The International Mobility Observatory

The International Mobility Observatory was established with a threefold purpose in mind: (1) to provide an overview of change and innovation in the field of surface transportation; (2) to identify and assess trends likely to affect the transportation sector in the years ahead; (3) to serve as a source of insights and stimulation to the Cooperative Mobility Program's research team. The Observatory represents, to our knowledge, the most comprehensive effort of its kind to document the state of innovation in surface transportation. Counting Supplement 5, the Observatory has identified over 320 different innovations since the projects inception in February 1995.

Innovations are being documented under ten topical headings:

- Policies Affecting Automobile Use
- Transportation Demand Management
- Intelligent Transportation Systems
- Innovations in Transit Service and Operations
- Advanced Transit Systems
- Innovative Financing of Transportation Infrastructure
- Land Use and Urban Design Strategies
- Novel Institutional Arrangements and Organizational Models
- Intermodal Issues
- Exemplary Metropolitan Mobility Systems

Introduction to Supplement No. 5

This is Supplement No. 5 to the International Mobility Observatory notebook. The update covers roughly 12 months from June 2000 to May 2001. Fact sheets marked "Rev." represent a revision or correction of a fact sheet already in the notebook, and should replace the older version. All other fact sheets describe innovations that have come to our attention since the last meeting of the MIT Cooperative Mobility Program Annual Meeting, in June 2000.

As in the past, the update is a product of a continuous scanning effort, invlving review of U.S. and foreign transportation journals and newsletters, internet searches, attendance at transportation conferences, and personal communications with professional colleagues.

To request the other sections or the complete International Mobility Observatory, email mobility@mit.edu or send a request to Observatory Request, MIT Cooperative Mobility Program, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Building E40-343, Cambridge, MA 02139.

Table of Contents

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **POLICIES AFFECTING AUTOMOBILE USE** NO. 1.1.11

CONCEPT: Limiting Car Access to City Centers

PROJECT NAME: Car-Free City

LOCATION: Bogota, Columbia

In a referendum held on October 29, 2000, City of Bogota (pop. 6.5 million) residents approved a measure banning the use of cars within the city beginning January 1, 2015. All cars, except taxis and emergency vehicles, will be prohibited from 6 to 9 am and from 4:30 to 7:30 pm on weekdays. The proposal received 51 percent of the vote, with 34 percent voting against it.

With 800,000 cars already in use, and another 40-60,000 autos expected to be added each year in the coming years, city officials fear that Bogota would experience monumental traffic jams. In preparation for the auto ban, the city will be building a 200-km bike path network and implementing a new high capacity busway system that will criss-cross the city.

Spearheading the movement to ban cars has been Bogota's mayor, Enrique Peñalosa who hailed the referendum as "an outstanding exercise in popular democracy, which gives the citizens of Bogota an opportunity to make their voices heard about the destiny of their own city."

Also approved in the same referendum was a measure establishing an annual Car Free Day, to be held the first Thursday of February of every year, beginning with 2001. The vote was 63 percent for and 26 percent against. The strong support for this measure was attributed to the successful Car Free day in February 2000. The city was awarded the Stockholm Challenge Prize for the environment for this unique citywide effort. Bogota already restricts car use in peak hours, taking 35 percent of cars out of circulation every day through a system based on the last digit of the car license plate. In addition, every Sunday the city closes 110 km of main arteries for seven hours to all traffic, mainly for the use of bicycles.

Source: http://www.alcaldiabogota.gov.co

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **POLICIES AFFECTING AUTOMOBILE USE** NO. 1.1.13

CONCEPT: Limiting car Access to City Centers

PROJECT NAME: Automated Access Control

LOCATION: Rome

The history of access control in Rome began in 1989 when restrictions were placed on vehicle entry into the historic city center (see, 1.1.9). These restrictions were not enforced in a systematic way until 1998 when police began to check the credentials of those authorized to enter the zone, such as residents and permit holders. The manual enforcement of these restrictions proved to be difficult and inefficient, and led to the installation of an automatic access control system. Permanently authorized vehicles (those of residents, delivery vehicles, emergency vehicles, taxis, etc) are recognized through wireless electronic onboard transponders. Visitors are issued temporary permits for a fee. A list of vehicles bearing temporary permits is compiled daily. Their license plates are checked at entry points by optical license plate recognition readers against the data base of authorized plate numbers for that day.

The enabling law allowing operation of automatic access control systems was passed by the national legislature in 1999. Implementation of the law was entrusted to the Ministry of Public Works, which alone can issue authorizations to municipalities to deploy access control systems that involve remote enforcement. The transition from manual to automatic access control involved a resolution of many regulatory and institutional issues. Among them were questions of protecting the privacy of motorists, the design and visual aspects of the access gates, the location of entry points, the legality and mechanics of remote enforcement, the treatment of disabled drivers, and procedures for issuance of entry permits. The transition process began in July 1999 and was completed in June 2000.

Rome's request was the first official application for a full-scale implementation and operation of an automated access control system in Italy. The lessons learned by Rome during the implementation process will help other Italian cities currently planning similar access control systems, such as Florence, Sienna, Milan, Perugia, Bologna and Turin.

Source: Traffic Technology International, Oct/Nov 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **POLICIES AFFECTING AUTOMOBILE USE** NO. 1.9.4

CONCEPT: Advanced Propulsion Technologies

PROJECT NAME: Zero Emission Vehicle

LOCATION: California, USA

Despite strong lobbying by vehicle manufacturers, the California Air Resources Board (ARB) refused to abandon its Zero Emission Vehicle (ZEV) requirement. At its September 7, 2000 meeting, the Board reaffirmed its intent to maintain the 10 percent ZEV requirement that will begin in 2003.

The original ZEV requirement, adopted in 1990, specified that beginning with model years 1998 through 2000, auto manufacturers had to include two percent of ZEVs among the vehicles they offered for sale each year in California. This quota was to rise to five percent in model years 2001 and 2002, and to ten percent in model years 2003 and beyond.

In 1996, the ARB modified the regulation after intense lobbying by the auto industry. The requirement for model years 1998 through 2002 was dropped and in its place the ARB substituted memoranda of agreement with the seven largest automakers to place 1,800 advanced battery-powered electric vehicles in circulation in the years 1998 through 2000. The ARB made further concessions in 1998, when it reduced the 2003 ZEV requirement from ten percent to four percent, allowing auto companies to meet the remaining six percent with very clean advanced technology vehicles – the so-called partial ZEVs or PZEVs. Several candidate technologies are vying for PZEV credit, notably the hybrid electric.

Meanwhile, auto manufacturers announced earlier this year that they would stop production and distribution of electric vehicles in California, claiming that the lack of public acceptance of battery-powered vehicles, their high cost (upwards of $20,000), and the fact that they can go only 70 miles per charge and require 3-4 hours for a recharge, would doom the program to failure. Only 3,300 electric cars have been sold in the U.S. between 1996 and 1999.

California's ZEV program is more than just an attempt to force the auto industry to progressively tighten existing technology standards, as was the case with catalytic converters. The ZEV mandate will require a huge technological leap with unpredictable costs and uncertain market response. The California Air Resources Board seems to be aware of the challenge facing the auto industry, as demonstrated by its repeated willingness to stretch the regulatory timetable.

Source: Innovation Briefs, Nov/Dec 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **TRANSPORTATION DEMAND MANAGEMENT** NO. 2.1.11

CONCEPT: Congestion Pricing

PROJECT NAME: London Congestion Charges

LOCATION: London

London has longed toyed with the idea of charging directly for the use of congested roads in its central and inner areas. Back in 1964, the Smeed Committee reported on the "Economic and Technical Possibilities of Road Pricing," and concluded that it was within technical reach. No action was taken on the findings of this study but ten years later, in 1974, the Greater London Council initiated public consultation on a Supplementary Licensing Scheme for central/inner London. This scheme was not implemented because of concerns about administrative complexity and problems of enforcement.

Five years later a simplified scheme was devised which applied only to passenger cars and was aimed principally at keeping out through traffic. However, again concerns about enforcement and the adequacy of the peripheral routes prevented the proposal from being implemented. In 2000 London elected a Mayor whose platform included the introduction of congestion charging in the Capital. After a thorough study, the Government authorized congestion charges in the legislation setting up the Great London Authority. This scheme is now being prepared for implementation by the end of 2002. *(Road Charging Options for London – A Technical Note, The Stationery Office, London, 2000; The Mayor's Transport Strategy Draft for Public Consultation, Greater London Authority, London, 2001).*

The scheme will cover a ten square mile Central Business District and charges will be levied between 7.00am and 7.00pm on weekdays. The daily charge will be £5 and will apply to both cars and commercial vehicles. Public transport, public service vehicles, motorcycles, disabled persons' vehicles and electric cars will not be charged. Enforcement will be through automatic license plate checking against a list of vehicle numbers with a valid warrant (automatically entered into the computer database on payment of the charge). The scheme is predicted to reduce traffic in central London by 10% to 15%. The scheme is expected to generate net revenue of £190 million a year, which must, by law, be spent on improving transport in London.

