Transportation Demand Management & Corridor Projects

February 2002

Produced by UrbanTrans Consultants, Inc.
for the Colorado Department of Transportation

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February 2002

Transportation Demand Management Elements in Corridor Projects

Effective corridor improvement projects seek to maximize the efficient use and capacity of limited transportation resources. As with any project, supply cannot be the only solution; the demand for any system must also be considered.

In the late 1970s, efforts were pursued to manage the demand for transportation systems and services. The idea was to encourage shared forms of travel as well as promote a balanced transportation system with a focus on more than one mode of travel. This trend has continued and taken on a more formal role in how we address major public investments in transportation.

Transportation Demand Management (TDM) elements have played a key role in corridor projects. In some cases, TDM has been used to offset environmental impacts of roadway expansion, in others, it has helped to mitigate traffic during construction. In either case, TDM is becoming a critical element to consider in any corridor effort.

This handbook offers an overview of demand management strategies for transportation projects in Colorado. It defines strategies, presents potential program effectiveness, and details how these strategies can be applied and evaluated.

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Section One: Definition

Transportation Demand Management (TDM) is a set of strategies for managing the demand placed on the transportation system. It is a term that has been applied to a range of actions that are directed at encouraging the use of alternative travel options, such as carpooling, vanpooling and public transit, and in some cases, limiting the use of single-occupant vehicles (SOVs). TDM relies on incentives and disincentives to change travel behavior and is often based on participation from both the public and private sectors.

TDM has also been an effective tool affecting where and when people work. Programs such as teleworking and variable work hours can improve the efficiency of the transportation system.

TDM strategies include:

- Carpooling: two or more people traveling in a car
- Vanpooling: eight to 15 people traveling in a van
- Transit: shuttles, buses and rail
- Bicycling and Walking
- Variable Work Hours: changing work schedules to more effective managing work and home life
- Teleworking: working from home and teleconferencing

TDM support strategies:

- Parking Management: preferential parking for carpoolers and vanpoolers, allowing non-drivers to "Cash Out" the value of an employer provided parking space, and charging for parking.
- Rideshare Matching: Ridematching is a service that identifies people that live and work close to each other. Matching services can offer full-time partners or simply, a person to call in the case of an emergency.
- Incentives and Subsidies: either bring down the cost of a transit pass or vanpool fare, or reward commuters with cash, prizes, time off and recognition.
- Marketing and Promotions
- Guaranteed Ride Home: a ride home by taxi or rental car for carpoolers, vanpoolers and other alternative modes in the case of an emergency or need to work late.
- Value Pricing: the use of market-based transportation strategies to enhance mobility options (e.g., parking pricing, tolls, etc.).
- Intelligent Transportation Systems: the use of information technology to enhance travel & system efficiency.
- On-site Amenities and TDM-friendly Site Design: designing facilities that support an array of convenient transportation options.

Factors affecting the use of TDM strategies:

- The availabilitity of alternatives to driving: for example: transit, carpooling, vanpooling, bicycling, walking, onsite amenities, TDM friendly site design, and teleworking.
- The provision of information about alternatives: key programs include: rideshare matching, marketing and promotions, intelligent transportation systems, and Guaranteed Ride Home.
- Competitive travel times
- Convenience and comfort
- Travel cost advantages: achieved through incentives and subsidies, value pricing, and/or parking management programs.

Section Two: Effectiveness

Although TDM measures have become increasingly popular among decision-makers, research is limited on the effectiveness of TDM programs area-wide or along a corridor. TDM has been shown to be most effective in single work site locations where an employer offers employees a blend of incentives and disincentives to reduce single occupant vehicle travel. In some case examples, TDM has achieved as much as a 30 percent reduction in vehicle use.

Comprehensive TDM programs typically reduce peak-period automobile trips by 10 to 30 percent at worksites. On an area-wide basis, programs typically have less effective results (due to the variability of implementation from worksite to worksite). However, achieving substantial automobile trip reduction is possible. Some of the best experiences have been:

- Downtown Bellevue (WA): 17.8 percent reduction in automobile trips
- Bishops Ranch (CA): 16.6 percent reduction
- Minneapolis (MN): 15 percent reduction.

Transportation Management Associations (TMA) are organizations tasked with implementing commuter and TDM assistance programs within a given service area. These service areas may be small, such as the former University of Colorado Health Sciences TMA, or large, such as the TMA of Utah, which has oversight over the entire Salt Lake City metropolitan area. The typical TMA, though, has a subregional service area, such as the U.S. 36 TMO (Broomfield / Westminster), Downtown Denver Partnership TMA, and the Southeast TMO (Denver Tech Center). A study conducted by the TDM Resource Center in 1996 found that TMAs typically reduce a minimum of 6 to 7 percent

of total commute trips, and more if implemented in conjunction with transit improvements. A TMA formed in suburban Los Angeles, Warner Center, managed to shift nearly one-third of all commute trips into some form of shared travel. The program has been in operation for nearly fifteen years.

Some of the most successful applications of TDM involve mandates, pricing and/or parking management elements. Charging for parking can be a major motivating factor for commuters to consider some other form of travel. However, strong results require the active promotion of alternatives and a blend of public and private investment in support services, incentives and education. In a 1997 national study, and confirmed in a separate 1998 study for Los Angeles, charging for parking (approximately $2 fee) reduces auto commuting by a minimum of 12%, with a total reduction possible of 19 - 30% if conducted in conjunction with other TDM strategies.

Trip Reduction Regulations

Trip reduction mandates emerged in the early 1980s as a means of reducing traffic in communities throughout the United States (e.g., Pleasanton, CA). In the late 1980s, environmental agencies began to use trip reduction mandates to address air quality. "Severe" and "Extreme" Ozone non-attainment areas were required to regulate employers with more than 100 employees at a work site. The employers were asked to promote commute alternatives to their employees.

These mandates were slow in achieving results and many questioned whether the efforts were cost-effective. Most of the mandates were repealed in the mid-1990s. However, some areas continue to use mandates for trip reduction and air quality purposes. Some examples include:

- In the Los Angeles region, the South Coast Air Quality Management District introduced Regulation XV (later Rule 1501 and Rule 2202) in December 1987. The goal of the regulation was to reduce vehicle trips by 25 percent at sites with more than 100 employees. By 1995, the effort was successful in reducing only a quarter of the target emissions. The air district then went to a voluntary effort (HR836) for a one year period (1997) to see if businesses could do more without regulation. The evaluation indicated that trip reduction accomplishments could not be maintained voluntarily. The air district is considering a return to more stringent trip reduction mandates.

- The Portland (OR) area implemented a trip reduction regulation in August 1996. The Department of Environmental Quality worked closely with the business community in designing and implementing the rule. The goal was to reduce 10 percent of the vehicle trips within three years, at sites with 50 or more employees. Initial findings have been very positive. The rule continues to have support from the private sector and many sites accomplished the 10 percent target within the first year.
- The Denver region explored the potential application of trip reduction mandates through a two-year study (1992-1994) involving 40 randomly selected employers. The study demonstrated the potential for voluntary efforts and recommended the creation of TMAs. The study recommended against the implementation of mandates, as defined by the Clean Air Act Amendments, suggesting that mandates offered only modest reductions in regional vehicle trips at a significant cost. Private sector resistance to mandates was also a consideration. Since then, five TMAs were created in the Denver area, with four remaining in 2001.

Average Effectiveness

The effectiveness of TDM strategies are not mutually exclusive and are not cumulative. In that, individual strategies may "double count" for the effects of other TDM strategies which are implemented in conjunction with the strategy being evaluated. This is the reason why most comprehensive TDM programs, which offer a multitude of services and strategies, appear to have a ceiling of approximately 30 percent vehicle trip reduction. However, studies have been conducted over the past few years to attempt to ascertain the individual effects of programs.

