport involving an integrated system of rail, transit, and managing and monitoring traffic demand.

**JFK, NY.** In addition to improving access to the John F. Kennedy Airport (JFK) in New York City, the $1.9 billion JFK AirTrain investment provides access for passengers traveling between terminals and other ground facilities.

## Airports

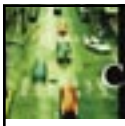
In recent years, increased attention has been given to transportation systems supporting airports both locally as well as internationally. Airports are vital to local economies and therefore should be given due diligence for continued and orderly expansion. Transportation management efforts, whether or not expansion is on the horizon, include internal circulation plans, overall master planning efforts, and regional transportation infrastructure investments. Planning efforts should take a critical look at airfield capacity, terminal and parking space and access issues. Besides encouraging travelers to use alternative means to travel to, from and within airport property, successful planning efforts have incorporated transportation options for airport employees. Since the terrorist events on September 11, 2001, transportation infrastructure as it relates to maintaining airport security has also been taken to a level of elevated importance and scrutiny.

## Incidents & Emergencies

Strategies to improve traveler awareness of an unplanned event and to expedite the response to incidents on the roadway network are essential for maintaining freeway operations. Traffic incidents are a significant cause of freeway congestion. When an incident occurs, roadway capacity is typically reduced by blocking a lane or introducing a distraction in the traveling environment that causes motorists to reduce travel speed. Considerable documentation is already available on incident and emergency management programs throughout the country. FHWA has numerous publications, including the Benefits Brochures series, highlighting technology for incident and emergency response. AASHTO has published the Connecticut Department of Transportation (CONNDOT) Incident Management System (IMS) as one of their highlighted Success Stories. CONNDOTs IMS, like many throughout the country, monitors traffic operations at a traffic operations center, dispatches and coordinates interagency emergency response, adjusts traffic signal systems to manage flow, and supports highway service patrols. Transportation management plans are also critical to emergency preparedness planning efforts for natural disasters and other major, unexpected occurrences

## Freight Transportation

Considering that commercial vehicle traffic typically comprises a steady percentage of daily traffic on state highways and the interstate system, further research on non-commute demand-side strategies would benefit from a more detailed discussion of freight management and commercial transportation. As a function of their size, freight trucks have been attributed with adding to congestion, road surface degradation and traffic accident severity. Commercial vehicle travel reductions can provide benefit to both the highway system and local roads utilized for delivery. There are a number of programs around the country that have been implemented to streamline commercial vehicle operations. FHWA has also documented the benefits of commercial vehicle electronic screening in their Benefits Brochures series. Besides streamlining operations, perhaps the most effective way to manage commercial vehicle travel is to encourage off-peak travel or alternative routes. Improving scheduling and truck routing processes can contribute to a reduction in freight vehicle mileage.



### Case Study Examples

**DEMAND-SIDE FREIGHT STRATEGIES – LONG BEACH, CA.** The Los Angeles region has 16 million residents, 9 million jobs, and one of the busiest freight ports in the world. In the Los Angeles area, the Long Beach port moves close to 13,000 20-foot long containers each day. To better manage this high level of goods movement, Intelligent Transportation Systems can be used as a tool to implement Transportation Demand Management concepts traditionally seen in personal commuting. TDM concepts in goods movement include better scheduling, better routing and reduction of bottlenecks at check points.

On December 10th, 2003, the Marine Terminal Operators (MTO) introduced a new truck identification technology that has potential to reduce air pollution and relieve truck congestion around the port. The two tracking devices currently being considered are radio frequency identification tags (RFID) and Real-Time Locating System tags (RTLS). Both systems are similar to electronic toll collection devices currently used in private automobiles across the country. At the MTO's expense, these devices will be installed in over 30,000 trucks that use the Long Beach terminal.

The new technologies will help reduce congestion in several ways. First, it allows the MTO to identify and register trucks without the need for them to stop at port entrances. Electronic identification also will reduce the entrance gate personnel requirements for the MTO, making off-hour deliveries less expensive and more realistic. Increasing off-hour deliveries has the potential to shift delivery schedules to times of the day that experience less commuter congestion. Thirdly, the new technologies could locate lost truck drivers and facilitate route finding back to the terminal. Finally, electronic identification provides an excellent tool to gather data on truck contributions to local highway congestion.

The Vice Mayor and City Councilman of Long Beach, Frank Colonna is excited about the potential to reduce the impacts of truck congestion on neighboring communities. Mr. Colonna has said, "I like the initiative. It will provide a pathway to better manage truck traffic, minimize congestion, [and] reduce air pollution..." The MTO intends to have the system up and running by March 2004. For more information contact: Port of Long Beach, (562) 437-0041, info@pobl.com.

# SUMMARY OF CASE STUDY EXPERIENCE

## this section reviews the case studies collected and key lessons learned from the case study exploration

*Mitigating Traffic Congestion* provides over 25 in-depth case examples of demand-side programs implemented in a rich and varied range of locations, including the following (with corresponding page numbers):

Demand-side programs have also been applied to major employment centers, new development sites, airports, freight movement, and to entire regions (via road pricing and travel reduction regulations).

This shows the diversity of applications for demand-side strategies, some focused on the traditional commuter market and others applied to school, recreation, and other types of travel. The common theme is the desire to reduce peak period travel by managing demand and removing cars from the most congested places (parking lots, roads, highways) and the most congested times. This is accomplished by facilitating efficient traveler choices of the mode of travel used, the time of departure, the route used, and by reducing the need for some trips altogether.

Another commonality is the use of demand-side strategies to address very specific problems, such as:

- Inadequate parking or road space for employees, visitors, fans, customers, etc.
- Harmful effects from automobile emissions.
- Employee tardiness or absence due to travel delays or lack of travel options.
- Recruitment and retention of skilled workers with minimal stress from commuting.

The more targeted the problem and travel market, the better chance that demand-side programs can provide an effective solution or be part of a package of solutions.

All of these problems impose a tangible cost on travelers, on business, on government, and on society as a whole. The benefit-to-cost ratio of many demand-side programs is quite high, as is discussed below.

## What Works Best? A Review of International Experience

Several seminal research projects and guidance reports have been produced since the 1993 FHWA report "Implementing Effective TDM Measures" (COMSIS, 1993). This body of knowledge includes studies performed at the regional, state, national and international levels. Considerable research has been performed in U.S. regions that require employer trip reduction programs (e.g., WA and AZ); in states that embrace TDM (e.g., Florida); among research organizations (e.g., TRB and TCRP); and federal agencies (FHWA, FTA, EPA). Among the more important recent references is the TCRP Report 95, the "Traveler Response to Transportation System Changes," which documents the impacts of various demand management strategies in chapters covering: HOV facilities, vanpools, pricing, parking management, and employer TDM (R.H. Pratt Consultant, 2003).

An example of this research comes from another TCRP project, B-4, "Cost Effectiveness of TDM Programs," that evaluated some 50 employer-based demand management programs in the U.S., but provides insight into demand management effectiveness in both commute and non-commute applications. The study estimated that the average reduction in vehicle trips among all these "successful" programs was 15.3% (at a cost of about $0.75 per trip reduced). However, programs that focused on information/promotion alone exhibited no measurable decrease in trips. Programs that provided enhanced alternatives, such as vanpools or shuttle buses, realized a 8.5% reduction in trips. Programs that focused on financial incentives and disincentives realized a 16.4% reduction of trips and

programs that combined enhanced alternatives with incentives/disincentives for their use, realized a 24.5% reduction in vehicle trips. (COMSIS, 1994).

Evidence also suggests that the number of strategies implemented, or the size of the budget, does not positively correlate with higher effectiveness. Some of the simplest, albeit politically controversial, measures involve pricing of automobile travel and subsidies for high occupancy modes. So, one researcher concluded: "It's more what you do to influence commute behavior (the strategies/incentive utilized), more than how you market the program or how much you spend" (ESTC, 1998).

Another important study, the Congressionally-mandated review of the Congestion Mitigation Air Quality (CMAQ) federal funding program performed by the Transportation Research Board, revealed that four of the five most cost-effective strategies (measured as the cost per pound of emissions reduced) funded by CMAQ were demand-side strategies, including: regional rideshare programs, charges and fees for drivers, vanpool programs, and "miscellaneous TDM" programs, (TRB 2002).

Many other recent research projects have documented the effectiveness of TDM strategies to reduce automobile travel for school trips, recreation and special event trips. This was accomplished by increasing auto occupancy (which is already higher than work travel) and providing quality shuttle service and traveler information.

The scope of demand-side strategies has evolved over the past 30 years in the U.S. However, these measures (referred to as Mobility Management in Europe and some other regions of the world) are a growing phenomenon in other countries and are even integrated into national policy in places like:

- **Sweden.** Where a region must consider demand management solutions before considered new road capacity.
- **The Netherlands.** Where travel reduction goals have been set and TDM is an integral part of the program to meet these goals.
- **United Kingdom.** Where all regions are required to have "green travel plan" capabilities and integrate TDM into land development approvals (AMOR, 2003).

Many other innovative applications of demand-side strategies have been tested, evaluated, and documented in Europe, Australia, Canada, etc. In Europe especially, demand-side strategies are being applied to non-commute travel markets (tourists, schools, special events) in a conscious effort to address the growth in automobile use that is affecting most countries of the world. The E.U.–funded project MOST (MObility STrategies for the next decades) provides comprehensive findings from over 30 pilot projects (AMOR 2003). A recent study by the Organization of Economic Cooperation and Development (OECD), "Road Travel Demand: Meeting the Challenge," documents world-wide experience with demand management strategies (OECD, 2002). The resource section of this report provides references and links to related websites.

## LESSONS LEARNED FROM THE CASE STUDIES

**all the research on, and experience with, demand-side programs and strategies cannot possibly be summarized in 10 brief points. However, a few common findings and lessons can be offered here**

1. Demand-Side Strategies Are About Choices – As the term implies, demand-side strategies intend to modulate the demand for travel in a way that is based on choices (mode, time, route, etc.), and incentives for using alternatives to driving alone and avoiding the most congested conditions. A good example of this is the I-15 FasTrak program in San Diego, which allows solo drivers to pay to use the HOV lanes and allows those sharing a ride to use the lanes for free, but does not force a fee on any driver or require anyone to use a particular facility (OECD, 2002).

2. Time and Financial Incentives Are Most Effective – Time savings for alternative mode users (such as HOV lanes), financial incentives (such as vanpool subsidies or tax incentives) and financial disincentives (such as parking or road pricing) are consistently cited as the most effective demand-side strategies. These intervening influences help to balance out the perceived convenience and speed of driving alone (ITE, forthcoming).

3. Incentives and Disincentives Require Good Alternatives – Time and financial incentives and disincentives are most effective when they support good travel alternatives, such as transit service, vanpool formation, carpool matching, bicycle facilities, etc. The TCRP B-4 study, cited earlier, provides tangible evidence of this symbiosis by showing that the most effective programs combined financial incentives (such as transit subsidies) with improved alternatives (such as more frequent and convenient bus service (COMSIS, 1994).

4. Managing Demand Can Be a Cost-Effective Tool – Many studies that have compared mobility and air quality strategies have concluded that demand management strategies are among the most cost-effective in that they can reduce a trip, mile of travel or ton of emissions for a relatively modest amount of money. Demand-side strategies may not be the primary solution to these problems, but if they are applied in the right situation, they can help address traffic and air pollution problems in modest, yet very affordable ways (TRB, 2002).

5. Information Technology Enhances Demand-Side Programs – While incentives and disincentives are perhaps the key to effectiveness, much of managing demand relies on good information about travel conditions and alternatives. Advances in information technology make managing demand more effective by providing real-time, accurate information on travel options, traffic conditions, alternative routes, and even dynamic matching of travelers into shared ride arrangements.

6. The Implementing Organization Should Match the Scope of the Strategies – The organizational home for demand-side programs should match the scope of the application. For example, strategies to reduce congestion around employment centers or in corridors might be managed by Transportation Management Associations, whereas regional traveler information and ridematching services might better be implemented by regional agencies with access to appropriate resources and information. Multiple organizations are often involved in a given urban area, calling for coordination and cooperation to maximize impacts

7. Packaging Demand-Side Strategies Can Create Synergies – Research indicates that the greatest potential for demand management lies in strategic grouping of measures into "programs" of reinforcing actions. For example, limiting parking in a high-density commercial development served by convenient, reliable transit can do more to reduce vehicle trips than can solely limiting parking supply (ITE, forthcoming). One study concluded that "packaged, complementary solutions are usually more effective than a single measure" (OECD, 2002).

8. Expectations Need to Be Realistic – Demand-side programs are not a panacea for all social ills or a cure-all for traffic congestion problems. However, they can have a significant impact on travel. If the correct incentives and disincentives are used to facilitate shifts to alternative modes, demand-side strategies can reduce vehicle trips and VMT 10%-20%. Most decision-makers, however, are reluctant to adopt certain disincentives (such as parking pricing) to change travel behavior in a significant way. In the absence of these strategies, most demand management programs should only be expected to reduce travel by 0% - 5% (COMSIS, 1993). At the same time, it is important to recognize that the goals for demand-side programs often extend beyond reducing VMT to include mobility, accessibility, environmental, and other outcomes.

9. Plans for Managing Demand Should Be Integrated into Overall Transportation Plans – Demand-side strategies should be considered a set of measures to better manage existing infrastructure, but they still need to be well-planned. Demand management actions should be considered simultaneously with related transit, traffic engineering, and land use plans (ITE, forthcoming). Since many metropolitan planning organizations and regional councils now fund and oversee demand management efforts, it is important to integrate demand-side strategies into long-range plans, as well as shorter-term management and operations actions. It is also important to evaluate the impacts of actual demand-side measures, as implemented, to better inform future decision-making.

10. Demand-Side Strategies Are Practical – Demand-side strategies are compatible with sustainability, transportation-land use interaction, and other longer-term goals. Yet, it is most applicable to managing demand for finite travel markets, to solve real problem that provide tangible benefits to users and implementers. Travels are smart consumers and, when faced with tangible changes in out-of-pocket costs and travel time, will change their travel behavior in immediate and significant ways (ESTC, 2003).

# CONCLUSIONS & FUTURE DEVELOPMENTS

## a summary of concluding thoughts from the publication and highlights of important future developments

This report offers a new, broader perspective on demand-side strategies. These programs can be a critical component of a comprehensive transportation improvement program to improve the efficiency of the current transportation system, and they can also be an integral part of longer-term transportation and land use plans in order to change the fundamental influences on demand for the single occupant vehicle traveling at peak periods on congested roads. Ultimately, demand-side programs can be a critical factor in "decoupling" the link between economic growth and transportation growth. Economic growth creates new demands for travel and not all of this new demand can be accommodated on current or future roads (OECD, 2002).

Demand-side programs, in their traditional form of commute trip reduction, were born from energy crises of the 1970s as a response to fuel shortages. In the new millennium, managing demand extends to all types of travel, be it parents walking a group of kids to school in a "walking bus," visitors to a National Park leaving their cars off-site and using clean shuttles, new residents opting to live in "transit-oriented developments" to avoid the need for an extra car, or shippers coordinating deliveries to avoid congested roads and clogged city streets.

This is all demand management. Many of the tools used today by transportation planners, traffic engineers, and traffic operations managers are designed to modulate the demand for travel (by mode, route, location or time) rather than provide more capacity in the system to accommodate more trips. This new perspective on demand-side programs can still benefit from some of the findings from the 1993 FHWA report, "Implementing Effective TDM Measures." That report discussed the "economics of TDM" by estimating that the average cost to society to accommodate a one-way daily solo commute trip was $6.75, whereas the cost to employers to reduce a commute trip was $1.33. Carpooling cost commuters $1.92 per trip, whereas driving alone cost $4.81. (COMSIS 1993) These economics are as compelling today and they were ten years ago. Perhaps as the "demand for TDM" grows and is applied to other travel markets, the economics are even more compelling.

**MEMPHIS**, TENNESSEE

In the future, the role of demand-side programs in solving specific problems and contributing to larger goals will be even greater as our inability to squeeze more cars into a limited road system compels us to look for ways to do things "smarter" and to focus on moving people, goods, and information rather than cars and other vehicles.

# ADDITIONAL RESOURCES & CITATIONS

**a collection of organizations, publications and internet resources, along with citations from this publication**

## GENERAL RESOURCES

Association for Commuter Transportation – www.actweb.org

America Bikes – www.americabikes.org

American Planning Association – www.planning.org

American Public Transportation Association:
Homepage – www.apta.com
APTA Transit Resource Guides – www.apta.com/research/info/briefings/

Best Workplaces for Commuters[SM] – www.bwc.gov

Better Environmentally Sound Transportation (BEST) – www.sustainability.com/best

Commuter Choice – www.commuterchoice.com

Institute of Transportation Engineers – www.ite.org

International Telework Association & Council – www.telecommute.org

National TDM and Telework Clearinghouse, National Center for Transit Research – www.nctr.usf.edu/clearinghouse

Northwest TDM Resource Center – www.wsdot.wa.gov/Mobility/TDM/default.htm

Organization for Economic Co-operation and Development – www.oecd.org

Pedestrian & Bicycle Information Center – www.bicyclinginfo.org, www.walkinginfo.org/

Promotional Materials Clearing House at F.S.U.'s The Marketing Institute – http://nctr.cob.fsu.edu/

Smart Card Alliance – www.smartcardalliance.org

Surface Transportation Policy Project – www.transact.org

Victoria Transport Policy Institute, Online TDM Encyclopedia – www.vtpi.org

U.S. Department of Transportation (DOT):
ITS/Operations Resource Guide – www.its.dot.gov/guide.html
ITS Benefits & Costs Database – www.benefitcost.its.dot.gov/
FHWA Office of Operations – www.ops.fhwa.dot.gov

U.S. DOT 511 Resources – www.itsdocs.fhwa.dot.gov/511/511.htm, www.deploy511.org/

### International Experience

Association for Commuter Transport (United Kingdom) – www.act-uk.com

Australian TravelSmart Program – www.dpi.wa.gov.au/travelsmart/

European Union, MOST, Mobility Management Strategies for the Next Decade – http://mo.st

European Commission, PORTAL (Promotion Of Results in Transport Research And Learning) – www.eu-portal.net

European Platform on Mobility Management – www.epomm.org

International Association of Public Transport – http://www.uitp.com

National Travelwise Association (United Kingdom) – www.ntwa.org.uk/

VM2, Vereniging Mobiliteitsmanagement (The Netherlands) – www.vm2.nl

World Bank, Transport – www.worldbank.org/transport/

## REFERENCES

America Bikes, *America Bikes, America Benefits.* Spring 2003. www.americabikes.org

American Public Transportation Association. *2004 Public Transportation Fact Book.* 2004. www.apta.com

American Public Transportation Association. *Online Transit Resource Guide: Smart Cards and U.S. Public Transportation.* Number 6 - Revised October 2003. www.apta.com/search/info/briefings/

Austrian Mobility Research (AMOR). *MOST Final Report D9*. Prepared for European Commission, March 2003. http://mo.st

Baig, Edward C. "Verizon hooks up Wi-Fi alternative; BroadbandAccess zippier than its predecessor." *USA Today.* Mar 25, 2004. p. B3.

Battelle. *Evaluation of the Acadia National Park ITS Field Operational Test: Final Report.* Prepared for the U.S. Department of Transportation, ITS Joint Programs Office. June 2003. www.benefitcost.its.dot.gov/

Beers, Thomas M. "Flexible schedules and shift work: replacing the '9-to-5' workday? *Monthly Labor Review.* Bureau of Labor Statistics. June 2000. p.33. www.bls.gov

Burris, Mark, Ashley Yelds. *Using ETC to Provide Variable Tolling: Some Real-World Results.* Paper presented at the ITS America 2000 Annual Meeting. Boston, MA. May 1-4, 2000.

California Department of Transportation, District 7. *2002 HOV Annual Report.* 2003. www.dot.ca.gov/dist07/aboutdist7/pubs/hov_annual/2002/2002_HOV_annual.pdf

Charles River Associates Incorporated. *Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies That Influence It.* Transit Cooperative Research Program, Report 27. National Academy Press. 1997.

COMSIS Corporation. *Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience.* Prepared for FHWA, Report DOT-T-94-02, September 1993.

COMSIS Corporation, "Cost Effectiveness of TDM Programs," Transit Cooperative Research Program Project B-4, unpublished Working Paper #2, 1994.

Cura, Fredrico. "Transit Agencies Seeing Increased Interest in Transit-Oriented and Joint Development." *APTA Passenger Transport.* April 18, 2003: Volume 61, No. 33.

Davis, Donald D., Ph.D. and Karen A. Polonko, Ph.D. *Telework America 2001 Summary.* Old Dominion University, October 2001.

Dieringer Research Group. "Home-Based Telework by U.S. Employees Grows Nearly 40% Since 2001." The American Interactive Consumer Survey. A press release from the International Telework Association & Council: September 4, 2003.

ESTC, "Overview of TDM in the United States: What Makes for Successful TDM Programs," paper presented at ACT UK Conference, London, November 1998.

ESTC. *Commuter Choice Primer: An Employer's Guide to Implementing Effective Commuter Choice Programs.* Prepared with SAIC for FHWA, FTA and EPA, Report FHWA-OP-03-007, 2003.

Federal Highway Administration. *Value Pricing Project Quarterly Reports.* Office of Transportation Policy Studies, Value Pricing Pilot Program. 2004. www.fhwa.dot.gov/policy/otps/valuepricing.htm

Federal Transit Administration. "FTA Selects Four Communities For Pilot Program To Boost Public Transportation Ridership." FTA Press Release. April 2, 2004.

Federal Transit Administration. *TDM Status Report Variable Work Hours.* U.S. Department of Transportation. August 1992. (Available on www.cutr.usf.edu).

