Technology that Moves Us

by David Burwell
STPP President and CEO

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Mineta Appoints Jackson, Dorn, Taylor

Newly sworn in Transportation Secretary Norman Mineta has recently appointed Michael Jackson as Deputy Transportation Secretary. From 1992-1993, Jackson served as chief of staff to then-Transportation Secretary Andrew H. Card Jr. Jackson has also held leadership positions at the Department of Education, the American Trucking Association and most recently in Lockheed Martin’s transportation division. In addition, Jenna Dorn was recently appointed Federal Transit Administrator Designate. Dorn held several positions at the Department of Transportation from 1983 to 1987, including assistant deputy secretary and director of the Office of Commercial Space Transportation. She has also served as Assistant Secretary of Labor and is currently the president of the National Health Museum. Finally, Secretary Mineta announced on May 9th that Vincent Taylor, formerly of the State Department, has been appointed Deputy Chief of Staff for the U.S. Department of Transportation.

For more information, see http://www.dot.gov

High Speed Rail Bill Introduced with Strong Bipartisan Support

Legislation was introduced in January to allow Amtrak to raise $12 billion in capital funding to begin upgrading 11 rail corridors for high speed passenger rail service over the next decade. The High Speed Rail Investment Act of 2001 is cosponsored by 56 senators including Senate Republican Leader Trent Lott, (R-MS) and Democratic Leader Tom Daschle (D-SD).

The bill has strong support from federal lawmakers as well as state and local elected officials represented by the National Conference of State Legislatures, the National Governors Association and the U.S. Conference of Mayors (USCM). The USCM released the results of a nationwide poll this January showing 80 percent approval ratings for commuter rail as an alternative commuting option. The legislation was referred to the Senate Finance Committee in early February.

For more information, see http://www.congress.gov.

Bush Cabinet Includes Smart Growth Leaders

Several Bush Cabinet members and agency heads brought attention to transportation and land use issues while serving as state and local elected officials. These include former New Jersey Governor Christie Todd Whitman now head of the Environmental Protection Agency, Mel Martinez, former Director of Florida’s Growth Management Study Commission and now Housing and Urban Development Secretary, and former Wisconsin Governor Tommy Thompson who is now Secretary of Health and Human Services, but continues to serve on the Amtrak Board of Directors.

Brownfields Bill Passes Senate

This April, the Senate passed S. 350, the Brownfields Revitalization and Environmental Restoration Act of 2001, by a vote of 99-0. The bill authorizes $200 million per year to state and local governments to assess and cleanup brownfield sites, and an additional $50 million per year to establish and enhance state brownfields programs. The bill also clarifies liability for contiguous landowners, prospective purchasers and innocent landowners. Attention now turns toward the House of Representatives where there is also considerable interest in the bill.

For more information, see http://www.congress.gov.
Advancing ITS to the Next Level

by the Honorable Norman Mineta
U.S. Secretary of Transportation

EDITOR’S NOTE: The following text is adapted from a speech given by U.S. Secretary of Transportation Norman Y. Mineta at the ITS America National Summit this April. See http://www.dot.gov/briefing.htm for the full remarks.

My interest in transportation began three decades ago when as Mayor of San Jose, California, I found that the policy tool that made the most difference in my community was transportation. Nothing else had as great an impact on our economic development, on the pattern of growth, or on the quality of life. I have found in the years since that this is true both locally and nationally.

Congestion and delay not only waste our time as individuals, they burden our businesses and our entire economy with inefficiency and higher costs. Today, providing the public with timely transportation information and alternatives is a key to both our economic success and to our quality of life. Another essential ingredient for providing the public with meaningful and tangible transportation options is true intermodal integration.

This integration is important not only within the Department of Transportation, but for all aspects of transportation in both the public and private sectors. This means that railroads can’t any longer just think about railroads, but must also think highways and airways. We have the technology to bring our separate transportation infrastructures together to create true intermodalism.

This is where Intelligent Transportation Systems (ITS) are so important.

Having chaired the House Public Works and Transportation Committee during the creation of the Intelligent Vehicle-Highway System (IVHS) program in ISTEA and as a former Board Member of ITS America, I am no stranger to ITS. I was glad to see that the innovations we built into ISTEA, including ITS, were reaffirmed in TEA-21.

ITS has an important role to play not only in bringing technologies from other modes to the vehicle and to the highway, but also to all modes of transportation. ITS means powerful benefits in managing congestion, reducing crashes, and improving the efficiency of the trucking and transit industries as seen in North America, Europe and Asia.

These successes, and our vision for ITS’s greater potential, led to the Department of Transportation’s decision to invest $253 million, a 32 percent increase over 2001, for Intelligent Transportation Systems in FY 2002. During my tenure as Secretary of Transportation, the benchmark of success for ITS will be the deployment of Intelligent Transportation Systems. In order for our efforts to be truly successful, we are investing tax dollars in programs that work. Research and development remain essential to building the future of ITS. However, we cannot limit our focus to R&D efforts. We must deliver the practical and usable transportation systems that can benefit the public today.

We need to develop practical applications that will provide the public with real transportation alternatives. Let me give you an example. When you’re driving down the highway, and you see a flashing sign that tells you: “Congestion Ahead” how much does that really help you, when you’ve already slowed to 5 miles an hour? You know there’s congestion; you’re sitting in it! Wouldn’t it be great, if instead, that electronic sign told you: “Take exit 34, Left on Main, Go Three miles, Re-enter highway at Exit 37.” Now, that’s an intelligent transportation solution.

Some of these solutions can mean saving real lives by way of greater public safety in transportation and emergency response systems. For example, we all know that telecommunications companies are working to improve emergency notification systems — specifically E-911 and we must support this important work. We must work collectively — with the private sector, with other federal agencies, and with state and local governments — to deploy an intelligent system to save more lives.

This must be a comprehensive, end-to-end system of emergency notification, and response. It should indicate the location of a crash, provide data about its severity, and notify the necessary responders. Such a system will not only help to save lives at the time of a crash, but also help to prevent others in the future by providing data that will allow us to build safer cars and roadways. These systems are just a few examples of the countless important and innovative solutions that we can bring to fruition.

Norman Y. Mineta was sworn in as the nation’s 14th Transportation Secretary this February. At his January confirmation hearing, Secretary Mineta described his top priorities for the transportation department as improving safety on highways and other parts of the transportation system, eliminating bottlenecks on highways, and reducing congestion at airports.