These are summarized below:

TDM Strategy	**Automobile Trip Reduction**
Financial incentives / subsidies (1997)	3 - 7 % ($1 per day) 6 - 15% ($2 per day)
Parking cash out (1997)	10 - 13% (worksite)
Compressed work weeks (1998)	7 - 10% (worksite)
Telework (1997)	1 - 4% (areawide)
Walking / bicycling improvements (2000)	1-2% (areawide)
Carpooling / vanpooling programs (1996)	1 - 3% (areawide)
Marketing and promotion (1996)	1-3% (with other strategies)

Section 3: Local & National Experience

Local Experience

In most metropolitan areas, TDM is implemented regionally, by either Metropolitan Planning Organizations, transit agencies, or other appropriate entities. Colorado's TDM service providers have been operating for over a decade. Formal rideshare and TDM programs include:

- RideArrangers (Denver region)
- GO Boulder (City of Boulder)
- SMART*Trips* (North Front Range)
- RideFinders (Colorado Springs)

Often times, metropolitan areas need local representatives to coordinate subregional transportation programs and promotions with employers. The focus of these efforts is to address subregional commute challenges and to provide services direct to commuters. In Colorado, Transportation Management Organizations (TMO) and Associations (TMA) have been established to address these subregional concerns. The service area of TMAs and TMOs differ, with some serving corridors, central business districts, resorts, or office parks:

- Downtown Denver Partnership TMA (Denver CBD)
- Southeast TMA (Denver Tech Center)
- Transportation Solutions (Cherry Creek-Glendale TMA)
- U.S. 36 TMO (Broomfield / Westminster)
- Garden of the Gods Corridor TMA (Colorado Springs)
- Transportation Options Program (Aspen area TMA)

TDM strategies will have variable success in Colorado. In many situations, the extent of success is directly proportional to the nature of worksite development within the area, severity of congestion, availability of viable alternatives to driving, and the specific promotions offered for using alternatives. Sometimes, simply good, outgoing personalities and strong, vibrant relationships between TDM service providers and employers are all that are necessary to yield a successful program.

Recent data on TDM effectiveness in Colorado is relatively sparse. This is primarily a factor of TMAs only just now maturing into long-term organizations. However, some examples of TDM activities and effectiveness in Colorado include:

DRCOG RideArrangers

RideArrangers is a commuter services subdivision of the Denver Regional Council of Governments. In operation for well over a decade, RideArrangers has endeavored to promote the use of alternative forms of transportation throughout the

Denver metropolitan area. Recently, RideArrangers has worked extensively with local Transportation Management Associations (TMA), for which DRCOG has partially funded over the years.

Services offered by DRCOG, as of a 1999 agency-wide survey, include (Sections 5&6 offer additional general information on these types of TDM strategies and support strategies):

- Carpool / vanpool matching: RideArrangers has approximately 7,000 carpoolers in its database, and reports 5,000 annual requests for carpool matches. Approximately 16% of its requests actually form a carpool. These statistics (both number of entrants in the database and number of carpool formations) are expected to increase significantly in the near future, as the T-REX project, on southeast I-25 in the Denver area, encourages commuters to explore alternatives.
- Vanpools: Until 2000, DRCOG had 15 vanpools and approximately 150 vanpool riders. DRCOG managed the vanpool program in-house and did not offer fare subsidies to vanpool participants. However, recent cooperation with RTD & CDOT has expanded the total number of vanpools available and added operational subsidies for commuters. The vans are provided as part of the TDM corridor efforts of the T-REX project.
- Guaranteed Ride Home: GRH is provided with all ECO Pass memberships, or on a separate employer-contract basis with RideArrangers. GRH is contracted by RideArrangers with local taxi-cab companies.

Downtown Denver

- Telework promotion and assistance: RideArrangers sponsors a website and local demonstration projects for Telework Colorado. Over the past three years, over a dozen demonstration programs have been financed and implemented at area employers. The website can be found at http://www.teleworkcolorado.com/
- Campaigns and events: RideArrangers regularly sponsors numerous events and campaigns throughout the year, including “Pollution Solution”, “Bike to Work Month”, and others. The 1999 budget for events & campaigns was approximately $1.4 million.

Although DRCOG has not updated its *Surface Transportation Data File*, which details TDM and transit effectiveness regionwide, since 1996, some results are available. Recent findings for RideArrangers include:

- Daily 106,674 Vehicle Miles Traveled (VMT) reduction, Monday to Friday, for the Denver region (1996 figures).
- In 1999, DRCOG reported as much as 456,000 VMT reduced as a result of various campaign efforts.

In terms of the statistical analysis of travel reduction strategies at area employers, the most recent comprehensive study is from 1994. In that study, travel reduction opportunities in the Denver region were examined at specific "pilot" employers. Many of these firms experienced a decrease in the drive alone rate. Examples from this study includes:

- Payroll One (15.3 percent in drive-alone use)
- Master Magnetics (7.2 percent)
- Felsburg, Holt & Ullevig (4.6 percent)
- City and County of Denver (2.1 percent)

The study supported the promotion of voluntary programs and recommend against mandates (see section on regulations).

City of Boulder

TDM has been a cornerstone of Boulder's transportation planning program since the inception of the City's Alternative Modes Center in the late 1980s. Since then, TDM promotion by the City has evolved into the internationally-recognized GO Boulder program. Transportation efforts in Boulder have relied upon TDM strategies, in cooperation with transit and Transportation System Management (TSM) strategies, to reduce single occupant vehicle (SOV) travel in the City. The City's Transportation Master Plan (1996) established an SOV modal share target of 25 percent of all trips by the year 2020. This is an ambitious goal, and will require a dramatic reduction in total SOV travel in the City.

Boulder has been successful in its application of TDM strategies. Since 1990, the City has measured, every two years, the change in modal use and vehicle miles traveled (VMT) throughout the City. In itself, this measurement process leads the nation in the evaluation of TDM success. Findings from the most recent evaluation (February 2001) include:

- Since 1990, the proportion of all trips made by SOV has

decreased by 3 percent, however, most of this occurred in the early 1990s with the onset of the majority of the City's TDM strategies. Since 1994, the SOV modal share has remained at approximately 41 percent of all trips. This finding indicates that TDM's initial success as reducing SOV trips was not defeated by a "lack of interest" in maintaining the use of modal alternatives (as is often the case with TDM programs elsewhere in the country). Rather, the constant marketing and promotion of TDM allowed for the maintenance of the SOV reductions.

- Walking trips increased by 1.5 percent; transit trips have increased by 2.5 percent. More importantly, there has been a shift of about 2.5 percent in the proportion of miles traveled by transit (increasing to 6.5 percent of all miles traveled in 2000).
- TDM strategies have been particularly effective with the commute, as SOV commuters declined by 9 percent from 1990 to 2000. Again, most of the reduction was achieved when TDM was first introduced to Boulder, however, the steady application and promotion of TDM has maintained those reductions since. In the same time, transit share of work commutes increased by 4.7 percent (to 8.7 percent in 2000), however carpools declined by 2 percent. This implies that transit not only captures previously SOV commuters, but also carpoolers. Finally, on an average day, Boulder reports that 11 percent of employees will telework, placing it slightly higher than the Denver region's overall telework estimates.

Breckenridge Trolley

Summit Stage, Frisco

National Experience

TDM has been implemented in many corridor projects throughout the country. More successful applications of TDM in corridors are articulated below.

State of Washington, Puget Sound Region, I-405 Corridor TDM Program

Like many urban corridors, I-405 in the Seattle area has experienced increasing congestion. In response, the Washington State Department of Transportation (WSDOT) recently conducted an Environmental Impact Statement (EIS) to review four build alternatives for the corridor. Regardless as to which of the four alternatives was selected, WSDOT planned and implemented a comprehensive corridor TDM program with consistent strategies across all four alternatives.

WSDOT promotes a few core components about the I-405 Corridor TDM Program:

- Existing public and private TDM efforts will continue, with expansion in new and growing markets
- TDM is implemented by an alliance of regional and local entities
- Strategies are flexible, to respond to the needs of travelers
- TDM is funded through demonstration projects and ongoing funding by WSDOT

Specific strategies enacted by the Corridor TDM Program include:

- Vanpools and transit. In support of the goal to add 2,000 new vanpools in the next 20 years, WSDOT provides financial incentives to both users and providers of vanpools. For potential users, WSDOT finances an ongoing vanpool marketing program, a 50% vanpool fare subsidy for users of the corridor, and "value-added" incentives (such as frequent flyer miles). For providers, WSDOT provides a revolving no-interest loan fund for purchasing vans, owner-operated vanpool promotion, and other start-up subsidies. Transit subsidies, innovative demonstration programs for smart card technologies, state tax credits, and park and ride support are included, as well.
- Public information, education, and promotion. The TDM program's information emphasis is on helping

travelers plan TDM-friendly trips in the corridor. This includes trip-planning assistance for transit, interactive ridematching, and other awareness programs.