Fekpe, Edward, Shawna Collins. *Evaluation of Intelligent Transportation Infrastructure Program (ITIP) in Pittsburgh and Philadelphia, Pennsylvania.* U.S. Department of Transportation. March 2003. www.itsdocs.fhwa.dot.gov

Freas, Alyssa, Stuart Anderson. *The Effects of Variable Work Hour Programs on Ridesharing and Organizational Effectiveness, A Case Study: The County of Ventura.* A paper before the Transportation Research Board. January 1991.

Giery, Margaret, Martin Catala, Philip L. Winters. *Proximate Commuting: Potential Benefits and Obstacles.* Center for Urban Transportation Research. National TDM and Telework Clearinghouse. July 2003. www.nctr.usf.edu/clearinghouse/

Holmes, John R. *Effects of Compressed Work Week on Employee Travel.* California Environmental Protection Agency – Air Resources Board. June 1995.

ICF Consulting. *Strategies for Increasing the Effectiveness of Commuter Benefits Programs.* Transit Cooperative Research Program, Report 87. National Academy Press. 2003.

Institute of Transportation Engineers, *Information Report on TDM in Highway Reconstruction*, prepared by PBQ&D, publication pending, 2004. www.ite.org

Intelligent Transportation Society of America (ITS America). *An Overview of Transit Signal Priority.* July 2002. www.itsa.org

Intelligent Transportation Society of America (ITS America). *Delivering the Future of Transportation: The national intelligent transportation systems program plan: a ten-year vision.* January 2002. www.itsa.org

Kotler, Philip, Ned Roberto and Nancy Lee. *Social Marketing: Improving the Quality of Life.* Sage Publications. 2002.

Lewis, Mike. "Boeing Will Study Moving The Jobs Of Its Workers Closer To Their Homes." *Seattle Post-Intelligencer.* Thursday, March 21, 2002. http://Seattlepi.Nwsource.Com

Live Baltimore Home Center. *Live Near Your Work.* www.livebaltimore.com/homebuy/lnyw.html

Minnesota Department of Transportation. *Twin Cities Metro Area Ramp Meter Study Final Report.* Office of Communications and Public Relations. May 2002. www.dot.state.mn.us/rampmeterstudy/reports.html#finalreport

OnStar. "GMAC Insurance and OnStar Create Innovative Insurance Products." OnStar Press Release. January 28, 2004.

Organization of Economic Co-operation and Development. *Road Travel Demand: Meeting the Challenge.* 2002. www.oecd.org

Organization of Economic Co-operation and Development. *Communicating Environmentally Sustainable Transport The Role of Soft Measures.* 2004. www.oecd.org

Parsons Brinckerhoff. *Statewide TOD Study: Factors For Success In California.* California Department of Transportation. 2002. www.dot.ca.gov/hq/MassTrans/

R.H Pratt Consultant, Inc., et al. *Traveler Response to Transportation Systems Changes, Transit Cooperative Research Program Report 95.* 2003 – 2004. (Selected chapters available at www.trb.org/trb/bookstore/)

Roitz, Joseph, Dr. Brad Allenby, Dr. Robert Atkyns. "AT&T 2001/2002 Employee Survey Results - Telework, Business Benefit and the Decentralized Enterprise." 2002. www.att.com/telework/article_library/survey_results_2002.html

Rosenbloom, Sandra. *Transit Markets of the Future: The Challenge of Change.* Transit Cooperative Research Program, Report 28. National Academy Press. 1998.

Schrank, David, Tim Lomax. *The 2003 Annual Urban Mobility Report.* Texas Transportation Institute, The Texas A&M University System. September 2003. http://mobility.tamu.edu

Shoup, Donald. "Evaluating the Effects of California's Parking Cash-out Law: Eight Case Studies," *Transport Policy*, Vol. 4, No. 4, 1997, pp. 201-216.

Shoup, Donald. *The High Cost of Parking.* Presentation to the International Symposium on Road Pricing. November 2003. www.trb.org/Conferences/RoadPricing/Presentations/Shoup.ppt

Social Marketing Institute. Success Stories: Florida Truth Campaign. 2004. www.social-marketing.org

Surface Transportation Policy Project. *Americans' Attitudes Toward Walking and Creating Better Walking Communities.* April 2003. www.transact.org/report.asp

Surface Transportation Policy Project and Center for Neighborhood Technology. *Driven to Spend.* March 2000. www.transact.org/report.asp

Todreas, Ian L. "My Kingdom for a Horse: All About Emergency Rides Home for the Rest of Us." TDM Review, Association for Commuter Transportation. Issue 1, 2004. www.actweb.org

Transport. *TravelSmart: A 10-Year Plan.* September 1999. www.travelsmart.transport.wa.gov.au

Transportation Research Board, *The Congestion Mitigation Air Quality Improvement Program: Assessing Ten Years of Experience, TRB Special Report 264.* National Academies. 2002.

U.S. Department of Labor. *Current Population Survey.* May 1997. www.dol.gov

Volpe National Transportation Systems Center. *Cape Cod National Seashore Alternative Transportation Systems Long-Range Planning Study: Final Report.* National Park Service. May 2003.

Wachs, Martin, "Regulation XV in Southern California: Success or Failure?" *TDM Review*, Association for Commuter Transportation, Winter 1996. www.actweb.org

White, Christopher, Jonathan Levine and Moira Zellner. *Impacts Of An Employer-Based Transit Pass Program: The Go! Pass In Ann Arbor, Michigan.* APTA, 2002. www.apta.com/research/info/briefings/documents/white.pdf

Xylo, Inc. "Commuter Assistance Benefits in the Workplace," Xylo Report, April 2001. www.xylo.com/press/pr042501.htm

# MITIGATING **TRAFFIC CONGESTION**

## THE ROLE OF DEMAND-SIDE STRATEGIES

# CASE STUDIES

# University of Washington - Seattle, WA

**FAST FACTS ABOUT:** Univ. of Washington - Seattle, WA

**Types of TDM:** Mode Choice
**Keywords:** U-PASS, university transportation, parking disincentive, flexible parking, transit service
**Area Demographics:** UW-Seattle is the City's second largest employment and activity center outside of the central business district. In 2002, enrollment topped 39,000 students.
**Program:** One pass, the U-PASS, provides an array of transportation options including transit service, preferential parking, consumer discounts, and rideshare matching.
**Results:** Due to its success, other campuses have developed their own programs using U-PASS as an example. U-PASS has saved UW-Seattle capital investment costs associated with traditional parking expansion projects. U-PASS has eliminated 91 million trips since 1991.
**Cost of Program:** $11.3 million for the 2002/2003 school year.
**Staff:** Unavailable
**Contact:** Peter Dewey, US-Seattle Transportation Office, www.washington.edu/upass

## Large University Grapples with Growth

The University of Washington's (UW) Seattle campus of 643 acres is the heart of the University District, the City's second largest employment and activity center outside of the central business district. In Fall 2002, student enrollment was over 39,000 and faculty and staff nearly reached 22,000. According to 2002 Campus Master Plan efforts currently underway, the Seattle campus is projected to grow by 1,000 students and 2,000 additional faculty and staff by 2012 triggering significant development and transportation demands.

## The "Universal" Solution: U-PASS

The current Transportation Management Plan (TMP), U-PASS, demonstrates a strong, collaborative partnership between the University, the City of Seattle and transit providers, King County Metro (Metro), Snohomish County's Community Transit (CT) and the regional transit authority Sound Transit. In the late 1970's, University transportation goals were conceived and then formalized in 1983 as part of the City-University Agreement. Specific goals included maintaining 1983 traffic volumes traveling to or from campus during peak periods and limiting UW parking supply to 12,300 while making certain that additional spill-over parking would not occur within the surrounding neighborhoods.

As part of the 1989 General Physical Development Plan (GPDP) for the campus, it became clear that forecasted population growth and development would trigger a significant increase in vehicle trips and a loss of approximately 1,700 surface lot parking spaces to new construction. As part of the GPDP planning process, a task force was formed to develop, guide and oversee the implementation of a new TMP. The task force recognized the importance of transportation incentives as well as complementary disincentives (i.e. parking rate increases).

**Removing the volume discount provided by a quarterly parking pass, the variable rate method favors infrequent users. In other words, the more you park, the higher the fee.**

In 1990, the task force pitched the U-PASS as a "universal pass" providing card holders with a range of transportation options and incentives with one pass, the U-PASS. The U-PASS Program began as a three-year pilot program in 1991 with a budget of $17.4 million. In 2002, the U-PASS annual budget was approximately $11.3 million. Since its inception, the most significant cost of the U-PASS Program is related to transit service. Currently, user fees cover 50 percent of the Program costs while the remaining revenue is generated from parking fines, fees and other UW sources.

Today, U-PASS provides an array of transportation options for a quarterly fee to eligible students ($35 in 2003) as well as faculty and staff ($48.96 in 2003). Record sales in Fall 2002 indicated that nearly eight-six percent of the total student population participated. Transportation alternatives and programs included with a U-PASS include the following:

- Full fare coverage on Metro Transit, Sound Transit, CT and Sounder commuter train service,
- Free carpool and vanpool parking,
- Vanpool subsidies,
- Discounted "occasional" parking permits,
- Local merchant discounts,
- Ridematching services,
- Reimbursed rides home for faculty and staff, and
- Evening neighborhood shuttle service.

Considering all the transportation options U-PASS provides, it is most frequently used for transit service on Metro Transit, Sound Transit and CT. Transit agencies have preserved and stimulated ridership by increasing capacity and introducing new routes as user needs change. Today's U-PASS is less than half the price of the traditional bus pass of 1990. Since 1991, 91 million vehicle trips to or from campus have been eliminated by U-PASS transit riders.

Managing traffic demand through pricing has been documented as a key component of U-PASS Program success. Besides quarterly and daily parking rate increases, UW has developed a number of flexible parking features to compliment other U-PASS program components and alternatives to single-occupancy vehicle (SOV) travel including the Pay Per Use Parking (PPUP) program. Basically, PPUP participants are tracked each time they use the West Campus Garage and are subject to a variable parking rate structure. Removing the volume discount provided by a quarterly parking pass, the variable rate method favors infrequent users. In other words, the more you park, the higher the fee.

**Today's U-PASS is less than half the price of the traditional bus pass of 1990. Since 1991, 91 million vehicle trips to or from campus have been eliminated by U-PASS transit riders.**

## U-PASS Success Leads the Way

Immediately after implementation, U-Pass was a success in reducing vehicle trips and parking lot occupancy on campus. The Program is continually monitored and evaluated through a series of surveys, traffic counts, parking utilization studies, and individual U-PASS component monitoring. As a result, comprehensive measures of effectiveness are available. As reported in the 2001-2002 U-PASS Annual Report produced by the UW Transportation Office, U-PASS has been attributed with the following:

- Prevented the need to build 3,600 new parking spaces saving considerable capital cost,
- Reported 86% U-PASS user satisfaction, a 13% increase over Year 1992, and
- Reduction of 33% in parking permit purchases since October 1990 indicating that users are finding another way to school or work.

In addition, 2002 traffic counts indicate that morning peak period traffic was 18 percent below the 1983 traffic levels, a goal set forth in the City-University Agreement.

As a result of the success of the U-PASS Program on UW's Seattle campus, similar but fiscally-separate programs have been implemented at UW Bothell, UW Tacoma, and Harborview Medical Center. In addition, Metro has developed FLEXPASS for metropolitan Seattle employers and commuters using the U-PASS as a model. As a tribute to U-PASS success, the Program has been heavily awarded both locally and nationally.

# Contra Costa County SchoolPool - CA

**FAST FACTS ABOUT:** Contra Costa SchoolPool

**Types of TDM:** Mode Choice
**Keywords:** school pool, rideshare, transit, students
**Area Demographics:** Contra Costa County, one of the nine counties in the San Francisco – Oakland Bay Area.
Program: Rideshare matching service offered to parents to encourage consolidating school trips. Additional incentives to ride local transit are also provided.
**Results:** In 2002, 536 families joined a carpool and 27 % of carpools formed in 2001 continued carpooling in 2002. The program has also been credited with an annual vehicle trip reduction of 1.1 million and a vehicle miles traveled (VMT) reduction of nearly 4 million.
**Cost of Program:** $95,000 for the 2002/2003 school year.
**Staff:** SchoolPool requires a full time employee for 6 months or a half-time employee on an annual basis.
**Contact:** Lynn Osborn, CCCAN Program Manager, www.cccan.org


## Identifying the Problem – Outside of the Classroom

The SchoolPool program serves western, central, and eastern Contra Costa County, in the northern California Bay Area. Very few schools in Contra Costa County offer bus service for their students. As a result, traffic congestion within the communities surrounding the schools presents a significant mobility challenge. The average one-way trip length to or from school within Contra Costa County is about 4.3 miles. Similar to other parts of the country, crowded classrooms are forcing students to attend a school "across town" instead of in their own neighborhood.

## Offering Options for School Trips

The SchoolPool program is administered by staff at the Contra Costa Commute Alternative Network (CC CAN) and has been in operation for 5 years. The goal of the SchoolPool program is to provide parents with information on neighboring students who are interested in carpooling to and from school, and to encourage the parents to establish a carpool. Carpooling is voluntary and no financial incentive is offered to the parents. Carpool ridematch lists are provided to parents with students attending the same school(s) to encourage carpooling. It is promoted among residents who have children in all public and private schools throughout the County (kindergarten through college).

For the 2002 school year (July 2002 – June 2003), carpool ridematch forms were sent directly to 150 participating schools and in turn were distributed in Fall registration packets to over 157,000 school children. Additional program outreach efforts included presentations to Parent Teacher Associations (PTAs) and school administration.

As ridematch applications are received, rideshare matches within the same district are found and sent within three days to the applicant. For the 2002 school year, approximately four ridematch lists were sent to each parent during the course of the first three months of the school year. Additional ridematch lists were sent throughout the year as new parents moved into the school area, or as parents' commute patterns changed.

Parents who were unable to find a carpool partner were encouraged to have their children try transit instead of driving. To encourage participation, a $20 bus pass was provided for the student's use. CC CAN Staff worked with County bus operators to develop bus schedule brochures for each school district. In turn the brochures were distributed with free tickets so that parents could see and experience which routes and schedules serviced their schools.

SchoolPool requires a full time employee for 6 months or a half-time employee on an annual basis. The most intense time is between April and October when registration forms are generated and distributed and most of the outreach occurs. The total program cost for SchoolPool during the 2002 school year (July 2002 to June 2003) was $95,000.

### Setting a Good Example

For the 2002 school year, 710 individual ridematch requests were received from parents. Of these, 174 included siblings (essentially duplicate requests) who were also riding in the carpool, which resulted in a total of 536 unique ridematch requests. In general, parents must make two round trips to the school (one each morning, and one each afternoon) to pick up their children. These two round trips equate to four one-way trips. Allowing for 25% of the trips to be drop-offs on the way to work, it is estimated that three one-way trips are saved for each non-sibling, which in this case is a reduction of 1608 one-way trips per day.

A follow-up survey was conducted to determine the usage and satisfaction of program participants from SchoolPool 2001/2002. Of the participants who were contacted, 27% indicated that they have continued to carpool resulting in continued reduction of 816 one-way trips per day.

In addition to the carpool riders, another 1,932 students received bus passes in 2002. These passes were given to students whose parents indicated that they usually drive the student to school. Nearly 2,000 bus riders equates to a reduction of around 4,000 one-way trips per day.

Collectively, the three groups discussed above, new carpools, 2001 carpools still ridesharing, and bus riders have contributed to an annual one-way trip reduction of 1.13 million trips and a vehicle miles traveled (VMT) reduction of 3.96 million.

In addition, due to additional school bus cutbacks in the summer of 2003, the SchoolPool Program had over 3,000 bus riding participants. The construction of a new school without bus service (even public bus service) has resulted in additional rideshare requests topping the 2002 totals.

# Summerfest and Concert Tour - WI

**FAST FACTS ABOUT:** Summerfest and Concert Tour - WI

**Types of TDM:** Mode Choice, Route Choice
**Keywords:** Special events, ITS, concert, multi-jurisdictional coordination, transit advantage, enforcement, park and ride, Freeway Flyer
**Area Demographics:** Two venues featured, both in southeastern Wisconsin attracting between 35,000 and 1 million visitors per multi-day event.
**Program:** Coordinated, pre-emptive special events planning which offers public information and transportation alternatives to event attendees.
**Results:** Event planning Severity Level Matrix, County ordinance adopted which provides fiscal reimbursement for extra government services required as the result of a special event. Increased transit usage (25% of total attendance).
**Cost of Program:** Not available; numerous agencies and departments cover resource needs.
**Staff:** Not available; numerous agencies and departments cover resource needs.
**Contact:** Scott Silverston, Wisconsin Department of Transportation, scott.silverson@dot.state.wi.us

## Recurring Event Traffic Management

Southeastern Wisconsin is host to various special events throughout the year ranging from sporting events to rock concerts, all attracting a large number of visitors from around the region. In particular this case study will focus on two events, both being music festivals/concerts. Summerfest is an annual music festival that takes place at the Henry W. Maier Lakefront Festival Grounds near downtown Milwaukee and within a close proximity of several major freeways. The second highlighted event is the Grateful Dead Tour that took place at the Alpine Valley Music Theatre in the rural Wisconsin city of East Troy in Walworth County.

## Combining Resources and Integrating Technology

In 1995, a number of key components added to the local transportation system as part of an Intelligent Transportation System (ITS) early deployment package, MONITOR, set the stage for special events planning and traffic management in the future. Also in 1995, the Traffic Incident Management Enhancement Program (TIME) was conceived consisting of four inter-related components: 1) special events and construction, 2) emergency response, 3) corridor traffic management, and 4) public information. TIME has been the catalyst of multi-jurisdictional coordination and collaboration regarding regional transportation issues.

The importance of special event transportation planning was recognized through a review of incident management procedures and programs. Wisconsin DOT (WisDOT) and planning partners began to collaborate on traffic issues related to recurring events such as Summerfest (attracting 1 million people over the course of eleven days), the State Fair and professional sporting events. Planned special events have tangible elements of time, location and content that lend themselves to early coordination unlike unpredictable, unplanned incidents such as a major traffic accident.

**Throughout the process, additional challenges have been recognized such as the compounding effect of numerous events, even if they are small in scope, occurring at the same time**

## Summerfest

Summerfest is an annual, eleven-day outdoor music festival that starts during the last week of June and lasts through the Fourth of July weekend. Summerfest attracts approximately 100,000 patrons per day and over 1 million annually. It's been estimated that approximately 45% of all attendees are out of town travelers.

Since parking on-site is limited near the venue, alternative means of providing transportation and informing festival visitors with traffic, alternative route and parking information were essential. In order to manage the steady influx and departure of Summerfest attendees, several Wisconsin DOT field components and other regional resources were utilized. Managing traffic for Summerfest requires high level interagency coordination on the part of WisDOT, Milwaukee County Sheriff's Department, City of Milwaukee Public Works and Police departments, MCTS, and Summerfest Staff. A scenario based Traffic Management Plan was in place to inform travelers of traffic conditions and detour information.

For Summerfest, several transit enhancements were deployed including expanded transit and shuttle bus service. Temporary access improvements including bus only access to closed freeway ramps as well as bus only lanes and one way traffic patterns increased transit effectiveness and reliability during the event. Other operational measures such as providing round trip fares and separate staging areas for expanded shuttle service expedited passenger loading.

### Grateful Dead Tour

The Grateful Dead Tour in 1989 held at the Alpine Valley Music Theatre in East Troy, Wisconsin was attended by nearly six times as many people as expected (200,000 instead of 35,000). At the time, a coordinated Traffic Management Plan was not in place. Attendees arrived earlier and stayed later than the venue itself and damages to personal property, severe congestion on local roads, and inadequate emergency access were consequences of the 1989 Tour.

Thirteen years later, local law enforcement officials requested the assistance of the Wisconsin DOT to create a Traffic Management Plan that would reduce or possibly eliminate the congestion and problems experienced in 1989. On June 26, 2002, a Concert Management Plan was created after approximately 5 weeks of planning time consisting of four sub-plans, 1) Traffic Management, 2) emergency government, 3) weapons of mass destruction, and 4) emergency medical.

The plan implemented several traffic control measures to guide and control traffic including portable VMS, type 3 barricades and traffic cones, portable lighting units, ATV/bicycle/equestrian patrols, HAR, and a significant law enforcement presence. In addition, a nearby permanent WisDOT Rest Area was temporarily utilized as a remote command center for Walworth County Sheriff Department and a WisDOT remote TOC.

### Indicators of Successful Event Planning

Special events planning in southeastern Wisconsin has lead to the development of a number of tools including the Severity Level Matrix. Developed in coordination with local law enforcement and event sponsors, the Excel-based Matrix indicates anticipated level of response based on event criteria such as predicted attendance and road closures.

WisDOT continues to work with local agencies and event planners on special event transportation planning. While mitigating traffic congestion for special events is often limited by transportation facilities or time of day, agencies continue to give due diligence to safe, efficient, and informed traffic management. Throughout the process, additional challenges have been recognized such as the compounding effect of numerous events, even if they are small in scope, occurring at the same time.

### Summerfest

Quantitative effectiveness data for the Summerfest Traffic Management Plan is limited. However, MCTS ridership data for Year 2000 listed below provides an indication of success:

- Approximately 25% of the total attendance utilized bus transportation.
- The Downtown Shuttle provided 100,000 rides.
- 300,000 riders utilized the Freeway Flyer service from 13 park-and-ride lots.

### Grateful Dead Tour

The two-day Grateful Dead reunion took place on August 3-4, 2002 without serious incident. Approximately 37,000 people attended the reunion, not the expected 100,000. Attendees and residents followed the traffic guidance. During the entire two-day event, 123 citations were issued for various charges and 15 arrests were made, which is a significant decrease compared to 1989. Public information campaigns, "If you don't have a ticket, don't come" and national media attention were successful in detouring impromptu concert goers without tickets from loitering the venue.