He brings to the U.S. Department of Transportation more than 25 years of public service experience as Mayor of San Jose, CA, Secretary of Commerce during the Clinton Administration, and Member of the House of Representatives from California, where he served as Chairman of the House Transportation and Public Works Committee and played
Turning Swords into Ploughshares in Tucson

by the Honorable Bob Walkup
Mayor, City of Tuscon

As Mayor of a city that is seeking to grow smarter, I am charged with identifying the right policies and technologies to make Tucson a better place to live. ITS technologies have helped our region manage congestion and provide better alternatives to driving, one of the goals of the Livable Tucson Vision Program.

Traveler Information

In Tucson, we provide the latest traveler information to our residents through commercial radio, television and the Internet. In addition to timely and accurate information on traffic incidents, Tucson’s Transview website provides information on routes and schedules for the local transit system, the trolley network, bike paths, ridesharing and park-and-ride services. In 1998 the City of Tucson established a partnership with METRO Networks-Tucson, a private traveler information provider, to implement a regional ITS Traveler Information System program. METRO Networks-Tucson provides funding for the operation and upgrading of the region’s transportation control center, helicopter flight time for staff to monitor roadway conditions, broadcasting of peak-hour transportation announcements, and a potential revenue stream for the city to use on related ITS projects. Also, the Tucson region is investing in smart roads, transit improvements, regionally coordinated traffic signals, electronic signboards and other advanced transportation technologies to improve the movement of people and goods.

Public Transit Systems

Green light traffic signal extension research for transit is underway in cooperation with the University of Arizona. This technology would prolong green lights when transit vehicles are approaching, enabling buses, vans and trolleys to keep to their schedules. One technology that is already in place is an Automatic Vehicle Location system (AVL). This allows Sun Tran transit dispatchers to track the location of each transit vehicle.

This system also provides a “mayday” capability to drivers who require assistance; pushing an in-vehicle button alerts dispatchers of any problems.

Improving Bicycling Conditions

The City of Tucson has installed smart traffic signals at several crosswalks that lengthen the crossing time when pedestrians and cyclists are present. The technology is called “TOCAN Crossings”, since TwO groups of road users CAN cross at the same time. The traffic light is extended based on the information provided by cameras that detect bicycles or pedestrians. Tucson’s metro area has more miles of bikeways than any other metro area in the U.S. Technologies like TOCAN enable us to integrate the bicycle network into the overall transportation system in a way that is safer for everyone.

Enhancing the Pedestrian Environment

Tucson has also introduced a crossing signal technology that help drivers brake for pedestrians. Coupled with our “Watching Over the Pedestrian Like a Hawk” media campaign, the HAWK (High-intensity Activated CrossWalk) system has generated one of the nation’s highest driver yielding rates, increasing compliance from 30 percent, under normal conditions to 93 percent over an eight-month study period. The City of Tucson will receive a national award for pedestrian safety from several governmental and non-governmental agencies for this innovative program.

Emergency Room Technologies

ER-Link Tucson is a public/private partnership that allows doctors to be virtually “transported” from the hospital emergency room into an ambulance with a highly skilled paramedic by the patient’s side. As planned for phase one, the project will allow for video and voice teleconferencing capabilities between the University Medical Center and the Advanced Life Support (ALS) ambulances of the Tucson Fire Department. The system facilitates near-constant two-way audio and video communication between the attending paramedic in the ambulance and the emergency room personnel in the hospital.

Mayors and other policymakers have continuously been confronted with the problem of how to develop and maintain an Intelligent Transportation System program. Although federal assistance enabled our region to initiate our successful ITS programs, there is currently no mechanism with which to maintain them. We should make continued innovation possible. When transportation initiatives prioritize mobility, safety, environmental quality and community goals, ITS can help us create a more livable community for everyone.

As Mayor of Tucson, Bob Walkup has sought to make Intelligent Transportation Systems (ITS) available in Tucson since he first moved there in 1990. Prior to holding elected office, he worked in the high-technology aerospace industry as an engineer and executive for more than 30 years.
Navigating Atlanta Out Of Congestion

by the Honorable Bill Campbell
Mayor, City of Atlanta

Atlanta's regional Intelligent Transportation System is a dream that is becoming a reality. In the mid-1990s, the City of Atlanta, the Federal Highway Administration and the Georgia Department of Transportation launched a $145 million project to build a state-of-the-art regional transportation management system upgrading the existing Traffic Control System (TCS). The City of Atlanta’s TCS began three decades ago, growing from a few dozen signals to the new Advanced Transportation Management System (ATMS) system that will ultimately include all of the City’s 890 traffic signals. As Mayor, I am proud that Atlanta is at the forefront of technology implementation to meet our future transportation challenges.

During the first phase of this project, we rebuilt field equipment infrastructure such as traffic signal controllers, poles, heads, and communications hardware. Almost 500 traffic signal intersections were modernized during this phase. These systems (now called NaviGator) have laid the foundation for a comprehensive multi-modal network, and will provide support for many City functions such as public safety, planning, and emergency operations. The new ATMS puts numerous technologies into service, including video surveillance, ramp metering, High-Occupancy Vehicle (HOV) lane operations, and the integration of Geographic Information Systems (GIS).

Currently, the Atlanta Transportation Control Center (ATCC) has central system control for over 600 traffic signals. The system monitors traffic signal locations for proper timing and synchronization, and reports problems with traffic signal controllers. Incident detection and management technologies are used for freeway operation. Vehicle sensors imbedded in the freeway pavement can monitor the flow of traffic and any unusual vehicle activity is reported to central operators. Using video surveillance, an operator can verify incidents, and can select the appropriate system management strategy. They can alert drivers of conditions downstream and display alternative routing using changeable message signs. This system also benefits surface street operation. When freeway congestion occurs, drivers tend to use surface streets as alternate routes. With better incident detection and management, these technologies can help minimize this spillover effect.

The second phase of the NaviGator project is now underway. This phase includes further integration of ITS technologies into all modes, expanding the current system with more devices, extending the communications network, enhancing current systems to provide more information and including more transportation and governmental agencies in the system. For example, the Metropolitan ITS Integration Project (MITSi) integrates data from the NaviGator ATMS, the City of Atlanta 911 Center, and the Metropolitan Atlanta Rapid Transit Authority (MARTA).

