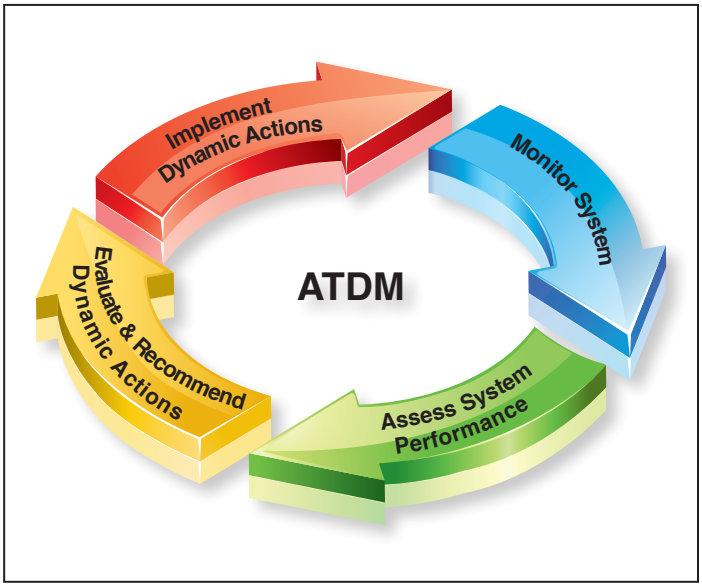
Active Transportation and Demand Management

U.S. Department of Transportation
Federal Highway Administration

ATDM Program Brief: Active Demand Management

What is Active Transportation and Demand Management (ATDM)?

ATDM is the dynamic management, control, and influence of travel demand and traffic flow on transportation facilities. Through the use of available tools and assets, traffic flow is managed and traveler behavior is influenced in real-time to achieve operational objectives, such as preventing or delaying breakdown conditions, improving safety, promoting sustainable travel modes, reducing emissions, or maximizing system efficiency. Using archived data and or/predictive methods, agencies continuously monitor the transportation system and perform in real-time to achieve or maintain system performance.



Active management of transportation and demand can include multiple approaches spanning demand management, traffic management, parking management, and efficient utilization of other transportation modes and assets. An agency can deploy a single ATDM approach in order to capitalize on a specific benefit or can deploy multiple active strategies to gain additional benefits across the entire transportation system. Some example approaches are included in the table. This brief focuses on the active demand management (ADM) component of ATDM. Some representative ADM strategies are highlighted in yellow in the table below.

Active Demand Management	Active Traffic Management	Active Parking Management
Dynamic Ridesharing	Dynamic Lane Use/Shoulder Control	Dynamically Priced Parking
On-Demand Transit	Dynamic Speed Limits	Dynamic Parking Reservation
Dynamic Pricing	Queue Warning	Dynamic Way-Finding
Predictive Traveler Information	Adaptive Ramp Metering	Dynamic Parking Capacity

What is Active Demand Management?

One key tenet of ATDM, as defined above, is the ability to influence travel behavior in real-time. This is consistent with the desire to maximize available choices of mode, time, route or even the location of (i.e., need for) travel. Traditionally, demand management has focused on mode choice, inducing commuters to switch from driving alone to higher occupancy modes.

Active demand management (ADM) goes a step further to use information and technology to dynamically manage demand, which could include redistributing travel to less congested times of the day or routes, or reducing overall vehicle trips by influencing a mode choice.

ADM seeks to influence more fluid, daily travel choices to support more traditional, regular mode choice changes. For example, the parking arrival incentive program (CAPRI) pilot at Stanford University seeks to either shift travel outside of the peak hours or to encourage parkers to use less convenient parking on days when it is feasible for them. This initiative complements the overall TDM program at Stanford (through its Commute Club), which offers cash and other incentives to Stanford commuters to use alternative modes or to avoid purchasing long-term parking permits.

ADM is very supportive of other active measures by redistributing or reducing overall traffic levels during congested conditions, thus becoming an integral part of an overall management philosophy to actively manage a facility or system.