As a result, Walworth County adopted an ordinance (Ordinance No. 232-11/02 Sec. 10-28 a) stating that an event licensee is responsible for reimbursing the County for the cost of providing extraordinary governmental services required as a result of an event. Grateful Dead Tour promoters were required to pay the County $15,000 in additional fees.

# Seahawks Stadium (Qwest Field) - Seattle, WA

**FAST FACTS ABOUT:** Seahawks Stadium (Qwest Field)

**Types of TDM:** Mode Choice
**Keywords:** Special events, multi-jurisdictional coordination, neighborhood impacts, stadium construction, parking reduction goals
**Area Demographics:** Professional sports stadium and adjacent exhibition center proximate to other regional venues and I-15. Seahawks Stadium is situated on the former Kingdome site surrounded by residential land uses.
**Program:** Transportation Management Program (TMP) was a condition of project (i.e. Stadium) approval. TMP implementation roles and responsibilities are clearly defined.
**Results:** Coordinated approach to demand management for special events. In the first year of the program, mode split goals were surpassed.
**Contact:** David Markley, Transportation Solutions, Inc.

## A New Stadium for Seattle

In the late 1990s, as plans for a new football and soccer stadium began to take form, public agencies and the private sector acknowledged the importance of a balanced Transportation Management Program (TMP). The TMP needed to be consistent with the region's approach on engaging stakeholder involvement and preserving the quality of life and the natural environment.

In 1998, Washington voters approved Referendum 48 allowing the use of public funds to build the stadium, an adjacent exhibition center and a parking structure. The referendum also created the Public Stadium Authority (PSA) to provide public representation as part owner. The new Seahawk Stadium is west of I-5 and north of Seattle Mariner's Safeco Field. The site is where the former Kingdome stood within Seattle's Pioneer Square neighborhood. In 2000, the Kingdome was imploded and construction began. Two years later, the facility was completed within the $430-million budget and ahead of schedule. Seahawk Stadium was designed to host professional football and soccer games with a seating capacity of 67,000. The adjacent exhibition center typically hosts non-sporting events with up to 15,000 attendees.

**The TMP is explicit regarding roles and responsibilities for TMP planning and implementation by assigning responsibility in one of four ways: exclusive, lead/ coordination, partner, or advocate.**

## TMP Sets the Stage

As transportation and parking mitigation for the Environmental Impact Statement (EIS) prepared for the project, the Transportation Management Program (TMP) was born. The Seattle Department of Construction and Land Use (DCLU) required that the conceptual TMP contained in the Final EIS be further developed and committed to as a condition of project approval. The TMP has built on the success of other local projects including the TMPs for prior Kingdome Stadium, the new Safeco Field, and the Seahawk's temporary use of the University of Washington's Husky Stadium during construction. The TMP was designed to minimize personal vehicle use to and from the site by supporting other transportation modes thereby minimizing negative transportation-related impacts to visitors as well as the immediate neighborhood. A number of goals were set as guiding principals for the TMP concerning area residents and businesses. Specific goals included minimizing the impact of event parking on adjacent neighborhoods as well as minimizing access delay and confusion for neighboring residents and businesses prior to, during, and following events. The TMP is flexible in nature with the ability to adapt to tenant changes, travel pattern variations, and transportation improvements as they occur in the vicinity.

The development of the TMP was a collaborative process engaging key stakeholders through a series of meetings including the re-establishment of the Parking and Access Review Committee (PARC), a group previously organized to address transportation and parking issues associated with construction of nearby Safeco Field.

Input on the TMP was obtained from all affected agencies including King County METRO, the Seattle Department of Transportation, the Seattle Police Department, the Washington State Department of Transportation, and the Port of Seattle. The TMP was subsequently approved by the stakeholder groups and forwarded to the DCLU for final approval, which was granted in early 2002 allowing enough time for implementation prior to the stadium opening in August 2002.

The TMP is organized into four strategic program groups, which include: 1) Traffic and Parking Demand Reduction, 2) Management of Resultant Vehicle and Pedestrian Demand, 3) Event Management and Public Information, and 4) Implementation and Monitoring. The TMP is explicit regarding roles and responsibilities for TMP planning and implementation by assigning responsibility in one of four ways: exclusive, lead/coordination, partner, or advocate.

Transportation options for Seahawk Stadium include, but are not limited to, regular Metro transit service, Metro Express Bus Service from Park and Ride lots, charter buses, Sounder train service, and Event Match ridematching service.

### Settling the Score

In order to evaluate the effectiveness of the TMP, it was important to have measurable criteria. Recognizing that personal vehicle use and parking have a significant impact on area traffic circulation and congestion, an index was developed to measure the reduction in personal vehicles traveling to and from events. The index has been defined as the number of personal vehicles per 1,000 persons attending an event.

The index is directly affected by the use of transit and other alternative modes of travel and average vehicle occupancy for the personal vehicles that do travel to the event. Based on historical travel data for the Kingdome and applying performance assumptions for each program contained in the TMP, an estimated mode split was derived that was then used as the basis for performance goals for the new stadium in terms of cars per 1000 attendees. The index-based approach has proven to be well-suited as an evaluation tool since it allows for varying degrees of attendance and time of day. The table below indicates performance goals (less than or equal to) for a single event occurring at any given time.

**Single Event Performance Goals**

| | Vehicles per 1,000 Attendees | | | |
|---|---|---|---|---|
| **Event Type and Timing** | **Kingdome Baseline (1998 and 1999)** | **2002** | **2003** | **2004+** |
| **Stadium Weekend** | **340** | **319** | **298** | **277** |
| **Stadium Weeknight** | **370** | **349** | **328** | **307** |

Although scheduled events at Safeco Field, Seahawks Stadium and the exposition center were never to occur concurrently or even within four hours of one another, an additional set of goals were established for dual events. Prior to the City of Seattle's approval, a "Dual Event Agreement" was established eliminating the possibility of having two events with a combined attendance of over 58,000 occurring within 4 hours of each other without a special TMP.

An initial review of 2002 results indicate that mode split goals have been surpassed. The non-auto mode split was surveyed at between 25% and 30% which exceeded initial projections of 20%. Success can not be directly attributed to any single mode of travel, but is reflective of the range of options available including Park and Ride facilities, transit service, ferry and rail services as well as bicycling and walking.

# Pac Bell (SBC) Park - San Francisco, CA

**FAST FACTS ABOUT: Pac Bell (SBC) Park**

**Types of TDM:** Transit service improvements, information and incentives, and parking management
**Keywords:** Special events, multi-jurisdictional coordination, transportation management plan, neighborhood impacts, parking pricing
**Area Demographics:** Professional sports stadium in rehabilitated warehouse district proximate to regional commuter rail and light rail service. PacBell Park (now SBC Park) is situated in South or Market district adjacent to San Francisco Bay.
**Program:** Transportation Management Program (TMP) was a required by City. Ballpark Transportation Coordinating Committee appointed to develop TMP among stakeholders.
**Results:** Achieve objective of 50% of fans arriving by non-auto modes. Parking lots never full to capacity.
**Cost of Program:** $1.5 million spent on transportation facility improvements and information campaign.
**Contact:** Gerald Robbins, City and County of San Francisco Planning Department

## A New Downtown Ballpark for the SF Giants

Pacific Bell Park, the San Francisco Giants 41,000-seat "downtown ballpark," opened in March 2000. The ballpark is located alongside San Francisco Bay, approximately one mile (1.6 km) south of the center of downtown San Francisco. The ballpark is located in the South of Market Area (SOMA) of San Francisco, a former warehouse district that in recent years has become a popular location for new technology firms and high-density residential development. The ballpark site is relatively small and is bounded by water on two sides. Unlike most sports stadia, PacBell park and its parking lots were constructed almost entirely with private funds. As a result, very little funding (about $1.5 million) was available for off-site transportation improvements, such as improved roadway, transit or pedestrian facilities. However, the Giants promoted the downtown site, in part, because of its proximity to regional transit and existing commuter-oriented parking supply. Additionally, the ballpark planners also hoped that many downtown workers would walk or ride bicycles to PacBell park on weekdays. Traffic concerns included the fact that weekday afternoon ball games would be over within close proximity to the start of the evening rush hour.

**The Giants and regional transportation agencies educated fans on the potential traffic and parking problems and the range of convenient and affordable transit options.**

## TMP Required by City

Due in part to concerns of local residents and businesses about traffic congestion, particularly for weekday afternoon games, the City and County of San Francisco required a Transportation Management Plan (TMP) be developed and approved to assure efficient transportation operations and minimal impacts to the surrounding neighborhoods. A Ballpark Transportation Coordinating Committee (BTCC) was appointed to develop the TMP and garner buy-in from affected parties. One key objective of the TMP was to maximize the use of non-auto modes by baseball fans, particularly public transit.

**The TMP included the promotion of existing and new transit services:**

- Caltrain commuter rail service terminus adjacent to the ballpark.
- A new LRT line from Caltrain to BART Embarcadero station.
- Nearby BART regional rail under Market Street.
- New ferry service to the adjacent China Basin Ferry Terminal.
- Various SF Muni bus lines and regional bus service to the Transbay Terminal.

PacBell has 5,000 dedicated parking spaces in lots located across Mission Creek. New residential area parking restrictions were imposed and several streets and lanes closed during games (including access routes to the parking lots and regional transit service).

Finally, a set of transit promotional activities and incentives were part of a comprehensive marketing campaign called "Your Ticket Home" and were funded by the Giants, the Metropolitan Transportation Commission, and several corporate sponsors. The campaign was designed to entice first time user to try transit and included the following components:

- A pocket-size pocket information guide for fans and all season ticket holders.
- A transit information hotline answered by the regional ridesharing organization.
- The opportunity to purchase transit tickets by mail (resulting in over $100,000 in advanced fares purchases).
- An incentive program that rewarded Giants fans points toward their fan appreciation program for purchasing transit tickets.
- Promotion of the Your Ticket Home campaign on Bay Area trains and buses serving the ballpark.
- The deployment of "Transit Ambassadors" to answer questions and guide new riders through transfers and fare collection particulars.

### Better than Expected Results

The primary measures of success were the proportion of fans arriving by transit and the severity of traffic and parking congestion. During the first year in PacBell Park (renamed SBC Park in 2004), the ballpark and its TMP achieved a 50% non-auto mode split and the dedicated parking lots never reached capacity.

**Half of Giants fans arrived by non-auto modes and parking lots were never full to capacity due to the effectiveness of the TMP.**

Part of the evaluation of the TMP's effectiveness was a comparison of the first year operation of PacBell Park with 3Com (formerly Candlestick Park). Some key comparisons are provided below and bear witness to the success of the TMP:

| | 3Com Park | PacBell Park |
|---|---|---|
| Seats | 58,000 | 41,000 |
| Dedicated Parking Spaces | 8,800 | 5,000 |
| Parking Fee | $6 | $15-20 |
| Other Nearby Parking Spaces | 10,000 | 2,000-3,000 |
| Percent on Transit | 3-4% | 34-41% |
| Percent Walking | 0% | 5-8% |
| Percent in Autos | 96% | 48-58% |
| Average Auto Occupancy | 2.5 fans per car | 2.8 fans per car |

What do the Giants and City of San Francisco attribute the high transit usage and lack of parking and severe traffic problems? First, pre-opening public information not only educated fans as to the lack of parking and congested downtown streets, but one the range of affordable transit options. Pre-paid transit ticket opportunities and a high proportion of advance payment season ticket holders provided fans with ample time to plan their trip to the ballpark and reduce spur of the moment travel (more commonly made by car). A significant percentage of fans at weekday (32%) and weeknight (28%) games came to the ballpark directly from work.

The high level of transit use at PacBell can be attributed to the following factors: 1) availability of reliable, efficient, and affordable mass transit; 2) commitment to quality transit service by regional providers and the Giants made possible by predictable ridership; 3) high parking costs and limited availability; 4) close proximity to a large downtown population base; a well developed and executed transportation management plan; and 5) public expectations as to the severity of traffic and parking problems.

# Zion National Park - UT

**FAST FACTS ABOUT:** Zion National Park - UT

**Types of TDM:** Mode Choice
**Keywords:** national park, shuttle system, sustainable practices, parking restriction, road closure, alternative fuel vehicles
**Area Demographics:** Utah's first national park, annual visitation of 2.61 million in 2002.
**Program:** Mandatory summer shuttle system since 2000 serving Zion Canyon and Springdale. Parking is restricted on Scenic Drive.
**Results:** 75% of Zion's annual visitors use the system. In 2000, the shuttle system reportedly reduced nearly 1,200 vehicle trips per day and almost 11,000 vehicle miles traveled per day.
Cost of Program: $12 million for the initial capital investment and approximately $2.5 million in annual operating costs.
**Contact:** Ron Terry, Zion National Park

## Protecting Assets

Zion National Park, located in southwest Utah, was designated as the state's first national park in 1919. The Park, associated with deep canyons, dramatic cliffs and the Virgin River, is nearly 230 square miles although most of the visitation in focused on Zion Canyon. The Park is accessible from the south, west and east with the southern access through the town of Springdale. The usual approach to the southern access is from the west via State Route 9.

In the early 1990s an escalated number of visitors to the Zion Canyon made it increasingly difficult for visitors to find parking along the Zion Canyon Scenic Drive. In 1999, the annual visitation was 2.4 million. Increased visitation resulted in traffic congestion, inadequate parking, destruction of natural resources and a diminished visitor experience in the 6-mile upper portion of the Zion Canyon. On an average day during the peak season up to 5,000 cars including tour buses were using the Scenic Drive. Only 400 parking spots were available along the scenic roadway and as a consequence visitors typically double and triple parked destroying vegetation.

## Bold Idea for Zion

Several alternatives were considered by Park officials prior to implementing the existing shuttle program. Alternatives considered but rejected included increasing parking in the Canyon, closing the scenic drive once the parking filled, and providing a voluntary shuttle system. The selected alternative included the implementation of a mandatory shuttle system using propane-powered vehicles during the peak tourist season.

The shuttle system began operation on May 26, 2000 allowing only the Park's shuttle busses to operate north of the Zion Canyon Visitor Center during the peak summer season. An exception has been given to allow employees and guests of the Upper Lodge to continue using the Scenic Road although they are encouraged to use the shuttle system once their vehicle is parked. Parks Transportation, Inc. currently operates 30 NPS-owned propane-powered shuttle buses. Approximately 20 of these buses operate exclusively within the park with attached trailers capable of holding a total of around 66 passengers each. The shuttles have operated daily from the beginning of April though the end of October since 2000. Personal vehicle access is only permitted from November to late March on the Scenic Drive except for Upper Lodge employees and guests.

The shuttle system operates in two loops. One route makes six stops within the town of Springdale and the other has eight stops along the Scenic Drive. The Visitor Center is the central transfer point for both the Zion Canyon route and the Springdale Loop. Although parking is permitted at the Visitor Center, it is typically full by late morning during the peak season. Parking at the Visitor Center is equivalent to the 400 spaces that used to be available to visitors on the Scenic Road prior to implementation. Some of the Scenic Road parking has been converted to bus stops, but most of the spaces remain providing general parking during the off-peak season when the road is again accessible to all.

Visitors are encouraged to park in Springdale and use the shuttle system to access the Park free of charge. Springdale has provided approximately 1000 parking spaces for Park visitors. Shuttles operate within the Canyon at 6 minute headways during the middle of the day and approximately every 10 to 15 minutes in the morning and evening. Between 6:30 - 7:30 AM and 9:00 – 11PM frequency is reduced to every 30 minutes. Each full shuttle bus, which has a capacity of 66 people has the potential to replace 25 cars.

The shuttle system is an integral component and was the catalyst of a large-scale improvement project including the construction of a new Visitor Center and a bus maintenance facility, as well as a 3-mile pedestrian path, the Pa'rus Trail. Additional streetscape and safety improvements near shuttle stops were also included in the project. The Visitor Center showcases award-winning energy efficient design and sustainable development practices. Like a number of other National Parks, Zion is also testing alternative fuel vehicles to assess environmental impacts. Zion has two electric trams each holding up to 36 passengers.

**The town of Springdale has directly benefited from their Partnership with the Park on the shuttle system. Today, over half of the system operates within Springdale thereby providing free transit service to the residents.**

The total cost of the improvement project was $27.4 million, including $9.4 million for shuttle buses and trailers. The bus maintenance facility cost an additional $2.6 million. Annual operating costs of the shuttle system are estimated to be $2.5 million, or about one dollar per visitor. The street, landscaping, and sidewalk improvements surrounding the Springdale shuttle stops were financed by federal enhancement funds secured by the Utah Department of Transportation.

## Benefits Started on Day One

The shuttle system has had a significant impact on traffic operations and the natural environment within the Canyon. The 2000 operational period lasted from the 26th of May until the 29th of October, during which more than 1.5 million passengers utilized the system. The effectiveness data below indicates the marked success of the system during its' first year of operation.

| Year 2000 Shuttle System Effectiveness | |
|---|---|
| **Shuttle Passenger / Day** | **2,994** |
| **Reduction in Vehicle Trips / Day** | **1,183** |
| **Reduction in Vehicle Miles Traveled / Day** | **10,877** |

Source: 2001 Draft Report on Air Emissions Inventory for Zion National Park

Current estimates indicated that about 75 percent of the 2.5 million annual visitors ride the Zion Canyon shuttle. In the programs second year, 2002, annual shuttle boardings (2.35 million) almost equaled park visitation (2.61 million).

The shuttle system has been attributed with eliminating much of the vehicle congestion, parking conflicts, and aesthetic and noise related issues associated with vehicle use in the Park. Research is underway to quantify the effect that propane-powered shuttle buses have had on reducing noise levels. Prior to implementing the system, a noise impact assessment concluded that a considerable portion of the Canyon noise was a result of commercial tour bus traffic which is now prohibited north of the Visitor Center.

The town of Springdale has directly benefited from their Partnership with the Park on the shuttle system. Today, over half of the system operates within Springdale thereby providing free transit service to the residents. Likewise, the Park has also benefited from collaborating with Springdale. Without the partnership, the Park would have had to invest in additional roadway and parking infrastructure to support the shuttle system. The partnership has been attributed with reducing Park roadway construction needs by 40% and parking development by 54%. Aside from providing a transportation alternative for Park visitors and staff as well as Springdale residents, the shuttle system has indirectly promoted the local economy. Springdale experienced a 5 percent increase in retail sails during the first year of shuttle operation

# City of Aspen - CO

**FAST FACTS ABOUT:** City of Aspen - CO

**Types of TDM:** Mode Choice
**Keywords:** tourism, shuttle service, paid parking, marketing, ridesharing, recreation, HOV
**Area Demographics:** Premier winter sports and recreation destination in west-central Colorado. Peak season visitor population nearly matches resident population.
**Program:** Various programs including, carpool parking incentives, mandatory shuttle service, paid parking programs, and aggressive marketing.
**Results:** Money generated from the paid parking program directly benefits demand-side strategies. Traffic volumes have not exceeded 1993 volumes. Parking occupancy reduction of 10%.
**Cost of Program:** Unavailable; numerous departments cover resource needs. As an indication, the City's marketing budget (including printing costs) for 2003 was approximately $50,000.
**Staff:** The City of Aspen has one full-time individual dedicated to demand-side strategies.
**Contact:** Lynn Bader, City of Aspen, www.aspenpitkin.com

## Aspen at the Top

Aspen, Colorado is recognized as a premier recreational and resort destination in the western United States. Located approximately 220 miles west of Denver, Aspen is home to less than 15,000 permanent residents. Visitors push the seasonal population to 25,000 during the winter peak ski season. Aspen is home to the Aspen Skiing Company (ASC) which operates two luxury hotels and 15 restaurants. At the peak winter season, ASC employs 3400 people, and is the largest employer in the Valley.

Aspen is accessible via Colorado Highway 82 (CO 82), which is currently under construction. The C0 82 project is a 40-mile corridor improvement from Glenwood Springs, Colorado at I-70 to Aspen. A key project component includes the installation of high occupancy vehicle (HOV) lanes. When completed, the HOV facility will stretch 16 miles from Basalt to Aspen. The HOV lane has also served as a construction traffic impact mitigation tool, reducing the number of vehicle trips passing through the construction zones along CO 82. By using temporary signing and striping during construction, the Colorado Department of Transportation (CDOT) was able to start providing a time-saving advantage to HOVs.

Aspen has implemented transportation goals to preserve the physical environment and control future traffic impacts on the community. The 1993 Aspen Area Community Plan adopted a transportation goal to limit the traffic entering Aspen to 1993 volumes. Traffic volume counts are taken continuously at Castle Creek Bridge and are summarized monthly to ensure that the goal is being met. The goal has been met every year since. The City of Aspen has adopted several transportation goals besides limiting traffic volumes such as reducing parking occupancy rates downtown and offering viable alternatives to driving alone.

## Program Description - Complementing Strategies

Aspen exemplifies the cohesion of a range of demand-side strategies, in most cases implemented by a number of different organizations (local transit agency, non-profit, local jurisdiction, etc.), successfully contributing to vehicle trip reduction. The section below highlights a few of the Aspen's programs although success is difficult to attribute to only one or two strategies.

**Area-wide Rideshare** - The City of Aspen coordinates the local rideshare arrangements. The distribution of daily Carpool Parking Permits provides an indication of the success of their ridesharing program. To encourage carpooling, vehicles with more than 3 people entering the downtown area can stop at a kiosk and receive a Carpool Parking Permit that allows that vehicle to park in a designated area free of charge all day. Approximately 16,000 daily permits

are issued annually. Coupled with the high-occupancy vehicle lanes and transit signal priority, the distribution of these permits is one of the most successful incentives to rideshare.

**Transit Service** - The Roaring Fork Transportation Authority (RFTA) provides daily fixed route and demand response transit services. RFTA operates partially on a local sales tax. The local jurisdictions including Aspen and Glendale contribute proportionately to the transit service they receive. During the summer, RFTA operated the Maroon Bells shuttle service to the Maroon Bells National Recreation Area. Personal vehicle traffic is restricted between 9:00 AM and 5:00 PM daily allowing access only to shuttles and those with special needs. The combined June and July 2003 ridership was over 40,000 passengers.