Though predicting future transportation trends is a challenge, we do know that traffic demands will increase. Our job is to prepare for this by building smart, flexible systems that can accommodate these dramatic changes.

Mayor Bill Campbell is an acknowledged expert on transportation issues, and serves as chair of the U.S. Conference of Mayors’ Transportation and Communications Committee, as well as Chair of the Atlanta Regional Commission’s Environment and Land Use Committee.

Additional ITS Resources

Publications


Toolbox on Congestion Reduction and Mobility Enhancement, Michael Meyer, PhD., Institute of Transportation Engineers, Washington DC, 1998.


On-Line Resources


Transportation Task Force, Public Technology Inc., http://www.pti.org

National Transit Resource Center, Community Transportation Association of America, http://www.ctaa.org

ITS Training Courses, the National Transit Institute, http://www.ntionline.com
Technology for Choice?

by Michael Replogle
Environmental Defense

The impact of any new powerful technologies depends on how they’re used. Smart cruise control on vehicles could potentially squeeze more traffic capacity out of existing highway lanes. But this technology could also spur more long-distance commuting, sprawl, smart super-roads for affluent communities, and new safety and equity challenges. On the other hand, other technologies can enable communities to reduce automobile dependency in favor of better traffic management and information-based transit strategies that support existing communities, provide travel choices, and ensure equitable access. Help your community make the smart choice. Below are some examples of ITS applications.

Electronic Tolls for Better Transportation Choices. High-speed electronic toll systems are becoming favored ways to cut congestion and pollution. Road operators like the Port Authority of NY-NJ are raising peak period cash tolls while offering savings for off-peak electronic toll users. Trans-Hudson River tolls are a vital revenue source for the PATH rail system that links Manhattan and New Jersey. The automated Electronic Toll Road 407 outside Toronto offers time-of-day tolls without burdening travelers with toll booths. Most drivers pay electronically as they pass detectors on entry and exit ramps. Vehicles lacking transponders are detected by cameras which capture license plate information as you enter and exit; computers match them to figure the toll, then mail the bill with a $1 surcharge.

On San Diego’s I-15’s High-Occupancy Toll (HOT) lanes, carpools and buses travel for free. Excess express lane capacity is offered to solo drivers for a fee, which changes based on traffic demand. Toll revenues are being used to improve transit service. HOT lane revenue in San Diego pays for new bus service. Recent studies of Southern California’s SR-91 HOT lanes by Ed Sullivan of Cal Poly University show that the key determinant of whether someone pays to use a HOT lane is time-pressure. While high-income people use HOT lanes more often, there is substantial use by those of low to moderate incomes. Studies by Metro in Portland, Oregon, and Environmental Defense in California show that appropriately designed time-of-day road pricing can boost social equity by giving low-income travelers greater access and mobility.

Use-Based Car Insurance. With most policies, drivers save little on their car insurance if they cut their annual mileage even ten percent. But Progressive Insurance is saving 1,200 Texas households an average of 25 percent with an insurance policy that rewards those who drive less. Rates are based on when, where, and how much you drive, with less emphasis on traditional factors like neighborhood of residence, gender, sex and marital status. Using Global Positioning System (GPS) monitors in each car, Progressive generates monthly bills with the same privacy protection as a phone or credit card. Many new cars already offer GPS systems for navigation and emergency services. Incentives could make such equipment standard on motor vehicles, speeding adoption of new traffic-management tools.

Smart Transit and Travel Information Systems. Transit ridership has grown faster than car use for the last four years. To sustain that trend, riders need better information, time savings, and reliability. Transit agencies in San Francisco, Delaware, Montgomery County (MD), and the Washington, DC area are implementing systems similar to those in Europe and Japan that give riders real-time information on when the next bus or train will come. Smart systems can help dispatchers route and manage bus and vans, and give priority to buses at traffic signals, delivering more and better service for the same number of buses and drivers. Smart card fare collection is speeding transit boarding and reducing need for cash handling on transit systems in metropolitan Washington and New York. Employer-provided tax-free transit benefits can be transferred automatically to smart cards for hassle-free employee benefit administration. Systems that track cell phone movements on roads are transforming real-time traffic information in dozens of U.S. cities such as Metro New York and Los Angeles. These travel information systems are also linking to door-to-door flex routes, transit schedules, and taxi services.

Smart Traffic Calming? As smart technologies permeate the system, new options will likely appear. Insurance companies may one day offer cost savings for motorists who keep within 5 mph of speed limits and observe traffic lights, adapting from initiatives already underway in Scandinavia. Pressures for a more customer-responsive transportation system and for reduced greenhouse gas emissions may encourage restructuring of surface transportation management. A growing role for private capital in roads and transit will make the future system look more like a public utility and less like a monopoly. Perhaps in 20 years, rather than buying a car, we will contract with “mobility providers” for a bundle of services, including a transit pass and a low-pollution car for everyday use, and access to SUVs and sports cars. Price incentives will allow us to save money if we make choices that are environmentally friendly and allow the private sector to profit from incentives that reduce solo driving and SUV use. Smart cards and electronic toll devices may support barrier-free non-attended parking payment systems and allow travelers to earn redeemable ‘FAIR lane’ credits that are good for occasional use on HOT lanes or for free transit.
Transit Goes High-Tech

by Robert F. Casey
Volpe National Transportation Systems Center

Advanced Public Transportation Systems (APTS) are transforming the way public transportation systems operate, providing decision-makers with tools to enhance safety, punctuality, timely information and quality of service. These generally fall into three categories: Traveler Information Systems, Electronic Payment Systems, and Fleet Management Systems. These are described below:

**Traveler Information Systems** combine computer and communications technologies to provide information to travelers at home, at work, on the roadside, at bus and rail transit stations, or on the vehicle. This enables transit providers to supplement printed route maps, schedules, and fare information with dynamic real-time information about route delays, arrival estimates, next stop and transfer possibilities. Travelers can access real-time schedules and congestion information through telephones, cable television, personal computers, cellular phones, pagers, handheld computers, variable message signs, or kiosks. Implementation will be a major opportunity and challenge as applications of real-time information systems become more widely distributed.

**Electronic Payment Systems** combine fare media, such as magnetic stripe cards or smart cards, with electronic communications systems, data processing computers, and data storage systems to make fare payment more convenient for travelers and revenue collection less costly for transit providers. This means that travelers only need to carry one payment card to access all transit services within a region. Also, these systems can help transit managers gather real-time data on travel demand for better planning and scheduling.