- Employer-based programs. An extensive employer-based TDM effort is conducted for the whole corridor, in order to reduce single occupant vehicle commuting and vehicle miles traveled to worksites in the corridor. Efforts include: telework, alternative work arrangements, tax credits and other incentives for commute behavior, support for TMAs, parking cash-out incentives and financing, and an expansion of the Commute Trip Reduction (CTR) program to smaller employers.
- TDM friendly land use. TDM friendly site design and land use efforts include broad transit oriented development planning, code changes that support TDM friendly redevelopment, design review support to local jurisdictions, developer and business incentives, and parking management programs.

WSDOT has identified success factors in the I-405 Corridor EIS planning process:

- The packaging of TDM strategies was approved by all key decision makers in the corridor, marking the first time TDM had been identified and approved in the early months of a major-planning process
- There is wide acceptance of TDM cost effectiveness across corridor stakeholders. This acceptance included not only public officials and decision makers, but also corridor citizens.
- TDM has been identified as the quickest and cheapest multi-modal option for the corridor. As such, the implementation is fast-tracked while build-based alternatives are arranged.

The I-405 Corridor TDM Program has a 20-year estimated cost of $350 - 400 M ($11 - 13 M per mile), yielding a 2 - 5% reduction of trips.

State of Delaware Philadelphia / Wilmington area, I-95 Integrated Transportation Management Effort

I-95 serves as the principal connection between Philadelphia, Wilmington, and Baltimore. Reconstruction of I-95 in northern Delaware (New Castle County) was recently initiated by the Delaware Department of Transportation (DelDOT), with the focus on reconstruction, highway widening, and capacity improvements. Construction began in 2000 on the "North Section" (north of Wilmington and south of the Pennsylvania border). Additional construction activities will occur in the Wilmington area over the next few years.

In preparation for this project, DelDOT has worked with TMA Delaware and the Delaware Administration for Regional Transit (DART First State) to help mitigate construction impacts, and, to build the use of alternatives for the long-term. The term DelDOT uses for TDM efforts is "Integrated Transportation Management", whereby the focus is not simply on demand-oriented strategies, but also how TDM can be used in conjunction with transportation system management (TSM) strategies to best manage existing infrastructure.

One of the first tasks was identifying an "inverse mascot" - the Traffic Creep. The Traffic Creep "thrives on traffic congestion and smiles when he keeps drivers waiting in long lines." Travelers are encouraged to make the Traffic Creep unhappy by riding transit and ridesharing. Specific efforts that have been intensified in the I-95 Corridor include:

- Corridor ridematching. TMA Delaware and DART conduct coordinated and targeted ridematching for the I-95 Corridor. Registration for ridematching automatically includes the "Home Free Guarantee". About 5,000 carpoolers have registered since August 2000.
- Transit promotion. Bus and rail transit promotion occurs throughout the Corridor, with focus upon new services that enhance convenience (such as the DARTCard, an electronic fare collection system). Marketing efforts highlight the cost and time advantages of using transit to Wilmington.
- Employer workshops. Over 60 large employers in Wilmington have sponsored workshops on site for showing construction and traffic avoidance options to employees. These workshops, accompanied by a permanent "Commuter Corner" to be installed at offices, include information on how to rideshare and use transit throughout the reconstruction efforts. These workshops & commuter corners have reached 30,000 commuters.

State of Utah, Salt Lake City area, Wasatch Front Corridor TDM Program

TDM got its start in the Salt Lake City metropolitan area as a result of concern regarding pending reconstruction of the I-15 Corridor. Coupled with the need to address long-term growth planning through efficiency-maximizing strategies, the Salt Lake Area Chamber of Commerce formed a partnership with the Utah Department of Transportation (UDOT), Utah Transit Agency (UTA) Wasatch Front Regional Council, and other governmental agencies to develop a comprehensive TDM program for the Corridor and a regional TMA.

Over time, the TMA became the principal representative for business concerns to UDOT, UTA, and the construction contractors. This was an important role, as construction along Main Street for the new TRAX Light Rail Transit system began to impede upon business operators' stream of revenue. The TMA of Utah is the primary conduit for business and employer outreach in the I-15 (Wasatch Front) Corridor. However, UDOT and UTA are the primary agencies responsible for delivering TDM services to the Corridor.

Specific strategies that were enacted include:

- Community Coordination Team. Demand management starts with coordinating the business community around corridor improvement projects. The Community Coordination Team (CCT) is a representative body of small and large groups within the corridor. They are tasked with reviewing month-to-month construction activities and developing targeted demand management strategies with employers and neighborhoods that will be particularly affected in the months ahead.
- Demand-management focused contractor bonus. The TMA of Utah and the CCT have control over a corridor reconstruction effort's bonus to be paid to the design/build contractor. If the contractor satisfies business and commuter concerns, it receives a bonus; if the contractor does not satisfy demand management concerns, then bonuses are not awarded.
- Employer-based programs. An extensive employer-based TDM effort is conducted for the whole corridor, in order to reduce single occupant vehicle commuting and minimize construction impacts. Efforts include: telework, alternative work arrangements, leased and no-interest van pool programs, co-op and ECO transit passes, tax credits and other incentives for commute behavior, guaranteed ride home, vanpool and carpool matching, and Commuter Choice promotion.

Section 4 – Developing a Plan

Developing a TDM Plan for your corridor requires a clear understanding of the application, realistic objectives and commitment from the surrounding community to participate. Steps to consider include:

- **Clarify purpose and need for TDM**. The integration of TDM strategies into a corridor plan is often based on a variety of mutually-supportive needs:
  - Providing a near-term component to a phased corridor investment plan
  - Ensuring a balanced array of transportation options and support programs
  - Supporting a major transportation investment (i.e., developing an integrated rideshare program as part of a Bus/HOV investment)
  - Mitigating traffic congestion and providing traveler information during construction

  Work with project stakeholders to develop a statement of purpose regarding the role(s) of TDM in each phase of the corridor planning and construction process.
- **Meet with stakeholders in the corridor**. Invite stakeholders to participate in a process that involves discussing the problems – both real and perceived – regarding transportation. Gauge commitment to implementing strategies. TDM relies heavily on both public and private participation to be successful.
- **Inventory existing TDM service**. Develop an understanding of what is currently available in the region. Figure out how those services could be applied to the corridor plan. Recognize that just because a service organization exists, it doesn't mean that they can automatically provide enhanced services without additional funding. Too often transportation plans in Colorado have identified TDM strategies and then listed TMAs as the implementor. Without funding and careful coordination with TMAs and their stakeholders, little may be accomplished.
- **Prepare list of strategies**. A list of potential services and strategies should be developed with input from stakeholders and a review of other similar efforts throughout the state and elsewhere in the nation. The list should look at varying levels of application based on funding and stakeholder interest.

  Strategies should also be developed based upon the statement of purpose for the TDM program. Individual TDM strategies can be more effective at achieving specific results. For example, alternative work schedule programs can be effective in spreading out

peak period congestion during corridor construction projects. Telework programs are most effective if the program goal is to eliminate trips altogether. The selection of an initial package of TDM strategies should be linked to the overall goals for the project.

- **Test acceptance of strategies with employers and commuters**. Conduct interviews with employers and focus groups with commuters. Find out what is likely to work in the area. Learn what employers are willing to commit to before preparing any plan.
- **Be realistic about partnership for sustaining the effort**. TDM builds on partnerships with a variety of entities. Roles and responsibilities need to be clearly identified at the beginning of the program. Commitments should be secured for the full project period. Don't assume that service will continue indefinitely if a sustainable funding source can't be identified.
- **Estimate results**. The program performance could be estimated based on similar experience in other areas, feedback from employers and commuters, and in some case, estimated using the TDM Model developed for the Federal Highway Administration.
- **Refine plan to complement the preferred alternative**. TDM needs to serve the core effort of the corridor plan. For example, if the plan is to build rail, TDM should promote ridership, support station access and in some cases, address travel that cannot be accommodated by the preferred alternative. Additionally, TDM can help to mitigate traffic during construction.

These steps can lead to the development of a comprehensive plan that will support the objectives of offering more alternatives to commuters, reducing vehicle travel and emissions and promote area-wide mobility.