**Park and Ride Lots** - Highway 82, the main north-south roadway has eight P&R lots available to commuters. The lots range in size between 10 and 150 spaces. The neighboring Town of Snowmass hosts an aggressive intercept parking program in which perimeter parking lots are available to leave vehicles and use transit. The alternative to intercept parking in Snowmass is to buy a parking permit to park in the core area.

**Employer-based Support Programs** - The Transportation Options Program (TOP) is comprised of 32 businesses and over 6000 employees. Participating employers provide an employee transportation coordinator (ETC), nicknamed TOP Dogs, to attend meetings and disseminate information to employees. TOP has also negotiated the creation of the Zone Pass with Roaring Fork Transit Association (RFTA), which enables individualized transit options to encourage employers to purchase transit passes for their employees. Other TOP incentives include schedule display boards, email traffic alerts, and monthly newsletters. TOP is operated on funds from the paid parking program. All TOP services are free.

**Parking Incentive Programs** -The paid parking program, Pay and Display, has been implemented with the highest rates charged downtown. One Pay and Display ticket covers the entire block with a maximum of two hour parking. Aspen also has traditional parking meters. Money generated from Aspen parking programs is applied directly towards other transportation management programs.

**Marketing** - Find Another Way Day is an annual marketing campaign to encourage commuters to try another mode of travel. For the last 7 years, the City of Aspen has sponsored this event to encourage people to leave their car at home and use another means to get around town or commute to work. Find Another Way Day events include entertainment, food, prizes and free bicycle safety checks. In 2001, a Customer Appreciation event was also added to Find Another Way Day to enable citizen's not living and working near the downtown core area to participate. In 2003, the event became Find Another Way Week with daily events happening throughout the Valley. In 2002, the City implemented "Carpool Patrol" in cooperation with local radio stations by interviewing and giving prizes to carpoolers who stopped at the kiosk.

## A Decade of Success

The City of Aspen has designated one full-time individual to demand-side programs. The program is evaluated yearly and considers a documented goal and outcome plan. Aspen has found it fruitful to track quantifiable measures of effectiveness such as the number of transit passed sold, Carpool Parking Permits distributed and traffic volumes as well as performing annual reviews with their employer participants to ensure that their needs are being met. Each year, specific goals are outlined and later the outcome is documented.

The programs highlighted above have collectively but not exclusively contributed to achieving transportation goals. As of 2003, revenue generated from the paid parking program generated $600,000 for program support and $300,000 for future transit investment. This program is also attributed with reducing parking occupancy downtown by 10%. The City has also displayed flexibility with their programs to ensure that goals are met. For example, in 2003, parking rates were increased to cover higher transit costs as well as to preserve the parking occupancy rates downtown. In 2003, the City of Aspen became the first and only city in the nation to be awarded best workplace for commuter status by the US EPA. The City's program also received the 2003 Outstanding Service Award from the Association for Commuter Transportation.

# Lake Tahoe Basin - CA

**FAST FACTS ABOUT:** Lake Tahoe Basin - CA

**Types of TDM:** Mode Choice, Route Choice
**Keywords:** tourism, trolley service, private shuttle service, gondola, transportation management association, recreation
**Area Demographics:** Mountain communities surrounding Lake Tahoe, an attractive year-round recreation and vacation destination. Historically, a peak Friday in August experiences the highest annual daily traffic volumes. About 56,000 live in the Tahoe Basin year-round.
**Program:** Various programs including two summer trolley services and private shuttle services catering primarily to Basin visitors. Private investments such as the Heavenly gondola.
**Results:** 20% of Heavenly's visitors arrive via the gondola. In 2001, the combined trolley service ridership was nearly 90,000 passengers during a limited summer operational season.
**Cost of Programs:** Limited information available. In 2001, Nifty 50 operated on a budget of $200,000 which included 5 vehicles. During the same year, the TNT / TMA operated with a budget of about $160,000.
**Staff:** Limited information available. South Shore TMA has one full-time person. TNT / TMA utilizes one full time director and one part-time employee.
**Contact:** Dick Powers, South Shore TMA and Jennifer Merchant, TNT / TMA

## Area Characteristics

The Lake Tahoe Basin incorporates two states and five counties between the Sierra Nevada and Carson mountain ranges. Approximately two-thirds of the Basin is in California and one-third in Nevada. The area can be characterized as mountainous with limited areas of level terrain. Lake Tahoe itself is twenty-two miles long and 12-miles wide with 72-miles of shoreline.

The population of the Lake Tahoe Basin consists of residents and visitors. The Basin economy is significantly dependent on resort, recreational, and gaming industries. The resident population lives and works in the basin, and the influx of visitors arrive during the winter ski season (December through March), and the summer seasons (June through August). However, the month of August has the highest travel demand in terms of peak hour traffic volumes on the roadways. Currently (according to 2000 census data) about 56,000 people reside year-round in the Basin. Population growth through 2010 is expected to be modest in contrast to the rest of the four counties of which the Tahoe Basin is a part. The land use restrictions and the physical carrying capacity of the Basin will tend to maintain steady linear trends in population growth.

The roadway network within the Basin consists essentially of a "ring road" with a handful of regional access points. Most of the roadway network supporting the Basin can be classified as 2-lane highway and local collectors and arterials. Traffic entering the Basin has access from several points. The most direct access route to the City of South Lake Tahoe from points west and east is U.S. 50. State Route (S.R.) 89 and S.R. 267 provide access from Truckee and the I-80 corridor on the north. S.R. 89 through Tahoe City consistently maintains the highest traffic volumes entering the Basin both during the peak month and yearly. Except for U.S. 50 from the east, all the access routes are two-lane highways.

In response to the TRPA air quality threshold standards, the 1992 Regional Transportation Plan (RTP) established a VMT threshold standard to reduce vehicle miles of travel (VMT) by 10 percent of the 1981 base values. A number of demand-side programs have been implemented in an effort to obtain the VMT threshold.

## Public and Private Transportation Investments

The Tahoe Basin is served by two publicly operated transit systems, tourist oriented trolley services, and a number of privately operated shuttle systems. Demand response service is offered by many agencies, and subsidized taxi services are also available. Basin agencies have realized investment in existing infrastructure

with comprehensive studies concluding with detailed recommendation for pedestrian and bicycle facilities as well as enhancements to the existing ITS initiatives. Highlighted below are a few of the innovative programs and TDM measures that the Basin has successfully implemented in recent years.

**Visitor-based Trolley Service** - In addition to the two established local transit agencies operating in the Basin, there are two successful summer trolley systems operated by the local Transportation Management Associations. The north shore service, Tahoe Trolley, is free at night but requires a minimal fare during the day. Service is available for approximately 60 days during the summer. In 2001, 18,000 riders used the service despite a 25% service cutback due to the limited availability of drivers. The south shore of Lake Tahoe supports a separate trolley system called Nifty 50. As a tourist-focused system, Nifty 50 operates approximately 80 days during the summer months from 10AM to 10PM. In 2001, 70,000 passengers used the service.

**Privately Operated Shuttle Service** - Several privately operated shuttle services also operate in the Basin. Casinos and hotels offer daily shuttle services while the major ski areas offer shuttle services either on a contract basis or privately during winter months. Services are available on both the north and south shore areas. As documented, the casino shuttles offer a significant service providing nearly 500,000 one-way passenger-trips per year. North shore ski areas to the south shore also provide service. Coordination of services between the public transit system on the south shore and the ski shuttles is afforded by use of common bus stops. The Tahoe Queen operating out of the Ski Run Marina also provides a waterborne ski shuttle service between the north and south shore areas.

**Heavenly Ski Resort Gondola** - In 2000, Heavenly Ski Resort installed a gondola providing direct access from the hotels, casinos and center of South Lake Tahoe to the resort. The gondola affords mountain views covering 2.4 miles for the 17-minute scenic ride. The new gondola recently won the Silver Eagle Award from the National Ski Areas Association, recognizing the improvement the gondola has made to the resort and community in reducing vehicle trips while minimizing visual impacts and environmental disturbances. Heavenly reports that 20% of their winter visitors access the ski resort via the gondola, which has helped reduce traffic congestion in South Lake Tahoe.

**Transportation Management Associations** - Over the last ten years, a number of measures have been implemented in the Basin through two community-based transportation management associations (TMAs).

The Truckee/North Tahoe TMA (TNT/TMA) has been a local leader in addressing transportation issues as well as disseminating information and providing transportation alternatives. One of their most successful programs is the Tahoe Trolley, which provides a summer season service (approximately 60 days) in and around north shore communities, resort areas, and to Emerald Bay providing a link to the south shore transit options. In addition, the TNT/TMA has taken the lead in coordinating expanded winter transit service for the north shore. Currently, one full-time and one part-time employee operate the TMA with an annual budget of about $160,000. 44% of the required revenue is generated from member contributors including local jurisdictions and area resorts.

Serving South Lake Tahoe, the South Shore TMA has focused primarily on appealing to the visitor market of the Basin. Formed in 1994, the TMA initiated the successful summer trolley program, Nifty 50 Trolley. The TMA is responsible for maintenance, drivers and securing funding as well as all other logistical matters related to the service. The South Shore TMA is actively involved with local planning efforts and is leading the effort to institute the coordinated transit system (CTS), which would combine both public and private transit services of the south shore. The South Shore TMA and NDOT are also working on securing funding to expand the existing seasonal shuttle service and to provide service to employees commuting between the Tahoe Basin and the Carson Valley.

### Measures of Effectiveness

Programs highlighted above contribute positively to the overall transportation and visitor experience within the Tahoe Basin. Summarized below are indicators of program performance provided by project sponsors:

- Seasonal Trolley Service Ridership (Summer of 2001):
  - 18,000 passengers on Tahoe Trolley, north shore.
  - 70,000 passengers on Nifty 50, south shore.
- 500,000 one-way passenger trips per year provided by private casino shuttles.
- 20% visitor using the gondola to access Heavenly from South Lake Tahoe versus arriving by vehicle.

# I-15 Reconstruction - Salt Lake City, UT

**FAST FACTS ABOUT:** I-15 Reconstruction

**Types of TDM:** Mode Choice, Route Choice, Time Choice, Trip Substitution Choice
**Keywords:** ATMS, design-build, special events, Olympics, 511, light rail, capacity enhancement, TOC
**Area Demographics:** Salt Lake City metropolitan area. Recent 7-year design-build reconstruction project of I-15 including significant investment in ATMS technology. The project was complete prior to the 2002 Winter Olympic Games.
**Program:** CommuterLink (TOC, control and field equipment), marketing and outreach during reconstruction, coordinated special events planning for the 2002 Winter Olympic Games.
**Results:** Commuter Link is expected to save Utah more than $100 million annually.
**Cost of Programs:** Reconstruction = $1.52 billion, Initial ATMS investment = $70 million.
**Contact:** Lawrence Jesse Glazer, FHWA, Jesse.Glazer@fhwa.dot.gov

## Area Characteristics

The Utah Department of Transportation (UDOT) completed the 17 mile reconstruction of I-15 in July 2001. The project was completed in four and a half years at a cost of about $1.52 billion. Instead of rehabilitating segments of the highway, UDOT decided to rebuild the entire corridor. To meet an aggressive schedule and, in particular, aiming to finish construction before the 2002 Olympic Games, UDOT completed the project using a design/build approach.

The original I-15 infrastructure, built in the 1960's, was designed to support half the traffic capacity it served in 1997. This capacity-enhancing project included adding two general purpose lanes, two high occupancy vehicle (HOV) lanes and auxiliary lanes between interchanges. Project components also improved access to downtown Salt Lake City, provided railroad grade-separations, replaced deficient bridges and utilized single-point interchange design. The project mitigated conflicting merging traffic movements and significant traffic congestion.

## Program Description

UDOT recognized that the project would have significant consequences to traffic circulation and operations during all project stages. The contractor was required to maintain two lanes of traffic in each direction during peak commute periods as well as preserve critical freeway-to-freeway movements and access to downtown at all times. When interchanges and cross streets were closed, no two adjacent interchanges were inaccessible at the same time. Incident Management programs were expanded and supplemented by contractor-required courtesy patrols. As part of the reconstruction, emergency pullout locations were constructed along the corridor since limited shoulders were provided for disabled vehicles.

UDOT used a combination of demand-side strategies to maintain traffic during reconstruction. The ITS system (CommuterLink) was installed in three major pieces: 1) the Traffic Operations Center (TOC) including the physical building and internal networking equipment, 2) the control software, and 3) field equipment including VMS signs, cameras, and signal controllers. The comprehensive system includes a 511 Traveler Information Line, coordinated signals, ramp meters as well as speed, volume, weather and pavement sensors. UDOT installed the bulk of the $70 million worth of ATMS equipment using a design-build procurement method. CommuterLink was funded mostly by state funds ($52 million) with local ($1 million) and federal ($17 million) contributions.

ATMS technology enabled jurisdictions to monitor construction impacts, respond to traffic accidents faster, and communicate with the motoring public. The UDOT TOC is directly linked to both the Salt Lake City and Salt Lake County Traffic Control Centers and the Utah Transit Authority (UTA) Radio Center to provide seamless communication between jurisdictions.

UDOT also undertook a marketing campaign recognizing that one of the best ways to minimize traffic conflicts and delays on the interstate during reconstruction was to reduce the number of vehicles on the road. Employers and employees were encouraged to participate in ridesharing opportunities provided by UTA and commuter transit services, the Telecommuting Directive, and the Corridor Business Program. Informational services included the use of the internet, highway advisory radio, media outlets, signing, seminars and open houses. The importance of ridesharing and trip reduction was reiterated and promoted by such programs as Skip-a-Trip.

## Evaluation of the 2002 Winter Olympic Games

The ATMS was put to the test for the 2002 Winter Olympic Games which was the largest Winter Games held to date. In total, the Games utilized twelve venues across the region. With 1.5 million tickets purchased, the travel needs were unprecedented. After the conclusion of the Games, an assessment was made on program components.

A number of goals and programs were established specifically for the Games TDM Plan depending on the venue and transportation user group. The two primary user groups considered were spectators and residents. For example, a specific TDM Plan goal was established to reduce background traffic by at least 20%. The strategies implemented to achieve this goal included transit, carpools, shifting work hours and travel routes and times. A follow-up survey with residents concluded that approximately one-fifth of residents changed travel patterns during the Games. Most residents offered that the change was related to an adjustment in daily work hours as opposed to a change in mode or route. In addition, a reduction in day-time truck traffic reduction between 30 -45% indicated by limited date from UDOT's Automated Traffic Recorder (ATR) system also contributed to reducing background traffic. The Olympic Spectator Transportation System (OSTS) was developed to address the transportation needs of the spectator population and included 19 park and ride lots served by shuttle buses, the TRAX light rail system with overflow parking lots and publicly - subsidized shuttle services to mountain venues.

Athlete and media transportation needs were also identified and addressed. A shuttle service was created exclusively for 11,000 members of the media, which operated on fixed routes 24 hours a day. The Athlete Transportation System served 3,300 athletes and officials housed in Olympic Village. The System included over 500 passenger vans, 50 cargo vans, 44 coach buses which operated 24 hours a day. Both media and athlete services were encouraged to use alternate routes.

## Measures of Effectiveness

CommuterLink has already demonstrated its effectiveness. During its first years of operation, CommuterLink has been attributed with the following successes:

- Increased peak hour freeway speeds by 20%,
- Decreased freeway delay by 36%,
- Decreased traffic signal stops by 15%, and
- Decreased Intersection delay by 27%.

Considering the efficiency measures above, CommuterLink is projected to save Utah more than $100 million annually.

An evaluation of the ATMS and TDM Plan components specifically for the Winter Games provide the following results:

- 80,000 unique visitors visited the CommuterLink web site during the Games,
- 511 Traveler Information line daily usage peaked near 4000 calls. By comparison, 511 usage on a typical day in 2002 was around 300 calls.
- Over 2.5 million passenger-trips were recorded on public transit during the Games.
- Park and ride shuttle buses carried one-third of the transit passenger trips.

# I-25 & I-225 Reconstruction - Denver, CO

**FAST FACTS ABOUT: I-25 & I-225 Reconstruction**

**Types of TDM:** Mode Choice, Route Choice
**Keywords:** design-build, corridor reconstruction, construction mitigation, rideshare, transit subsidies
**Area Demographics:** Metropolitan Denver, T-REX includes both light rail construction and highway capacity and safety improvements to I-25 and I-225.
**Program:** TransOptions offers transit and vanpool subsidies, community outreach and education on construction and transportation options.
**Results:** Transit and vanpool subsidies account for a daily VMT reduction of 74,800. Refer to the case study for additional results.
**Cost of Program:** $3 million allocated to TransOptions.
**Contact:** Allison Hodge, Director of TransOptions, HodgeAM@trexproject.com

## Area Characteristics

The I-25 corridor in metropolitan Denver is one of the most overburdened sections of roadway in Colorado. Over the past twenty years the region has experienced intense residential and employment growth leading to increased travel demand and congestion along the I-25 corridor.

In an effort to confront congestion along I-25, the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD) initiated a multi-modal design-build project known as the Transportation Expansion Project, or T-REX. The design-build approach compliments T-REX project goals, which are:

- Minimize inconvenience to the public,
- To stay within the $1.67 billion project budget,
- To provide a quality product, and
- Complete the project on time (2008).

The project is ahead of schedule and is estimated for completion in 2006.

The T-REX project includes both light rail construction and highway capacity and safety improvements. T-REX, a design-build project, will add many new elements to the transportation system including 19 miles of double track light rail, 13 light rail stations (all but one with park & Ride lots), 34 additional fleet vehicles, and a new maintenance facility. The project will also provide additional lanes on both I-25 and I-225 within project limits as well as other safety improvements associated with save ingress and egress.

## Program Description

T-REX owners recognized the potential impact that the large-scale project could have on the motoring public and took steps to minimize inconvenience associated with the reconstruction project. The TransOptions program was formulated in consultation with key community stakeholders as a construction mitigation program designed to assist employers and commuters in dealing with the challenges of traveling to, from and through the corridor during construction. CDOT and RTD dedicated $3 million to the TransOptions program, which included transit and vanpool subsidies, community outreach and education as well as maintaining a project website. The project is now in it's fourth construction season (2004). TransOptions has been recognized as a key element of construction mitigation by providing commuters and employers with incentives to use alternative modes to, from and through the corridor. TransOptions builds on the success of the TMAs and TMOs and established demand-side programs implemented by local jurisdictions including the Denver Regional Council of Government's (DRCOG) RideArrangers.

**Facilitative leadership has helped avoid roles and responsibilities pitfalls. For continued success, it will be important to communicate the role of agency partners to ensure focused but collaborative efforts through established and new partnerships.**

Due to the fluid nature of a design-build project and the foresight of those involved, a number of recent project features have been deployed to manage travel demand during construction. In November 2002, T-REX opened a temporary bus/HOV lane on I-25 to promote the benefit of higher occupancy modes. In May of 2003, T-REX launched a real-time instant email alert system utilizing project ITS components as they became operational. In May of 2003, TransOptions was honored with a TDM Award presented by the Southeast Business Partnership for it's continued commitment to and success with construction related transportation management to date.

## Measures of Effectiveness

Recently, the T-REX TransOptions program has undergone an evaluation of it's first two years (2001 and 2002) utilizing a variety of measures including documentation review, stakeholder interviews, e-mail surveys, and quantitative analyses of program data. The evaluation identifies strengths and weaknesses of the TransOptions program, as well as opportunities and threats for the future of the program.

By reducing daily vehicle miles traveled (VMT) along the T-REX corridor, the TransOptions program is contributing to T-REX's goal of minimizing inconvenience along the corridor. As part of recent analysis conducted by UrbanTrans Consultants, Inc., TransOptions contributed to VMT reduction was measured. Collectively, transit and vanpool subsidies provided by TransOptions have reduced daily VMT by 74,800. The following successes have been cited as contributors of VMT reduction based on analysis completed to date:

- 14 employers purchased Eco Pass which resulted in over 1,200 employee Eco Pass holders,
- 66 commuters purchased ValuPass,
- 318 commuters purchased subsidized transit pass products at 4 Sales Pass Outlets established with T-REX support,
- 80 commuters utilized Commuter Checks to purchase transit products,
- 179 Vanpool riders received T-REX TransOptions subsidies, and
- 9 Vanpools were formed.

A number of TransOptions strengths were documented as part of the evaluation and are seemingly applicable to all highway reconstruction projects. Collaborative, responsive leadership of the TransOptions staff is imperative for the continued interest of project team members including the TMA/TMOs, DRCOG, RTD and the TransOptions TDM Committee. Facilitative leadership has helped avoid roles and responsibilities pitfalls. For continued success, it will be important to communicate the role of agency partners to ensure focused but collaborative efforts through established and new partnerships. Program credibility continues to be strengthened by the presence of a public relations firm on the TransOptions team. Marketing and public relations outreach of the TransOptions program resulted in increased employer and employee awareness of transit, vanpool and carpool. Success is evident measured by the implementation of over 300 events, attended by more than 20,000 persons by the end of 2002. In addition, just as important as providing employers and commuters with subsidized transit and vanpool products, it was necessary to enable the TMA/TMOs and DRCOG the tools to effectively provide those products. TransOptions is flexible in nature, adjusting to user needs.