The flexibility offered by smart card systems permits operators to more easily implement fare changes by uploading new fare structures electronically to system payment and sales devices, rather than minting new tokens or recalibrating fare boxes. Smart cards offer a benefit over magnetic stripe tickets in terms of security, flexibility and data capacity, but at a higher cost. Some smart cards use radio frequencies to signal a card reader and require no physical contact between card and reader. Hybrid cards contain both a smart card and a magnetic stripe.

**Fleet Management Systems** include a whole range of technologies used to improve fleet management, responsiveness and planning. They include:

**Transit Operations Software** is used to develop and display information for a variety of transit decision-making activities including making real-time service adjustments (when service begins to deteriorate) and directing response to vehicle incidents and emergencies.

**Communications Systems** pass voice and data information (both raw and processed) between transit vehicles and transit agency dispatching centers. Transit communications systems are comprised mostly of wireless technologies and applications.

**Geographic Information Systems** (GIS) are database management systems that organize and display layers of geographic data. GIS provides operators, dispatchers, and street supervisors with visual information about transit systems, which impacts system management, responsiveness and planning.

**Automatic Passenger Counters** (APC) collect data on passenger boardings and alightings by time and location. APCs makes data gathering much easier, more reliable, and less costly.

**Traffic Signal Priority Systems** technologies give transit vehicles the green light whenever possible, by either changing a signal from red to green when a bus, trolley or van is approaching, or prolonging a green light. Signal priority produces faster, more reliable transit service and reduced operational cost.

**Automatic Vehicle Location Systems** (AVL) are computer-based tracking systems which allow transit operators to automatically locate fleet vehicles by using signals from signposts and Global Positioning System (GPS) satellites. They provide the location data needed for operation of the systems listed above: software, silent alarms, automatic passenger counters, real-time passenger information, in-vehicle signs and annunciators, and traffic signal priority.

Recently, APTS deployments have increased substantially. Studies by the Volpe National Transportation Systems Center show a 200 percent rise over the past five years. Electronic Fare Payment Systems have grown by more than 130 percent. Fleet Management System applications have more than doubled. Increasingly, APTS technologies are being integrated with other ITS systems. Conformity with the National ITS Architecture has facilitated this integration. As more fleets implement their APTS plans, it is believed that transit agencies will reap system-wide benefits and provide better service to users.
The Future of ITS Is Here

Bringing ITS All Together in Ann Arbor

by Chris White, Ann Arbor Transit Agency

The Ann Arbor Transportation Authority (AATA) became the first transit agency in the U.S. to integrate system communications and real-time connections into a single system. Although components of these technologies have been used in other locations, the agency, which installed its Smart Traveler, Smart Bus, and Smart Operation Center from 1997 to 1999, became the first to operate a single advanced operating system (AOS) in 1999.

The heart of AOS is a computer on board each bus which controls differential GPS for automatic vehicle location, a mobile data terminal for the driver, in-vehicle and external audio and visual displays, surveillance cameras, passenger counters, and monitoring of the engine and transmission. The bus knows where it is scheduled to be throughout the day which allows it to automatically change destination signs, make stop announcements to passengers, and provide schedule adherence information to AATA's control center as well as transit centers and displays at bus stops. The driver can use the mobile data terminal to send and receive text messages to AATA's control center and other buses, play announcements on board, and coordinate passenger transfers to and from other routes. Drivers can also switch the system to voice communication on demand.

Although it is impossible to attribute it directly to the AOS, ridership has increased more than 15 percent since the AOS was introduced. The next step for AATA is making real-time system information (such as the arrival time of the next bus) available to customers on the internet, at kiosks at major boarding locations, and at individual bus stops. These technologies are anticipated to increase the reliability and user-friendliness of service on the agency's fleet of seventy-seven “smart” buses. The leadership and stable local funding that enabled AATA to pursue demonstration funding for the ITS program continue to give the transit operator the ability to see the possibilities for transit supportive technologies.

Access Through Bits: A New Goal for ITS and Transportation

by Thomas A. Horan, Ph.D.
Claremont Graduate University

Transportation planners have long grappled with the distinction between mobility and access. At the beginning of the federal road policy era in the 1920's, these concepts seemed inseparable—providing mobility by getting “farmers out of the mud” meant access to urban markets.¹ Since then, the relationship has become more complicated. For example, because of worsening congestion and longer trip lengths, expanding highway capacity (and in theory, mobility) doesn’t always improve one’s ability to obtain desired goods, services and information.

Moreover, it is now easier than ever to gain access without mobility, thanks to the recent rise in communications technologies. Phone calls, faxes, emails, and the telecommunications network provide rapid access to people, goods, and information. And we’ve only just begun; today’s emerging fiber infrastructure has the theoretical capacity to transmit three million large books—more than the inventory of Amazon.com—on a single fiber-strand per second.²

The relationship between concrete/asphalt and electronic access networks is complex. For example, electronic demands (for goods and services) can both substitute and stimulate use of the transportation system. Calling a colleague on the phone can save a trip, while ordering an iMac can stimulate a trip.

Nonetheless, transportation policy makers and system designers have great opportunities to improve access through the digital network. The appropriate framework for this is the Intelligent Transportation System (ITS), the “official” program for organizing and deploying digital technologies.

Motor Mobility to Bit Access

For the past decade, ITS has enjoyed strong federal funding for planning, programming and deployment. Major urban areas nationwide now have a basic technological infrastructure supporting their surface transportation system, a general architecture and planning process to integrating their information system into traffic management systems, and a range of technology services providing drivers with information about traffic and travel conditions.

These reflect the original focus of ITS programs: better mobility, i.e. improving traffic flows, vehicle crash avoidance, linking users with different transportation modes.
Integrating ITS into Portland’s Multi-Modal Transportation Policy

by Dennis Mitchell, Oregon Department of Transportation

The Portland region’s transportation policies prioritize people, not cars. The result is a very beautiful area with a viable downtown core where 50 percent of commute trips are made by transit. To plan for future growth, the region has launched an aggressive program of using Intelligent Transportation Systems (ITS) to achieve our goal of a fast, safe, efficient, accessible, convenient and sustainable transportation system. Projects include the implementation of operational systems, integration of ITS into the region’s coordinated planning process, and the creation of new ITS capabilities that leverage our current investments in freeway, arterial, and transit management and operational infrastructure. Some examples of the current ITS projects being deployed are:

- **Real Time Customer Information Displays** will provide real-time transit information to customer waiting areas (e.g., vehicle arrival information, transfer information or service disruption messages).
- **Traffic Signal Priority** will extend the “green-time” at traffic signals for buses running behind schedule in Portland and, eventually, throughout the region.
- **Automated Stop Announcements** will announce stops to passengers on Tri-Met’s bus fleet, similar to technologies on the MAX light rail. This will help visually impaired passengers navigate their journey.
- **Using buses as traffic probes** Tri-Met will report travel speeds over high-priority corridors. This data will allow agencies to better monitor and manage the transportation system.