The following sections define the key strategies and support strategies for TDM.

Section 5 – Strategies

A variety of strategies are used to influence the demand on the transportation system. These strategies focus on encouraging different forms of travel and alternative work arrangements. Transportation modes include carpooling, vanpooling, public transit, bicycling and walking. Alternative work arrangements include flex-time, compressed work weeks and teleworking.

The following is a list of potential TDM strategies for corridor projects. Each alternative is introduced in three levels of potential application. The level demonstrates both the intensity of application and possible resource commitment needed. The three levels are defined as:

- **Basic** – using existing resources to implement the alternative in the area (for most major metropolitan areas in Colorado) or services that are relatively common and readily available.
- **Enhanced** – applying strategies from similar successful applications and adding resources to the basic services.
- **Aggressive** – moving beyond current experiences from around the country to create a new level of implementation. In some cases, concepts may be experimental.

These terms may be different depending on the community. What might be basic in Fort Collins or Denver, could require a significant investment in Burlington or Eagle. Check with local implementors or with the Colorado Department of Transportation TDM Coordinator (Deborah Sakaguchi, 303.757.9088) to learn what is available.

Strategies by Mode of Travel

TDM strategies focus on a variety of alternative modes and are supported with direct commuter assistance and promotional activities. Mode options include:

Carpooling

Defined as two or more people sharing a ride in a car. Carpooling is the most common and flexible way for commuters to share a ride. 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. One person may drive every day, with passengers sharing the cost of gas and/or parking expenses, or participants may rotate driving responsibilities, circumventing the need to reimburse the driver. Carpooling seems to be most appealing to people who commute at least ten miles or whose trip to work takes at least 30 minutes.

Basic

- Promote on-line ridematching.
- Conduct annual carpooling registration surveys at all sites with 50 or more employees.
- Work with property managers/owners to distribute registration surveys at sites with smaller employers (less than 50 employees).
- Encourage prize drawing and promotional events at work sites.
- Offer guaranteed ride home.

Enhanced

- Create Commuter Club incentive program (see Incentives for more details).
- Incorporate TDM-friendly site design and facility improvements (see Site Design for more details).
- Require preferential parking at work sites in the area (ten percent of all employee spaces).

Aggressive

- Charge for parking and/or require a transportation allowance at work sites in the area (see Parking Management for more detail).
- Create for-profit carpooling as part of a regional Smart Shuttle program (demand responsive dispatch, etc.)
- Create HOV facilities on and around corridor.

Considerations – Carpooling requires active promotion and support. The average carpool last for 2.5 years. Efforts need to focus on making carpooling convenient and cost effective in relation to drive alone commuting. Carpoolers can reduce travel time by using HOV facilities and preferential parking spaces at the work location. Convenient drop-off and pick-up location should be available throughout the area adjacent to the entrances of buildings. To make carpooling economically appealing, riders should share in the cost of operating the vehicle and incentives can be provided by both the employer and public agencies. Ongoing marketing and promotions is critical to carpooling's success.

Typically, carpooling accounts for 5 to 15 percent of travel in an urbanized area. An *aggressive* carpooling efforts may be able to achieve a 25 percent mode share at participating work sites in urban and suburban locations.

Vanpooling

Vanpooling can provide a realistic alternative for groups that travel over 15 miles to their jobs or to school. Generally, vanpools work best for groups of 6 to 15 people who live relatively close to each other and work for the same employer or for employers in the same general area. One of the members of the vanpool can drive or participants can alternate driving responsibility.

Vanpool programs can be structured in one of three ways:

1. **Owner Operator** – This approach allows individuals to purchase a van and charge passengers for commuting costs only (not for profit). These programs can be supported by subsidies from employers or facilitation from public agencies. With owner-operated vanpools, the maintenance and insurance costs are paid by individual owners. In some areas, public agencies and private, non-profit groups have encouraged owner-operated vanpools through offering low-interest loans, arranging for the purchase of vehicles at wholesale prices and helping operators secure better maintenance and insurance rates.
2. **Employer sponsored** – Companies purchase vans, provide insurance and maintenance and administer ridesharing. Employers have the option of either purchasing or leasing vehicles, with cost recovered through passenger fares, reduced parking, and improved employee productivity.
3. **Third-party Programs** – This setup involves a ridesharing organization (e.g., RideArrangers – Denver, VanGo – North Front Range and RideFinders – Colorado Springs), public agency, public-private partnerships or van leasing companies (e.g., VPSI). Leasing and maintenance are handled by the third-party. Van drivers are often allowed to driver for free and use the vehicle for some personal travel not to exceed a certain amount each month (e.g., 100 miles per month).

RideArrangers Vanpools

Basic

- Provide matching service for vanpooling.
- Host ZIP code meetings at worksites (commuter from similar ZIP code get together for a brown bag lunch to meet each other).
- Cover the cost of empty seats for up to three months to avoid rate fluctuation for other riders.
- Offer guaranteed ride home.

Enhanced

- Use third-party vendor and subsidize a quarter or half of the operating cost. Or, purchase vans for employers in the area. Provide funds for maintenance and replacement.
- Create "Quick Start" strategy that provides a variety of incentives for first time riders that continue for at least six months (e.g., child care vouchers, prizes, etc.).
- Implement Commuter Club.
- Incorporate TDM-friendly site design and facility improvements (see Site Design for more details).
- Require preferential parking at work sites in the area.

Aggressive

- Create flexi-van service (demand responsive, curb-to-curb service) with paid drivers.
- Create HOV facilities.

Considerations – Vanpools, like carpools, require active promotion and support. The average rider remains in the vanpool for a little over four years. The cost of vanpooling must be less that the cost of drive alone commuting. The vans must be comfortable and well maintained. Van drivers should be given adequate incentives to drive and manage the vehicles. Vanpooling serves a limited market of long distance commuters and often accounts for less than one percent of total travel.

Transit

Transit provides passenger service to the general public. Key principles of transit include: standard fares and either local and/or regional service. Local transit service generally operates within one community or area. Regional services connect rural areas or distant communities to a larger town or regional center. Typically in Colorado, the public sector operates local transit services and many regional services, however, the regional and intercity bus services operated by the private sector are also an important part of the transit network. Employers and others can support transit use through transit

pass subsidies and assistance in purchasing passes. For example, the RTD ECO pass is one option that helps employees and residents use transit. Area employers frequently requested links to park-n-ride locations to improve access to transit.

Basic

- Encourage employers to subsidize employee bus passes or offer ECO pass
- Offer guaranteed ride home
- Improve bus stops and shelters

Enhanced

- Implement Commuter Club.
- Incorporate TDM-friendly site design and facility improvements (see Site Design for more details).
- Develop feeder services to local park-n-ride locations (shuttles, jitneys, etc.)

Aggressive

- Provide ECO pass to all employees and residents of the area.
- Provide light rail, commuter rail and/or guided bus services.

Considerations – Transit has limited appeal in suburban locations. Local services extend travel times, over that of the private automobile, for trips that are greater than two or three miles. Line haul services depend on good feeder services and are limited by the number of transfers for the rider. Providing passes to employees and residents of the area will eliminate one barrier, cost, but further efforts should focus on enhanced services and methods to make transit more competitive with the car.

Steamboat Springs Transit

Bicycling and Walking

Walking is often overlooked as an alternative form of travel due to distances involved. However, walking can be the perfect complement to other TDM strategies, such as transit and carpool programs. A safe and convenient environment for pedestrians can dramatically increase the number of commuters walking to offices, stores, or schools during the day. Walking then enables sharing a ride or taking the bus as a realistic commute alternative.

Similar to walking, bicycling can serve as a complement to transit services, extending the reach of alternative modes of travel to commuters. Furthermore, employers and employees realize a wide array of benefits by enhancing bicycle facilities and promoting bicycle commuting. Bike and pedestrian amenities, as well as incentives are critical in encouraging these modes.

Basic

- Provide bicycle information to employees.
- Support Bike to Work week.
- Encourage walking to work where feasible
- Offer guaranteed ride home.

Enhanced

- Create safe and convenient bicycle route and pedestrian amenities throughout the area.
- Promote local (within two miles) real estate information to new employees.
- Implement Commuter Club
- Incorporate TDM-friendly site design and facility improvements (see Site Design for more details).

