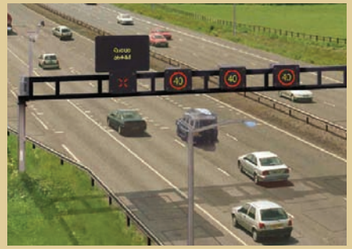
The European experience

The tools and technology of ATM have proven successful at reducing collisions and improving traffic flow in urban areas throughout Europe. Here are a few examples.

Birmingham, England



ATM strategies:
Variable speed limits, lane satus, variable message signs, traffic cameras, emergency roadside telephones, peak-hour shoulder lanes

Rotterdam, The Netherlands

ATM strategies:
Variable speed limits, traffic sensors, traffic cameras, truck restrictions, Real-time electronic driver information signs.

Hessen, Germany

ATM strategies:
Real-time traveler information, traffic sensors, traffic cameras, variable speed limits, seven traffic management centers, peak-hour shoulder lanes

Where will the technology be applied?

I-5

By spring 2010 variable speed limits, lane control and electronic traffic information signs will reduce congestion-causing collisions on I-5 from Boeing Access Road to I-90.

SR 520

In spring 2010, variable speed limits and electronic traffic information signs will help reduce congestion and smooth traffic flows along SR 520 and its floating bridges. These tools are funded through a federal program.

I-90

I-90 and its bridge across Lake Washington soon will have variable speed limits and electronic traffic information signs. By March 2011, 19 additional sign bridges will support traffic information and variable speed limit signs over each lane from Seattle to I-405.

SR 167

Since May 2008, the SR 167 HOT Lanes Pilot Project has used a form of ATM to get more efficiency from its carpool lane with an electronic toll system that allows solo drivers to fill unused lane space.

For more information

Craig J. Stone, P.E.
WSDOT Urban Corridors Administrator
206-464-1222
StoneC@wsdot.wa.gov

Patty K. Rubstello, P.E.
WSDOT Urban Corridors Office
206-464-1299
RubsteP@wsdot.wa.gov

Washington State Department of Transportation

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Building smarter highways

Spring 2009

High-tech tools to ease your commute

In the driver's seat, with a carpool or on a bus, most of us spend a good portion of our day in traffic, and we know what congestion costs in lost time and productivity. That's why WSDOT is making our highways smarter, safer and more efficient. Smarter highways will move more people by operating more efficiently. The first step is to make better use of the highways we have.

21st century technology for safer, smarter highways

WSDOT is improving your commute with new tools and technology to reduce collisions and smooth traffic flow on some of our busiest routes. This high-tech approach is called active traffic management (ATM).

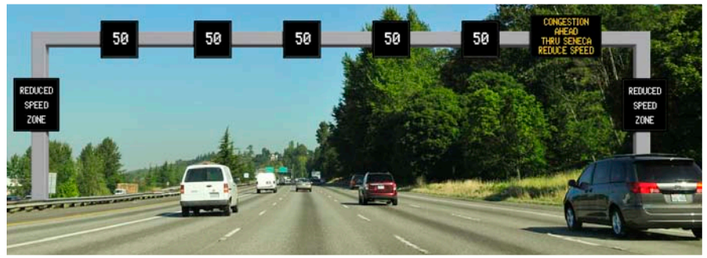
We already use several ATM tools, such as ramp meters and reversible express lanes. These tools and others are proven successful at making our highways more efficient, but there is much more to a smart highway.

New tools and technology, such as electronic signs that display real-time traffic information and variable speed limits soon will help motorists avoid backups and reduce traffic collisions, which cause more than 25 percent of congestion.

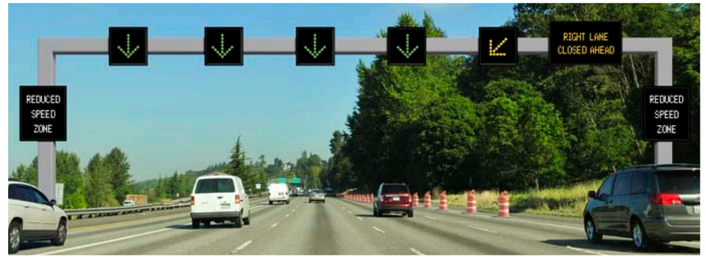
When used selectively to match a roadway's unique conditions and demands, ATM tools have proven effective at reducing congestion in urban areas of the United States and Europe.

In Europe these new tools and technologies resulted in major benefits, including:

- Lanes with ATM moved 3-7 percent more vehicles than those without during rush hour.
- Overall capacity of roadways with ATM increased by as much as 22 percent.
- Congestion-causing incidents, such as collisions, decreased up to 30 percent.
- Secondary collisions caused by blocking incidents fell 40-50 percent.



Speed limit signs automatically reduce speed and warn drivers of backups ahead.