The Portland regional ITS infrastructure has been built through cooperation and communication between the transportation stakeholders in our regional and statewide partnership. This coordination is critical to meeting our future challenges in transportation system efficiency and safety.

Given the new popularity and power of Internet use, ensuring better access to goods and services is now a more appropriate focus. Here are some actions that can help fulfill this objective:

**An Infrastructure for Access.** ITS infrastructure should enhance the access needs of those who live and work near electronic networks. ITS broadband networks can facilitate community digital access in places that currently lack good surface transportation options (such as the Compton Blue Line, Connecting Minnesota, the Great American Station Foundation’s “e-Stations” concept) or, on the wireless side, access to mayday and other safety services (for example, e-911).

**Traveler Information.** The next generation of traveler information services should deliver real-time conditions, alternative travel modes, and ideally, pricing information and value packages for a range of needs: commuting, senior access, student specials, etc. The Seattle Smart Trek system is a standard bearer on real-time information for multiple modes.

**Environmentally-Friendly Trip Substitution.** Perhaps the greatest access gains can be achieved by providing people with more access choices, including environmentally-friendly options. For example, people with telework options and flexible work schedules could tap into traffic information before they depart on their commute. E-commerce delivery systems could include environmentally-friendly or energy-efficient shipping options. Newly designed communities can use electronic connectivity to enhance the types of services that are provided in pedestrian environments.

To date, most transportation technology planning has focused on system-level mobility. Our new challenge is to bring transportation services and options to a personal level so that people can have more access choices. Such a system would enable better telework opportunities, would contain more useful information about various travel options, and would allow for environmentally-beneficial e-commerce delivery systems. Since the U.S. Department of Transportation is just beginning a new ten-year planning effort for ITS, the time is right to move these technologies to favor access.

**Notes**

The communication possibilities and data generated by ITS can be used for operational control, public information, and service planning. North American agencies are lagging behind their European and Asian counterparts for several reasons: the lack of a modern database infrastructure that allows efficient access and distribution of data, a lack of trained staff, and competing priorities for limited investment funds. But the effort to overcome these obstacles can pay off in cost savings for agencies, time savings and increased ridership, as the following examples suggest.

Montreal
Over the last twenty years in Montreal, bus lanes of all types, including counterflow, center and curb lanes have been added on the 15 bridges crossing onto the island and along major arterial roads. What sets the region apart from most of the rest of North America is that some lanes have dedicated signals for buses and taxis. While such solutions are effective, they can be costly and take years to implement, especially when computerized signaling systems have to be installed or modified at numerous intersections. Furthermore, despite Montreal's reputation as a transit-friendly city, bus lanes are still politically difficult to implement if they replace on-street parking.

ITS offers a potential lower-cost compromise: bus detection coupled with right-side queue bypass lanes just before and just after an intersection. When an approaching bus is detected, the right-turning traffic gets a green signal a few seconds early so that the bus can come forward to the intersection. At the next cycle, the bus is given a signal early so it can cross and then remerge left, putting it in front of all other traffic.

Suburban Washington, DC
The Potomac and Rappahannock Transportation Commission (PRTC) began providing its "OmniRide" local transit service in the Virginia suburbs of Washington, DC, in 1995. OmniRide combines general service with paratransit service using a combination of fixed stops and flexible routing within 3/4-mile corridors on either side of established routes. Transit schedules have margins for deviations, and the control center alerts drivers to changes. This integrated system appealed to the agency because it enables them to comply with the Americans with Disabilities Act more efficiently than the common alternative – parallel paratransit and fixed route service – while providing improved coverage to the general public in a low-density suburban area. The smaller paratransit-style vehicles are also more appropriate for neighborhood streets.

OmniRide’s five routes attract between 6 to 15 passengers per hour. Call-in requests account for about 13 percent of trips. With the recent increase of daily operating hours, ridership has jumped 58 percent to 1,900 passengers per day. Further ITS improvements will be added, including a more automated means of communicating with drivers (mobile data terminals) and more accurate location reporting to aid vehicle tracking and dispatching (using GPS automatic vehicle location). This last feature also will allow for the automated statistical analysis needed to refine routes, stops, and schedules.

Los Angeles
Los Angeles MTA has two new "Metro Rapid" bus routes to complement MetroRail. They feature low-floor buses with a distinct image, longer bus-stop spacings, and ITS that can detect approaching buses and give them up to 10 seconds longer to get through an intersection. Travel times on both routes are now more reliable and have been cut by an average of 25 percent. The increased speed means more service for the same operating budget, for two reasons: the fleet can make roundtrips at a higher rate, and better service attracts more passengers and revenue. The Ventura Boulevard line connects with the Red Line subway such that travel time to downtown LA is now competitive with autos. The investment of about $10 million was modest considering how long these routes are, and can readily be justified by the results -- since their opening, ridership has grown by more 25 percent.

For more information, look to http://www.stcum.qc.ca for Montreal, http://www.omniride.com for Virginia’s OmniRide, or http://www.mta.net for Los Angeles. To find out more about the OmniRide program, please contact Eric Marx at emark@omniride.com. Eric Bruun can be reached at BruunB@aol.com.
Think Tram – Use Buses!

by Ingemar Lundin
Jönköping Public Transport Authority

What public transit solutions best suit medium-size cities, where bus systems aren’t particularly appealing and modern tram systems might be considered too expensive? The solution may be to build a new bus network that resembles a tram system. Here’s the experience of Jönköping, a city of 100,000 in southern Sweden.

Using the motto, “think tram, use buses,” Jönköping launched a new system on June 10, 1996 which features: a new bus network based on two main routes; low-floor articulated buses; and an information system that gives the location of all buses, real time information for passengers at bus stops, and green light priority for buses. The system also features shorter distances between terminals, modern bus stops, and three transit providers in the same city bus system.

