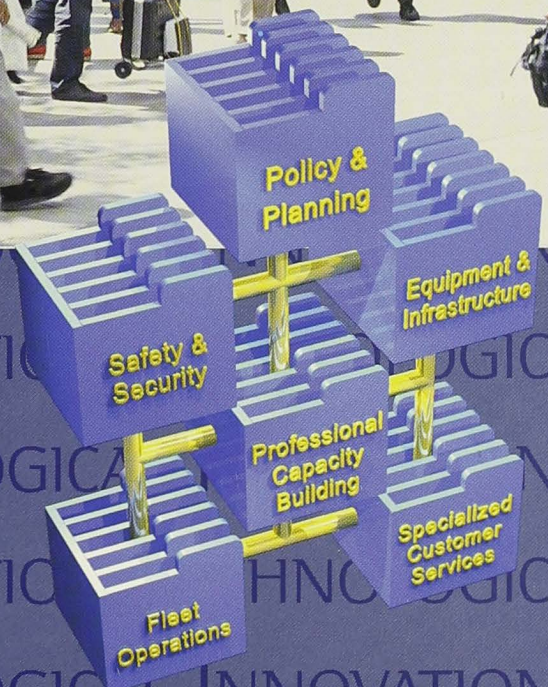




U.S. Department
of Transportation

TRANSIT RESEARCH AND TECHNOLOGY PROGRAMS



Federal Transit
Administration

INTRODUCTION

The mission of Federal Transportation Administration's (FTA) **Research and Technology Program** is to partner with the transportation industry in establishing preeminence in U.S. transit technology, institutions, and customer services to increase the quality and level of transit services. As a result of this mission, FTA will support deployment of technological innovations to improve personal mobility, minimize fuel consumption and air pollution, increase ridership and enhance the quality of life of all communities.

FTA takes a leadership role in coordinating transit research and technology activities for public transit agencies and the private sector, promoting global competitiveness, international information exchange, and mainstreaming innovation.

This leadership role calls for vigilance in understanding the problems of the transit industry and the major trends which affect the future of transit services -- an aging population, safety and security, globalization of economies, sustainable development, and technology advancements. These trends affect the demand for specialized services, the need to counter terrorist attacks, the importance of environmentally-sensitive transit services and facilities, and the call for a strong and stable domestic transit manufacturing industry. The Transit Research and Technology Program addresses these trends and is consistent with the goals of the National Science and Technology Council, the U.S. Department of Transportation (DOT) Strategic Plan and the FTA Strategic Plan. The DOT strategic goals are:

- **Safety:** Promote the public health and safety by working toward the elimination of transportation-related deaths, injuries, and property damage.
- **Mobility:** Ensure a transportation that is accessible, integrated, and efficient, and offers flexibility of choices.
- **Economic Growth and Trade:** Advance America's economic growth and competitiveness domestically and globally through efficient and flexible transportation.
- **Human and Natural Environment:** Protect and enhance communities and the natural environment affected by transportation.
- **National Security:** Advance the nation's vital security interests ... by ensuring that the transportation system is secure ...

FTA Strategic Plan includes the above goals and also adds, *"Ensure a quality organization that is responsive to employee needs, empowers its employees and provides excellence in customer service."*

Furthermore, FTA has identified societal benefits of congestion management and livable communities as desired

outcomes of investment in a seamless, safe, secure, accessible and affordable public transit system. Continued deployment of innovations assists in attaining these benefits.

Federal investment in transit research and technology strengthens the domestic base ensuring stronger local economies. As a result, U.S. transit goods and services become more competitive in the global marketplace, particularly in the growing markets of Africa, South America and Asia. Special emphasis is being placed on (1) promising advanced vehicle technology, and (2) showcasing intelligent transportation system technologies.

The **Transportation Equity Act of the 21st Century** (TEA-21) includes new research and technology initiatives. They are the Joint Partnership Program for Deployment of Innovation (JPP), the Advanced Technology Pilot Program for Low-Speed Magnetic Levitation, the International Mass Transportation Program, a Clean Fuels Formula Grant Program, and several other advance technology deployment efforts. Today, information generated through research and the introduction of cost-effective technology provides unprecedented opportunities to boost ridership and reduce capital, operating and maintenance costs of services and facilities. The JPP and International provisions of TEA-21 are important implementation mechanisms.

Starting in 1997, FTA worked with the transit industry to develop a **Research and Technology Five-Year Plan** that identifies research and technology priorities. Priority areas are: system safety and personal security, lower-cost and environmentally-friendly vehicles, labor-management relations, customer service quality, equitable access, innovations in planning and infrastructure development, professional development, and new paradigms in mobility management.

Based on the transportation trends, DOT and FTA strategic goals, and industry input, FTA organized the Research and Technology Programs around the following areas:

- Safety and Security
- Equipment and Infrastructure
- Fleet Operations
- Specialized Customer Services
- Policy and Planning
- Professional Capacity Building

Collectively, programs and projects in these areas will improve customer service, increase the cost-effectiveness of transit assets, and contribute to improved environmental quality while building the professional capacity of the industry and increasing transit ridership.