The outcome of the London congestion charging scheme is uncertain at this time. Prime Minister Tony Blair has joined forces with the Conservatives to declare his opposition to the scheme. Together, they pledged to block the proposal in London's governing body, the Greater London Assembly.

Source: Innovation Briefs, Sep/Oct 2000; Traffic Technology International, Oct/Nov 2000, Dec 2000/Jan 2001; for background, see 2.1.3, 2.1.8

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **TRANSPORTATION DEMAND MANAGEMENT** NO. 2.1.12

CONCEPT: Congestion Pricing

PROJECT NAME: EURoPrice

LOCATION: Bristol, Belfast, Copenhagen, Genoa, Edinburgh, Leicester, Rome, Trondheim

In order to advance road pricing initiatives in Europe, the European Commission and the City of Bristol, U.K. have organized a group of eight cities to form a European Urban Road Pricing Network (EURoPrice). The objectives are to develop a common position on road pricing, take a coordinated approach to road pricing experimentation, and disseminate experience gained in pilot experiments to other cities in order to gain public acceptance.

The consortium has designed a "development path" to classify the implementation stage of each of its member cities. Only Trondheim, has reached Phase 4, a fully operational pricing scheme (see 2.1.4). Rome is in Phase 3, a pilot access control system , in operation since Spring 2000 and currently being converted to a fully electronic system (see 1.1.9). The remaining six other cities are in Phase 2, involving design, analysis and public consultations.

Source: www.europrice-network.org; EUROPRICE newsletter; private correspondence

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **TRANSPORTATION DEMAND MANAGEMENT** NO. 2.1.13

CONCEPT: Congestion Pricing

PROJECT NAME: *Spitstarief* (Rush hour fee)

LOCATION: Randstad, the Netherlands

Spitstarief, formerly known as *Rekeningrijden*, is a proposed road pricing scheme for the Randstad region of the Netherlands (comprising Amsterdam, Rotterdam, The Hague and Utrecht). It is part of a comprehensive mobility strategy (*Bereikbaarheids Offensief Randstad*) designed to keep the Randstad region moving. In addition to road pricing, the strategy involves construction of new toll roads and express toll lanes, and better utilization of existing infrastructure using ITS technology.

The road pricing scheme will involve electronic fee collection (EFC). Payments from motorists will be collected in two ways: through a smart debit card or using optical license plate recognition technology to bill by mail. Eight cordon points have been agreed upon in consultation with local authorities: two intercepting traffic toward Amsterdam, three towards The Hague and three towards Rotterdam. Testing of several competing EFC technologies was performed in 1998-2000 (see, 2.1.10) and the contract award went to *Q-free VOF*, a consortium of a Dutch, Norwegian and Portuguese firm.

The scheme cannot proceed until legislative approval has been obtained. A bill authorizing the road pricing scheme has been introduced in the Dutch Parliament and is expected to be considered by July 2001. The bill authorizes a two-year test period. Based on an evaluation of the test results, the Parliament will decide whether to make the scheme permanent (and possibly increase its scope) or terminate it.

Source: www.bereikbaarheaidsoffensief.nl; Traffic Technology Int. Feb/March 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **TRANSPORTATION DEMAND MANAGEMENT** NO. 2.2.4

CONCEPT: Variable Tolls

PROJECT NAME: Distance-Based Truck Fees

LOCATION: Switzerland

As of January 1, 2001, all domestic trucks and all foreign trucks transiting through Switzerland are assessed a weight-and-distance-based fee. The purpose of the fee is threefold: to compensate for the higher road maintenance costs due to a higher weight limit (40 tons) that Switzerland was obliged to adopt in order to harmonize it with the weight limit of her EU neighbors, France, Italy, Germany and Austria; to raise revenue to help finance the new transalpine rail tunnels that will provide a long-term solution to the north-south freight capacity crunch; and to restore a better modal balance between transport by rail and transport by truck.

The fee is levied for the use of all public roads, hence there is no incentive to use back roads in order to avoid the fee. The distance traveled on Swiss roads is determined from a sealed onboard tachymeter, which is required equipment on all Swiss trucks. Domestic trucks are required to periodically download the mileage reading logged in the unit and report it electronically to the Swiss Customs Authority, which is charged with administering the scheme. Vehicle owners are billed periodically by mail.

Foreign trucks not equipped with the tachymeter unit are issued vehicle identification cards. Using a self-service card reader, the truck driver records the mileage and is issued a ticket upon entry into Switzerland. He surrenders the ticket to the customs authority upon leaving the country, after filling in the exit mileage reading. The owner of the foreign truck receives a billing in the mail just like domestic owners.

For a 34-ton truck, the fee is approximately 0.30 to 0.45 cents per kilometer. The fee is expected to bring the Swiss treasury over 500 million dollars per year.

Source: TOLLtrans, Aug/Sep 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **POLICIES AFFECTING AUTOMOBILE USE** NO. 2.10.3

CONCEPT: Parking Automation (Update)

PROJECT NAME:

LOCATION: Hoboken, NJ, USA

A first-of-its kind, fully automated parking facility has opened in Hoboken, New Jersey. The facility operates using a computerized network of rails and pallets that handles cars with no human intervention. Developed by Robotic Parking, Inc. the system optimizes space utilization by doubling the number of parking spaces of a typical parking garage, or utilizing half the space of a conventional garage to accommodate the same number of cars.

To park a car, the driver pulls into one of four bays, locks the car and inserts a card into a computer. The car is lifted on a pallet and moved to an available slot. To retrieve the car, the driver again inserts the card in the computer and punches a secret code. The car is delivered in a bay with its front facing the street for easy exit. The process takes one to two minutes. The car is never driven once inside the facility and the driver never sets foot inside the garage or in a driveway, thus reducing the risk of personal injury. Multiple cars can be handled simultaneously. The computer allows the site to be monitored from a remote location, showing real-time vehicle movements for rapid detection of any mechanical problems. The garage is equipped with sensors, and if any unusual motion is detected (e.g., a child or a dog forgotten in the back seat), the parking system will not operate.

Because of the scarcity of space in cities, automated garages are viewed as price-competitive despite their higher initial cost. Automated garages are contemplated in Chicago, Portland, OR, Washington DC and New York City.

Source: ITS International, March/April 2000; Company literature

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **TRANSPORTATION DEMAND MANAGEMENT** NO. 2.11.2

CONCEPT: Miscellaneous TDM Measures

PROJECT NAME: “Smart-Bike” Programs

LOCATION: Rennes, France and Annapolis, MD, USA

A smart-bike program, modeled after a program pioneered in the French city of Rennes, has been introduced in Annapolis, MD in June 2000. The program is designed to provide bikes as an alternative to cars in the historic city district, which is characterized by narrow streets and a scarcity of parking spaces. The bikes, which are available to visitors and residents alike, can be “borrowed” for local trips within the specified service area. The bikes are stored at several strategically placed locations within the city and can be unlocked and operated only when a smart card is inserted. Bikes must be picked up and left off at authorized depots. Volunteers near each bike depot register users and dispense the smart cards. To prevent pilferage, the bikes are painted bright yellow, so that they can be easily recognized as belonging to the municipally-run “smart-bike” program.

The aim of the program is to demonstrate to residents and visitors that bicycles can be a convenient means of local circulation. The use of bicycles for local transportation is already widespread in the cities of Holland, Denmark, and Japan. City of Annapolis officials hope that the “bicycle habit” can be transplanted to their city.

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **TRANSPORTATION DEMAND MANAGEMENT** NO. 2.12.1Rev

CONCEPT: Incentives to Reduce Driving

PROJECT NAME: Pay-As-You-Go Auto Insurance

LOCATION: Houston

Progressive Auto Insurance Co, one of the largest auto insurers in the United States, has begun a limited marketing test in Houston of a new approach to auto insurance pricing that bases insurance premiums on actual vehicle usage. Although some insurance companies have been using vehicle mileage in their calculation of insurance rates, this is the first time that the rates will be based on actual data as to when and how much a vehicle is driven. Progressive's product, called Autograph, is a device the size of a videocasette, that records vehicle mileage and reports it automatically to the insurer using wireless data transmission technology. Autograph works like an electric meter, with the consumer paying by the month, based on actual usage rather than on a user's estimate or on historical data derived from users with similar characteristics.

Progressive has launched a 3-year test program in January 2001. During the test period, the company will record travel behavior of a test sample of 1200 volunteer drivers to determine whether pay-as-you-go insurance influences the amount of driving they do or the time of day they drive. The vehicles are equipped with GPS receivers and a wireless communications link back to a database at Progressive's headquarters in Houston.

This is the first instance of a "distance-based fee" that certain economists and environmentalists have been advocating as an incentive to reduce driving. Skeptics point out, however, that driving is singularly price-insensitive, and that small savings in insurance premium would have negligible effect on total VMTs.