This bus rapid transit system, dubbed “Comfort 96”, was designed to reverse a long-term decline in ridership (1-2 percent a year), dwindling farebox recovery (then 50 percent), low investments in buses, and a city center that had lost many core businesses.

The city had two challenges: the renovation of the public transport system and the revitalization of the city center, which was failing to compete with new commercial areas outside the city. To bolster this effort, the City of Jönköping and the county Public Transport Authority called Jönköpings Länstrafik AB started to analyze the relationship between public transport and urban development, which was often overlooked in the past.

The City bus system serves areas of greatest population concentration. More than 60 percent of the inhabitants can reach their bus within a 600-meter (0.37-mile) radius. The average distance to the nearest bus stop is less than 200 meters. Jönköping needed a bus that would combine high capacity with low floor technology. Like a tram, the new City bus has four doors. The first and the third for entering and the second and fourth for getting off the bus. Ticket buyers use the first door. If you have a periodic card or a discount card you may enter the first or third door and then use the ticket machine inside the bus. Most passengers appreciate low floor buses, especially disabled and elderly people.

Each City bus contains a computer that monitors progress through a GPS system. The computers also trigger destination signs and give information about the next stop on screens and loudspeakers inside and outside each bus. At the bus stop, a monitor tells people when the bus is arriving. Shopkeepers like to have these monitors inside the shopping area. Less time at the bus stop allows more time for shopping. As a result, businesses have warmed to public transport since the new system started. Some have proposed a third City bus route which would pass by the main entrance to a big shopping centre.

During most of the day City buses depart every ten minutes. The controller can follow each trip on the monitor and summon another bus if there are delays in the system. However, delays are less common since computers also communicate with traffic lights. The City buses get a “green wave” while cars and local buses have to stop at crossings.

Findings show that from 1996 to 1998, ridership rose more than 10 percent. The system generated SEK 2.0 million in additional passenger revenues and reduced running costs by SEK 4.0 million, or an improvement of about SEK 6.0 million (US$592,000). This was double the revenue expected. Despite low fares, the two City bus routes cover over 100 percent of costs. However, if all local buses are included, the level of cost coverage declines to about 70 percent. That is still a marked improvement. Before we started, the modal share for public transport was 19 percent in the city area. Now it has increased to 22 percent (biking/walking not included).

Co-operation has been a key word in the project. Without a positive relationship between the Public Transport Authority and the city the project could not have been implemented. It is also important to have a good relationship with local entrepreneurs and their staff. Thanks to the fact that all the decision-makers had the courage to believe in the project, initial difficulties during the implementation phase were resolved. Moreover, Jönköping got a public

Jönköping’s City bus system utilizes ITS to improve transit service and to encourage shopping in the town center. To read the unabridged version of this article visit http://www.jlt.se. Photo by Jönköping
In 1999, Americans owned 220 million cars, trucks, and motorcycles—about 33 million more vehicles than licensed drivers. In 1998, American households spent $663 billion on their motor vehicles. For the average family, this works out to about $6,200 per year, mostly in fixed costs like insurance, vehicle purchase, taxes and fees. To save money, some households move to transit-rich, bicycle and pedestrian-friendly neighborhoods so that they can reduce the number of cars they own. But for many households, living car-free just isn’t an option. And they still have to pay through the nose just to own their cars, regardless of whether they drive them a lot or a little because most costs are fixed.

In several cities, a revolutionary new concept is attempting to address those inefficiencies. Car-sharing allows many people to share a single car, split the costs, and avoid the hassles of maintenance. Most operations charge members a minimal annual fee, and then charge by the hour, the mile, or both when the car is used. Over 1,000 Americans are members of car sharing programs across the country, and this number is growing every day.

**Car-Sharing as a New Form of ITS**

While the concept of car sharing is rather simple, the logistics of managing and maintaining a fleet of cars and making sure that the vehicles are available when members want them are tricky. In most cases, car sharing requires a relatively sophisticated reservation system, entry system, and tracking system to determine how far and for how long cars have been driven. Car-sharing employs several new technologies including advanced keyless entry, Internet-based reservations, and advanced telecommunications for sending data on car use back to the central computer.

Through technological innovation, car-sharing has the potential to reduce congestion, improve air quality, and free-up parking spaces. Studies of European car-sharing programs have found that one shared vehicle can replace four to eight privately-owned vehicles, and that members typically reduce car usage by as much as thirty percent. Because it provides the convenience of a private auto without the cost of ownership and maintenance, car-sharing can also be a real money saver. Members of CarSharing Portland estimate that they save an average of $154 per month in transportation costs compared to private auto ownership. Over the course of a year, that adds up to more than $1,800.

**City CarShare**

San Francisco’s City CarShare was founded by a group of transit activists and planners in 1999. That same year, the San Francisco Board of Supervisors voted unanimously to support City CarShare as an alternative to auto-dependence. Since its launch on March 1, 2001, City CarShare has enrolled 350 members and has fifteen vehicles in five locations throughout the city.

City CarShare members use the Internet to reserve a car. An on-line calendar tells them where, when, and for how long cars are available. Once they have a reservation, members can stroll down to their neighborhood City CarShare parking lot, unlock the car with a special key “fob”, and drive off. The key fob uniquely identifies members and works with an on-board computer to record the distance and duration of their trip.

At the end of the trip, City CarShare members return the vehicle to the lot. A transmitting box in the parking space retrieves mileage from the odometer, when the car is returned. The box transmits that information back to City CarShare’s home computer which automatically updates members’ accounts. At the end of the month, the database automatically generates bills for each member.

Some 70,000 people belong to car-sharing programs in 500 European cities. Elizabeth Sullivan, executive director of San Francisco’s City CarShare notes that if new car-sharing businesses proliferate across America, shared cars may one day “make the private auto an urban relic.”

Elizabeth Sullivan and Tony Pecore, both of City CarShare, contributed to this article.