# Springfield Interchange - VA

**FAST FACTS ABOUT: Springfield Interchange - VA**

**Types of TDM:** Mode Choice, Route Choice, Trip Substitution Choice
**Keywords:** reconstruction, HOV, retail information center, park and ride, commuter rail
**Program:** TDM Program as part of Congestion Management Plan for the Springfield Interchange Improvement Project.
**Cost of Program:** $10 million for TDM program over 8 years
**Contact:** Valerie Pardo, Virginia Department of Transportation

## Area Characteristics

The Springfield Interchange Improvement Project, a major reconstruction project sponsored by the Virginia Department of Transportation (VDOT), is currently mid-way through construction. The multi-phased, $350 million project began in March of 1999 and is scheduled for completion in 2007. The pre-project interchange, where I-95, I-395 and I-495 met, was nearly a mile long linking the three major interstates and serving nearly 400,000 vehicles a day. The original interchange was constructed in the 1960's and was not equipped to handle current or future transportation needs. Traffic forecasts projected volumes to double by 2020. Project improvements include building more than 50 bridges and flyovers, 30 ramps, and installing nearly 200 guide signs and 20 electronic message signs. Among a number of goals, VDOT undertook the Project to improve safety and access while increasing throughput capacity. A main project feature is to barrier-separate HOV lanes, through lanes and local lanes on I-95 to reduce weaving conflicts.

## Program Description

VDOT has worked with federal and local agencies to create a comprehensive Congestion Management Plan ($28 million) including incident management, traffic operations, and demand management. The program allocation is $10 million over 8 years. Specific Plan goals were established to reduce 1,000 vehicles per peak hour and 2,500 vehicles per peak period.

Incident management components include the use of an on-site mobile command vehicle, equipment to respond to hazardous waste spills and traffic incidents of all degrees as well as increased patrols by the police and safety service units. Operational improvements include the installation of cameras to monitor traffic flow proximate to the interchange, a coordinated construction phasing plan, and information dissemination regarding alternate routes and emergency routes. In addition, signal timing adjustments and spot intersection improvements (installing or lengthening turn pockets) were also made. Infrastructure improvements also included capacity enhancements at intersections along parallel routes to accommodate diverted trips. Other specific TDM investments included a 10% increase in Park & Ride spaces, expanded commuter rail service, OmniRide bus enhancements, telework centers, fare discounts for both bus and rail service, and the promotion of vanpools, carpools, and private buspools of more than 30 passengers.

The region has numerous transportation management associations (TMA)s and ridesharing organizations available to users. Currently, bus service proximate to Springfield is free of charge thanks to a state-funded program conceived by the Northern Virginia Transportation Commission, Fairfax County, and the Washington Metropolitan Area Transit Authority (WMATA).

The Project maintains a project website, an information line and utilizes media for public outreach. Commuters or other travelers are encouraged to stay informed about project conditions. VDOT has enhanced information dissemination to the public by opening the nation's first formalized retail Information Center (IC), which is located in the Springfield Mall to help disseminate project information. The storefront station is equipped with monitoring cameras and can provide rideshare assistance and transit information and passes. Additional project elements promoting TDM include High Occupancy Vehicle (HOV) lanes, including the two-lane reversible facility running north to south and roadway operational improvements.

### Measures of Effectiveness

The use of transit, carpooling, and vanpooling in the I-405 corridor has been consistently high due in large part to the success of the HOV lanes and Metrorail line. The challenge of the Congestion Management Plan was to provide additional services that would encourage drivers to change their behaviors. An early survey of single occupant drivers determined the most effective improvements to entice people out of their cars. Demand-side strategies were formulated based on these improvements. With HOV lanes already in place, VDOT was able to offer a time-savings advantage. The public outreach component is proving to be a success. As of May 2003, over 230,000 motorists had visited the Information Center in the Springfield Mall.

The Springfield Interchange Improvement Project is currently in Phase 4 and 5 and continues to operate the Congestion Management Plan established for the Project. As of June 2002, the Congestion Management Plan had been through three evaluation processes and has not been substantially modified. Minor shifts in programmed funds have occurred, but the majority of demand-side strategies are performing at or above their anticipated goals. Even during reconstruction, the original number of through travel lanes is maintained during peak hours.

# Bal Harbour Village - FL

**FAST FACTS ABOUT:** BAl Harbour Village - FL

**Types of TDM:** Modal Shift
**Keywords:** Vanpool Subsidy
**Employer Demographics:** The Village of Bal Harbour is a small community located south of Miami Beach. Traffic congestion is not a problem in Bal Harbour, but traffic around the Bal Harbour area is challenging.
**Results:** 48% drive alone, 12% vanpool, 2% telework, 38% flextime (police officers)
**Cost:** $7,440: 93% = Vanpool subsidies, 7% = staff/management
**Staff:** Minimal staff time and staff costs once program was set up.
**Contact:** Alfred Treppeda, manager@balharbourflorida.com

## Vanpooling: A New Idea Presents Itself

Bal Harbour Village is a small, upscale resort town located in South Florida. With a population of 3,309, the Village has implemented strict growth management policies since its incorporation in 1946. Today, the Bal Harbour Village Manager seeks out ways to sustain Bal Harbour's appeal to both Village employees and in turn to visitors. Despite good bus service, Bal Harbour Village employees are not avid bus riders. The presence of free parking for employees may be one explanation for low bus usage. Residential location may be a second explanation. Most of Bal Harbour Village's employees commute from outside the town limits and prior to August 2001, a great majority of them drove alone.

In August 2001, the Village Manager received a flyer advertising the South Florida Commuter Services (SFCS) vanpool services. SFCS works with the South Florida Vanpool Program (SFVP) to provide vanpool services and programs. SFVP works directly with employers to design a vanpool program, present vanpooling options to employees and manage the program from the start-up through implementation. The Village Manager's interest was peaked and he scheduled an employee vanpool presentation.

**In just 2 years, 12% of Bal Harbour Village's employees are vanpooling.**

## Immediate Vanpool Formation

The presentation concluded with high employee interest in starting a vanpool. Immediately, eight Bal Harbour employees signed up to form a vanpool. In addition to presenting the Vanpool program to employees, the Village Manager began researching subsidies and payment options for employees. In order to tap into employee motivation, the Village Manager leveraged a subsidy paid by Miami-Dade County with funds from the Village of Bal Harbour to establish the first vanpool. The employee and Village divided the remaining vanpool costs.

Employees that participated in the first vanpool began to report reduced commuting costs and influenced other employees to consider vanpooling. Not long after the first van formed, the Village Manager acquired enough employees to sponsor a second vanpool. In just 2 years, 12% of Bal Harbour Village's employees are vanpooling. Due to the vanpool popularity, the Miami-Dade County subsidy and new transportation tax proceeds, the Village of Bal Harbour is able to pay 100% of the vanpool costs. Thus, as of Summer 2003, employees pay only the cost of gas to vanpool. All vanpoolers are eligible to participate in the County's Guaranteed Ride Home program.

## Results

The Village Manager's interest in promoting alternative mode choices to employees has resulted in the formation of a strong vanpooling program. Today, Bal Harbour's mode split reflects the high interest in vanpooling. 12% of employees vanpool, 2% telework and 48% drive alone. The remaining 38% are police officers that work irregular shifts.

# Calibre - Alexandria, VA

**FAST FACTS ABOUT: Calibre - Alexandria, VA**

**Types of TDM:** Modal Shift, Location Shift
**Keywords:** Transit Subsidy, Parking Management, Shuttle, Relocation, Parking Cash Out, Telework, Lease Negotiation
**Employer Demographics:** Located in Alexandria, VA near Washington, DC in an area well served by subway, commuter train and bus
**Program:** $65 transit, bike or walk subsidy, $65 parking cash out, carpool subsidy, telecommute
**Cost of Program: $99,000 -** $30,000- transit subsidies, $5,500 Telecommute program administration, $64,000 TeleworkVA! subsidy
**Staff:** 2 (Benefits Coordinator and HR Director)
**Results:** 2% carpool, 12% transit, 5% telework
**Contact**: Michelle Voisinet Caylor, Benefits Coordinator
mcaylor@calibresys.com

## Company on the Move

CALIBRE is an employee-owned government information technology and management services firm headquartered in Alexandria, Virginia. CALIBRE's transportation program is a reflection of company objectives to "Take Care of Our People", "Manage Our Company" and "Be Good Citizens". CALIBRE opened its Falls Church, Virginia office with 44 employees in 1989. Over the next seven years, the company added two offices in the Virginia area. By May of 2001, company management recognized the benefits of consolidating Metro Washington, DC area staff into one office and began searching for appropriately sized office space. To assist the company in selecting a highly accessible location, the company looked at where employees lived and estimated employee commute times. The company found that relocating corporate headquarters to the Alexandria/Springfield, Virginia area would equalize commute time.

In addition to equalizing commute time, the company wanted to relocate to an area better served by a variety of transit modes. The Metro Park area of Alexandria provides access to the Franconia-Springfield station, which serves both the DC Metrorail and Virginia Railway Express (VRE). The new facilities accommodated staff from the three Virginia offices and provided ample room for predicted growth.

**In an attempt to pro-actively address future parking demand issues, management began encouraging alternative mode usage immediately.**

The Springfield office lease included an allotment of parking spaces based on the amount of square footage leased. Although the parking allotment fully meets and exceeds CALIBRE's present needs, the company's continued growth will someday out pace the allocated number of parking spaces. In an attempt to pro-actively address future parking demand issues, management began encouraging alternative mode usage immediately. Through the development and implementation of an aggressive transportation benefits program, CALIBRE hopes to avoid the high cost of increased parking in the future. As a first step towards this goal, CALIBRE negotiated, in its lease, a shuttle to the Metro station that allowed for free transportation to and from the Franconia-Springfield Metro station and the office. The Washington Metro Area Transit Authority (WMATA), under contract to the Transportation Association of Greater Springfield (TAGS), operates the shuttle.

## Pulling the Pieces Together

Prior to relocating to the Alexandria/Springfield Area, a landlord-operated shuttle to and from the Pentagon, a major CALIBRE client, was the extent of the transportation benefits program. Today, CALIBRE's transportation benefits program is flexible towards a variety of transportation modes. All CALIBRE employees in the National Capital Area are eligible to receive subsidized parking or participate in the Metrochek program. CALIBRE's corporate headquarters employees may also receive parking cash out benefits. Metrochek, a transit program sponsored by WMATA, provides employees with vouchers from $65-$100 for approved transit costs. The

voucher can be applied to most forms of public transportation. The parking cash out program provides employees who opt out of their parking space and do not utilize transit, a subsidy of $65.00 a month. Cyclists and walkers can utilize the subsidy to defray the costs of commuting on bike or foot. CALIBRE employees who choose to carpool receive parking cash out of $32.50 a month. Additionally, employees outside the Metropolitan Washington Area may identify local transit programs for consideration in the Commuter Transit Benefit program.

**CALIBRE recognized that employees did not need to work from the office to be productive.**

In addition to transit, bike and walk subsidies and the parking cash out program, CALIBRE supports both flextime and telecommuting. As a high tech company, CALIBRE recognized that employees did not need to work from the office to be productive. In June of 2002, CALIBRE began a pilot program with TeleworkVA! a public and private partnership that promotes telecommunting. TeleworkVA! assisted CALIBRE by mapping out a telework policy plan highlighting how best to work with employees that telework. CALIBRE's telework plan requires employees interested in telework to first gain support from their supervisor and then together, submit a telework application. Employees are required to set up a home office, send in a photo of the office, pass a safety check and attend telework training with their supervisor. The training focuses on communication expectations, offers suggestions on supervising from a distance, and provides tips on avoiding telecommuting pitfalls. To provide seamless phone access, CALIBRE upgraded their phone system to allow for a telework employee's home phone to ring when their office number is dialed. The company reimburses employee expenses incurred from telecommuting and requires the employee to come into the office at least twice a week. Although supportive of the telework concept, the inter-connectedness and teamwork qualities of the CALIBRE culture necessitate the presence of employees at least twice a week.

## Marketing the Program

Prior to hiring employees, CALIBRE invites the potential hire to an offer interview at which, a Vice President explains the CALIBRE culture and employee benefits, including telework, parking cash out and subsidized transit passes. Because of the offer interview, employees are aware of the transportation benefits before they accept the job. Once at CALIBRE, employees attend a new hire orientation where the transportation benefits program is reintroduced. In addition, information on the program is always available via the company's intranet. This has proven to be an effective marketing and outreach strategy as more new employees take advantage of the program than existing employees.

The Benefits Coordinator at CALIBRE includes the transportation program and any upcoming regional events in the monthly employee newsletter. She works with the local rideshare agency to host transportation and telecommuting fairs at the office. The Benefits Coordinator has recognized that the motivation to try transit stems primarily from an employee's experience and frustration with a long commute. Employees who first choose parking often decide commuting via Metro and commuter rail may be more time efficient and cost effective. Therefore, the program allows employees to switch from parking to subsidized transit at any time.

## Results

CALIBRE evaluates the success of their program in a simple yet effective manner. As long as the number of transit users grows, the program is deemed successful. Upper management is concerned with stalling the parking demand issue as far into the future as possible. Continued growth in the transit pass and parking cash out programs assists CALIBRE in meeting this goal. If participation in the transportation benefits program decreases, management will re-evaluate the program's effectiveness. At that time, a new program or a more aggressive parking management program may emerge.

After 2 years of program implementation, 2% of CALIBRE's employee's carpool, 12% utilize transit (bus, rail, subway) and 5% participate in the telework program. Although 81% of CALIBRE employees continue to drive alone, many of them utilize the nearby Metro to travel to and from work-related meetings and trips during the week.

# CH2M Hill - Denver, CO

**FAST FACTS ABOUT: CH2M Hill - Denver, CO**

**Types of TDM:** Time Shift, Location Shift
**Keywords:** Telework, Intranet, Technology, Flextime, Relocation
**Employer Demographics:** Located in a suburban business park, little bus service, ample parking, adjacent to a large corridor construction project.
**Program:** Corporate Telework and Flextime policies, "Look Before You Leave" Intranet travel site, relocation based on commute time analysis, accessibility to roadways and future alternative mode infrastructure.
**Results:** *17% mode shift*
8% Telework and Flextime 3% transit 5% Carpool .5% bike
**Cost of Program:** $60,000 includes 40 hours a month of staff time, Intranet upkeep and marketing costs.
**Staff:** 1 FTE with limited transportation related responsibilities.
**Contact:** Michele Wagner, michele.wagner@ch2m.com

## Strategic Relocation

CH2M HILL is an employee owned, engineering, construction, and operations firm serving a variety of public and private clients throughout the world. CH2M HILL's mission states, "We are a global project delivery company making technology work to help our clients build a better world." Fulfilling this mission begins with CH2M HILL's commitment to fostering healthy employees and leaving as light an environmental footprint as possible. An example of this commitment to the environment and employees is reflected in the firm's transportation benefits program.

CH2M HILL has 165 offices throughout the world with both corporate headquarters and regional operations located in Denver, CO. Prior to 2002, CH2M HILL's corporate and regional employees were scattered in four locations throughout Denver. CH2M HILL's executive leadership team decided to relocate employees to one campus-style office park. Prior to choosing the location of the new corporate and regional Denver offices, the leadership team plotted where employees lived and made relocation decisions based upon accessibility. After careful consideration, CH2M HILL chose an area south of Denver, along the I-25 corridor. The Meridian International Business Center, located less than 20 miles south of Denver and 30 miles north of Colorado Springs, boasts easy access to multiple east-west and north-south highways. The campus is in a traditional suburban business park setting featuring ample parking and sparse bus service.

Roadway convenience and employee residential locations were not the only factors driving CH2M HILL to relocate to Meridian. In 2001, the Colorado Department of Transportation and the local Regional Transportation District (RTD) began to move forward with plans for a massive corridor-wide roadway expansion and light rail project. The corridor construction project, entitled Transportation Expansion or T-REX, included plans for a Denver light rail system with a station near CH2M HILL's then-anticipated campus. The Leadership Team was keenly aware of the positive opportunities for increased mass transit use by the firm's employees as a result of this new transportation infrastructure.

## Corporate TDM: Telework and Flextime

At a corporate level CH2M HILL has established an aggressive Telework and Flextime program. CH2M HILL's Telework Program Policy views telework as a "mutually beneficial work arrangement designed to attract and retain employees and reduce company costs." Participation in the company's telework program is based on job suitability, suitability of the employee's skill sets, job performance and suitability of home work site. Employees must obtain supervisory approval to participate in the firm's Telework Program. Once approved, employees are required to complete a two-hour telework training that covers IT and ergonomic aspects of teleworking. The teleworker is responsible for defining a safe and appropriate workplace using the tools provided by the company. CH2M HILL provides specific equipment and software tools and reimburses employees for appropriate office supplies and voice and data connectivity charges. While CH2M HILL is supportive of both full-time and part-time/occasional telework arrangements, only full-time teleworkers receive financial support. The company provides

in-house “hoteled offices” or carrels within the CH2M HILL office, which come equipped with phones, networking capabilities and office supplies. Employees who telework on a full-time basis can utilize these workstations if and when they are required to work from the office. CH2M HILL also recognizes the need to provide employees with work hour options.

### Regional Denver Office TDM: “Look Before You Leave”

Because the culture within CH2M HILL leans toward decentralized decision-making, there is no corporate mandate to offer transportation benefits. There are offices, (such as the Seattle, Washington office), which are required by the state to provide transportation benefits. Despite the lack of such a mandate in Colorado, CH2M HILL’s Denver office initiated an innovative TDM program. As the company moved forward with office relocation plans, recruitment and retention were forefront in managers’ minds. Management recognized commute times would increase for a number of employees either by virtue of the office relocation or by the up-coming T-REX project. Either way, they did not want highly valued employees dissatisfied with working at CH2M HILL due to the impending traffic, congestion and construction. To complicate matters, transit service to the new campus was severely limited as was bike accessibility.

With support from management, an employee in the Denver office asked other co-workers to volunteer their time to assist CH2M HILL in addressing transportation related concerns. Soon the T-REX Tamers Transportation Team was formed with the intent of helping managers create new services and programs aimed at improving accessibility and mobility to, from and around office locations all of which were in the direct path of the T-REX project. Utilizing employee survey results, the T-REX Tamers were able to focus efforts down to the types of information and programs that employees would respond to the most. First, they chose a TDM program theme: “Look Before You Leave” which encourages employees to look at traffic conditions before leaving home and/or work. As employees began to “look before they left” they were presented with the information they needed to make intelligent transportation decisions, including the decision to not drive at that specific time.

The central feature of the program is a transportation Intranet featuring current traffic updates, planned closures, T-REX project information (closures, construction updates), links to Denver International Airport, subscription service to a traffic alert service provided by MyTrafficNews.com and driving directions using popular websites. Employees can also access links to Denver Metro’s transit provider (RTD), carpool and vanpool information and rideshare matching services, bike to work information and links to company telework and flextime policies. The Intranet also provides links to local businesses that provide pickup and delivery of dry cleaning, meal delivery and car maintenance services. Finally, the site offers information on learning and professional development opportunities. Employees faced with a congestion-filled commute can opt to stay and earn CH2M HILL professional development credits. A transportation fair was held to heighten awareness of the T-REX project and introduce the new tools and alternatives available to employees

### Results

CH2M HILL evaluates success through two main efforts. First, periodic surveys are provided to employees to learn more about travel modes and commuting concerns. Second, alternative mode users are encouraged to register with Teletrips, a web-based alternative mode data gathering resource. Employees who register with Teletrips receive a weekly e-mail survey requesting information about their commute and in return receive a aggregate report on the amount of pollution they reduced, number of drive-miles avoided and an estimate of time saved by teleworking, using the bus, carpooling or vanpooling. Additionally, CH2M HILL receives a company-wide profile, which generates air pollution credits through the e-Commute program. In 2002 alone, 81 Denver campus employees reported the following results: 115,130 miles saved, 3,689 hours saved, 61,325 lbs. of carbon dioxide saved and 3,497 lbs. of carbon monoxide not created.

CH2M HILL has been successful at getting 17% of its employees out of single occupant vehicles. A little more than 8% of employees take advantage of CH2M HILL’s Telework and Flextime programs; 5% carpool; 3% take transit and .5% bike commute. Given CH2M HILL’s remote location, lack of bus service and the on-going construction project, a 17% mode shift is a solid start. Furthermore, the light rail segment of the T-REX project includes a stop near the Meridian International Business Center. CH2M HILL provides solid stepping-stones to assist in further employee transit usage.

# Georgia Power Company - Atlanta, GA

**FAST FACTS ABOUT:** GEOrgia Power Company - Atlanta, GA

**Types of TDM**: Modal shift, Location shift
**Keywords:** Company sponsored vanpools, Fleet vehicles, transit subsidy, telework, intranet
**Employer Demographics:**
**Program:** Smart Ride commuter options program. Offers a variety of commuter options to employees
**Results**: 15% Compressed/flex time, 13% Vanpool/Carpool, 5% Telework
**Cost of Program:**
**Staff:** 3 FTE. 1 Project Coordinator, 2 Corporate Facilities Analysts
**Contact:** Jane Franklin, Project Coordinator 404-506-1967

## Summer Olympics + Increased Parking Demand + Poor Air Quality = New Commuter Benefits

Georgia Power, an investor owned utility that serves customers across the state, boasts office locations throughout the State of Georgia. 5,500 of the approximately 8,800 Georgia power employees are located in the greater Atlanta metro region. Executives at Georgia Power were concerned that there was not enough parking at the downtown Atlanta Georgia Power Headquarters location. As such, in 1994 they decided to provide the commuter benefits to downtown employees. The commute options program, titled SmartRide, included subsidizes for Metropolitan Atlanta Rapid Transit Authority (MARTA) transit tokens. Initially, the SmartRide program was only available at the downtown Georgia Power facility but eventually expanded to other regional offices.

With the upcoming 1996 summer Centennial Olympic Games in Atlanta, employers throughout the greater Atlanta region were concerned with the impact the Games would have on traffic congestion and employee accessibility to the workplace. Additionally, in 1996 Georgia Power was consolidating two downtown offices into one building. Given these two pressures, executives at Georgia Power opted to increase the types of transportation programs offered. Unfortunately, in 1997 the consolidated downtown building experienced serious parking problems. Georgia Power also responded to pressure from the 1998 Voluntary Ozone Action Program, which encouraged state agencies and major corporations to reduce vehicle miles traveled by 20%. To reduce demand for employee parking and assist in reducing Atlanta's worsening traffic congestion and air pollution, Georgia Power redesigned their SmartRide program.