Source: Progressive Auto Insurance Co press release, October 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.1.19

CONCEPT: Systemwide ITS Deployment

PROJECT NAME: Universal Traffic Management System (UTMS 21)

LOCATION: Japan

UTMS 21 is a "next generation" integrated traffic management system currently being developed in Japan under the sponsorship of the National Police Agency, the public agency responsible for traffic management at the national level. UTMS 21 comprises ten subsystems :

- **ITCS – Traffic Control Center**, which is at the heart of UTMS 21, controls traffic based on information received from traffic detectors and vehicle probes;
- **AMIS – Advanced Mobile Information System**, provides motorists with real-time information on congestion, incidents, parking availability and travel time . The information is depicted on graphic map displays;
- **DRGS – Dynamic Route Guidance System,** recommends to drivers the shortest route to their destination, based on traffic conditions;
- **IIIS – Intelligent Integrated ITV System,** controls traffic signals and prevents illegal parking through closed circuit video cameras; provides traffic information to drivers through infrared beacons;
- **DSSS – Driving Safety Support System,** reduces the risk of accidents and pedestrian casualties by providing motorists with visual alerts of stop signs, pedestrian crossings, etc;
- **PTPS – Public Transportation Priority System,** improves bus performance by giving preferential treatment to public transportation vehicles through priority signal control and dedicated bus lanes;
- **MOCS – Mobile Operation Control System,** enhances fleet management by tracking buses, taxis and trucks and providing information about their location in real time to transport operation managers and vehicle dispatch centers;
- **HELP – Help for Emergency Life Saving and Public Safety,** notifies public safety centers of accidents and other emergency situations, and facilitates medical emergency response;
- **FAST – Fast Emergency Vehicle Preemption System,** reduces accident-caused traffic tie-ups by reducing response time and facilitating accident clearance;
- **PICS – Pedestrian Information and Communication System,** supports pedestrian safety by providing visual and audible signals and lengthening "walk" signals to accommodate elderly, wheelchair-confined and visually impaired persons.

Source: UTM Society of Japan, Tokyo

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.1.20

CONCEPT: Systemwide ITS Deployment

PROJECT NAME: Traffic Control Centre (TCC)

LOCATION: United Kingdom

A privately operated Traffic Control Centre (TCC) is expected to bring a whole new dimension to traffic control on England's main arterial roads. Intended to provide a strategic approach to managing the national road network, the TCC was created by the UK Government's 1998 decision to maximize the use of existing road infrastructure rather than expand network capacity. Turning the responsibility for operation of the TCC over to the private sector represents a major policy change for the UK where, traditionally, traffic management has been seen as a public sector responsibility.

A key function of the TCC will be to provide real-time traffic data content to private information providers ("Value-Added Service Providers") who, in turn, will distribute customized traveler information to individual subscribers and commercial fleet operators through various communication media such as GSM (Global System for Mobile communications), DAB (Digital Audio Broadcast) and WAP (Wireless Application Protocol.)

The TCC will use a variety of data collection mechanisms, including a nationwide network of sensors, local police and emergency services, public transport agencies and local traffic authorities. How to effectively fuse information from these different sources over the entire national motorway and trunk road (arterial) network has been the subject of an ongoing demonstration project, *The Travel Information Highway*. TCC will sell the processed data at cost, i.e. simply to recover the expense of data collection and fusion. All private providers will have equal access to the data and the price charged will be the same to whoever wants to buy it.

The TCC is expected to become operational over the next two years.

Source: Traffic Technology International, Dec 2000/Jan 2001; www.tih.org.uk

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.1.21

CONCEPT: Systemwide ITS Deployment

PROJECT NAME: i-transport

LOCATION: Singapore

Singapore is well known for its transportation firsts. These include the world's first congestion pricing Area Licensing Scheme and its 1998 conversion to the world's first Electronic Road Pricing (ERP) scheme. Singapore's attention has now shifted to what may become another first: an Integrated Transport Management System (i-transport) that makes full use of ITS technologies throughout its rapid transit system and extensive bus system. Singapore's transport system carries over 80 percent of all trips, of which 60 percent are bus, 20 percent rapid transit and 20 percent taxis.

ITMS, which is expected to be fully deployed by 2002, consist of four subsystems:

- *Traffic.Smart* – a traffic information system that collects data from various traffic monitoring and incident management subsystems (cameras, vehicle probes, dynamic traffic signal control); proceses the data, and disseminates it to the public via the internet. Almost 50 percent of Singapore's taxi fleet (7,500 vehicles) are used as probe vehicles to monitor traffic conditions. Their GPS receivers are polled every five minutes to provide real-time data on travel speeds throughout the city.
- *Transit.Smart* – This system facilitates the timely dissemination of information on bus and train services. It integrates data from several subsystems (bus, rail. Electronic Travel Guide). Key bus stops will be equipped with variable message signs giving real-time bus arrival information. The location of buses will be tracked using a GPS system. Singapore's 3,800-bus fleet will be polled regularly using a dedicated radio communication link.
- *Route.Smart* – This system involves integrating real-time traffic and public transport information to provide a city-wide multimodal route advisory service. The system will be sensitive to real-time traffic and public transport service conditions. Travelers will be able to input travel criteria (shortest route, quickest route, cheapest fare, etc). The information will be available through personal computers and a range of personal wireless devices, including Wires Application Protocol (WAP) enabled phones, personal digital assistants (PADs) and multimedia kiosks.
- *EnhancedIntegrated Fare System (EIFS)* – a smart card ticketing system for public transport includes 22,000 readers, 3,800 onboard readers and 5 million smart cards (more than one per capita)

Source: Traffic Technology International, Dec 2000/Jan 2001; www.gov.sg/mcit/pr/ict.html

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.1.22

CONCEPT: Systemwide ITS Deployment (Update)

PROJECT NAME:

LOCATION: Japan

Japan continues to lead the rest of the world in ITS deployment. An extensive network of highway sensors covers most of the Tokyo area and will soon extend to most other cities and expressways. The Tokyo Control Center (TCC) gathers data from 16,000 overhead sensors that measure vehicle speeds. The TCC also controls 300 close circuit television monitors.

Two traveler information providers, ATIS and VICS, provide drivers with real-time trip time estimates and dynamic route guidance. VICS covers the whole of Japan while ATIS covers the central Tokyo region. During the last decade a national digital map has been developed and in-vehicle navigation screen displays are now common. By the end of 2000 more than 2 million VICS systems and 800,000 ATIS systems had been sold. Some of the VICS and ATIS in-vehicle systems are used as mobile probes to monitor traffic flow. Data from electronic toll collection (ETC) facilities, now deployed throughout the national expressway system, is used as another source of traffic information.

Many Japanese expressways have ben instrumented with surface temperature transducers to provide warnings about ice formation and standing water. These warnings are passed on to drivers through variable message signs. Ultimately, hazard warnings will be communicated to motorists in their vehicles through visual displays.

Source: Traffic Technology International, April/May 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.3.16

CONCEPT: Traveler Information Systems

PROJECT NAME: *Visionaute*

LOCATION: France

Available since 1997 in the Paris Region (see 3.3.12), the *Visionaute* traveler information service has extended its coverage to all of France. The traveler information is broadcast in the European RDS/TMC standardized format. It covers the 20,000-km French intercity road network as well as the urban road network of the Paris Region.

Starting in January 2001, the coverage has been progressively extended to all other major cities. In addition to providing real-time information on traffic conditions, *Visionaute* offers road weather reports and information on parking lot availability in urban areas. The new Renault *Laguna* has been the first car to have an OEM-installed *Visionaute* receiver. Eventually, all Renault cars will be equipped with a *Visionaute* receiver, which includes a location-based traffic information display.

Visionaute is a partner in an "International Traffic Data Alliance" which also includes Germany's *Tegaron* and U.K.'s *Cue Ltd.* The Alliance provides a transnational network that offers motorists a traveler information service throughout France, Germany, United Kingdom and, eventually, the rest of Europe.

Source: Traffic Technology International, March/April 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.3.17

CONCEPT: Wireless Geolocation

PROJECT NAME:

LOCATION:

While traditional traffic reports delivered over the airwaves are likely to retain a commanding role in the near term, the longer-range future belongs to more advanced traveler information systems. Significant advances in the technology of data collection promise to make future traffic reporting more accurate and richer in content. Using GPS-enabled triangulation or a technique called "location pattern matching," vehicles equipped with mobile phones can now be located and tracked, and traffic speeds accurately estimated. This capability makes it possible to monitor traffic conditions even on highways that are not equipped with road sensors or video cameras. What is more, traffic coverage will no longer be dependent on how fast (or slowly) traffic detection infrastructure is installed by the public sector. Currently, only 7 to 12 percent of U.S. urban freeway miles are instrumented with vehicle detection devices, and this coverage is expected to increase to no more than 15-20 percent by 2020, according to the U.S. Department of Transportation.