**For More Information**

Car-sharing programs are up and running in Seattle, Portland, OR, San Francisco, and Boston, and coming soon to Washington, DC and Chicago. For more information about these and other car-sharing programs, visit the following websites:

- General information – [http://www.carsharing.net](http://www.carsharing.net)
- San Francisco – [http://www.sfcarshare.org](http://www.sfcarshare.org)
Delivering the Future: e-freight

by Michael D. Meyer, P.E.
Georgia Institute of Technology

E-commerce has revolutionized corporate America. Business applications range from electronic information exchange with customers and business partners to electronic monitoring of goods movement through the supply chain. E-commerce places a premium on getting the product to the consumer quickly and reliably. Supply chain alliances between companies (a.k.a. the business to business, or “B2B” strategy) permit a more efficient utilization of resources. With freight, shippers can enjoy increased reliability of product delivery and monitoring and can receive better information on network flows.

Efficient internet communications between customers and businesses promote expectations of fast and reliable delivery. This strategy requires a transportation system that provides near ubiquitous access to all possible consumer locations in a market. Without coordination and integration of such service, the increased flows could result in greater levels of congestion and impacts on community quality of life.

As a result, intermodal transportation becomes a more important concept in system planning. Terminal capacity, location and operations that allow integrated product movements across modes are critical business considerations in providing the most cost-efficient delivery of services.

Integrating Freight and Planning
Providing infrastructure and services that will support e-freight activity is an important component of a metropolitan area’s regional transportation strategy. The following examples illustrate how such a strategy can be applied.

Portland’s Regional Transportation Strategy. Portland, Oregon’s 2000 transportation plan gives freight movement considerable attention. As noted in the plan, “the significant growth in freight projected by the 2040 Commodity Flow Analysis indicates the need to make adequate land available for expansion of intermodal facilities, manufacturing, wholesale and distribution activities, and to continue maintaining and enhancing the freight transportation network.”

Intermodal Freight and Brownfield Redevelopment. The New Jersey Transportation Planning Authority is planning the redevelopment of abandoned industrial sites near northern New Jersey ports, airports, and rail terminals. This “freight village” concept is not only a response to expected increases in freight volume, but is also a strategy to “reduce freight-driven sprawl in greenfield areas by developing freight and trade-related distribution facilities within existing transportation corridors.”

Consolidation/Clustering Distribution Centers Near Intermodal Facilities. There are numerous examples of distribution centers and warehouses being located near intermodal facilities. Public investment strategies that support this type of consolidation include primarily access improvements, both physical infrastructure as well as signing and traffic control.

Priority to Freight Movements. Some metropolitan areas are considering ways to segregate and/or give priority to goods movers. Southern California is considering providing freight haulers with preferential treatment on freeway lanes and a commercial vehicle-only lane has already been implemented in the new tunnel under Boston harbor. It seems likely that preferential treatment for freight will be more widely considered in heavily congested regions.

Improving System Reliability Through ITS Technologies. Transportation reliability is essential to e-commerce. As noted in a recent U.S. DOT report, “by 2010, high quality, real-time travel information will be generally available for urban and heavily used Interstate routes, usually via wireless receivers. By 2025, real-time transportation management will be a reality, with highways and transit not just monitored, but proactively managed.” Global Positioning Systems (GPS) in combination with advanced system surveillance and communications capabilities will allow a more efficient schedule operation for many freight operators.

Emerging Concepts in Service Reconfiguration. It is likely that increased e-commerce activity will cause package deliverers to rethink basic strategies in delivering goods, especially in metropolitan areas where congestion levels create significant delays. Not only is it inefficient to make multiple delivery attempts, but it also delays shipments to other customers. A concierge service has been implemented by New Jersey Transit in which packages can be left for pick up at neighborhood commuter rail stations. A European system uses urban rail systems to deliver packages in congested urban cores.

Our Challenge
The history of transportation has been dominated by the interplay between changing market demands and technological potential. The Internet presents unprecedented opportunities to society and the marketplace. Yet, the impact of this phenomenon on the way Americans live, work, shop and recreate is still poorly understood. As we begin to grasp how the Internet will shape urban form and transportation systems, we all must prioritize the improvement of goods movement within future planning.
significant discounts for off-peak travel. The second increase, incentive for electronic toll payments (E-ZPass) and offered effect as of last September, the first increase created an January 2000 when it approved a two-tier toll increase. In drivers. The New Jersey Turnpike Authority set the trend in travel by charging peak-period drivers more than off-peaking or congestion pricing, applies market forces to rush hour New York region. Variable toll pricing, also known as value pric-cessful campaign to bring variable toll pricing to the New region. The Tri-State Transportation Campaign is celebrating its suc-Environmental justice (EJ) continues to frame the trans-ortation planning process in Gary, Indiana. Last September, U.S. DOT granted the Northwestern Indiana Regional Planning Commission (NIRPC) its MPO certification with continuing federal oversight despite EJ complaints raised by a local faith-based organization. Instead, the U.S. DOT awarded NIRPC an EJ Challenge Grant to help it respond to environmental justice concerns.NIRPC, the Indiana Department of Transportation, and the Northwest Indiana Environmental Justice Project at Indiana University Northwest are now initiating an environmental justice strategy to improve involvement by low-income and minority communities in the transportation planning process. This spring, transportation equity consultants will begin training planners to identify the communities most affected by negative aspects of transportation plans such as increased exposure to air pollution or inadequate transit access to jobs, using GIS tools. In January, NIRPC rec-ommended that a proposed commuter rail extension serving existing communities be prioritized over a proposed extension that would most likely have induced sprawl.Despite this progress, the Interfaith Federation which filed the EJ complaint believes transportation equity still has a long road ahead before NIRPC and Indiana DOT heed their call for transportation spending parity between highways, commuter rail, and buses—or a third of transportation funds for each mode. The coalition of Northwest Indiana congregations is now working with Lake County’s newly formed Regional Transportation Committee to determine the region’s transit needs. The group is also calling for better coordination between the three bus systems that serve the Gary, Hammond, and East Chicago municipalities in Lake County.

For more information on transportation planning in the Gary region visit http://www.nirpc.org. To reach the Interfaith Federation, contact Cindy Bush at 219.886.3647 or

set to take effect in January 2003, will make those incentives even more dramatic. Eventually, cash payers will pay 37 percent more than E-ZPass users and peak hour drivers will pay 13 percent more than off-peak driver. This March, the Port Authority of New York/New Jersey began charging higher tolls at rush hour at several of its bridge and tunnel crossings. While the plan approved by Governors Pataki and Whitman does not increase the tolls at the levels called for by local advocates, it continues to represents a significant commitment to pricing. Tolls for peak-period drivers will be $1.00 higher than for off-peak drivers. Tri-State estimates that the Port Authority and NJ Turnpike congestion pricing programs are among the largest road pricing schemes in the world in terms of cars affected.