## Vanpool Becomes Mode of Choice

In 1998 Georgia Power extended their SmartRide program from a downtown focused transit subsidy program to an extensive regional commute options program. The program featured company sponsored vanpools, fleet vehicles, free MARTA passes, telework, flextime, alternative work locations, free and preferential parking for vanpools and first come first serve preferential parking for carpools. Of the commute options benefits offered, the company sponsored vanpool is the most popular among employees.

**Fleet vehicles are available to employees who use alternative transportation to get to work. This is an important transportation strategy the company offers because employees do not feel "trapped" in the office once they carpool, vanpool or use transit.**

As of summer 2003, approximately Georgia Power supports over 50 vanpools involving over 500 employees. Fifty percent of vanpools travel to the downtown headquarters office and fifty percent travel to regional offices. The vanpool program is offered to all employees, including temporary contract employees. Currently, the longest vanpool trip documented is 160 miles round trip from Rome, Georgia to a North Atlanta metro regional office.

## Additional Program Details

Fleet vehicles are available to employees who use alternative transportation to get to work. This is an important transportation strategy the company offers because employees do not feel "trapped" in the office once they carpool, vanpool or use transit. Employees are allowed use of a fleet vehicle to run errands or go to meetings during the work day. Keeping with its desire to be good environmental citizens, the Georgia Power vehicles are either powered by electricity or ethanol.

To keep track of employee usage of transportation options, an internal alternative mode tracking system was developed for Georgia Power. Also called SmartRide, the software provides employees with a web-based reporting portal that offers a user friendly way to track carpool, vanpool and transit use. Separate internal timekeeping software is used to report when employees telework, work at an alternative location, or work an alternate schedule.

Georgia Power participates in the Guaranteed Ride Home (GRH) funded by Commute Connections, the regional rideshare agency. Employees who use alternative transportation have access to a free ride home in case of an emergency or unplanned overtimes. If there are any overages in the program, Georgia Power supplements the program.

In previous years, the program was highly marketed through e-mail, and messages on televisions monitors around the downtown campus. Employees received information from management and letters from the CEO that encouraged individual travel behavior changes. Additional program marketing and outreach was done in conjunction with the smog alerts season which initially lasted from May to October but eventually became a year round event. Given budget cuts, Georgia Power currently markets the transportation program through human resource orientations, word of mouth and occasional e-mail messaging. Georgia Power attempts to increase awareness of the transportation benefits program during smog alert season but to a much more limited extent.

## Measuring Success

The main goal of the commuter options program is to get as many cars off the roads as possible. Georgia Power has been successful in accomplishing this goal as the company boasts over 1.2 million VMT reduced each month. Even with a downturn in staff, participation in the programs has been steady with 13% of employees carpooling or vanpooling, 15% working compressed or flex time schedules, 5% using transit while another 5% telework.

The success of this program is also measured by employee reaction. Employees recognize this as a good benefit and management sees it as a recruitment and retention tool. Georgia Power's efforts have been recognized with a host of awards from local, regional and national organizations since 1997. As recipients of the 2001 Clean Air Campaign's HOVie Award, Georgia Power's program was acknowledged for encouraging the use of HOV lanes through carpooling, vanpooling and/or alternative fuel vehicles. The company has also been honored as a designated US EPA Best Workplace for Commuters, and was awarded the 1999 Outstanding in the Field Award from the Southeastern Association for Commuter Transportation.

# Hennepin County - MN

**FAST FACTS ABOUT: Hennepin County - MN**

**Types of TDM:** Modal Shift, Location Shift
**Keywords:** Transit subsidy, Pre-Tax benefits, Legislation
**Employer Demographics:** Hennepin County, Minnesota, has 130 offices and facilities dispersed throughout the county with differing levels of transit service at each site. About 10,000 County employees are located in downtown Minneapolis and are well served by transit.
**Results:** Estimated 60% drive alone, 15% carpool, 2% vanpool, 15% bus, 3% telework, 5% flextime
**Cost:** $559,000 bus subsidy + $14,000 vanpool, parking and administration costs = $573,000 - $109,000 FICA Savings = Total Cost: $464,000.
**Staff:** Minimal staff time and staff costs once program was set up.
**Contact:** Mike Bastyr, Sr. Human Resources Representative, 612-348-4640

## Local and Federal Legislation and Policy Impacts

Since 1960 the City of Minneapolis's growth management policies concentrated office and retail use in a downtown core and limited parking to areas just outside the core. These policies have resulted in high bus service and ridership in the downtown core, where most of Hennepin County's employees work.

Like many other US cities, Minneapolis is recently experiencing a resurgence in downtown growth and development. As Minneapolis's downtown core continues to grow, city and county officials have become concerned about increasing congestion and decreasing air quality.

In 1999 Minneapolis expanded the smart growth policy in their City Comprehensive Plan to include more emphasis on transit. Per the plan, "Minneapolis will follow a policy of 'Transit First' in order to build a more balanced transportation system than the current one."

In addition to the local "Transit First" policy, federal legislation passed in 1999 encouraged employers throughout the United States to reevaluate their transportation benefits programs. Internal Revenue Code Section 132 (f), allows employees to exclude certain transportation fringe benefits from gross income. In 1998, these pre-tax fringe benefits were limited to $65.00/month for transit or vanpool and $175.00/month for qualified parking. In 2000, the benefit limits were increased to $100/month for transit or vanpool and $195.00/month for qualified parking.

**The convergence of local policy and federal legislation provided the impetus for Hennepin County to reevaluate its 20-year old bus pass program.**

The convergence of local policy and federal legislation provided the impetus for Hennepin County to reevaluate its 20-year old transportation program. During the 1980's and 1990's Hennepin County's transportation program consisted of a pay-roll deducted bus pass. Convenience and a 5% discount from the local transit authority, MetroTransit, motivated employee bus pass purchases. In 1999, spurred by new federal transportation benefit regulations, Hennepin County introduced a pre-tax employee transportation program that covered bus and parking costs (in 2000).

## Pre-Tax and Creative Use of Savings

Hennepin County's pre-tax transit pass program, available to all 13,000 employees, immediately increased transit usage by 400-500 employees spread throughout the County's dispersed offices.

Soon after Hennepin County's introduction of the pre-tax transit program, MetroTransit, introduced a metro pass. Although employees voiced interest in the metro pass, the cost was too high for Hennepin County. Instead, in 2000, the County enhanced the transit pass program by providing a 40% discount on transit pass purchases. The combined subsidy and pre-tax status of the transit pass reduced costs for the employee. Transit purchases increased to over 1,900 by January 2003.

As an employer, the pre-tax bus and parking program saved the County money on FICA payments. The County decided to filter the FICA savings back to offset the subsidy program. Doing so defrays 30% of the cost to provide the subsidy. From June 2000 through January 2003, the subsidy, less the FICA savings, totaled $666,464.

**One Year Example of FICA Savings**

| Item | Annual Cost | % of Total Budget |
|---|---|---|
| Transit Subsidy | $559,000 | 98% |
| Other (Vanpool Parking) | $14,000 | 2% |
| Total | $573,000 | 100% |
| FICA Savings | $109,000 | |
| **Total Budget** | $464,000 | |

## Results and Challenges

Due to the high level of bus service in the downtown core, Hennepin County's marketing and outreach is focused on encouraging bus ridership. The combination of subsidies and pre-tax incentives captured the attention of employees and increased bus ridership by almost 900 employees in one year. Success for Hennepin County is measured by increased participation in the transit subsidy program. Since the changes in the program, SOV rate has reduced to approximately 60% with an estimated 15% of employees carpooling, 2% vanpooling, 3% teleworking, 5% using flextime and 15% utilizing transit.

Despite the initial success of the transit subsidy/pre-tax incentive program, employees complained about the confusing pre-tax parking process. As the pre-tax parking benefits operate differently than the popular and familiar flexible spending accounts, employees became frustrated.

Hennepin County's Benefits Unit kept an open-door policy and sought and responded to feedback on a regular basis. County newsletter articles and e-mail announcements were used to both inform and clarify the program to employees.

One employee responded to a newsletter article with an e-mail stating, "Pre-tax parking is confusing and stupid." That quote was used as the title for an employee mailing that explained changes that made the program easier for employees to use. Feedback loops and consistent updates increase the appeal to employees, and therefore participation.

The local MetroTransit group recognized Hennepin County's innovative funding model with a transportation benefits program award.

# Johns Manville - Denver, CO

**FAST FACTS ABOUT: Johns Manville - Denver, CO**

**Types of TDM:** Modal Shift
**Keywords:** Transit subsidy, parking management, pre-tax benefits
**Employer Demographics:** Corporate office located in downtown Denver near ample bus and light rail service, limited parking. Although Johns Manville has multiple offices around the country, the program is offered to Denver employees only
**Program:** 100% transit subsidy, GRH, free-parking vouchers and parking subsidy
**Results:** 55% drive alone, .5% vanpool, 44% bus/rail, .5% walk, carpool not tracked
**Cost of Program:**.$372,129 includes parking charges, EcoPass and parking validation stamps.
**Staff:** 1 FTE, Risk Management Coordinator dedicates 20 hours a month to transportation benefits.
**Contact:** Pam Linam, LinamP@JM.com

## 1987-1990s: The Early Years of the Transportation Program

In 1987 Johns Manville, a leading manufacturer and marketer of premium-quality building and specialty products, moved from a spacious location in the Foothills outside of Denver, Colorado to a transit-convenient location in downtown Denver. Despite the expense, management guaranteed employees free parking for the first five years at the new location. For employees that did not want to drive, the company paid all but the taxes on either a monthly transit pass or up to four coupon books of transit tickets. Employees opting for the monthly pass could choose between purchasing a subsidized Local, Regional and Express bus pass. The individual employee's commute lengths determined the type of pass they preferred.

Johns Manville extended their parking subsidy after five years and continued to pay 100% of parking costs for employees until 1998. On October 1, 1998, Johns Manville capped the employer paid parking expense at $110 per month. Employees had the option of parking on the roof for no extra expense or parking under cover for an additional $15.00 per month. For those who chose covered parking, the additional $15.00per month was deducted through payroll at $7.50 per pay period. Both rooftop and covered parking costs increased through the next four years. Effective March 1, 2002, roof top parking increased to $131.30 and covered to $146.40. Current lease requirements include a 1% increase in parking costs per year, which Johns Manville passes down to employees. Currently, Johns Manville continues to subsidize all parking at $110.00 a month.

## Pre-Tax Benefits and Light Rail

A provision amended by the Transportation Equity Act for the 21st Century increased the limits for public transit to $65 dollars per month (Federal, tax free) in January of 2000. The allowed pre-tax amount exceeded the cost to ride the bus and therefore, the employee was no longer taxed as part of the program. This legislation encouraged Johns Manville to reevaluate their transportation benefits program. Cost-effectiveness and bottom line good business sense became the main motivations for Johns Manville.

**It became cost effective for Johns Manville to purchase the local annual employee bus pass, the Eco Pass, when over 30% of employees started riding light rail and transit.**

In 1994, Denver welcomed its first light rail line which included a stop in front of Johns Manville's Denver office. The opening of the rail line attracted additional employees to transit. It became cost effective for Johns Manville to purchase the local annual employee bus pass, the Eco Pass, when over 30% of employees started riding rail and transit and the cost for the monthly pass increased. Purchasing individual monthly

passes for 30% of employees became far more expensive than purchasing the Eco Pass for all employees. Additionally, upper management recognized the financial benefits of providing an Eco Pass program for employees as annual parking costs were significantly reduced as the number of employees choosing light rail and transit increased.

In 2000, Johns Manville worked with the local transit district, RTD, to provide the Eco Pass to all employees. The company received a variety of incentives and "first-time-Eco Pass" subsidies that further convinced upper management to expand the transit program. Despite the short-term incentives, the company recognizes the need to provide choices to employs and is committed to providing the Eco Pass as long as the benefit is cost-effective when compared to parking. Johns Manville pays 100% of the Eco Pass cost.

### Employee Choice

Due to the fact that Johns Manville subsidizes each parking space they require employees to choose between a parking space and the Eco Pass, employees cannot have both. Given the "either-or" policy, Johns Manville recognized the need to provide flexibility within the program. Therefore, employees are free to try one form of commuting for a short term in order to make the best decision between driving and utilizing transit. Additionally, all employees that chose an Eco Pass are eligible to participate in the Guaranteed Ride Home Program and can receive up to 12 free parking days a year. Finally, Johns Manville's transportation program also provides $110/month in vanpool subsidies for interested employees. Given the close proximity to transit and rail, only two employees currently participate in a vanpool program.

### Results

Since 2000, when the Eco Pass program started, Johns Manville's transportation benefits program has resulted in the following mode split: 55% drive alone, 44% bus/rail, .5% vanpool, .5% walk.

# Nike - Beaverton, OR

**FAST FACTS ABOUT: Nike - Beaverton, OR**

**Types of TDM:** Time Shift, Modal Shift
**Keywords:** Internal Rideshare Technology, Incentives, Flextime, Relocation, Transit Subsidy, Bike Commute
**Employer Demographics:** Located in a suburban business park, bus and light rail service, ample parking. 5,000 employees at world headquarters.
**Program:** Evolution of incentive based program from Nike Buck giveaway to TRAC program featuring prize incentives, transit and rail subsidy, preferential parking, shuttle, service amenities and flextime.
**Results:** 78% SOV, 10% carpool, 5% bus/rail, 5% flextime, 2% bike
**Cost of Program:** .$302,000 annually plus staff time. 43% of expenditures go to shuttle operations, 34% to transit subsidies, 6% to incentives, 1% to marketing, remainder to other expenses.
**Staff:** 1 FTE , Transportation Specialist dedicates 150 hours a month to the TRAC program.
**Contact:** Linda Bainbridge, Linda.Bainbridge@nike.com

## Nike Bucks

The Nike Corporation has a history of supporting alternative mode usage through the creation of aggressive employee transportation benefits. In 1991, when upper management decided to relocate Nike's World Headquarters (WHQ) to a suburb outside of Portland, Oregon, they recognized the opportunity to save money by building fewer parking spaces and promoting carpool, vanpool and the overall use of alternative modes. In 1992 when Nike moved its WHQ to Beaverton, Oregon they introduced the incentive based Nike Bucks program. Alternative mode users could choose between receiving $1.00 a day in a Nike Buck voucher or a $21.00 bus pass subsidy. The Nike Buck vouchers could be used at on-site cafeterias, shops and Nike stores. The Nike Bucks program was initially only available to employees housed at the new WHQ, but due to its popularity, the program was expanded to include Nike's Portland area retail stores and Portland's Niketown. Ensuring employees outside the WHQ were indeed utilizing alternative modes became more and more difficult. By 1996, management began to question the overall effectiveness of the program as it became more difficult to manage and monitor.

## 1996: Mandates, Economics and Reevaluating Programs

At the same time Nike management began to reevaluate the Nike Bucks program, the State of Oregon's Department of Environmental Quality (DEQ) established a commute trip reduction mandate (titled the Employee Commute Options program or ECO) aimed at employers in the Portland area with more than 50 employees reporting to a single work site. Beginning in 1996, affected employers were required to provide incentives and programs for employee use of alternative commute options. Employers were now required to reduce single-occupancy vehicle commuting by 10 percent over three years. As 5,000 employees reported daily to Nike's WHQ in Beaverton, Nike was affected by the new mandate. By the time the mandate became law, Nike had been working on reducing SOV commuting for three years. After consultation with the DEQ, Nike was given permission to utilize their 1992 levels of SOV usage for base line data purposes.

Layered upon the growing difficulty of monitoring the Nike Buck program and the new local mandate was the 1996 Asian economic downturn's impact on Nike. The Asian economic downturn resulted in huge layoffs at Nike as well as a corporate-wide reevaluation of every Nike program. As such, management questioned whether or not the hard to track $250,000 a year Nike Buck price tag was the best way to encourage alternative mode usage.

## A New Program

With upper management's support, Nike's Employee Transportation Coordinator (ETC) gathered employees from various departments to create a new, cost-effective and easy to manage transportation benefits program. With management's support, they decided to retain an incentive based program but to alter the incentive to a

large quarterly drawing with smaller monthly drawing. At first employees that participated in the Nike Bucks program were resistant to changes and the alternative mode usage decreased when the new prize-oriented program was implemented. The ETC marketed the program through a transportation fair, newsletters, flyers and posters and soon, interest in the prizes and utilizing alternative modes increased. The ETC and employee planning group named the new program TRAC.

**To encourage rail usage, Nike sponsors a shuttle to transport employees to and from the light rail station, which is located about 1/2 mile from the World Headquarters campus.**

In addition to the prize incentives, Nike also developed transit subsidies and carpool incentives. Since 1996, all WHQ employees have been eligible to receive a transit pass for the local bus and light rail system. Nike subsidizes the cost of an annual bus/rail pass by 72% and the WHQ are well served by both bus and light rail service. To encourage rail usage, Nike sponsors a shuttle to transport employees to and from the light rail station, which is located about 1/2 mile from the WHQ campus. All bus pass holders are eligible to participate in the Guaranteed Ride Home (GRH) program, which is administered by the local transit authority, TriMet. The ETC promotes carpooling through the use of an in-house rideshare matching list and the presence of preferential carpool parking. Nike also supports a flextime policy allowing employees to work with their supervisors to determine the best schedule most appropriate for them and their workload.

### Commuting by Bike and Building Amenities

Nike's ETC provides a variety of services for bike commuters, and interested bike commuters. Upon request, the ETC will work with employees to map out the safest bike route, provide regional and local bike resources and information to assist with their commutes, and promote bike specific events to all employees. Nike has two fitness centers for employee use and bike commuters can easily access the showers and locker room. Nike also provides bike racks scattered around the campus and bike cages in the fitness center area. Furthermore, employees are allowed to bring bikes into the building and store them in their offices. Bike commuters are eligible to participate in the monthly and quarterly drawings.

In addition to the two fitness centers, Nike's WHQ features a variety of on-site amenities designed to limit SOV and vehicle usage during the workday. Nike employees can access quality childcare at one of the two on-campus childcare centers. Employees that need childcare for only a short time can utilize the Nike Tykes drop off program when regular care is unavailable. Nike's WHQ campus also features two sundry stores, dry cleaning service, beauty salon, an ATM and on-site movie ticket sales.

### Goals and Evaluation

Nike's extensive transportation benefits program and the presence of a variety of on-site building amenities stems from the company's commitment to environmental leadership and sustainable practices. Although Nike is affected by local commute mandates, their commitment to promoting alternative mode usage existed prior to the mandates. Today, Nike's goals revolve around the ECO mandate, which includes reporting progress towards meeting the specific mandate goals every two years. Additionally, Nike tracks awareness of and participation in the TRAC program through a newly developed in-house technology. This new technology allows alternative mode users to report their commute mode on a weekly basis. The ETC can utilize information garnered from the employees for both evaluation and targeted marketing. Additionally, the employees are automatically entered into drawings each time they register their commute modes.

## Results

Nike's SOV rate in 1992 was 98%. Since moving the WHQ's and implementing the Nike Buck and TRAC programs, Nike's SOV rate has reduced to 78%. 10% of employees carpool, 2% bike, 5% use bus and rail and 5% use flextime. Employees provide the ETC with feedback and ideas for program improvement and the ETC is given flexibility from upper management to make appropriate changes when necessary. Nike's ETC is actively involved with the local TMA and is on the MPOs TDM subcommittee. Nike's transportation programs have resulted in numerous recognitions and awards including recognition as a "Best Workplace for Commuters" by the EPA.

# Overlake Christian Church - Redmond, WA

**FAST FACTS ABOUT:** Overlake Christian Church

**Types of TDM:** Modal Shift
**Keywords:** Suburban Location, Carpool, Incentives
**Employer Demographics:** Located in the City of Redmond, WA, Overlake Christian Church has ample free parking and receives minimal bus service.
**Program:** The transportation benefits program provides up to 16 hours of paid time off per year to employees utilizing other forms of alternative transportation and $20 a month financial subsidy for public transportation.
**Results:** 52% drive alone, 1% bus, 26% carpool, 12% Flextime/ compressed work week
**Cost of Program:** $4,000
**Staff:** 1 FT with other various responsibilities including transportation program and 1 FT Director with only oversight of program.
**Contacts:** Nancy Thorgeson, Director of Human Resources, nancyt@occ.org; Barbara Graef, Human Resources Administrative Assistant, barbg@occ.org

## Community Driven

The Overlake Christian Church broke ground in 1968 with a handful of members and even fewer employees. By the mid-1990's, its growth resulted in the need for a new, larger church. Church leaders selected a 27-acre site in Redmond, Washington and oversaw the construction of the 250,000 sq. ft. campus located minutes from Microsoft. The Overlake Christian Church (OCC) development included the construction of a parking lot necessary to accommodate the 2,000 plus vehicles for attendees and employees. In November 1996, OCC opened the doors to its new campus for 3,500 plus attendees and 109 employees.

**OCC was driven to provide commute benefits to employees by the desire to set an example to other employers and the opportunity to be a role model in the community.**

With assistance from the Greater Redmond Transportation Management Association (GRTMA), the OCC chose to voluntarily comply with Washington State's Commute Trip Reduction (CTR) law. The CTR law requires that all employers with more than 100 employees traveling to work during peak morning times provide commute alternative programs. These programs must reduce the number of single-occupancy-vehicles (SOV) on the roadway during the busy morning commute. Though over 100 employees worked at OCC, not all traveled to and from work during the peak morning commute times. Nonetheless, OCC was driven to provide commute benefits to employees by the desire to set an example to other employers and the opportunity to be a role model in the community.

## Carpool and Take Time Off

OCC is located in an area of Redmond that receives minimal transit service. This, combined with the availability of ample free parking, led OCC to develop a carpool-oriented transportation program. Upper management supported the program by providing opportunities for creativity and innovation. They also set aside funds and assigned transportation benefits program management responsibilities to a staff member. As such, the Human Resource Director and the Employee Transportation Coordinator (ETC) developed an incentive based program.