The leading firm in the still evolving field of wireless geolocation information is US Wireless. Using a proprietary "Radio Camera" system, the company is deploying location detection networks in several cities. The Radio Camera identifies a "signature" based on the radio frequency (RF) pattern of an operating cellular telephone or other wireless device. It then compares the RF pattern signature with a database of previously identified RF signatures and their corresponding geographic locations. By matching the signature pattern of the caller's signal with the database of known signature patterns, the caller's geographic location can be precisely determined. This makes it possible to determine real-time traffic speeds and estimate travel times between various points on the road network. By the end of 2001, US Wireless hopes to have location information networks in place in the Washington DC/Baltimore region, Seattle, and Hampton Roads. Eventually, the company intends to extend its wireless geolocation network to other cities and to offer accurate and meaningful depiction of traffic conditions to traffic control centers, incident management teams, emergency services, fleet management operators and telematics service providers.

Source: Innovation Briefs, Jan/Feb 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.8.12

CONCEPT: Telematics

PROJECT NAME: Telematics Services

LOCATION: United States

Motorists in the United States can now access four different telematics services, each with its own response center, depending on the make of car they are driving. *OnStar* the most widely used service thus far, is available as standard or optional to owners of 32 GM models including Saab. As of April 2001 *OnStar* signed up over one million subscribers. In addition, *OnStar* has struck agreements with several other automakers. *OnStar* services are now also available to owners of Lexus (*Lexus Link*), Audi, Toyota, Honda (Acura), and Subaru. *OnStar* core services include automatic notification of air-bag deployment, stolen vehicle tracking, emergency services, roadside assistance with location, remote door unlock, remote diagnostics, route support and concierge and convenience services such as hotel reservations. In addition, *OnStar Personal Calling* allows drivers to make and receive hands-free voice activated calls. Another new service is *Virtual Advisor,* which allows subscribers to access personalized web-based information and real-time traffic information.

Ford Motor Co. has announced the creation of its own telematics service, named *Wingcast. Wingcast* will be offered in more than one million Ford cars in model year 2002 and in three million vehicles in the following year, according to a company announcement. By 2004, nearly every Ford car could be equipped with a Wingcast system. In addition, Nissan Motor Co. reportedly plans to integrate Wingcast services into its *Infiniti* luxury models. Wingcast is expected to offer several different subscription plans. The basic plan will focus on emergency services; higher-priced options will offer Internet access, voice-activated e-mail and real-time traffic information.

Mercedes-Benz' *Tele-Aid* and Jaguar's *Assist* are served by ATX Technology, an independent "private label" telematics service provider whose clients also include Lincoln-Mercury, and the Infiniti Division of Nissan Motor. ATX Technologies forecasts 200,000 customers for its telematics services by the end of the year. Like *OnStar* and *Wingcast*, ATX service includes a response center staffed seven days a week, 24 hours a day.

The fourth entrant into the field of telematics service provision is the American Automobile Association (AAA) whose *AAA Response Services Center* has been set up to deliver wireless mobile emergency assistance and travel information to its 43 million members nationwide.

Source: Traffic Technology International, Oct/Nov 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS (ITS)** NO. 3.8.13

CONCEPT: Telematics

PROJECT NAME: Satellite Radio (Update)

LOCATION: United States

A new communications technology is making a serious bid for the attention of the motoring public. XM Satellite Radio and Sirius Satellite Radio, are developing satellite-based digital mobile radio systems, a technology that promises to do for the car radio what cable television did for home TV (see 3.8.9). Satellite radio will have up to 100 channels of commercial-free music, news, sports and entertainment and will be made available by subscription. In contrast to the regional reach of traditional AM and FM radio stations, satellite radio will provide nationwide coverage, a great convenience to long distance travelers who will be able to listen to their favorite channel without searching the dial as they travel through unfamiliar parts of the country.

XM Satellite, which has entered into an arrangement with General Motors and Honda, expects to begin broadcasting nationally in the late summer of 2001 and charge $9.95 a month for its service. Sirius has negotiated agreements with Ford Motor Co., DaimlerChrysler, BMW, Jaguar, Mazda and Volvo. The company, which has experienced some production delays, hopes to launch its service in 2002 and charge $12.95 a month.

In contrast to other high-tech communications services, entertainment is something consumers have demonstrated a willingness to pay for. With an estimated 28 million car radios sold each year, including 16 million on new cars and trucks alone, the two companies expect one million subscribers by the end of 2002 and over 5 million by 2004. Vehicle-based satellite radio receivers will be available as a factory-installed option for about $250 as early as certain 2001 GM models. They will also be available as a dealer-installed option on certain DaimlerChrysler and BMW models. Major automakers have an interest in seeing satellite radio take off since the car companies have invested in the satellite radio companies.

Source: company press announcements

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.8.14

CONCEPT: Telematics

PROJECT NAME: ComCARE

LOCATION: United States

The ComCARE Alliance is a broad-based national coalition of more than 50 organizations that includes emergency medical personnel, wireless companies, automobile companies, telematics service providers, public safety officials and others who are working to deploy wireless communications networks and technologies to connect motorists to emergency services. The ComCARE technologies include:

- **Automatic Crash Notification (ACN)** – systems that automatically alert private telematic response centers following a vehicle crash or automatic air bag deployment, indicating precise location of the scene of accident; and
- **National Mayday Readiness** – wireless data transmission networks that can send vital signs of crash victims and crash data directly from the scene of accident to public emergency response centers. Automobiles are capable of producing increasingly sophisticated crash data from which emergency medical experts can predict the probability of crash injuries. This data can reduce response times, help determine the severity of crash injuries, facilitate treatment at the scene of accident, and allow hospital emergency rooms to anticipate the critical care needs of incoming crash victims.

ComCARE seeks to establish efficient, fast and accurate communication in emergency situations between private telematics call centers (such as OnStar, ATX Technologiers, AAAResponse and Wingcast – see, 3.8.13)) which initially receive calls and data from the “mayday” devices, and the 6,000 “Public Safety Answering Points” (PSAP) which have been designated as the nation’s public emergency response agencies. A national data base of the PSAPs, 9-1-1 centers, trauma centers and other members of the emergency response community, compiled by ComCARE, will be made available to the private telematics response centers.

Source: ComCARE Alliance releases; www.comcare.org

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 3.8.15

CONCEPT: Location-Based Services

PROJECT NAME:

LOCATION:

Location-based (also called "location-aware") services is a generic term that refers to personalized services that are tailored to the user's geographic location. Location-based technology identifies a caller's location by triangulating the position of the caller's wireless device or by using global positioning systems (GPS). The service rendered may consist of calling roadside assistance to a stranded motorist, orienting the caller geographically, informing the caller of transportation options available at his location, providing travel directions, or offering phone-directory-type information on the location of nearby retail outlets, restaurants, hotels, service stations and other types of services. The advertising industry is eying location-based technology as a vehicle for targeting potential customers who find themselves in the vicinity of the advertiser, e.g. motels and service stations calling attention to themselves on the motorist's wireless device.

While emergency roadside assistance and location-based traffic alerts are probably the best known location-based services today, analysts predict that location-based services will become increasingly popular with other segments of the public as people get used to retrieving information "on the go." For example, one telematics service provider reports that his subscribers primarily use his service to save time finding residential, commercial and business addresses – and not just when they are in an unfamiliar place, but also in their home area.

Source: Allied Business Intelligence, "Location-Based Services"

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.1.9

CONCEPT: Dynamic Scheduling and Routing

PROJECT NAME: *FlexRoute*

LOCATION: Göteborg, Sweden

To meet the mobility needs of its elderly residents who do not qualify for the very expensive shared-ride taxi Special Transport Services (STS) for handicapped persons, but who still have difficulty using regular public transport, the city has introduced a new innovative flexible transport service called *FlexRoute.*

FlexRoute is an intermediate form of demand-responsive service using 12-14 passenger minibuses fully accessible, with low floors. The minibuses operate between two fixed end-points with scheduled departures every 30 minutes. However, the routing between the end-points is fully flexible, and is determined by requests from the passengers.

Supporting *FlexRoute* is an advanced communications system that enables: (1) Automated trip notification (call-back) with an advanced warning 15 minutes before pick-up time; (2) Automated trip booking using touch-tone phone and Interactive Voice Response technology; and (3) Automated trip booking for the return trip home at four major destinations. Users need only to sweep their STS or Flexcards in the reader and press a button to book the return trip home.

After an initial test in October 1996, *FlexRoute* became a regular service in the Högsbo district, where a third of the population is elderly. The service now includes some 70 meeting points and is provided weekdays, 9 am to 5 pm. The fare is the same as on regular public transit.

After three years of operation, user acceptance of *FlexRoute* is remarkably high. The average age of the users is 77 years old. Ridership is still increasing, now approaching 5,000 passengers/month or about seven passengers/vehicle-hour. Following the positive results, the city has decided to expand the service to a major part of the urban area, with 10 additional routes and a total of 30-40 minibuses. Several other cities in Sweden have introduced, or have plans for, similar services.