Aggressive

- Offer bike loan program.

Bike Racks on Bus

Considerations – Walking is limited to people that live in close proximity to work. Some employers have been successful in promoting the health benefits, as well as offer incentives such as walking shoes, etc. Bicycling is a mode option for people that live close to the work location. Bicycling is also limited by the weather. Barriers to cycling include lack of safe routes and amenities at the work place (bicycle lockers, showers, etc.).

Teleworking

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. The U.S. used to be largely an industrial nation. In fact, in 1950 only 17 percent of workers were in information or service businesses like sales, public relations, personnel, banking, health-care and publishing. By 1980, that number grew to more than half – and it's expected to jump to three-quarters of all workers early in the twenty-first century.

While these factors may make it possible to telework, others may make it necessary. Some of the changes in our lifestyles are dictating a need for change in our work styles. The standard "nine to five" schedule was designed around a traditional family that doesn't exist anymore. Picking up and dropping off small children at day-care, arranging after school care – or even handling the growing demand of elder care – cause many employees to need more flexibility in their schedules. While teleworking is not a substitute for child care, it can allow some workers much-needed freedom.

Some of the benefits of teleworking include:

- Increased productivity
- Savings on facility costs
- Reduced absenteeism
- Recruitment and retention of skilled employees
- Improved customer service
- Business continuity in the event of an emergency or disaster (teleworking proved vital for businesses in New York, NY, and Washington, DC, following the events of 9/11/01
- Reduced traffic congestion and improved air quality

Telework Options:

- **At Home** – Currently the most popular option, this involves little or no outlay in time or cash for employers. Some employers only allow employees that have home computers to telecommute. Others may provide portable computers to help those that would otherwise not be able to work from home.
- **At Satellite Work Centers** – Often confused with "branch offices," satellite work centers differ in one important respect: all the people who work at them also live near them. For example, if an employer in Boulder had many employees living in Estes Park, the employer could lease office space in Estes Park for the occasional use of employees. The employees' managers would continue to work from the main office.
- **At Neighborhood Work Centers** – Similarly, neighborhood work centers provide an opportunity for employees to work closer to home – in this case, in office facilities with employees of other firms. Tenants in a neighborhood work center usually share support services, such as clerical help, telecommunications equipment, photocopying machines and office supplies.

Basic

- Offer implementation assistance to employers including development of policies and procedures, employee orientation, and program evaluation.
- Promote benefits to management.

Enhanced

- Offer start up grants to employers to cover the cost of additional equipment for people that work from home.
- Promote teleworking at the home-end.

Aggressive

- Create telecenters throughout the area.

Considerations – Teleworking is increasing used by employers to reduce office space demand and to help employees reduce travel needs. Additionally, teleworking is often used as a recruiting and retention tool. However, teleworking is new to most employers. Approximately one-quarter of employers offer teleworking to employees informally. Less than ten percent have created formal programs. DRCOG is currently working with employer pilot programs throughout the region and has established state resources available on-line at www.TeleworkColorado.com.

Variable Work Hours

Public agencies can promote variable work hour strategies to employers, to help to reduce congestion, spread out the peak or help travelers adjust their schedule to catch the bus or form a carpool arrangement. This can help significantly during a reconstruction effort. Strategies include:

- **Flex-time** – With a flex-time program, employees work five eight-hour days each week, but they are allowed to choose their work arrival and departure times, as well as the length of their lunch break. Flex-time programs generally require employees to be present during a specified "core" time when meetings or other company-wide events are scheduled.

  Note that a flex-time schedule allows employees to work early or late, depending on their personal preferences. Some people may come to work at 6 a.m. and leave at 3 p.m., while others will arrive at 9:30 a.m. and work until 6:30 p.m. However, all employees must complete their usual number of hours by the end of each workday.
- **Compressed Work Weeks** – 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 or two days off each week or one day off every other week, depending upon which type of compressed work week program you prefer.

  The two most popular compressed work week schedules are the 4/40 and 9/80 programs, although other variations also exist.
  - 4/40 Program – Employees work four 10-hour days each week, with the fifth day off. To ensure five-day coverage, you may want to consider having 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.
  - 3/12 Program – Employees work three 12-hour days each week, with two days off. (Employees often get the four additional hours to make a 40 hour work week as credit for working longer days).

- **Staggered Work Hours** – This concept involves spreading out employee arrival and departure times by anywhere from 15 minutes to two hours. By staggering these "shifts," you can help reduce bottlenecks in employee parking lots, in streets at the entrance to your office park or building, and even in elevators. Communities have asked businesses to voluntarily stagger their start and stop times to reduce localized traffic problems especially during construction.

Basic

- Offer implementation assistance to employers including development of policies and procedures, employee orientation, and program evaluation.
- Promote benefits to management.

Enhanced

- Offer start up grants to employers to cover the cost of implementation.
- Coordinate schedules and options between employers.

Aggressive

- Provide employers with incentives to implement compressed work week schedules. For example, get a portion of the companies to minimize operations one day each week by working 10 hour days. If the non-work days are spread out over the week, it could result in as much as a 20 percent reduction in commute trips in and out of the area.

Considerations – In any alternative work arrangement program, there must be adequate coverage in the office for employees who are taking their day off. Generally, this means that not everyone takes the same day off.

- Employers may want to rotate days off every six months so that every employee gets a three-day weekend.
- Another option is for small departments or work groups to have everyone take the same day off and simply close down the department for the day. This is common in agencies extending customer service hours.
- To encourage ridesharing, you may want to give carpoolers, vanpoolers and employees who ride the bus "day off" preference over non-ridesharers.
- Employees who must attend important meetings may change their scheduled day off with advance notice.
- Some employees may need to be exempt from the alternative work arrangement program because of child-care duties, medical reasons, or conflicts with school.

Section 6: Support Strategies

Support strategies enhance the effectiveness of the various modal options described in the previous section. These include services, incentives and marketing strategies. Unfortunately, too often support strategies are ignored in developing programs. It should be noted that research clearly shows that without the support strategies, rarely can any of the modal options succeed on their own.

Support strategies include:

Ridematching

Ridematching is a service that identifies people that live and work close to each other. The idea is that if you know someone that lives close by, you may decide to share the ride together and leave a car at home. Matching services can offer full-time partners or simply, a person to call in the case of an emergency. In Denver, hospitals match up key personnel that own four-wheel drive vehicles with other essential staff to help get people to work in the case of severe weather.

Ridematching is usually done through a computerized matching system. A variety of vendors have developed inexpensive, effective software for matching. The system identifies people living within the same grid that work at the same location. Some systems can match people from area park-n-ride lots or from child care facilities. Employees simply fill out a brief ridematching form that requests information about work schedule, days of travel, nearest cross streets to their home and their work location.

Ridematching systems are set up to respect confidentiality. Most systems provide the prospective rideshare partner with the work telephone number only. One town has developed a portable system that they can take to work sites and provide matching services over the lunch break for employees.

Increasingly, ridematching services are being offered on-line. Travelers can find a person to share the ride by use of the Internet or from information kiosks set up at local transportation, community or retail centers.

Less sophisticated, non-computerized systems have been developed by employers using index cards and bulletin boards to help match people. At the work site, matching can be as simple as plotting the home locations of employees on a map and then hosting brown-bag lunches for those employees that live in the same areas. The idea is that when people become more comfortable with their neighbor, they may be more likely to share the ride to work.

When you have six or more people that are willing to share the ride from a particular area, the carpools can be consolidated into a van. Ridematching can continue to bring in new riders to the vans. The Cities of Fort Collins, Loveland and Greeley advertise empty seats on their vans in a local newsletter. This effort has been successful in maintaining strong ridership in all of their vehicles.

Ridematching is most effective when offered region-wide. The larger the database, the more likely the system will find a good match. Government agencies have typically managed ridematching services in their community. Ridematching services are an eligible expense under a variety of state and federal funding categories.