What are the key aspects of Active Demand Management?

ADM builds upon the success of traditional TDM programs by using new technologies to inform and influence travel choices, which are not limited to mode choice decisions. As with many TDM efforts, financial levers are important to ADM either as incentives or disincentives (such as higher tolls for SOV or peak period travel). Incentives can take various forms:

- Travel time savings (HOV/HOT lanes)
- Direct financial incentives for avoiding peak hour travel (such as the CAPRI pilot to provide a financial reward to avoid peak parking hours)
- Gift certificates through points accumulated by offering rides with dynamic ride-sharing vendors
- Shopping information or discounts to encourage changes in departure times during peak periods

Information technology, especially with the connectivity and the social networking possibilities enabled by smartphones, is now being used to dynamically match en-route travelers with others needing a ride or providing comparative travel times for traffic and transit to induce an en-route mode or route shift after a trip as begun.

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Based on the results of early dynamic ridesharing pilot projects (see University College Cork, below), program managers identified five critical success factors, which could be applied to many ADM strategies: 1) a critical mass of travelers within a defined area, 2) an appropriate incentive program, 3) minimal complexity for the user, 4) demonstrated security and privacy, and 5) stakeholder engagement involving highway operators, transit, employers, and businesses to make sure the different needs of these groups are addressed by the active demand management applications.

As such, the key to successful ADM projects is an integrated approach to offering a technically-sound, user-friendly service, with incentives to make a different travel choice, and buy-in by key public and private stakeholders. The overall utilization and effectiveness of many of these approaches are still being tested.

Examples of Active Demand Management

The table below illustrates some active demand management programs that are either operational or being tested in the U.S. and Europe. Examples include dynamic ridesharing, on-demand transit applications (such as deviated-route service, demand responsive operations and flexible route service), dynamic pricing, and advanced traveler information.

Location/Project Name	Active Demand Element	Active Technologies
Cork, Ireland **Dynamic Ridesharing Pilot** University College Cork http://t4america.org/blog/ 2010/10/20/smarter-transportation-case-study-10-dynamic-ridesharing-in-cork-ireland/	Dynamic ridesharing	iPhone application, electronic wallet, Dynamic ride-matching to match available seats in-route
Krakow, Poland **Tele-bus** http://www.eltis.org/index.php?id=13&study_id=2840	On-Demand Transit	Dynamic dispatch and routing
Seattle, LA, San Diego, Atlanta **HOT Lane Projects** http://managed-lanes.tamu.edu/	Dynamic Pricing	Dynamic pricing of HOT lane and incentives for HOV usage
Palo Alto, California Stanford University **Congestion and Parking Relief Incentives (CAPRI)** https://stanfordcapri.org/	Dynamic Parking Pricing	Award credits for avoiding peak parking hours. Credits used for random cash drawings of $2 – $50. Transponders used to detect when cars park.
The Netherlands **Rush Hour Avoidance** http://www.vtpi.org/ spitsmijden.pdf	Dynamic Pricing	Financial incentive to avoid congested times and locations on certain facilities and transponder to assess behavior of participants
San Francisco Peninsula **MITTENS (Messaging Infrastructure for Travel Time Estimates to a Network of Signs)** http://www.calccit.org/projects_id=29.html	Predictive Traveler Information	Real-time highway and scheduled transit travel time displayed to induce in-route mode shift
San Francisco Bay Area **Predict-a-Trip℠** http://traffic.511.org/his_traffic_text.asp	Predictive Traveler Information	Predictive travel times using historical data to inform pre-trip travel decisions

ATDM Project Informational Briefs

This informational brief is one of the ATDM briefs in the Program category of the FHWA ATDM Brief Series. ATDM briefs are or will be available in the categories of:

- ATDM Program Yellow
- ATDM Planning Purple
- ATDM Analysis Orange
- ATDM Design Green
- ATDM Operations Red

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