Source: Stephen Wallman, Volvo; www.europrojects.ie/samplusmainweb

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.1.10

CONCEPT: Dynamic Scheduling and Routing

PROJECT NAME: "PersonalBus"

LOCATION: Florence, Italy

"PersonalBus" is a demand responsive system for disabled persons in Florence, Italy. The system provides two kinds of service: many origins-to-many destinations and single-origin-to-many destinations. In the many-to-many service, customers can access the service by calling a toll-free number. As calls for service are received, special booking/trip planning software determines which vehicle should answer the call, depending on the real-time location of all fleet vehicles throughout the service territory. Users are notified immediately about the wait time required until pick up. In the one-to-many service, from downtown Florence, users can specify the desired departure time and destination. The computer software consolidates the trip requests by destination. The routes are modified according to customer requests. Pick up and delivery points are located at all regular bus stops plus points in between for easy access by the users.

Source: www.europrojects.ie/samplusmainweb/italy

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.1.11

CONCEPT: Dynamic Scheduling and Routing

PROJECT NAME: The SAMPLUS Consortium

LOCATION: Belgium, Finland, Italy, Sweden

SAMPLUS was a collaborative European research program sponsored by the Transport Directorate of the European Union, to demonstrate the application of advanced communication and information technologies in Demand Responsive Transport systems in urban and rural areas. The project began in March 1998 and was completed in November 1999.

A total of nine demonstration projects and feasibility studies were conducted in six EU countries. The unifying theme was the use of GPS and intelligent transportation technologies in vehicle dispatching, fare collection (smart cards), automated booking of trips, fleet location monitoring and information management. Two of the projects, in Göteborg (4.1.9) and Florence (4.1.10), were demonstrations of demand responsive services in urban areas. Three other projects (Marsta, Sweden, Haselt, Belgium and Keski-Uusimaa in Finland) demonstrated demand-responsive services in rural areas. The remaining four projects were feasibility studies.

Source: www.europrojects.ie/samplusmainweb

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.2.9

CONCEPT: Passenger Information Systems

PROJECT NAME: NextBus (update)

LOCATION: San Francisco

NextBus uses Global Positioning System (GPS) technology and advanced computer modeling to track buses and streetcars on their routes. Taking into account the actual position of the transit vehicles, their intended stops, and the typical traffic patterns, *NextBus* estimates bus arrivals with a high degree of accuracy. These estimates are updated constantly as the vehicles are tracked and traffic conditions change. Information from a GPS receiver aboard each bus is relayed to a central server. Using predictive software that takes account of actual traffic conditions, *NextBus* predicts the actual vehicle arrival time.

Initially, arrival time data was displayed at individual bus stops and was available via the Internet (see, 4.2.9). Since September 2000, this data can also be accessed remotely through a variety of wireless devices such as wireless phones with text messaging capability and other devices that support the Wireless Application Protocol (WAP). For example a user attending a meeting can consult his Palm device and estimate with a high degree of accuracy how late he can stay at the meeting and still catch the next commuter bus home. Similarly, a suburban commuter driving to a park-and-ride lot to meet the bus that will take him to the city, can consult his wireless car phone, and know exactly how much time he has to catch the bus.

Source: www.nextbus.com

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.3.5

CONCEPT: Bus Fleet Management

PROJECT NAME: Intelligent Multimode Transit System (IMTS)

LOCATION: Japan

Bus platooning is an operating concept, first implemented in Santiago, Chile and Sâo Paolo, Brazil, that has several buses travel in a convoy much like the cars of a train. This technique increases the speed, efficiency and capacity of bus operation, especially in bus corridors that are equipped with bus priority traffic signals that speed the convoys through intersections. The system allows for flexibility, with the number of buses in a platoon adjusted according to fluctuations in demand during the day.

Toyota Motor Corp. has taken the concept of "bus platooning" one step further, by introducing automation into bus platoon operation. Up to 10 buses travel in driverless convoys on dedicated roadways equipped with magnetic guide markers at a fixed distance from each other. Each bus comes equipped with radar, sensors and communication equipment to maintain proper vehicle separation. The driverless buses start and stop in perfect unison.

Automated bus platooning has been demonstrated to be safe and technically feasible at Toyota Corporations's technical center in Susono, Shizuoka Prefecture. The technology is planned to be deployed at the World Exposition in Aichi, Japan in 2005. If proved successful in that venue, it may be implemented in other Japanese cities by the end of the decade.

Source: www.peak.org

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.3.6

CONCEPT: Bus Fleet Management

PROJECT NAME: Bus Improvement Program

LOCATION: Stuttgart, Germany

Stuttgart's effort to improve the performance of its bus service has gained international recognition. The modernization effort was undertaken in response to signs of lagging performance and falling ridership – the consequence of rising traffic congestion and a diversion of resources to expanding the light rail network during the early 1990s.

The bus modernization effort has several interrelated and coordinated components:

- **Vehicles**. All buses are being converted to a low-floor design, which speeds up and facilitates boarding and alighting.
- **Dedicated lanes**. Exclusive bus lanes have been created where possible in order to speed up bus operation in heavily used corridors
- **Bus priority signals**. Since exclusive bus lanes could not be created in heavily congested inner city areas, radio beacons are employed to detect an approaching bus and turn the signal green. So far, 26 percent of all traffic lights have been upgraded to give buses priority over general traffic.
- **Dynamic passenger information system**. Infrared beacons and a Global Positioning System monitor the position of all buses. Data processors calculate the time of arrival of each bus at the next stop, taking into account traffic conditions. The arrival time is then displayed to the waiting passengers at bus stops. "Next stop" announcements are displayed inside the buses.

The bus modernization effort has produced results. Travel speeds have increased from 9 to 10 miles per hour, on-time arrival and schedule adherence have been improved, and passengers experience more comfort and convenience. The bottom line: the bus system has attracted close to 10 percent more passengers.

Source: Manfred Bonz, Chief Executive, SBB, quoted in Passenger Transport, Sept. 11, 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.4.3

CONCEPT: Track Sharing

PROJECT NAME: Tram-Train

LOCATION: Various locations in Europe

Tram-Train is the name given in France to the seamless extension of urban streetcar service into outer suburbs and beyond, by physically interconnecting streetcar networks with existing mainline rail tracks and running dual voltage light rail vehicles on the combined rail network. The service concept extends the outreach of municipal rail systems, eliminates the need for intermodal transfers and cuts commuting time significantly since the streetcars can travel all the way downtown directly from outlying suburbs. Pioneered by the City of Karlsruhe, where the network now penetrates 126 km into the surrounding region (see 4.4.1 Rev.) the practice has spread to a number of other cities in Germany and other European countries (4.4.2). The latest entrants are a number of French cities, where the concept is known as *tram-train*. They include (in the order of likely deployment) Aulnay-Bondy in Ile de France, Mulhouse, Strasbourg, Grenoble, Lyons, and Nantes.

The emergence of networks interconnecting urban tramways and intercity rail is viewed by French municipal authorities as one of the most promising urban transport innovations in recent decades. The tram-train concept enables medium size cities that already possess light rail or tram networks to extend the outreach of their municipal rail transit service into the outer suburbs at only a fraction of the cost of building new track infrastructure. The tram-train concept has also caught the imagination of the French national railways (SNCF), which sees the concept as an opening into the profitable urban travel market. Most French metropolitan areas have well developed rail networks radiating outwards from the center, many of which are underutilized. According to French demographic studies *péri-urbanisation* is gaining strength, with 17 percent of total population already living there in 1990. SNCF, which has long been sidelined from urban transport services, sees the tram-train as an affordable means of serving this rapidly growing market.

In addition to France, track sharing is under active consideration in Benelux, United Kingdom (Bristol, Nottingham, Newcastle, Glasgow), Scandinavia (Oslo, Stavanger), Austria (Vienna, Graz, Salzburg), Italy, Switzerland and Spain.

Source: Public Transport International, Nov/Dec 2000; Axel Kuehn, TranportTechnologie-Consult

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 4.7.9

CONCEPT: Electronic Fare Collection (Smart Cards)

PROJECT NAME:

LOCATION: Rome, Italy

In December 2000, the city of Rome has launched the first full-scale deployment by a major city in Europe of an integrated multi-modal transport payment system using contactless smart card technology. The new system covers all bus, tram, train and metro services within the city of Rome. Annual and monthly transit pass holders are issued a smart card, which can be used on the entire multi-modal transport system. Public transport "units," purchased with cash or electronic transfer payments, are loaded directly onto the smart card and then debited by special contactless check-in/check-out terminals at rail stations or on buses and trams. Riders can still purchase single-ride paper tickets and season tickets.

The new fare collection system uses 9,700 validators, 4,000 points-of-sale devices, 200 portable card readers and a sophisticated communications and central computer systems. More than one million smart cards are expected to be issued by the end of 2001.

The contactless smart card system has been provided by the Australian-based ERG Group, a leading developer of automated fare collection equipment. ERG has already installed a similar system in Hong Kong.