In 2001, OCC unveiled its unique and award-wining transportation benefits program. Utilizing the GRTMAs rideshare matching software, OCC provides internal rideshare matching services to connect employees with one another. Employees that choose to carpool on a regular basis can earn up to 16 hours of paid time off

a year for carpooling. Time is earned on a quarterly basis and is based on the number of days per week an employee commutes using an alternative commute mode. As a further benefit, carpoolers receive the best parking spaces at OCC.

Recognizing carpooling isn't for everyone, the program also provides a $20.00 a month transit and ferry pass incentive. OCC has set up a telework program, supports flextime and alternative work schedules and provides bike racks, showers and covered bike parking for cyclists.

**Despite the presence of free and ample parking and the low level of bus service, Overlake Christian Church has created a successful model transportation benefits program.**

## Marketing, Partners and Results

The ETC utilized a thorough marketing campaign to educate employees about the new program. Presentations to new and existing employees throughout the year, as well as a transportation benefits program piece on the OCC Intranet ensure all employees are informed of the program. The transportation program is also shared at OCC's regular chapel meetings and all-staff lunches and via email notification.

OCC partners with the GRTMA to leverage marketing and outreach materials produced by them for employers throughout the Redmond area. GRTMA also sponsors multiple regional events throughout the year, including Bike to Work day and other alternative commuting campaigns. The ETC works diligently to ensure OCC's employees are aware of and involved in the various local, regional and state campaigns, events and activities.

Despite the presence of free and ample parking and the low level of bus service, Overlake Christian Church has created a successful model transportation benefits program. From 2001-2003, Overlake Christian Church's program has reduced SOV travel by employees from 84% to 52%. 31% of employees participate in the program, 26% carpool, 12% utilize flextime, 8% telework, 1% use transit and 1% bike to work.

Overlake Christian Church has won numerous awards including the Diamond Award from *Commuter Challenge* (the local employer commute assistance program), the City of Redmond's Commute Trip Reduction Program Award and recently the Washington State Governor's *Commute Smart Award*.

# Simmons College - Boston, MA

**FAST FACTS ABOUT: Simmons College - Boston, MA**

**Types of TDM:** Modal shift
**Keywords:** Transit subsidy, Parking Management, Incentives, Disincentives, Shuttle
**Employer Demographics:** Located in a dense, area of Boston, MA that is well served by transit.
**Program:** $65 T-Pass subsidy, increased parking costs
**Cost of Program: ESTIMATED COST?**
**Staff**: 1 (Director of Auxiliary Services), contributes approximately 20 hours a month to transportation program and has assistance from other staff.
**Results:** 27% transit usage, 41% SOV, 32% carpool, bike, walk
**Contact**: Roy Schifilitti, roy.schifilitti@simmons.edu

## Student Meetings at the Parking Garage

Simmons College is a small, nationally recognized, private university located in the Longwood/Fenway neighborhood of Boston. Surrounded by a variety of universities, cultural institutions and medical facilities, Simmons College is well served by the Massachusetts Bay Transportation Authority's (MBTA) transit and subway service, otherwise known as "the T". Though parking is limited in the area, Simmons College attempted to stand by a "low-cost-parking-for-all-faculty-and-staff" policy.

Most of Simmons' 740 faculty and staff prefer to drive to work, park in the Simmons owned lot and come and go at their leisure. In an effort to maintain popular parking benefits, Simmons College provided faculty and staff a parking spot on request. A year of parking cost employees a mere $200, far below the cost of utilizing transit or the nearby subway. As parking demand grew, the College recognized the need to change their parking policy. Yet, limiting parking or raising rates were not options under consideration.

**By raising the cost of parking while simultaneously increasing the attractiveness of transit, travel behavior could be changed and the parking crises could be quelled.**

In 1998, as parking demand increased, the parking situation became critical. Staff and faculty often waited in the parking garage entrance for a half hour before getting a space. Faculty began scheduling student meetings in the garage while they waited. Others used cell phones and laptops to remotely work from their vehicles. Frustration escalated and college leadership began to fear losing employees. As the situation worsened, the Director of Auxiliary Services researched similar problems and uncovered possible solutions. The research pointed to the economic reality that given a fixed supply of parking, demand could be influenced by changing price. By raising the cost of parking while simultaneously increasing the attractiveness of transit, travel behavior could be changed and the parking crises could be quelled. Yet, upper management remained opposed to increasing parking costs.

## Incentives and Disincentives

In 1998 leadership at the college changed and support for a parking management program grew. The Director of Auxiliary Services met with the new Executive Management staff and demonstrated that the parking crisis could not be solved without raising rates and supporting alternative modes. The College began to slowly increase the cost to park and also introduced a 25% transit subsidy, or T-Pass. Unfortunately, these techniques did not change travel behavior. The transit subsidy appealed to existing transit users and the parking increase was not enough to discourage parking. Over the next five years the College continued to both increase parking costs and transit subsidies. Eventually they got to a price point where transit was more appealing. Today, faculty and staff are eligible for a 60% T-subsidy (up to $65.00 a month) and parking has increased from $200 a year to $1200 a year.

## Program Goals:

Two main goals drive the Simmons College transportation benefits program. First, Simmons leadership is committed to reducing vehicle miles traveled. Few parking structures exist in the Longwood/Fenway neighborhood and the large medical center presence results in the need for ample patient and visitor parking. Furthermore, the City of Boston's strict parking development requirements inhibit future growth in parking. Therefore, Simmons College and other nearby institutions have made a community commitment to each do their part in reducing vehicle miles traveled and manage parking well.

Second, Simmons College strives to be a good employer by providing a wide array of employee benefits. The transportation benefits program compliments other employee benefits and promotes the College's commitment to employees. All new employees are introduced to the employee transportation benefits and the transportation coordinator sends out newsletters and bulletins reminding employees of their transportation options. Employees can opt for the T-subsidy at anytime.

## Program Details:

Faculty and staff of Simmons College must choose between paying for a parking space or receiving the T-Pass. Simmons College provides a 60% Subsidy for all MBTA transit passes, with a limit of $65.00 a month. This provides plenty of support for most of MBTA's pass programs and only those with commutes from New Hampshire accrue out of pocket costs. If faculty and staff opt to drive to work, they can pay $1200/year for a parking space in the faculty/staff parking garage.

All T-pass holders, carpoolers and cyclists are eligible to participate in one of two Guaranteed Ride Home programs. As part of the transportation benefits program, Simmons created their own Guaranteed Ride Home (GRH) program. The Simmons program is open to any employee in need of an emergency ride home. Additionally, due to a partnership with the local transportation organization, MASCO Commuter Works, a second GRH program is included in the benefits program. Though rarely utilized, the MASCO Commute Works GRH provides an added resource to commuters. In addition to the GRH programs, Simmons College provides 15 free-park day vouchers for T-Pass holders. Many faculty and staff take advantage of educational benefits and/or teach night classes. The vouchers allow employees to drive on those days, park and get home safely.

Additionally, as a member of the local TMA, MASCO Commute Works, Simmons College faculty, staff and students can utilize Commute Works' shuttle system. The shuttle system features six shuttles serving the Longwood/Fenway area, Cambridge, Chestnut Hill, University of Massachusetts and other destinations. Simmons College pays 60% of the shuttle pass for staff and faculty. Two shuttles transport commuters to and from the Ruggles and JFK T-stops. These shuttles are fully supported by MASCO Commute Works and are free to all riders.

The hiring of a professional parking management company rounds out Simmons College transportation program. During the first week of classes, on graduation day and on other days throughout the school year, Simmons College experiences peak period parking issues. The parking management company manages parking during these peak periods by providing valet parking and other parking services. Additionally, the company limited parking in the parking garage to faculty and staff. The surface parking lots became student parking lots. Frequent in and out student trips are easier to manage on a surface lot. The parking management company works closely with Simmons College and neighboring institutions to minimize parking problems.

## Results

Simmons College utilizes two tools to evaluate the success of their program. As the transportation coordinator works with the parking management company to track the parking demand. The ability to manage the lot and keep up with demand is a key indicator of success. To date, they have had far fewer parking problems and the demand has reduced by 20% over the last five years. The transportation coordinator also includes a few parking and transportation related question in the annual employee satisfaction survey. Negative comments regarding the T-Pass program rarely appear on the surveys, implying the program is working. The coordinator is open to feedback and constructive criticism about the T-Pass program. The transportation benefits program has significantly reduced drive-alone parkers at Simmons College. Today, 41% of faculty and staff park on campus, 27% use transit and the remainder carpool, walk or ride their bike to work. Although no one currently uses vanpool, the transportation coordinator is open to supporting any non-single occupancy vehicle mode usage with the 60% subsidy (up to $65.00 a month).

# Swedish Medical Center - Seattle, WA

**FAST FACTS ABOUT: Swedish Medical Center**

**Types of TDM:** Modal Shift
**Keywords:** Transit Subsidy, Ferry Subsidy, Parking Management, Preferential Parking, Vanpool and Carpool subsidy, State and Local Mandates
**Employer Demographics:** Swedish has three campuses dispersed throughout the greater Seattle area: First Hill in a downtown, dense, area well served by transit and Ballard and Providence, less dense and less transit service.
**Program:** Carpool promotion program expanded to include transit, vanpool and parking benefits. Program is flexible given different shifts and campuses.
**Results:** Varies with each campus, see table at end of case study.
**Cost of Program:** $1.6 million for Flexpass, Puget Pass and Washington State Ferry Pass
**Staff:** 1 FTE, Parking Manager/Employee Transportation Coordinator dedicates 80 hours a month to transportation benefits program.
**Contact:** Karen Lee Kimber, Parking Manager/Employee Transportation Coordinator, Karen.Kimber@swedish.org.

## Benefits Before and After State Mandate

Swedish Medical Center, in Seattle, WA, is comprised of three separate campuses spread throughout the greater Seattle area. Swedish's 7,000 employees and 2,000 physicians are accustomed to the irregular work shifts and on-call realities of hospital work. Despite the challenges inherent in scheduling and transportation, Swedish has supported transportation benefits since the 1980's. Carpools with three or more Swedish staff received free parking at the Swedish campus and those with two or more received a 50% parking subsidy. Employees were also eligible for a 25% transit pass subsidy. In 1986, Swedish Hospital's growth resulted in the need for a new building. At the time, the City of Seattle began to require all new construction and development plans whose fulfillment would result in adverse effects on traffic and mobility to include a transportation management program (TMP). The TMP included traffic and mobility mitigation plans as well as reporting requirements and schedules. In 1986, Swedish chose to focus their TMP and therefore, transportation benefits, on carpool and transit benefits. Swedish continued to provide free parking for vanpools, subsidized carpool parking and they extended the transit subsidy to 50%.

In 1991, Washington State passed the Commute Trip Reduction (CTR) law. The CTR law requires employers with more than 100 employees traveling to work during peak morning times to provide commute alternative programs. These programs must reduce the number of single-occupancy-vehicles (SOV) on the roadway during morning commute times. Thus, since 1991, Swedish has been required to develop programs that encourage employees to utilize alternative, non-SOV modes of transportation for their commutes.

**Swedish Medical Center strives to be a best work-place, recruit and retain high quality nurses, doctors and hospital staff and abide by the local and state mandates.**

## Motivation and Program Details

In addition to adherence to the CTR law, Swedish views their transportation benefits program as a recruitment and retention tool. Hospitals all over the country are experiencing nursing shortages and Swedish strives to be an employer of choice. Given these motivations, Swedish worked with the local rideshare and transit organization, to develop and implement a variety of incentives and disincentives to driving alone. Through the leadership of Swedish's Employer Transportation Coordinator (ETC), Swedish expanded the initial program to one that provides extensive transit, ferry and rail subsidies, preferential parking and vanpool subsidies.

Swedish tailors its transportation benefits for each of the three campuses and for night and day shift employees. All day and evening shift employees at each campus are eligible to receive a fully subsidized area transit and rail pass, called a Flexpass, or a Washington State Ferry pass. The Flexpass can be used on each of three adjoining county transit systems, the regional transit system, regional commuter rail and the soon-to-be-built monorail.

All employees with a Flexpass are eligible to participate in a county-sponsored vanpool program. Each of the three adjoining counties, King, Pierce and Snohomish, operates an extensive vanpool program. Swedish provides a $63.00 a month vanpool subsidy for all employees. Given that most vanpools do not exceed a cost of $63.00 a month, the vanpool subsidy is often 100% for employees. All alternative mode users who receive their Flexpass are eligible for the Guaranteed Ride Home (GRH) program that includes 16 free taxi-rides home a year. Additionally, all Swedish employees that work a 12-hour shift are eligible to participate in a unique taxi service Swedish provides. Every weekday between 6:00-7:00pm, employees with a Flexpass can take a taxi to specific park-&-ride. The taxi service is an extra bonus designed to assist employees achieve a quick and easy commute home after a long, over-time shift.

## Parking

Bus service and parking availability is different at each of the three campuses. The First Hill campus features fewer parking spaces and higher levels of transit service than either the Ballard or Providence location. Thus, the First Hill campus has limited all day shift SOV parking to upper management since July 1990. SOV parking costs $70/month; carpool parking is $12.50 per person per month and vanpools park free. Both carpools and vanpools receive access to the best parking spaces at the First Hill campus. Given the need for flexibility and the on-call realities of hospital work, carpool and vanpool passengers receive four free SOV parking days a month. Night shift employees at First Hill receive free parking but are not eligible for a Flexpass. Instead, night shift employees are eligible to receive a WA State Ferry pass and/or a dollar value Puget Pass that covers their specific commute. The Puget Pass can be used on all local and regional transit but is not valid for use on the ferries.

Neither the Providence nor Ballard campuses receive high levels of bus service. Additionally, parking is more plentiful at each campus. Therefore, Swedish charges SOV's $60 a month and carpools $12.50 per person per month to park at the Providence Campus. Parking at the Ballard campus, the smallest of the three campuses, is $30 a month for SOV parking and free for carpoolers.

## Role Modeling and Marketing

When the ETC was asked to take on full-time transportation benefits and CTR reporting responsibilities, she responded by relinquishing her SOV commute. Since then, she has tried most of the commute alternatives Swedish provides and is able to use her own experience and understanding of the process of commuting via vanpool, carpool and/or transit to encourage employees to at least give it a try. To market the program, the ETC sends out a fact sheet with bus route information, parking requirements and costs, and Flexpass, carpool and vanpool benefits to each employee when they are hired. This fact sheet is delivered to the employee's home along with two free transit passes to encourage transit usage on their first day of work. Additionally, the ETC utilizes the intranet, employee newsletters and new employee orientations to market the various program elements. Swedish's intranet includes information about local merchant discounts for Flexpass holders, all transit, rail and ferry schedules and services, adverse weather notices, links to the regional Rideshare organization and parking pricing information.

## Results

Swedish Medical Center strives to be a best workplace, recruit and retain high quality nurses, doctors and hospital staff and abide by the local and state mandates. Their efforts have resulted in the following modal splits:

| Mode | Providence | First Hill | Ballard |
|---|---|---|---|
| Drive Alone | 50% | 34% | 55% |
| Carpool | 19% | 23% | 14% |
| Vanpool | 4% | 3% | 0% |
| Bus/Rail | 22% | 32% | 15% |
| Bicycle | 1% | 1% | 6% |
| Walk | 3% | 5% | 8% |
| Other (flextime, compressed work week) | 1% | 2% | 2% |

# Texas Children's Hospital - Houston, TX

**FAST FACTS ABOUT:** Texas Children's Hospital

**Types of TDM:** Modal Shift
**Keywords:** Transit subsidies, Vanpool Subsidies, Carpool allowances, Recruitment and retention, Home/Life balance
**Employer Demographics**: Located within the largest medical center in the world, TCH is the largest pediatric hospital in the United States.
**Results:** 20% mode shift, 10% carpool/vanpool, 10% transit
**Cost of Program**: checking on that figure
**Staff:** 1 FTE for seven sites
**Contact:** Patsi Davis, Transportation Specialist, 832-824-2070

## Recruitment and Retention

Located just southwest of Houston, Texas in the Texas Medical Center, Texas Children's Hospital (TCH) is the largest pediatric hospital in the United States. A full-care pediatric hospital, the hospital's medical staff consists of more than 1,580 primary-care physicians, pediatric subspecialists, pediatric surgical subspecialists and dentists. In addition, Texas Children's boasts a nursing and support staff of more than 6,000. TCH's mission "to create a community of healthy children" is leveraged by the CEO's commitment to assist employees balance work and home life. Given the nursing shortage and limited supply of high quality doctors, recruiting and retaining top notch employees became difficult for TCH. Therefore, in an effort to increase TCH's recruitment and retention, the CEO convened a focus group in 2001. Vice Presidents and Directors of various departments participated in a brainstorming session and discussed ideas on how TCH can continue to function as a "world class" facility and attract and keep top notch employees.
Brainstormed ideas included providing free uniforms to staff, offering $2,500 per year tuition subsidy, and instituting free parking, bus passes and carpool allowances. All of the ideas were implemented at the cost of $5.7 million for the first year. Highlighted among the benefits was the flexible employee transportation benefits program.

## Flexibility is Key

Recognizing the changing needs and schedules of hospital employees, TCH's upper management is committed to providing flexible employee transportation benefits. Among the many benefits Texas Children's offers are transit subsidies, rideshare matching, vanpool subsidies, parking management programs, pre-tax benefits, bike/walk incentives, a telework program, flexible work schedules, a Guaranteed Ride Home program, and shuttle service. Most of the programs are flexible from month to month and all employees are eligible to participate. Due to the CEO's emphasis on home and work life, he wanted to make sure the program maintained an "ease of use" with the program. Employees feel like they own the program because they can pick and chose which options are best for them at different times. For example, in the summer months, more employees use alternative transportation modes. These employees are eligible to receive transportation benefits strictly for the summer months.

## Incentives for Options

**Management believed the presence of a subsidy would increase participation in the transportation benefits program.**

Previous to the 2001 brainstorming session, the hospital subsidized transit subsidies at less than 15%. After the brainstorming session, both the number of transportation options supported by TCH and the amount of subsidies provided increased. Management believed the presence of a subsidy would increase participation in the transportation benefits program. The table below summarizes TCH's program options and corresponding subsidies. Subsidy ranges shown are based on employee commute distance and cover 100% of vanpool and METRO transit costs.

| Commute Option | Subsidy Offered by TCH |
|---|---|
| Vanpool | $40 - $170/ month |
| METRO Vouchers | $35 - $110/ month |
| Woodlands Express Pass | $165/ month |
| Remote Parking | 100% cost (increases 10% each year. Currently $53/ contract) |
| Carpool Allowance | $20/ month |

### "Free Rides"

While not heavily marketed, when the commute options program is advertised the messages are simple, "Free Rides" or "Manage your home and work life". Information about the program is given to new hires during orientation along with free one-day passes from METRO. Enrollment forms and information about the programs can be found on TCH's intranet. Additional commuter option information is published in the company newsletters and are placed on bulletin boards in general employee areas. TCH also works with Commute Solutions, the regional commute alternatives program, to help get the word out to employees. Commute Solutions offers brochures, training and a telework program to TCH employees.

TCH has been challenged by the "it's too good to be true" employee mentality. Often, employees do not believe that these programs are free. They are looking for a catch or think this is a one time only subsidy. Once TCH management is able to clearly explain the transportation benefits program, employees are hooked.

### Make the Employees Happy

The program at TCH does not have set quantifiable goals to measure success. Success of this program is based on employee reaction. Management does not "worry" about the program unless there are negative reactions to it, which has not occurred to date. TCH management strives to ensure employees are provided with as many available commuter options and that the program remains flexible and open ended. Surveys about the TCH benefits package are performed regularly. The results of the survey are compiled and given to the Vice President of the institution on a monthly basis.

Currently, survey results show 20% of TCH employees participate in the commute options program. Of that population, approximately 10% carpool or vanpool, and 10% ride transit.

In addition to changing employee travel behavior, the employee benefits program has contributed to improving TCH's recruitment and retention numbers. Before program implementation, the population at TCH was 3,700. After implementation, with the addition of 1.2 million square feet to the facility, an additional 1,800 persons were hired. TCH's management praises the transportation benefits program and the other employee benefits (free uniforms, tuition) as an important recruitment and retention tool.

# Metropolitan Seattle Transit-Oriented Development and Flexcar - Seattle, WA

**FAST FACTS ABOUT:** Seattle Transit Development And Flexcar

**Types of TDM:** Mode Shift, Origin/ Destination Location Choice, Trip Substitution Choice
**Keywords:** park and ride, transit oriented development, parking variance, car sharing
**Area Demographics:** Metropolitan Seattle, project locations are varied
**Program:** Transit-oriented development at existing park and ride facilities, car sharing program.
**Results:** New multi-family construction parking variance. Flexcar operates over 100 vehicles in more than a dozen Seattle area neighborhoods.
**Cost of Program:** $1 million appropriation for staffing, consulting fees, and project development for TOD Program. Additional private development costs.The County contributes up to $200,000 per year for member incentives and staff support.
**Staff:** Three project managers oversee the TOD Program.
**Contact:** Flexcar – Christine Anderson, Flexcar Program Manager, King County Department of Transportation, cristine.anderson@metrokc.gov
TOD - Ron Posthuma, King County Department of Transportation, TOD Program Manager, ron.posthuma@metokc.gov.


## Area Characteristics

The City of Seattle, King County, Sound Transit, University of Washington, surrounding jurisdictions and private developers have committed to trip reduction by introducing a number of complementary programs and projects throughout the region. This case study will focus specifically on public-private partnerships that foster a complementary relationship between land use, transit, parking availability, and transportation demand. The success of transit oriented development (TOD) projects and Flexcar, the County's car sharing program, is due in large part to the willingness of program sponsors and participants to try something different. In addition to the programs highlighted below, three other case studies within this report are from the Seattle metropolitan region, the University of U-PASS Program, the Swedish Medical Center, and Seattle Seahawks Stadium.