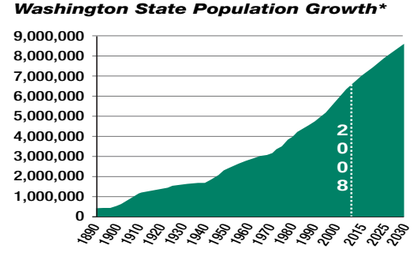
Signs cycle between the speed and a directional arrow in green or yellow and a red X for an approaching lane closure.

Meeting future demand

Our highways are already overburdened, and we expect the demand to keep growing. By 2030 our state's population is expected to increase by 3 million people, with more than 1 million more people and 1.5 million more vehicles in the Central Puget Sound region.

Making our highways smarter with ATM will help us manage traffic demands today and in the future.

Washington State Population Growth*



* Source: OFM Nov. 2007 forecast

Tools we already use

WSDOT has used smart-highway technology for years to improve traffic flow and reduce delay. Our tools include:

Traffic management centers

Traffic cameras

Incident Response Teams

Highway ramp meters

Electronic message boards and travel time signs.

Smart highways begin with proven science

Traffic management technology is nothing new at WSDOT. For years our state's highways have been equipped with advanced ATM tools from ramp meters to traffic cameras.

Washington State was among the first to use variable speed limits to make our highways safer during snow storms on Snoqualmie Pass and Stevens Pass. Our experience with a variety of smart-highway technologies has prepared us to best use the latest innovations.

An electronic message sign warns drivers of highway revisions ahead.

Smart-highway tools we already use

- **HOV**: More than 200 miles of high occupancy vehicle (HOV) lanes in the Central Puget Sound region make freeways more efficient.
- **Variable speed limits:** Adjusting traffic speed makes our mountain passes safer.
- **Incident Response Teams**: Incident response team (IRT) vehicles on the freeways assist drivers and help keep traffic flowing.
- **Traffic management centers:** Seven traffic management centers throughout the state monitor and manage traffic 24/7.
- **Real-time traffic information**: Hundreds of traffic cameras and sensors provide real-time information about congestion, alerts and travel times. The information reaches drivers through the media, the 511 Travel Info. hotline and the WSDOT Web site.
- **Electronic message signs**: 169 electronic message and travel time signs statewide, including 80 in the Central Puget Sound area keep drivers informed about traffic conditions.
- **Ramp meters**: Ramp meters improve trafffic clos also reduce collisions statewide by at least 30 percent.

Safer highways mean fewer backups

Managing congestion begins with making our highways safer. Rear-end and sideswipe collisions cause more than 25 percent of our traffic congestion, and congestion causes more collisions. Technology, such as ramp meters and variable speed limits, help drivers avoid collisions by responding sooner to changing circumstances and unforseen events.

For more information about WSDOT's ATM tools log onto:
www.wsdot.wa.gov/Congestion/technology

New tools make our roadways safer

WSDOT is expanding the technology we currently use to reduce collisions, manage traffic congestion, make our highways more efficient and help drivers avoid backups. New technology that soon will make our highways smarter includes:

- **Variable speed-limit signs** over each lane that alert drivers to slow down or switch lanes before reaching congestion or blocking incidents
- **Shoulder lanes** that automatically become an extra lane for traffic during rush-hour congestion
- **Travel time signs** that provide drivers with current travel time to a specific destination
- **Lane status signs** that automatically close or open lanes based on traffic levels to improve highway merging and reduce collisions
- **Queue warnings** – Electronic message signs located next to variable speed limits signs that warn drivers of traffic backups and blocking incidents ahead
- **Traffic sensors** along the roadway to collect traffic speed and volume data that control ATM systems

Variable speed limits in Hessen, Germany

An example of a travel time sign

Study finds new ATM tools could improve traffic

A recent study conducted by WSDOT, FHWA, and the Puget Sound Regional Council found that ATM tools can reduce collisions. Researchers concluded that ATM tools, such as variable speed limits, could improve traffic flow and reduce rear-end collisions by providing drivers with early warnings of slower traffic ahead.

The key to developing a successful ATM system, the study found, is to establish an integrated network of traffic techniques tailored for the geography, demands and conditions of each targeted segment of highway.

ATM by the numbers

Variable speed limits

586
Potential collision savings over three years

$13.3 million
Potential yearly saving in collision avoidance

$1.1-$5.4 million
Estimated cost per mile

Traffic information signs

15-20 percent
Potential collision reduction

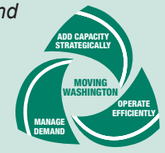
$128,000
Potential cumulative cost savings from reduced delay

$392,000
Potential savings from collisions avoidance

Data estimates based on I-405 from ATM Feasibility Study

***Moving Washington:** Efficiency, strategic capacity, managed demand*

New technology is a key element of Washington's program for curbing congestion called *Moving Washington*. Along with strategically adding new roadway capacity and managing the demand for lane space with more commute choices, technology will make our highways more efficient. Our transportation system better prepared for increasing traffic demands.



Smarter tools, smarter highways

WSDOT is investing in an array of new ATM tools, including:

Variable speed limit signs

Shoulder lanes

Lane status

Travel time

Queue warnings