Source: Press release, City of Rome

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTELLIGENT TRANSPORTATION SYSTEMS** NO. 4.7.10

CONCEPT: Electronic Fare Collection (Smart Cards)

PROJECT NAME: *Prestige*

LOCATION: London, U.K.

London is embarking on completely revamping the antiquated fare collection system on its public transport system. Known as *Prestige*, the operation will be completed in 2002. The project's central feature is a contactless smart card, which will offer passengers seamless intermodal journeys throughout the entire transport system. London has one of the largest public transport networks in the world, and *Prestige* will cover the full system: 6000 buses, 273 underground stations, plus commuter rail services and Docklands Light Railway. All buses will be fitted with smartcard readers. Roughly 16,000 Smartcard dispensing devices will be installed to cater to 927 million annual trips on the Underground and 1.3 billion trips on buses.

The contactless smartcard will replace the existing magnetic stripe card in 2002. Currently, users only have the option of paying cash and getting a single trip ticket, or buying a Travelcard in advance. *Prestige* will offer a greater flexibility. For example, discounts could be introduced according to the day of the week, the time of day or the number of trips made, to encourage travel at particular times.

Presige will also allow the transport authority to collect more detailed ridership data, to plan services and routes more effectively, and to allocate revenue to individual operators (London Undergound, individual bus operators, Docklands Light Railway, etc)

Source: Public Transport International, 2001/2

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATION** NO. 4.8.7

CONCEPT: Service Deregulation & Outsourcing

PROJECT NAME: Connex

LOCATION: Europe

Connex, launched in March 2000, has become Europe's leading private operator of urban public transport services. Its business has expanded very rapidly, reflecting Europe's trend to turn over the operation of public transport services to the private sector under long-term franchises. This trend is particularly strong in France, where 75 percent of all urban transport services are managed by the private sector. Connex is present in 42 French urban areas and is the main private operator in the Paris region where it operates 1,700 suburban buses. Other Conex operations include:

- Portugal, where Connex operates Lisbon's rapid transit system under a 30-year franchise;
- Germany, where Connex has partnered with DEG (Deutsche Eisenbahn Gesellschaft) to operate public transport services in Munich, Bonn, Frankfurt and a host of other cities;
- Spain, where Connex operates five urban tarnsport networks and has secured a franchise to build and operate Barcelona's future light rail line;
- United Kingdom, where Connex two rail franchises account for 17 percent of the national rail network and where it operates three bus routes in London;
- Sweden, where Connex has won a contract to operate Stockholm's metro system and a brand new light rail line;
- Eastern Europe, where Connex operates Warsaw's buses;
- Australia, where Connex is active in Perth (buses), Sydney (light rail and monorail) and Melbourne (commuter trains).

The Connex consortium includes an R&D subsidiary, EUROLUM, which carries out research and development in advanced communications and information technologies; and two training centers, in France and the U.K.

Source: Public Transport International Nov/Dec 2000,

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.9.3

CONCEPT: Innovations in Light Rail Operations

PROJECT NAME:

LOCATION: France

Several medium-sized French cities are building, expanding or planning future-oriented light rail networks, some of which will reach out into the far suburbs, sharing track segments with intercity rail lines operated by the national railways. These networks include regional "tram-train" systems that will be phased in over the next five years by half a dozen major cities, including Lyon, Mulhouse, Nantes, Nice, Marseille and Strasbourg (see 4.4.3).

The boom in building environmentally friendly electric-powered systems has been fueled by growing concerns about pollution and traffic congestion caused by private cars and buses. The futuristic, sleek tramways with their stylish and comfortable interiors are also expected to motivate greater number of motorists to switch to public transit.

Altogether, over the next ten years the equivalent of about $10 billion will go into construction of urban light rail systems in France, a renaissance that began in 1986 when the city of Nantes inaugurated a new generation of tramways. That project started a trend that has embraced more than a dozen cities. In the process, it has given rise to striking designs, epitomized by Strasbourg's curved glass "supertram" built by ABB, and the CITADIS built by Alstom, the latter the choice of many of the new systems starting in 2000 and beyond.

In the most recent development, the city of Bordeaux is in final negotiations for a turnkey contract to build and operate a three-line light rail network. To keep the city center free of overhead wires, a secure underground electrification system will be installed. In Lyon, the first two lines of a projected network of tramway routes are currently under construction. The new system, supplementing the existing metro and suburban rail network, will use the CITADIS and is expected to carry 100,000 passengers daily.

Two other cities, Montpellier and Orleans, are making rapid progress in the construction of their respective system, both of which will use the CITADIS. Several other cities have opted to move beyond the steel-wheel-on-rail technology, in favor of an innovative rubber-tired system developed by a partnership of Matra, Renault and Siemens (see 5.1.10).

Source: Passenger Transport, February 15, 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.11.4

CONCEPT: Bus Rapid Transit

PROJECT NAME: "Quality Bus Corridors"

LOCATION: Dublin, Ireland

Bus Rapid Transit (BRT) - as its name implies - is intended to mimic rail transit. BRT service typically involves operation in dedicated rights-of-way in the suburbs and in exclusive bus lanes on city streets. Headways are short, and enclosed stations equipped with high platforms facilitate rapid loading and unloading of passengers. Fares are collected upon entering the station, not on entering the bus, in order to speed up boarding and reduce dwell time at stations. The overall intent is to give bus service some of the qualities it currently lacks: faster operating speeds, greater service reliability, and increased comfort and convenience, matching the quality of rail transit service.

Dublin, Ireland's capital has probably the largest Bus Rapid Transit network in the world. It comprises 62 miles of exclusive bus lanes, to be expanded to 257 miles by 2005. Called Quality Bus Corridors, the system serves a metropolitan area of 1.6 million inhabitatnts.

Two factors prompted Dublin to opt in favor of Bus Rapid Transit. First, reflecting Ireland's high economic growth, Dublin has experienced a very rapid increase in automobiles, an increase that other European cities had half a century to accommodate. Secondly, Dubliners decided that no freeway would ever be built through their city and no streets would be widened anywhere. The answer was a high-capacity transit system that would appeal to car drivers and that could be put in place rapidly, an imperative that precluded consideration of a rail system.

The Bus Rapid Transit system was created essentially by restriping the roadways, taking over a traffic lane in each direction for the buses. The bus fleet was expanded to over 2,000 vehicles. New low-floor double decker buses run at one-minute headways during rush hours. High tech enhancements, such as a real-time passenger information system at bus stops, will be progressively introduced. According to the Dublin transit authorities, ridership on the system has increased by 220 percent, two-thirds of it from former car drivers, since the inauguration of the new system.

Source: Passenger Transport, April 30, 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.12.1

CONCEPT: Transit Operations in Small Communities

PROJECT NAME: *"Stadtbus"*

LOCATION: Germany

In Germany, the *Stadtbus* (TownBus) concept has brought viable public transportation to small and medium-size communities (i.e. with population up to 75,000). According to recent figures from the German Public Transport Association (VDV), *Stadtbus* systems have been introduced in 27 more communities in 1999-2000, bringing the nationwide total to well over 100. More are scheduled for launch in 2001.

The *Stadtbus* systems feature a hub-and-spoke pattern of routes with a central transfer point where all lines meet at regular intervals, short headways, distinctively painted mid-size or mini-buses, an easy-to-remember timetable, attractive signage, intensive marketing and local image building. One key component in the success of the *Stadtbus* concept is the support by the local political leadership and the local media. In many cases the *Stadtbus* phenomenon can be attributed to community activists who were dissatisfied with the lack of adequate public transportation in rural communities and small towns, and mobilized political and media support for the concept.

The systems are locally subsidized, with the amount of public subsidy depending on the size of the market. Revenue shortfalls are generally met by a variety of sources, including cross subsidies from electric utilities, local general revenue, contract payments for student transportation and revenues from municipal parking lots.

The *Stadtbus* has been promoted as the mobility solution for Germany's rural and small communities. A number of *Stadtbus* towns can also be found in neighboring Austria and Switzerland.

Source: Passenger Transport, December 4, 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.13.1

CONCEPT: Commuter Rail

PROJECT NAME:

LOCATION: Various locations in the United States

Unlike urban transit whose ridership continues to erode, commuter and regional rail services in the United States are booming. More commuters are riding rails than ever before. Since 1989, eight urban areas have launched commuter rail service, bringing the total of metro areas with regional rail to 15. New rail operations are being considered in several other metropolitan areas. According to a recent study by the American Public Transit Association, 2.1 million daily riders use commuter rail in the United States, up 6 percent from 1997. As recently as 1980, commuter rail operations existed only in five U.S. cities: New York, New Jersey, Chicago, Philadelphia, and Boston. By mid-2001, new commuter rail systems were operating in Southern California, the San Francisco Bay Area, Silicon Valley, Dallas-Fort Worth, Fort Lauderdale-Miami, Maryland, Seattle, and Northern Virginia. New commuter rail services are being planned in Raleigh-Durham, Minneapolis and Colorado.