Tri-State and the Connecticut Fund for the Environment also recently launched the Connecticut Transportation Choices Coalition. As a first step, the CT coalition published a “green paper” outlining a comprehensive trans-Portation reform program for state agencies, municipalitiecies and metropolitan planning organizations that builds on previous induced travel research. Recommendations include reorienting public investment and local planning to make transit work better for the public.

For more information, visit the Tri-State Transportation Campaign’s website at http://www.tstc.org.

Pennsylvania

Last June, Pennsylvania adopted its own “smart growth” legislation uniquely tailored to the traditions, law and politics of the state. Amendments to the Municipalities Planning Code (MPC), the statute giving Pennsylvania’s municipalities the authority to regulate land use, now enable counties and municipalities to enter cooperative agreements to plan together for both development and conservation of resources. The legislation corrects Pennsylvania’s prior land use laws that contributed to sprawl by requiring each of its 2,568 municipalities to plan and zone for all uses to accommodate projected growth. The rules essentially required communities to plan to become a small city if they chose to plan and zone (many did not). Moreover, the regional mechanisms for coordinating decisions among municipalities were cumbersome and little-used.

With the passage of Acts 67 and 68, counties and municipalities can now designate growth areas and rural resource areas, target infrastructure to growth areas, and provide for all uses over the region of the plan. State agencies are also authorized to prioritize state funds for multi-municipal planning areas. Municipalities participating in regional planning processes also retain control over local implementa-
tion—an issue in a state that adheres strictly to home rule.

The legislation provides a model for sound land use reform for states whose land use authority is delegated to diverse local governments and where land use laws are enabling and permissive, rather than mandatory. 10,000 Friends of Pennsylvania attributes the new smart growth act to the leadership of the bill’s sponsors, State Representative David Steil and Senator Jim Gerlach, solid bipartisan support, and a climate for change fostered by Governor Ridge’s 21st Century Environment Commission, which identified responsible land use as the most important issue for the next century.

State agencies and 10,000 Friends of Pennsylvania, the statewide group that led a multi-year land use campaign culminating in the bill’s passage, have initiated an education effort at the local level to explain the new laws and support implementation efforts. Multi-municipal planning efforts are now underway in over half of Pennsylvania’s 67 counties.

For more information, contact 10,000 Friends of Pennsylvania at 877.568.2225 or visit http://www.10000friends.org.

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**Washington**

In Washington, the Transportation Choices Coalition and other state grassroots groups have launched a “1/3 for Choices Campaign” to advocate that 1/3 of new transportation revenue be dedicated to transit, bicycling, walking, and other transportation choices. According to local advocates, the state legislative advocacy campaign is rooted in the controversial 1999 state ballot initiative that reduced funding for transit and supported by the environmental, business, and labor coalition that helped defeat another anti-transit measure last year.

The emerging coalition is now urging state policymakers to advance an overall transportation package with a budget that directs 1/3 of all new state transportation funds to transportation choices. Transportation Choices Coalition and the 1/3 for Choices Coalition have also recommended specific projects be included in the budget such as vanpools, cash incentives for trip reduction, and funding for smart growth programs. This February, the Transportation Choices Coalition, Bicycle Alliance of Washington, and People for Puget Sound met with all 45 members of the House and Transportation Committees and delivered one-third slices of pie to their offices to bring attention to the campaign.

This April, 50 state urban and suburban legislators formed the Washington State Legislature’s Mobility Caucus. Caucus members have submitted a letter to Governor Gary Locke recommending that 33.3 percent of the total of new transportation funds be directed bus, rail, and trip reduction. Governor Locke’s new budget proposal funds transportation choice programs at 18 percent of the total transportation budget—14 percent of which goes to HOV lanes and the remaining 4 percent for public transit and transportation demand management programs.

For more information about the campaign and other Wash-

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**Don Chen Leads Smart Growth Movement**

After six years of serving as STPP’s Research Director, Don Chen is now heading Smart Growth America. He is joined at SGA by Kate Bicknell formerly of Senator Monyihan’s Office and Elizabeth Humphrey formerly of the Maryland Department of Planning.

Don was instrumental in making STPP the leader in innovative transportation research, conducting our first analysis of induced travel, pedestrian safety, transportation equity, the true cost of automobile-dependency, and congestion. While at STPP he also co-authored the comprehensive sprawl primer, *Once There Were Greenfields*.

While we are sad to see Don go, we are delighted that he is leading the Smart Growth movement!

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**Wisconsin**

Alternative transportation activists are beginning to think that Wisconsin’s long transportation winter may finally thaw. Preliminary engineering is nearly complete for a high-speed rail project to connect Madison and Milwaukee. Given the leadership role played by Wisconsin’s former Gov. Tommy Thompson and current WisDOT Secretary Terry Mulcahy, Wisconsin could receive federal support to build high speed rail from a $12 billion bonding program that has a good chance of passing in Congress this year.

The state is also halfway through three alternatives analyses for rail transit: Madison/Dane County, the City of Milwaukee, and the corridor leading from Chicago into Milwaukee. In the Madison area, the state department of transportation is covering preliminary engineering costs and seeking funds to build rail transit as part of an agreement regarding the highly controversial widening of USH 12 north of Madison. In Milwaukee, funding for a downtown rail transit “circulator” in Milwaukee came from an agreement with the state regarding use of federal funds allocated in ISTEA. Advocates are hopeful that at least two of the three projects will move forward this year.

Meanwhile, Citizens for a Better Environment (CBE) is working with other environmental organizations as well as the four statewide organizations representing cities, municipalities, towns, and counties to support an alternative to a new, 20-year state highway plan. Active in three past state biennial budget sessions, the “Fair Share Coalition” is calling upon the legislature to establish a “multi-program” long range transportation investment plan to indicate how the state will fund local roads, bus and rail transit, and passenger rail, and not merely highways between now and 2020. Contact Rob Kennedy for more information: 608.251.9164 or robkennedy@igc.org.
The goal of Surface Transportation Policy Project is to ensure that transportation policy and investments help conserve energy, protect environmental and aesthetic quality, strengthen the economy, promote social equity, and make communities more livable. We emphasize the needs of people, rather than vehicles, in assuring access to jobs, services, and recreational opportunities.

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