Site Design and Facility Improvements

A variety of facility improvements can be pursued in an area to support the use of TDM. The following list of improvements could be considered by local jurisdictions as part of the design-review process for both small and large projects:

Pedestrian Walkways

- Minimize opportunities for pedestrian/auto conflicts by separating roads and parking from pedestrian walkways, consolidating driveways, creating safe pedestrian crossings and providing continuous sidewalks.
- Connect all buildings with walkways.
- Provide sidewalks that are at least five feet wide (eight feet or more for sidewalks adjacent to bus stops) along major streets. A minimum of a five foot buffer should be created between the walking area and adjacent traffic lanes.
- Consider using trees and other landscaping as part of the buffer zone (people will walk further in a quality pedestrian environment).
- Eliminate physical barriers such as poles and fences that can block passenger traffic.
- Be sure to include ample lighting for night time safety.
- Provide curb cuts for persons with disabilities.

Building Orientation

- Reduce building set backs to allow better street access for transit users and pedestrians (locate the parking behind the building).
- Cluster buildings and avoid campus-type office development which discourages pedestrian and bicycles travel.
- Provide front door access by transit and pedestrians.

Passenger Loading Areas

- Offer a turn-out lane for passenger drop off in front of the building. Be sure to provide adequate space for cars so as to avoid a "line-up" that could block traffic during peak commute hours.
- Provide passenger shelters.

RTD Bus Shelter

Transit Access and Visibility

- Bus stops should be within 500 to 1,000 feet of the building entrance.
- Orient building entrance toward public transportation facilities, not parking lots.
- At high volume stops, bus shelters, outside seating and trash receptacles should be provided.
- At low volume stops, bus benches and trash receptacles should be provided.

Bicycle Amenities

- Provide bicycle storage. For short term storage, provide racks to accommodate two to five bicycle spaces for every 100 automobile parking spaces. For long term storage and better protection from weather and vandalism, provide bicycle lockers.
- Consider bike paths and lanes. For a two-way, off street bike path: the width should be around 8 - 12 feet with a 2 foot graded shoulder on each side. For a bike path shared with pedestrian traffic: an additional 2½ foot minimum separation between bicyclists and pedestrians is needed. For a bike lane adjacent to a street: depending on whether or not the particular street allows parking, the width should be between 3 and 5 feet.
- Make linkages to the regional bike path system.
- Install additional amenities such as showers, changing rooms and clothing lockers.

Bike Racks

Amount and Location of Parking

- Explore opportunities for shared parking with neighboring facilities. Large, ample parking areas can be an inefficient use of land.
- Parking lots should be screened from adjacent sidewalks and streets by a wall, hedge or berm. The recommended height for a wall is 30 to 36 inches.
- Consider charging for parking. Where appropriate, paid parking can cut the number of people driving alone by up to 20 percent.

Garage Height Clearance for Van Vehicles

- Adjust parking structure ceiling heights to allow for vanpool access. The minimum ceiling height for vanpools is 8 feet 2 inches.

Access to Services and Amenities

- For large facilities, create a "village" atmosphere where employees don't have to take their cars out during the day. Some amenities include:
  - Restaurants
  - Convenience Stores
  - Banks or ATMs
  - Child Care Facilities
  - Post Offices or vending machine
  - Health Clubs
  - Cappuccino/Coffee Bars
  - Dry Cleaners
  - Bookstores
  - Shoe Repair Shops
  - News and Magazine Stands
- For smaller facilities, provide pedestrian linkages to nearby amenities.

Transportation Information Board or Kiosk

- Provide transportation information on a bulletin board, display rack or kiosk. Include local bus and rail maps and schedules, carpool matching information, available vanpools to the area and regional bike routes.
- Place the information in a high-traffic area such as a building lobby or cafeteria.
- For large facilities, consider a transportation office or commuter store that could provide direct assistance to commuters. The center could be incorporated into the building management office or be staffed by a TMA.

Parking Management

Parking management includes three strategies: preferential parking, parking pricing and the transportation allowance.

- **Preferential Parking** – Preferential parking is a means of offering employees that carpool or vanpool a qualitative advantage over those that drive alone. This strategy is one of the most common incentives offered by employers. What makes the *preferential* arrangement desirable depends employees' interests. Typically, this is be done by reserving the spaces closest to the door for ridesharers, however, it can be any space or arrangement that the employee chooses as "preferred". Some employers will set aside ten percent of all spaces for preferential use and restripe the spaces. Others prefer to make the spaces available as demand increases.

  One challenge in administering a preferential parking program is policing the use of the space. Many employers will require employees to register for the preferential spaces and be issued a hang tag. The tag is usually updated every three or six months. If a vehicle without a tag is parked in a preferential space, the vehicle is ticketed.
- **Parking Pricing** - Charging for parking is a powerful tool in changing travel behavior. The higher the price, the less likely a person will be to use or purchase the space. However, employees often strongly resist any attempt to charge for parking and employers rarely want to risk damaging employee morale by dealing with the parking issue. Many employees feel that free parking at the work place is a standard workplace benefit. Pricing may be especially difficult in some corridors given the moderate densities of development and lack of parking controls.
- **Transportation Allowance** - The concept of the transportation allowance has received increasing attention with employers, employees, city planners and regulators as a means of balancing the costs of different travel options and promoting individual choice. The idea is that when we are allowed to choose how a subsidy is spent in helping us get to work, we may choose something other than a parking space and driving to work alone.

  An allowance is not a new concept. It usually takes the form of a regular provision of money, food or other support provided by an organization or employer. When applied to transportation, it is a tool offered by

Preferential Parking

the employer to assist their employees in commuting to work. All employees receive the same dollar amount each month for use in offsetting commute travel expenses including bus passes, vanpool fees, parking passes (the employer must charge for parking) or other expenses associated with carpooling, bicycling, and walking to work. Any surplus can be pocketed. In essence, the transportation allowance is the cafeteria approach to commute travel.

Considerations:

- Parking Spill-over - Commuters strive to save money when similar options are convenient and safe. Most commuters will seek out the least costly space near the work place. Employees will use their money wisely. If the least expensive space is on the street or in a neighbor's parking lot, that is where they will park. In many cases, these spaces may be free and employees will continue driving their cars to work. It is important to give careful consideration to most opportunities within a reasonable walking distance (5 to 10 minutes or two to three city blocks).
- Labor Unions - Labor unions strive to maintain a consistent and improving working condition for its members. Since free parking has been so prevalent in the past, it has been increasingly included as part of the working condition of the employee. To change the mandated working condition, the employer must meet and negotiate the change with the union representatives.
- Equity - The parking charge must be fair. This can be a challenge in that tax laws do not offer balanced treatment of the dollar depending on how they are spent. Current Federal tax laws provide an advantage to driving alone by allowing an employer to provide up to $180 per month for a parking space tax free to the employee. The tax free limit on vanpooling and transit are much lower, $65 per month (increasing to $100 per month January 1, 2002). For carpooling, walking and bicycling, all financial benefits are fully taxable. Dollar for dollar, the greatest value for the employee, tax-wise, is in providing a transportation benefit in the form of free or subsidized parking.

Marketing and Promotions

Marketing and education are the foundation of any successful TDM effort. A lesson too often learned throughout the country is that alternative transportation service do not sell themselves. Marketing is essential to raising people's awareness of the options and motivating them to try them out at least once.

As a rule of thumb, it is usually a good idea to set aside up to 15 percent of a projects budget for marketing. For example, if you set up a $100,000 shuttle service – put $15,000 into marketing the new service. Marketing can go beyond simply advertising the new service, it can be a way to educate people about the overall benefits of not driving their car.

Marketing can address the consumer in three areas:

- **Awareness** – Let people know what services exist and how their use of these services can benefit them and the community.
- **Try** – Convince people to try an alternative transportation option at least once. Some communities have asked people to sign pledge cards to use an alternative transportation option at least once during a weekly promotional effort. The company that collects the greatest number of pledge cards can win a prize or simply get recognition for their efforts.
- **Maintain** – Once people try an option at least once, the message needs to focus on maintaining that person's participation in an alternative mode.

The TMOs could be provided with funds to actively promote TDM strategies to employees and residents. Options include:

- Conduct onsite promotional events and fairs.
- Establish "Rideshare Week" and seek pledges from participants.
- Place ads on the benefits of alternative transportation.
- Educate school children about the importance of sharing a ride.
- Seek media opportunities about successes in the area.
- Establish an awards program for employers and commuters that do something exceptional.

Incentives

Incentives are an important consideration in making alternative transportation more appealing. Some communities, such as Riverside and San Bernardino counties in California, rewarded people up to $2 per day for their use of an alternative transportation mode (up to six months) in driving to and from work. Other communities, such as Loveland, Greeley and Fort Collins, have developed commuter club programs where commuters can be eligible for discount coupons and special prizes by staying involved in transportation alternatives.