The success of these systems tends to confirm what demographers have been saying for some time: the fastest growth in the United States is occurring in the once rural counties, beyond the outer edges of metropolitan areas. A study by Harvard University's Joint Center for Housing Studies shows that for the first time since the 1970s, the pace of growth in exurban and semi-rural areas is approaching the growth rate of urban areas, an indication that more and more Americans are bypassing the city in their choice of where to live (*State of the Nation's Housing, 2000).*

Families that move into these places are leaving the suburbs, much as an earlier generation of suburbanites fled the city. Some move in search of more affordable housing, others say they want more space and a safer and healthier environment for their children. Unwilling to face extra-long commutes by automobile, these new exurbanites create a demand for commuter rail. Commuter rail, in turn, is the enabler that permits families to move beyond the confines of the suburbs. It is also a prime factor behind growing metropolitan decentralization.

Source: Mass Transit, March/April 1999, May 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN TRANSIT SERVICE & OPERATIONS** NO. 4.14.1

CONCEPT: Rail Transit Planning

PROJECT NAME: Circumferential rail lines

LOCATION: Madrid, Spain; Tokyo, Japan

Madrid, like Western Europe's other large metropolitan regions, is in the process of decentralization and dispersal. Since 1975 when Madrid reached its maximum population, the city has lost ten percent of its inhabitants. Today, the city of Madrid houses only 57 percent of the metropolitan region's population. The residential migration has given rise to a number of suburban shopping centers and "big box" retail outlets - from 8 centers in 1980 to 90 in 1998. The shopping centers attract customers not only from the surrounding suburban communities but also from the city itself, virtually all of them arriving by car. This has given rise to heavy congestion on Madrid's two ring roads (a third ring road is currently under construction).

The growing congestion on the suburban road network has led to a decision to construct a 40-km circumferential rail transit line (*Metrosur)* linking five large suburban centers, suburban university campuses, hospitals and shopping complexes. Madrid authorities estimate that the new line will decrease the number of visitors arriving at the suburban shopping centers by car from 96 percent to about 70 percent.

In Tokyo, a new circumferential underground rail line, Ô-Edo Line, has opened in December 2000. As in Madrid, the objective is to link a number of peripheral sub-centers (e.g. Shinjuku, Aoyama, Shidomei). The new line is the 12th subway line in Tokyo. Of its 28 stations, 21 connect with other, radial subway lines. This will increase metropolitan accessibility and the convenience and efficiency of Tokyo's metropolitan rail network, which formerly was interconnected only in the central area. Tokyo planners expect the circular line to have a major long-term impact on the location of population and economic and on Tokyo's urban structure.

Source: Public Transport International, January 2001;

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **ADVANCED TRANSIT SYSTEMS** NO. 5.1.10

CONCEPT: Automated Guideway Transit

PROJECT NAME: TVR, CIVIS, GLT

LOCATION: Trans Val de Marne

A consortium of 24 public and private transit operators, from France, Italy, Spain, Sweden and United Kingdom are funding a series of demonstrations of a new generation of medium capacity guided systems, to allow municipal and transit officials compare the competing technologies on a "level playing field" before making decisions as to an appropriate transport technology for their cities. The 12 km test track is located at Trans Val de Marne, an experimental busway corridor operated by the RATP near Paris. The three guided transit system technologies include:

Tranlohr (TVR) – manufactured by Lohr Industrie, is a modular vehicle guided along a shallow central rail. It can go off line under its own battery power to return to the depot or to negotiate wireless stretches or tunnels. It can carry 2,000 to 5,000 passengers per hour and negotiate gradients up to 13 percent. It costs half as much to build as a conventional light rail system. The demonstration of the TVR began in December 2000 and is expected to run through 2001, to be succeeded by CIVIS next year.

CIVIS, developed by a partnership of Matra, Renault and Siemens, is a rubber-tired hybrid bus with an optical guidance option. It can handle 3,000 passengers per hour. A camera mounted in front of the steering wheel, reads coded markings painted on the road, indicating the path to be followed. An image processor detects and corrects deviations by activating a motor on the steering column. The system keeps the vehicle on the required path with a tolerance of a few centimeters. The optical guidance bars are merely painted on the road surface and can be relocated at minimal expense. (see 5.1.8). More than 200 CIVIS units are on order or option by Lyon, Grenoble, Clermont-Ferrand and Rouen.

Guided Light Transit (GLT) – three French cities and suburban jurisdictions have opted thus far for this modular rubber-tired vehicle manufactured by Bombardier.

Source: Passenger Transport, Jan 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **ADVANCED TRANSIT SYSTEMS** NO. 5.2.3

CONCEPT: Magnetic Levitation (MagLev) Systems

PROJECT NAME: Shanghai Transrapid

LOCATION: Shanghai, China

Shanghai will be the home of the world's first magnetic levitation system in revenue service, along a 33-km route connecting the city's international airport with the downtown business district. The project, to enter into operation in 2003, is being constructed by the Transrapid International Consortium, which includes Siemens and ThyssenKrupp. The contract for the project was signed at the end of January 2001.

The project is supposed to serve as a pilot for other intercity links, notably the 200-km route from Shanghai to Hangshou, and, eventually, the 1,300-km connection between Shanghai and Beijing, the nation's capital.

The Shanghai Transrapid will operate on 10-minute headways, with the airport-to-downtown trip taking just seven minutes. The fleet will consist of three trains with six vehicles each.

Source: Passenger Transport, March 2001

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIVE INFRASTRUCTURE FINANCING** NO. 6.1.8

CONCEPT: Private Toll Roads

PROJECT NAME:

LOCATION: Brazil

Brazil is currently engaged in one of the world's largest highway privatization programs, with 36,000 km of major roads progressively being let out to a new generation of concessionaires. As part of their franchise agreements, the concessionaires are required to carry out extensive upgrading of the road facilities, including deployment of an emergency communication and information system, an incident detection system, an electronic toll collection system and a weigh-in-motion system.

The main focus of the privatization effort is Sâo Paulo, the country's largest city, where some 12 major roads are included in the program. Among them is the 162-km long Via Oeste, one of the first roads to be turned over to the private sector. The initiative is the latest manifestation of the country's National Privatization Program which is being implemented as part of the national policy of economic restructuring.

Source: ITS International, March/April 2001; Traffic Technology International, Oct/Nov 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIVE INFRASTRUCTURE FINANCING** NO. 6.3.1

CONCEPT: Marketization

PROJECT NAME: Overview

LOCATION:

What are now publicly operated freeways, could easily be managed by expressway operating companies under competitively bid long-term franchise agreements. Precursors of such arrangements exist in new public-private tolled expressway and bridge projects in operation or under development in the United States in California, Missouri, Puerto Rico, South Carolina, Texas, Virginia, and Washington State. They would most likely begin with first- or second-generation electronic toll collection (ETC) technology, but could be adapted to wide-area pricing if and as it evolved.

The main reason for franchising these expressways to private companies is to change the relationship between road users and road providers, turning the former into customers who express their demand in the roadway marketplace. Whereas state highway agencies offer a standardized product—a "one size fits all" approach under which every driver must sit in the same congestion regardless of the value of his time or the urgency of this particular trip—private franchise-holders would be likely to try out various levels of service targeted at different customer groups. While only some individuals might be willing to pay an extra premium for guaranteed arrival times, time-sensitive delivery services might well jump at the chance. The wearing-out of many urban expressways offers a golden opportunity to rebuild them with several different types and sizes of lanes, aimed at different categories of customer.

Source: Innovation Briefs, Jul/Aug 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIVE INFRASTRUCTURE FINANCING** NO. 6.4.1

CONCEPT: Privately Financed Rail Transit Systems

PROJECT NAME: "Skytrain"

LOCATION: Bangkok, Thailand

The first mass transit system in the world to be financed without any public funds opened in Bangkok in December 1999. The Bangkok Transit System (BTS), a $1.3 billion elevated heavy rail system, consist of two intersecting lines totalling 23.5 km. and 23 stations. It traverses Bangkok's famously congested central district and represents a major step toward relieving the city's proverbial gridlock.

Under construction since October 1996, the Skytrain project has been built by Siemens and an Italian-Thai civil construction consortium under a BOT (Build-Operate-Transfer) contract. BTS receives all income from the fare box for the duration of the 30-year concession. The $1.3 billion project represents one of the largest turnkey urban rail projects in the world. The financing was provided entirely by private sources. The international banking group providing the financing included the World Bank's International Finance Corporation, the Siam Commercial Bank and a German bank. The right-of-way was donated by the city free of charge. The land acquisition portion of the deal was critical to the project's success. If the private group had to purchase the air rights from the city, the project would not have been financially feasible.

The Skytrain is only the first in a series of major transit infrastructure initiatives in this city of eight million inhabitants. The city's entire mass transit system eventually will consist of a 240-km $2.3 billion rapid transit system, a 20-km subway portion of which is currently under construction. The entire system is expected to be completed by 2011.