## Program Description

**King County Transit Oriented Development (TOD) Program**
Developed in 1998, TOD efforts began by assessing established park-and-ride sites for development potential. Following a series of analysis efforts, a number of TOD projects have been completed, are under construction or are currently under study. Each success has led to a continued investment in infill development, affordable development and design practices that maximize the viability of alternate modes of travel besides single occupancy vehicles. Since 1999, the Program has received an annual $1million appropriation for staffing, consulting fees, and project development. Summarized below are three completed TOD projects developed at park-and-ride lots throughout metropolitan Seattle.

The Village at Overlake Station, Redmond, WA - As the first suburban "pilot" program, the Overlake project includes 308 apartments, a daycare facility and a shared parking structure open to park-and-ride users with spaces reserved for Flexcar. As a condition, the developer was required to provide one bus pass per apartment.

Northgate North, Seattle, WA - Northgate North opened in October 2000 as a four story retail project requiring a new access road which resulted in a loss of a portion of the park-and-ride lot. As a condition, the developer was required to provide replacement parking in its parking structure. In March 2002, the County purchased additional adjacent land to provide an additional 500 parking stalls. Negotiations continue regarding the ultimate outcome of the site which is only partially developed.

**Each success has led to a continued investment in infill development, affordable development and design practices that maximize the viability of alternate modes of travel besides single occupancy vehicles.**

Renton Transit Center, Renton, WA – The Renton site is home to 90 apartments and a new parking structure with 150 new park-and ride stalls. The apartments have all been rented and staff research indicates one third of the tenants travel by transit.

As the TOD programs continue to grow, a number of lessons learned have emerged. Although it might be challenging to agree on terms of shared parking arrangements, it introduces a substantial benefit to the viability of the site as both a TOD and park-and-ride facility. It has also been beneficial to evaluate existing park-and-ride demand and suggest consolidations where appropriate.

**Flexcar**

In 1998, King County Metro, the County's transit provider, initiated efforts to make the case for car sharing as a viable alternative to personal vehicle ownership. A number of successive events occurred leading up to the actual implementation of the program including the development of Business and Marketing Plan, the Request for Proposals to secure a vendor, and the explicit identification of roles and responsibilities among jurisdictional participants. From the onset, a number of distinguishing features were recognized as contributors to the program's success including the expectation of rapid growth, utilizing a multi-market approach, and the presence of political support.

In January 2000, Flexcar was implemented in Capitol Hill, Seattle's highest density neighborhood with four vehicles. According to 1990 Census data, Capitol Hill was home to 16,250 residents of which 37% did not own a personal vehicle. Within the first year, Flexcar grew to over 900 members with 19 vehicles with presence in five neighborhoods. Today, Flexcar operates more than 100 vehicles in over twenty neighborhoods. As a company, Flexcar continues to expand with operations in sic metropolitan areas throughout the U.S. (Seattle, Portland, Washington D.C., Los Angeles, San Diego, and Denver). In a report summarizing the first six months of Flexcar based on 146 responses to a new member survey it was determined that the majority of the members work in a managerial or professional occupation and 79% were college graduates. 55% of members indicated that they lived in a rental property.

Like other car sharing programs, Flexcar participants pay an annual fee and select a rate plan that suits their needs. Rate plans are offered hourly or monthly and fees are incurred based on time and distance driven. In return, user costs such as vehicle maintenance, gasoline, and insurance are paid for through the rate plans. Vehicles are parked within a reasonable distance from residential and employment centers. Reservations are made by phone or on-line.

## Measures of Effectiveness

As an indicator of TOD and Flexcar success, both programs have received awards and recognition as innovative strategies with a positive impact on regional travel. It's also evident that the two programs complement each other as car sharing has been included in development plans, including some King County TOD projects.

By requiring developers to provide bus passes and making transit and light rail highly accessible to tenants, the TOD program has been able to obtain a variance in the parking requirements for new multi-family construction. Instead of requiring 2.5 parking stalls per apartment, the ratio has been dropped to 1 stall per apartment as is the case at Overlake. Since tenants are required to register their car for the site, the actual stall usage per apartment ratio was able to be measured. On average, .6 of a stall is being utilized per apartment. It's also been inferred that a third of the tenants use transit, which is three times greater than a typical suburban multi-family apartment complex.

Currently, Flexcar program effectiveness is being analyzed by the University of Washington.

# Orenco Station Mixed-Use Development - Hillsboro, OR

**FAST FACTS ABOUT:** Orenco Station - Hillsboro, OR

**Types of TDM:** Mode Choice, Location Choice
**Keywords:** light rail, transit-oriented design, housing, zoning, community design
**Area Demographics:** Master-planned community at Orenco Station proximate to Tri-Met Westside MAX light rail within metropolitan Portland, Oregon.
**Program:** Transit-oriented development featuring a varied housing selection and pedestrian-friendly amenities. Free transit passes are offered to all new tenants for one year.
**Results:** 53% increase in transit usage after Westside light rail opened. Reduced need to travel outside of immediate community for discretionary trips.
**Contact:** www.orencostation.com

## Area Characteristics

The developers of Orenco Station call it America's most awarded new community. As the winner of the National Association of Homebuilders Master Planned Community of the Year (1999), there are many good reasons why. The 206-acre, transit-oriented development has many planning and design features that make it one of the most livable new communities in the U.S. Located on the Westside Light Rail line outside of Portland, Oregon, Orenco Station is a pedestrian-friendly, mixed-use development with all the fundamental features of a successful neo-traditional community including a menu of housing choices, a town center with a main street corridor, ample park and recreation amenities and a variety of transportation options including light rail.

Although the Orenco Station site was originally zoned for industrial use and later for subdivision housing, the site was ultimately designated as a "town center" in the Portland Metro Area 2040 Plan. The Plan specifies legally binding requirements for all Westside station areas, and mandates features such a minimum densities and residential density targets at varying distances from light-rail stops, mixed-use development in station areas, pedestrian oriented buildings, prohibitions on auto-oriented land uses, and reduced parking. A special zoning ordinance was customized for Orenco Station establishing design guidelines to allow for and ensure an urban mix of housing types and land uses not typically found in the suburbs.

## Demand Management by Community Design

One of the benefits of being a transit-oriented development is the provision of transportation alternatives. The community was designed to be a "complete community", meaning residents could work, shop, recreate and live within it, thereby reducing the need for travel outside of it. Orenco residents are located within a quarter mile radius of groceries, restaurants, and professional services.

The other defining transportation feature is the development of pedestrian pathways, and open space that all culminate at the Orenco Station stop of the Tri-Met Westside MAX light-rail line. This region-wide light rail system is one of the key features of the Portland region's livability. Orenco residents may walk to the station and have access via light rail to downtown Portland, the Portland International Airport, Hillsboro's high technology industrial center and other parts of the metropolitan region. The development team consciously biased towards pedestrians to encourage walking to transit and local commercial development and to encourage a more community-oriented life style.

**The community was designed to be a "complete community," meaning residents could work, shop, recreate and live within it, thereby reducing the need to travel outside of it.**

The town center is situated near Cornell Road, an existing major arterial road a quarter mile north of the station that bisects the entire development. The town center buildings provide for neighborhood retail and offices uses with

generous adjacent pedestrian facilities. In addition, a new grocery store and retail kitchen store will be opening in the fall of 2003. Housing units are also located above the retail spaces.

Several design features were employed in the residential areas to reinforce the pedestrian- and community-orientation of Orenco Station. Residential streets within Orenco generally allow for parking on one side with widths held to 25 feet. To further reduce the impact of automobiles, Orenco's site design provides alley-accessed parking, thereby eliminating front garages, curb cuts, and driveways.

The community was designed to provide a variety of housing options, all of which are made for compact development: single-family homes, townhouses, accessory units, loft units, and apartments. The single family detached units are relatively small, ranging from 1,400 to 1,700 square feet; but all units have a dedicated home-office space and features to reduce the amount of commuting in the community. Unlike more traditional subdivisions, the three- and four-unit townhouse structures are integrated with single-family detached housing. The loft units have many of the architectural features of single family homes. Apartments and lower price condominiums are also available in the development to offer more affordable options. All residential unit sales have been strong since the beginning.

At Orenco, all new tenants are provided free transit passes for one year with other tenant marketing materials. Intel and other large employers adjacent to Orenco provide transit passes through an arrangement with Tri-Met.

**A special zoning ordinance was customized for Orenco Station establishing design guidelines to allow for and ensure an urban mix of housing types and land uses not typically found in the suburbs.**

### Measures of Effectiveness

The planning and design of Orenco have been noticed by community residents and is reflected in their attitudes and behaviors. A Pilot TOD Pass Program was implemented in September 1998 to test the effectiveness of transit pass incentives. Under the program, new tenants were provided free transit passes with other tenant marketing materials. Some key findings include:

- Whereas only 30% of respondents reported using transit prior to the Westside MAX opening, 83% reported that they used transit in May 1999 (after the opening).
- From September 1998 to May 1999, transit use for commuting purposes increased 22%.

Although the Pilot program has expired, all new residents continue to receive free 1-year passes.

According to a recent Lewis and Clark College study, transportation practices were also affected by the design and planning of the Orenco community. The study suggests:

- 70% of those surveyed shop in the Town Center at least once a week.
- 85% of respondents stated that the close proximity of neighborhood businesses and amenities has reduced the need to drive elsewhere to purchase necessities or for entertainment.

# Lee County Variable Bridge Tolls - Lee County, FL

**FAST FACTS ABOUT:** Lee County Variable Bridge Tolls

**Types of TDM:** Value Pricing, Off-peak Travel Time Shift
**Keywords:** Value pricing, variable pricing, electronic tolling, flexible work arrangements, off-peak travel time shift, discounts, incentives
Area Demographics: Lee County, Florida (Cape Coral and Fort Myers); 400,000 residents
**Program:** 50 cent discounts on tolls for use of off-peak travel times on two principal bridges accompanied action to raise overall bridge tolls to $1 (from 75 cents)
**Cost of Program:** $9.7 million grant awarded by Federal Highway Administration for technology installation, demonstration, implementation, and evaluation; additional $7.0 million set aside as "emergency revenue reserve"
**Implementer:** Lee County Public Works
**Results:** 5% shift from peak to off-peak travel
**Contact:** Chris Swenson, CRSPE, Inc., crs@crspe.com

## Providing Choice in Tolling

Lee County, Florida, is a pioneer in using variable tolls as a way to manage congestion, provide traveler choice, and spread traffic away from the peak period. The principle behind this objective is that commuters will make rational choices if those decisions are based on balanced cost incentives. The Leeway project provides another measure of choice – price choice – to the mix of Transportation Demand Management (TDM) strategies.


## Background

Lee County is located in southwest Florida. Approximately half a million people live in the metropolitan area comprised of Ft. Myers and Cape Coral, with an additional 1.7 million tourists visiting per year. The Caloosahatchee River separates these two cities, and the County provides only three bridge crossings. Two of these crossings, the Cape Coral Bridge and the Midpoint Bridge, are the most relevant to commuter traffic, and were the focus of the Variable Pricing Program.

A toll of $1.00 was levied on both bridges in 1997. In order to convince the public to accept the higher $1.00 toll, over a previous $0.75 toll, Lee County Commissioners endorsed an innovative concept of varying the level of the toll based upon the time of day. In the "shoulders of the peak period" (6:30 – 7:00 am, 9:00 – 11:00 am, 2:00 – 4:00 pm, and 6:30 – 7:00 pm), patrons received a 50 percent discount on the toll if they utilize the bridge's electronic toll collection (ETC) system. Due to a popular "frequent user" program, this discount varies in value from either $0.25 to $0.50 each trip.

The objectives of the variable pricing program were to provide travelers with:

- an incentive to shift from peak periods
- an opportunity to lower out-of-pocket costs
- a reason to use ETC (which provides for better traffic management at toll plazas)

## Challenges

There are a variety of challenges involved with the variable pricing program. The two principal concerns were:

- marketing the benefits of variable pricing in an area with relatively low levels of congestion, and,
- ensuring sufficient funds are generated to repay bonds and cover operating/maintenance costs

Lee County does not experience significant levels of congestion. In fact, most of the main arterials and highways operate at free-flow even in the peak hour. The challenge to Lee County officials was how to market the new off-peak travel discounts, when shifting travel was not likely to significantly short the likely travel time. Lee County responded to this challenge by marketing the convenience of electronic tolling and the cost savings provided by using off-peak periods. A variety of media was used to market the service, with multiple points of presence throughout the County. Media coverage of the concept also was high, since there is appeal in the innovation of variable pricing. Within a year, the project had over 40 articles in print media and 150 news stories in televised media.

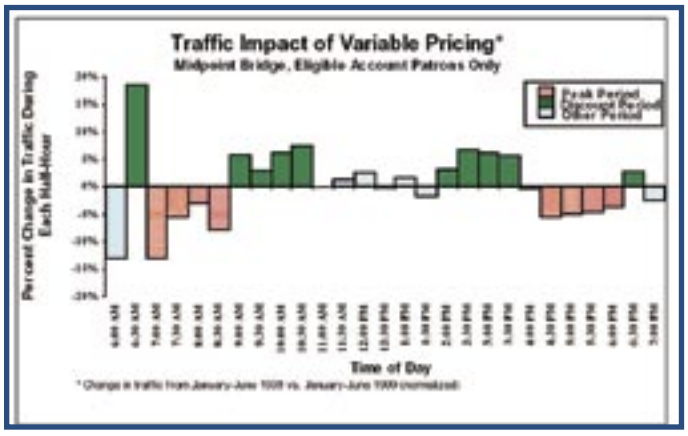
In addition to convincing travelers to use the program, Lee County also needed to convince employers to offer employees flexible scheduling and variable work hours. Without the ability to shift the commuter's travel time, the off-peak discount program would not be successful. In order to accomplish this, the County conducted outreach to medium and large size businesses in Ft. Myers (the principal employment node).

The issue of ensuring sufficient funds was critical to implementing the program. In 1996, Lee County applied for, and received, a grant from the Federal Highway Administration's Value Pricing Pilot Program. The $20 Million grant provided a $7 Million set-aside to compensate for lost tolls under the variable pricing program. The set-aside was necessary to alleviate concerns about the potential loss of revenue.

## Results

The variable pricing program has been successful in meeting the program's objectives. Approximately 7 percent of all eligible participants indicate the variable pricing program causes them to alter their tripmaking behavior. According to a telephone survey of eligible drivers in late 1999, half of respondents indicated they always or sometimes considered the discounts prior to making a trip across the bridges. Finally, the variable pricing program is well known in Lee County, with over 90 percent of travelers familiar with the program. Altogether, these show that travelers are aware of and consider the option provided to them from the variable pricing program.

In three years of the implemented project, as reported by Mark Burris at the Center for Urban Transportation Research ("Lee County Variable Pricing Project: Evaluation Report", January 2001), use of the bridges increased in the off-peak times and decreased during the peak periods. Traffic data near the bridges indicate that variable pricing had caused no measurable change in vehicle speeds, queue lengths at toll plazas, average vehicle occupancy, transit ridership, or accidents.




Over time, more and more travelers have utilized the electronic toll collection technologies, reducing the average cost per transaction. Lowered transaction costs on the bridges have partially offset the loss of revenue from the toll discount, as has the natural increase in daily traffic. It should be noted that the program continues to this day (September 2003), well after the expiration of the Federally funded toll revenue guarantee.

---

Evidence for this case study has been provided by numerous evaluation reports conducted by Mark Burris (Center for Urban Transportation Research) and Chris Swenson (CRSPE, Inc.).

# Commuter Link - Salt Lake City, UT

**FAST FACTS ABOUT:** Commuter Link - Salt Lake City, UT

**Types of TDM:** Advanced Traveler Information Systems
**Keywords:** Real-time communication, multi-jurisdictional coordination, technology, individualized demand management.
**Area Demographics:**
Salt Lake Area: 913,000 residents
**Program:** Technology allows SOV drivers to make better choices by managing their own demand with real time travel information.
**Cost of Program:** In 2004 the reduced cost of server technology makes this a much less expensive endeavor. Instead of requiring nearly a dozen Unix Servers to capture/generate images and nearly 40 Intel web severs to operate CommuterLink, TOC employees intend to operate all it with 3 or 4 more powerful Intel servers at an approximate cost of $60,000.
**Implementer (s):** Utah Department of Transportation (UDOT) in partnership with Utah Transit Authority (UTA), Salt Lake City, Salt Lake County, Wasatch Front Regional Council, Mountainland, Utah Department of Public Safety (DPS), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Federal Railroad Administration (FRA), Salt Lake City Airport, ITS Rocky Mountain, ITA America, and Georgia Navigator.
**Contact:** Troy Hyer –UDOT, Paul Jencks–UDOT, Brian Chamberlain–UDOT.

## Background Information

The CommuterLink system design was based on Navigator, the Georgia Department of Transportation's Intelligent Transportation System, which was used for the 1996 Summer Olympics in Atlanta. With a deadline to have the system operational by the 2002 Salt Lake City Winter Olympics, UDOT staff felt it was better to go with an older model that had been tested than to trouble shoot newer technology and deliver less than adequate service to travelers during the Olympics. UDOT employees customized Georgia's software to address their needs and added the feature that automatically disseminates alerts via email.

## Advanced Traveler Information System Issues

***Timing-*** Traffic reports on commercial radio stations are provided at specified intervals of time. Most often, traffic reports are not broadcast more frequently than every 10 minutes during peak rush hour. If an incident is reported one minute after the last traffic report is given on that station, it will be 9 minutes before commuters hear about it in the next report. That interval of time is often when commuters initiate their trip and make their decisions on which routes to take. Thousands of commuters may have made different travel choices had they heard the information. Instead they are choosing a route that will take them to and contribute to worsening delays at the incident. Receiving the traffic report as soon as the incident is reported gives commuters more opportunity to avoid it and lessen impacts of it.

***Simplicity-*** Radio stations often have to cater to their regional audience, and therefore provide traffic reports on all of the roads in the region. This is often rushed and confusing to listen to. If for some reason you were distracted when they said something about your route, it will be ten minutes before you can hear it again.

## Solutions

UDOT recognized that in order to effectively manage traffic it is as important to allow travelers to manage their own demand. This can be done by providing travelers with information when and where they need it. UDOT in partnership with numerous other organizations developed CommuterLink as a centralized system to manage travel in the region.

## Description of CommuterLink Website

In addition to traffic monitoring and incident detection, CommuterLink also provides a user friendly format to relay the information detected and monitored to the traveling public. This is done through the CommuterLink Website. The CommuterLink Website (CLW) is operated by UDOT, on computer servers located at the TOC. CLW provides a map of the freeway system and the major surface streets, where most of the surveillance equipment is installed. CLW offers three primary types of information to the traveler:

1. Traffic conditions (speeds, incidents)
2. Roadway closures and construction
3. Weather (including pavement conditions)

***Traffic information*** is presented in a number of ways. To display congestion conditions, the speed on each freeway segment (about one-half mile long) is shown as color-coded band (red = 0-30 mph, yellow = 31-50 mph, and green = 51 mph and above). Incidents are denoted with a red triangle; if the user clicks on that symbol, further information about that incident is displayed on a small portion of the screen, in the lower left corner. Visitors to CLW can also view video footage of real-time traffic conditions by clicking on the cameras located on the map.

***Roadway construction and closures*** are displayed as a color-coded triangle, near the location involved. Yellow triangles denote current construction and/or closures; blue triangles identify future construction or closures.

***Weather conditions*** are displayed as a cloud near the roadway where road conditions are provided.

## Alert System

The CLW also enables individual users to subscribe to an "Alert" system, which automatically sends an email message in the event of an incident that falls within user-specified parameters (time of day, day of week, severity of incident). CommuterLink provides information only about the routes with a traffic impact level that concerns the subscriber at a time when it concerns them. The criteria for which an individual can subscribe can be seen at right.

When an "Alert Subscriber" presses the "Create Profile" button they are added to the CommuterLink database. Every half hour subscribers who checked that "Notification Timeframe" box are activated. Within that half hour, CommuterLink captures information about travel speed on regional roadways every 20 seconds. If travel speed on any of those roadways indicates an incident, CommuterLink sends an email is sent to the subscriber. A sample message would be, "Crash I-15 at 1500N SPGVL on right shld."

A variation on receiving this information is an email account allows users to receive this information on their cell phone or pager using text messaging. This provides them with the information they need, when they need it, wherever they may be.

By receiving emails at work before they leave to get in their car, commuters can make a decision to delay their departure until incident is cleared or plan an alternative route to avoid the incident. In either case the traveler is not adding to the problem created by the incident and able to use their time more productively. Similarly, by having the information sent to their pager or cell phone, commuters can receive information about an incident before they leave the office or while they are on the road. If they receive it early enough they can receive the same benefits listed above.

## Quick Facts*

- CommuterLink initiated email subscriptions in late 2000.
- In March 2004, CommuterLink had 6,652 commuters subscribing for traffic incident information to be sent to their email account.
- CommuterLink had 121,117 visitor sessions during March of 2004. Averaging 3,907 sessions per day.
- 83% of the sessions occur during the week with Monday and Wednesday being the busiest days
- CommuterLink receives its most visitor sessions between 7:00 am and 6:00 pm. Peak usage is between at 4:00 pm and 5:00 pm for commuters to plan their trip home.

*Detailed usage statistics for the CommuterLink Website are maintained by the website host (UDOT), using the "Webtrends" tracking software package. All usage data reported in this section are based upon the information reported by that system.

U.S. Department of Transportation
**Federal Highway Administration**

Federal Highway Administration
US Department of Transportation
400 7th Street, S.W. (HOP)
Washington, DC 20590

To order a copy of this document contact the
ITS Toll-Free “Help Line” 866-367-7487
www.ops.fhwa.dot.gov

Publication Number: FHWA-HOP-05-001
Electronic Document Library (EDL) Number: 13668