The incentive is a way to reward those that help to reduce traffic congestion and clean the air. There are five types of incentives that can be offered by either a community or an employer:

- Cash – Travelers can earn cash to use towards a transportation expense or pocket the money as a benefit of their travel choice. The cash can help to offset the added costs related to a travel choice, such as a bus pass.
- Prizes – Travelers can be eligible for a prize drawing every time they use alternative transportation. The prize can be as simple as a gift certificate to a local store. Drawings can be done monthly, quarterly or annually. Often an annual prize drawing could be tied to a "Bike-to-Work Day" activity.
- Commuter Club Point Program – Travelers can earn points each time they use alternative transportation. For example, a cyclist can earn 150 point for riding his bike to and from work one day or 75 points for sharing the ride to work in a carpool. The points can then be applied to a select set of items or gift certificates at retailers. Research has shown that points are three times the monetary value than cash for motivating people to try something new. The point reward is a common strategy of airlines to maintain a regular, repeat customer base.
- Time Off – Some employers allow employees to earn vacation time by using alternative transportation. For example, an employee that uses some form of alternative transportation 60 times in a quarter can earn an extra four hours of vacation time. This could mean up to two extra vacation days each year.
- Recognition – People that use alternative transportation on a regular basis can be acknowledged in the local paper for doing something good for the community. Or, the city could provide "Good Citizen" certificates for people that consistently do something other than driving alone in their car.

Transportation Management Associations

In the 1980s, Transportation Management Associations began to emerge as public-private partnerships designed to address traffic congestion and air quality problems in communities throughout the United States. Over 150 TMAs are in operation today throughout the United States – seven in Colorado. The appeal of a TMA lies in the synergism of multiple organizations and individuals banding together to address and accomplish more than any one government agency, employer, developer or resident could alone. The need for the TMA stems from the realization that each group has a great influence on transportation and air quality, and each group has important contributions to improving mobility and air quality.

The geographic scope of a TMA varies with each organization. Across the nation, one-third of all TMAs offer services region-wide and one-fifth serve a Central Business District. The remainder serve suburban business parks, residential areas, transportation corridors and tourist venues. For example, in Missoula, Montana, public and private organizations set up a TMA focused on improving transportation options for workers coming in from surrounding communities. The TMA has expanded its services to address other work trips within and around Missoula.

TMA services also vary by organization. The most common services are rideshare promotions and member advocacy. Advocacy can range from working with the local transit provider to improve routing and services, to working with federal decision-makers on laws that can impact the commute. Other typical services include conducting promotional events at employment sites, producing periodicals and brochures promoting alternative transportation, forming vanpools and carpools, managing parking resources, selling transit passes, promoting the use of bicycle facilities and more. Additionally, some of the TMAs operate a shuttle service within their service area.

TMA Shuttle
Beeline Shuttle, Denver

The annual budget for TMAs is between $75,000 and $200,000. Two of the largest sources of revenue for a TMA are dues (34%) and grants (49%). In some cases, developers negotiated with cities to provide seed-funding for a TMA as opposed to having to pay for road expansion or other facility improvements. In most cases, the end result has been positive for both the developer and the community.

Section 7: Evaluation

TDM strategies can play a variety of roles in corridor projects. While selecting a specific combination of TDM strategies for a corridor project should be grounded in larger community and corridor goals, establishing more narrowly defined goals for the TDM program itself will determine the way in which individual TDM strategies are implemented. As discussed in previous sections, basic, enhanced and aggressive alternatives are available for each strategy. Developing an implementation plan designed to achieve desired project goals should involve:

- creating general and/or specific goals for the program,
- developing a time-frame to achieve these goals,
- establishing targets to assess incremental progress, and
- developing a system to measure cost-effectiveness and track success.

Establishing Goals for a Corridor TDM Plan

The overall goals for a corridor TDM plan will likely depend on the specific way in which TDM will fit into the overall corridor improvement plan. Will TDM strategies be used to complement and support a major investment strategy (roadway widening, transit investments, etc.)? Will TDM elements be used primarily as a construction mitigation technique? The types of goals for the TDM program can vary.

TDM goals can be general, as in the following:

- Improve mobility options in the corridor
- Promote enhanced utilization of transit options
- Improve community awareness of various travel and route alternatives during construction
- Shift travel demand to off-peak times or alternative routes during construction periods
- Reduce vehicle miles traveled
- Increase overall vehicle occupancy
- Establish a Transportation Management Association
- Improve business climate
- Improve air quality

TDM goals can also be very specific, as in the following:

- Maintain current Level of Service at key intersections
- Reduce traffic volumes at key corridor intersections
- Reduce vehicle miles traveled by 7% over the 15 years
- Shift 5% of all trips to alternative modes over 10 years

In most cases, the goals established for a TDM program will include a combination of general and specific measures of success. TDM strategies often attempt to address a wide variety of corridor concerns. As such, the goals established for a TDM program should track both traditional transportation measures of success and more broad-based economic and quality-of-life indicators. This approach recognizes that the quality of a transportation network is not only defined by its ability to move people from point to point, but also by its ability to support wider community or corridor-specific goals.

Evaluating the Program

TDM evaluation efforts attempt to determine how, when and where individual travel behavior is modified in response to the strategies employed as part the TDM effort. While measuring and evaluating individual TDM strategies can be a complex endeavor, the more work that is done early on, the more useful evaluation efforts will be down the road. Working with local employers, property managers and neighboring communities, evaluation efforts can provide consistent measures of cost and effectiveness that will prove invaluable in assessing the achievements of the TDM program. The ability to cite reliable and accurate data regarding the success or failure of individual TDM strategies, and of the TDM program as a whole, can generate further support for programs that work.

The most important part of the evaluation process involves the collection of baseline data. The types of data collected should be based on the goals established for the TDM plan. For example, efforts to reduce the vehicle occupancy of home-based work trips must begin with an assessment of current occupancy conditions. Efforts to maintain current levels of service at key intersections should begin with an analysis of current traffic volumes, level of service and hours of delay. While these sometimes cumbersome analyses may increase the initial cost of implementing a package of TDM strategies, reliable baseline measurements are critical to long-term program evaluation.

Baseline measures of TDM effectiveness can include a wide range of quantitative and qualitative information. For example:

- Average vehicle occupancy (peak-period, all-day avg.)
- Awareness of transportation or route alternatives
- Awareness of TDM incentives or transit pass programs
- Number of vanpools operating in the corridor
- Number of transit passes sold at area employment sites
- Total vehicle miles traveled in the corridor
- Vehicle emissions (based on vehicle miles traveled)

When creating a TDM implementation plan, community leaders, regional planning agencies and area businesses should clarify TDM goals and time frames, establish timeframes for success, and set parameters for measurement.

Tracking Air Quality Benefits

For many areas, tracking air quality benefits is an important element of a TDM program. If the TDM program intends to utilize funds from the Congestion Mitigation and Air Quality (CMAQ) program, funding agencies may require quantification of vehicle emission reductions as part of their funding process.

The Colorado Department of Transportation (CDOT) is currently developing a CD-ROM based application to improve the State's CMAQ reporting system.

The main goal of the CMAQ program is to fund transportation projects that reduce emissions in non-attainment and maintenance areas. Individual state CMAQ reporting is used to summarize the expenditure of CMAQ funds by each state that qualifies for CMAQ funds and to track program effectiveness so it can be reported to the Federal Highway Administration.

The aim of CDOT in developing the CD-based reporting system is to re-design the current Microsoft Excel based state reporting system to a more efficient, easier-to-update and more secure system. The new reporting system will be comprised of forms with a similar look and feel as the existing Excel application. CMAQ grant recipients will be provided a CD-ROM containing guidance and tracking forms. The reporting system will be designed to walk the user through a menu of questions and formulas, with the end result being a printable calculation page that shows the users inputs and the calculated results. Application security will be maintained by either requiring users to enter a username and password or by controlling CD-ROM distribution.

This tracking tool should be available throughout Colorado by December 2001. For more information, contact:

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Colorado Department of Transportation
(303) 365-7112
Vicki.Kraus@dot.state.co.us

Other Evaluation Resources

Federal Highway Administration &
Federal Transit Administration
A Guidance Manual for Implementing Effective Employer-based Travel Demand Management Programs. 1993.