Source: Traffic Technology International, Feb/March 2000; Mass Transit, May 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **NOVEL INSTITUTIONAL ARRANGEMENTS** NO. 8.1.2

CONCEPT: Regional Transportation Authorities

PROJECT NAME: The Georgia Regional Transportation Authority

LOCATION: Atlanta, Georgia, USA

The Georgia General Assembly recently passed legislation creating a transportation superagency with sweeping powers to address transportation and air quality problems in the Atlanta region. The newly created Georgia Regional Transportation Authority (GRTA) will be responsible for coordinating most aspects of transportation and regional planning in the Atlanta metropolitan area. The agency will have broad powers over all major transportation and development decisions. It will have authority to review and make recommendations to the governor on all proposed regional transportation plans and programs and have final say over road, rail and major development projects throughout metropolitan Atlanta. Only a three-fourths vote of the jurisdiction in which the project is located will be able to override the Authority's decisions. GRTA will also control all state and federal transportation spending within the region and have $2 billion in bonding authority.

The GRTA is governed by a 15-member board, but the real power belongs to the Governor who can hire and fire any of them at will. During his campaign for governor in the fall of 1998, Governor Roy Barnes frequently reiterated the need to strengthen Georgia's planning laws and made GRTA his number one priority of the legislative session. The legislation creating the Authority passed both houses overwhelmingly and was delivered to the governor for his signature only two months after it had been introduced. The ease and speed with which the bill was approved on a bi-partisan basis reflected the unanimous conviction of Atlanta's political leadership and the business community that the problems facing the region had reached crisis proportions and would jeopardize Atlanta's continued economic prosperity if not addressed rapidly and forcefully on a region-wide basis.

Atlanta's problems stem from its rapid growth. The region's population of 3.1 million has doubled since 1970, and its urbanized area has spread dramatically, with the city of Atlanta now making up less than 10 percent of the metro area. With 303,000 building permits issued from 1990 to 1997, Atlanta was third in the nation in home construction. The region's reliance on the automobile has created a major air quality problem. Traffic congestion is an equally urgent problem. Despite an ambitious highway expansion program in the early 1990s, the roads are saturated with traffic, with more than half of the area's workers commuting from one county to another. As a result, residents drive an average of 37 miles a day, even more than Los Angeles residents who average 21 miles a day. The median commuting time is 30 minutes, and is expected to rise to 45 minutes in the next decade.

Source: Innovation Briefs, July/August 2000

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **NOVEL INSTITUTIONAL ARRANGEMENTS** NO. 8.4.1

CONCEPT: Privatization

PROJECT NAME: Railway Reform

LOCATION: Western Europe

During the 1990s, western European countries made significant institutional and organizational reforms in their national rail systems. The old style regulated public monopoly model of rail organization – with its rigid bureaucratic hierarchy, its unproductive labor rules and adversarial labor relations, its take-it-or-leave-it marketing mentality, its murky cost accounting and open-ended public subsidies – has lost much appeal to politicians, to the public, and even to many railroad executives, according to observers. In its place has emerged a new model of a railway enterprise, that is more attuned to market signals from customers and investors, more entrepreneurial and more innovative. The “new model railway” has taken several different variants.

In the United Kingdom, the old British Rail (BR) has been entirely privatized. But instead of being sold off as a single going concern, ownership of track and stations, rolling stock, maintenance facilities, and freight and passenger train operations was split up among different private organizations. BR’s passenger routes were carved up among 25 train operating companies through long-term franchises, and rail infrastructure was acquired by a separate company, *Railtrack.*

Germany and Sweden have stopped short of privatizing their railroad systems. Instead, they have restructured their railroad organizations through “marketization” – encouraging management to respond to market forces as if they were running a private business, but without actually transferring ownership to private shareholders, and without cutting the umbilical chord of public subsidies, especially for rail infrastructure.

Source: James A. Dunn, Jr. and Anthony Perl, *Transportation Quarterly* (Vol. 55, No.2, pp. 43-57).

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INTERMODAL ISSUES** NO. 9.2.2

CONCEPT: Intercity High Speed Rail Access

PROJECT NAME: "Flying by Train"

LOCATION: Germany

Switching passengers from short flights to fast trains has long seemed an obvious way to relieve congestion at busy airports and reduce pressure on busy air routes. Experience with the *Eurostar,* the high speed train from Paris to London through the Chunnel, suggests that fast trains running between city centers attract many travelers. Now, European airline operators are planning to put this theory to test. In an experiment starting on March 5, Lufthansa, the German airline, started offering the alternative of rail travel to customers flying from Stuttgart via its congested hub at Frankfurt Airport. Trains carry Lufthansa's flight codes, and passengers are able to check bags through to their final destination.

The Lufthansa service will operate initially on six daily round trips. One first-class carriage with 46 seats will be set aside for passengers on each train. The service on board will be exactly the same as it is in the business class on the plane, with newspapers, snacks and drinks. The train trip takes 73 minutes, compared with 55 minutes for the flight. But in rush hour getting from the center of Stuttgart to the airport can take anything from 45 minutes to one hour. Lufthansa has also identified Cologne, Nuremberg and Dusseldorf as suitable candidates for rail links as alternatives to flights. A decision on whether to launch pilot programs on all or any of these routes will depend on customer reaction to the Stuttgart trial. Once the high-speed track between Frankfurt and Cologne is open in December 2002, it will take only 50 minutes by train versus 55 minutes by air, according to a Lufthansa spokesman. Switching passengers from domestic flights, however, will not get rid of the pressure to expand airports, Lufthansa warns. At best it will buy time, freeing enough runway capacity at Frankfurt to allow for one year's passenger growth. In a similar move, Air France is expected to curtail air service between Paris Charles de Gaulle – an airport which has its own mainline rail station – and Brussels, and switch passengers to high-speed trains instead. The airline currently operates five round trips a day on that route.

Somewhat further in the future are plans by Air France and British Air, the principal airlines serving Paris and London, to run high speed trains between London's Heathrow Airport, and Paris' Charles de Gaulle Airport. The *Eurostar* trains, which provide a three hour service between London and Paris at speeds of 180 miles/hour (300 km/hour) on the continent, already have captured 50 percent of the London-Paris travel market – Europe's busiest international route. With completion of a 74-km high-speed link between the Channel Tunnel and the outer periphery of London sometime around 2005, travel times between London and Paris will be further reduced to a little over two hours. The same trip by air can easily take three hours, counting access time to and from the airports. Flights to Paris take up about 60 take-off and landing slots a day at Heathrow and Charles de Gaulle. Switching all that air traffic to rail would free-up up to one hour of runway time a day at each airport.

Source: Innovation Briefs, May/June 2001

Cooperative Mobility Program
Center for Technology, Policy and Industrial Development
Massachusetts Institute of Technology

INTERNATIONAL MOBILITY OBSERVATORY

INNOVATION FACT SHEET

STRATEGY: **INNOVATIONS IN HIGHWAY OPERATIONS** NO. 10.1

CONCEPT: "Operations Initiative"

PROJECT NAME: Overview

LOCATION:

Launched by the Federal Highway Administration, the "Operations initiative" aims to shift the focus from new construction – which has been the primary mission of the U.S. highway program from the very inception of the federal-aid highway program in the 1930s – to efficiently managing and operating existing facilities. The objective itself is hardly new. Making the best use of existing road infrastructure has been the goal of the Transportation System Management (TSM) policy as far back as the mid-1970s. The federal TSM requirement, a radical concept when it was first promulgated in 1975, has since become the accepted wisdom. Today, the philosophy and techniques of transportation system management (including its offshoot, transportation demand management or TDM) constitute an integral part of the transportation planning process. What the current Operations initiative seeks is to develop a contemporary vision of TSM. A number of new influences are shaping this vision. They include the growing severity of capacity constraints, the new technology of intelligent transportation system, the pressures to improve system reliability and a new emphasis on achieving performance that " meets or exceeds customer expectations."

Operational improvements are particularly effective in reducing *non-recurrent congestion*, i.e. unpredictable disturbances in the traffic flow caused by collisions, vehicle breakdowns, special events, road repair and other random or unanticipated events. More efficient operation has been made possible by recent advances in the Intelligent Transportation Systems (ITS) technology. For example, modern sensing and communication technologies provide ways to quickly detect disturbances in traffic flow, thus enabling highway operators to clear scenes of accidents and restoring normal operating conditions more rapidly. Sophisticated roadway weather monitoring systems can be used to alert motorists to unfavorable road conditions and road hazards ahead. Electronic toll collection (ETC) are employed to reduce bottlenecks at toll plazas. Real-time traveler information systems alert motorists about incidents and special events, and advise drivers to take alternative routings. Telematics services provide quick response to stranded motorists. Computer-controlled traffic-responsive signal systems can be used to smooth out traffic flow. Improved equipment and techniques shorten the time required for routine road repairs and reduce disruptions due to work zones. Collectively, ITS-type improvements have been estimated optimistically to offer potential reduction in delay due to traffic congestion on the order of 10 to 15 percent.

Source: Innovation Briefs, Mar/Apr 2001