This manual "offers guidance on selecting TDM strategies to produce a needed level of trip reduction. The manual presents a series of worksheets and look-up tables with which you can estimate trip reduction impacts of individual TDM strategies and packages of strategies. These tables can be used to test the trip reduction impacts of various packages of TDM strategies you might be considering."

This manual may be found online at:

http://ntl.bts.gov/DOCS/474.html

Southeast Corridor EIS

Technical Report:
Transportation Demand Management Program

Prepared by:

Stuart Anderson

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Colorado Department of Transportation
Regional Transportation District
Federal Highway Administration
Federal Transit Administration

July 1999

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1.0 TDM BUDGET FOR CONSTRUCTION PHASE (Revised)

The following is a revised overview of the proposed TDM budget for the construction phase of the Southeast I-25 light rail and roadway improvement/expansion project. The revisions incorporate noncapital strategies and introduce commuter subsidies and education to the proposed program.

Assumptions:

- Construction phase will begin January 1, 2001, and end December 31, 2006. This is a total of six years.
- The post-construction TDM element will begin January 1, 2007.
- TDM will serve as a mitigation tool during construction. TDM will also help to build potential ridership for light rail and also help to establish a communication network.
- The total funding available for TDM during construction is $3,000,000. These funds can be used for both capital and noncapital costs. Shuttle services are funded separately and are not considered a part of the TDM budget.
- Agreements will need to be made with potential implementing agencies and organizations. TDM service providers along the corridor include SETMO, Transportation Solutions, RideArrangers, Downtown Denver TMO (Downtown Denver Partnership) and RTD.

This proposal splits the funding equally between subsidies and educational programs. Each strategy will need to be developed in greater detail once conceptual approval is given from the appropriate decision makers.

The strategies are summarized in the next few pages.

1.1 Employee ECO Passes

Provide a 25 percent subsidy to employers that purchase ECO passes for their employees. The ECO pass subsidy will help to reduce the cost to employers and encourage transit use for employees. The subsidy will be limited to employment sites in the study area, between Broadway and Lincoln (downtown Denver employers are currently eligible for a similar ECO pass subsidy) and along I-225 to Parker Road.

Current ECO pass usage is low in the southeast. However, with potential new services and the impact of construction, interest could increase significantly. If demand remains low, the subsidy could be increased to 50 percent (not to exceed the amount available in the budget).

Annual Cost Summary by Strategy:

Year 1 –	$ 100,000
Year 2 –	$ 150,000
Year 3 –	$ 200,000
Year 4 –	$ 200,000
Year 5 –	$ 200,000
Year 6 –	$ 200,000
Total Cost:	**$1,050,000**

1.2 Smart Community

Create Internet-based local information network. Provides promotional opportunities, real-time transit information, updates on construction, route closures, alternative route information and other transportation information and services. This will be coordinated with both the state and regional ITS projects.

Start up cost (2001):	$ 260,000
Annual update cost:	$ 25,000

Place information kiosks at a variety of public and employer locations along the corridor.

Design and purchase cost (2001):	$ 100,000
Annual update cost:	$ 5,000

Annual Cost Summary by Strategy:

Year 1 –	$360,000
Year 2 –	$ 30,000
Year 3 –	$ 30,000
Year 4 –	$ 30,000
Year 5 –	$ 30,000
Year 6 –	$ 30,000
Total Cost:	**$510,000**

1.3 Vanpool Subsidy Program

Provide a rider subsidy of $35 per rider per month for the six year construction period. The subsidy could be provided directly to the vanpool operator or through a voucher system. The subsidy would help to reduce the overall cost to the user.

Recipients of the subsidy must work for an employer that is located in the study area and has enrolled with one of the TMAs, RTD or RideArrangers for administrative purposes.

Additionally, an empty seat subsidy will be provided for vanpools. The subsidy will cover the cost of an empty seat for up to three months and not to exceed two seats per van. The empty seat subsidy helps to maintain a level monthly cost for other riders and provides a three month period to seek out replacement riders.

Annual Cost Summary by Strategy:

Year 1 –	$ 75,000
Year 2 –	$ 75,000
Year 3 –	$ 75,000
Year 4 –	$ 75,000
Year 5 –	$ 75,000
Year 6 –	$ 75,000
Total Cost:	**$450,000**

1.4 Commuter Education and Outreach

An ongoing information and marketing campaign will be conducted to inform commuters about travel options during construction, as well as alternative routes and potential delays. The focus of the campaign will be to encourage commuters to use transit, vanpooling, carpooling, alternative work schedules and teleworking.

Education can take many forms, the following is a short list of some options for the Southeast Corridor:

- ***Radio ads*** – Ads can highlight the ease of alternative transportation and help commuters understand the options.

- ***On-site promotional events*** – Promotional events can range from site specific events where transportation information is distributed to employees, to large campaigns that involve a whole business park or area. The events allow for one-on-one promotion and can help to make transportation alternatives more appealing to commuters. Events are also a great forum to reward those commuters that do something exceptional.

- ***Flyers and promotional materials*** – Flyers and promotional materials are a more passive outreach tool than events. Materials can be placed in transportation displays in building lobbies or distributed on the street or in parking lots. One effective promotional item is an access guide to the area. The guide would help people understand their options in getting to, from and around the area. The guide is an essential tool for new employees that are not familiar with the area and a easy tool for employers to use in an orientation.

- ***Ads on bus and van panels*** – Panels are another form of advertising. Unlike the radio campaign, panels can help to focus on commuters that use the corridor. Internal panels should focus on retaining ridership and encourage people to get others to use it. External panels should focus on inviting others to try the travel option.

- ***Speakers' bureau*** – A speakers' bureau provides for educational opportunities at business forums, events and schools. Different speakers could be identified to go out and talk to people about trying a transportation alternative.

- ***Newspaper ads*** – Newspaper ads are an effective tool for targeting decision makers at area companies. Recognizing employers that go beyond the call of duty in assisting their employees with the commute can motivate others to get involved. Providing case examples in the paper has been shown to be successful in getting others involved. Newspapers can also be an effective way to convey certain messages to commuters.

Commuter education also includes one-on-one outreach to commuters in the workplace. A strong network of employers working in cooperation with transportation services can help to get the message to commuters, as well as support commuters with both information and assistance.

The Transportation Management Associations in the corridor are building employer networks within their service areas. Employee Transportation Coordinators (ETCs) or worksite ambassadors can be identified through these networks to promote transportation options. ETCs can also distribute schedules and passes.

Annual Cost Summary by Strategy:

Years 1-6	$ 45,000 each year for commuter education (advertising)
	$120,000 each year for outreach and promotions (Possible allocation: SETMO $50,000; Transportation Solutions $35,000; and Downtown TMO $35,000.)
Total Cost:	**$990,000**

Total Cost by Year for All Strategies:

2001	$ 700,000
2002	$ 420,000
2003	$ 470,000
2004	$ 470,000
2005	$ 470,000
2006	$ 470,000
Total Six Year Cost:	**$3,000,000**

2.0 TDM Element (Revised Summary – July 5, 1999)

The following Transportation Demand Management (TDM) strategies are being recommended to enhance the success of the locally preferred alternative. These strategies evolve from the TDM program introduced during the construction period. Estimated implementation date is January 1, 2007.

1. **ECO Pass** – Employer subsidy for ECO Pass participants. Encourages employer investment in transit pass program and provides transit passes to more users in the area. Continuation and expansion of subsidy from construction period. — $300,000 annually

2. **Smart Community** – Internet based local information network. Provides promotional opportunities, real-time transit information and other transportation services. Continuation of annual maintenance and update from construction period. — $ 25,000 annually

3. **Commuter Club** – Membership incentive program for commuters using light rail or other transportation alternatives. Commuters earn points for using alternative transportation. Points can be redeemed for gift certificates and prizes. Replaces vanpool subsidy program from construction period and expands to encourage participation in light rail and other alternative modes. — $ 50,000 start up, $500,000 annually

4. **Commuter Education and Outreach** – Education campaign to promote alternative transportation to commuters. Outreach to employers to support employee commute programs. Provides for worksite promotional events. — $175,000 annually

Cost Summary by Year:

Year 1:	$1,050,000
Year 2+:	$1,000,000

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