SAFETY AND SECURITY

The goal of FTA's safety and security program is to promote public health and safety by working toward the elimination of transit-related deaths, injuries, property damage and the improvement of personal security and property protection. This is accomplished through the promotion of transit safety and security in the transit community. FTA encourages transit systems to collect and disseminate data on safety and security issues, identify and implement best practices, and develop and implement comprehensive system safety and security program plans covering passengers, transit agency personnel, vehicles, and facilities.

The main focus areas of this program are Railroad Grade-Crossing Safety, Information Security, Crime Prevention and Anti-Terrorism. FTA will demonstrate innovative security technologies, system design, and rail and bus vehicle enhancements which will lead to new techniques that enhance the personal security of the riding public.

FTA participates in a number of intermodal DOT efforts to develop safety and security strategies that promote national transportation interests. In partnership with the transit industry, national security agencies, and international trans-



Patrolling Metro – Passenger Safety

FTA RESEARCH AND TECHNOLOGY PROGRAMS



portation organizations, FTA continues to test and evaluate advanced technologies (including chemical and biological detection systems) to reduce transit crime and counter terrorism targeted at transit patrons, employees and facilities.

FTA is an active partner in the Department's cross-modal effort to improve railroad grade-crossing safety. New railroad grade-crossing technologies and strategies are being explored and tested to provide a safe environment for crossing users. Preemptive traffic signal systems, train-activated swing gates, advanced train detection systems and other train-to-wayside communications are being tested



LRT Downtown Mixed Traffic Crossing

and evaluated to improve and integrate highway rail transit grade-crossing safety.

FTA plans to develop a computer model for application in field operations that simulates the transit environment (including medical triage, contingency transportation, emergency evacuation routes, and vulnerable location points) which will aid security personnel in responding to catastrophic transit events.

EQUIPMENT & INFRASTRUCTURE

The goal of FTA's Equipment and Infrastructure program area is to achieve the highest level of passenger service and comfort by applying technology to increase the capacity and quality of transit service. This program area's goals include reducing life-cycle costs of vehicles, systems, and facilities, and assisting domestic manufacturers and service industries to enhance

their competitive position in the global marketplace. This program area is pursuing advancements in bus propulsion systems, enhancements in bus testing, adaptation of radio-based communication and control systems, and continuous dialogue with the bus and rail industry through research, workshops, conferences, and peer panels.

FTA plans to explore, develop and use advanced simulation systems. Simulation is used to improve products and ensure customer satisfaction, as well as reduce the time needed to design, evaluate, and test a product. With advanced virtual engineering, the prototype is an electronic virtual image of the product that can be placed into a realistic duty cycle and tested under simulated real-world conditions. Using computer-simulated testing, an entire rapid transit line can be tested. Many years of testing can be compressed into days, weeks or even hours of computer simulated testing. Simulation can also help in training people to use the finished product.

BUS EQUIPMENT

The bus equipment activities address a number of research and technology needs related to the future design, safety, and operation of the next generation of transit buses and associated components. The FTA advanced technology transit bus (ATTB) is a major technology effort representing state-of-the-art advancements in heavy-duty bus subsystems. The ATTB program



Chattanooga Electric Bus



Advanced Technology Transit Bus

began in 1992 with the objective of developing a lightweight, low-floor, low-emission transit bus using proven, advanced technologies developed in aerospace industries. The 40-foot bus improves passenger accessibility, while cutting operating costs. It uses an on-board computer management system, a new low-floor design, and advanced lightweight materials. Six prototypes were developed and tested. The ATTB provides a platform for other bus developments. Currently underway is the development of a small, low-floor, heavy-duty advanced technology bus that is more maneuverable, rapidly accelerating, and low-polluting, with a variety of propulsion systems and fuels. The bus will be designed for durability and an expected life of 10 years or longer.

Electric vehicle technology continues to gain momentum. FTA is developing energy-efficient, low-emission bus propulsion systems based on two-types of fuel-cell technologies. Three 30-foot fuel cell test-bed buses were developed in conjunction with Department of Energy (DOE), and work on two 40-foot transit buses has begun. Major strides are also being made in electric and hybrid-electric bus technology, including battery powered sources and new energy storage systems. Significant improvements

in hybrid-electric bus operating performance and efficiency will soon be possible with a compact, small and lightweight energy storage system to replace battery packs currently in use. Electric and hybrid-electric vehicles offer significant reductions in vehicle and greenhouse gas emissions and potentially more efficient power use, improved reliability, and lower maintenance costs.

TEA-21 authorized the Clean Fuels Program to further mainstream advanced power sources, propulsion systems and supporting facilities through the FTA Capital Program. Technical assistance, training and further research augment the capital assistance.

Testing and technical assistance for new models are key activities of the bus component. Before federal funds are expended on new model buses, they are tested at the Bus Research and Testing Center in Altoona, Pennsylvania. Testing of the first 96 new bus models resulted in 27 failures that could have led to serious problems during transit service. The Testing Program provides bus manufacturers and transit agencies invaluable information that is used to improve the quality and safety of transit buses. FTA plans to use advanced bus simulation systems to assist manufacturers and transit agencies in designing and

pre-testing new bus models before they are actually built. FTA continues to work with transit operators, bus manufacturers, standards-setting organizations and the alternative fuels industry to improve the safety and efficiency of all new bus models.

RAIL EQUIPMENT AND SYSTEMS

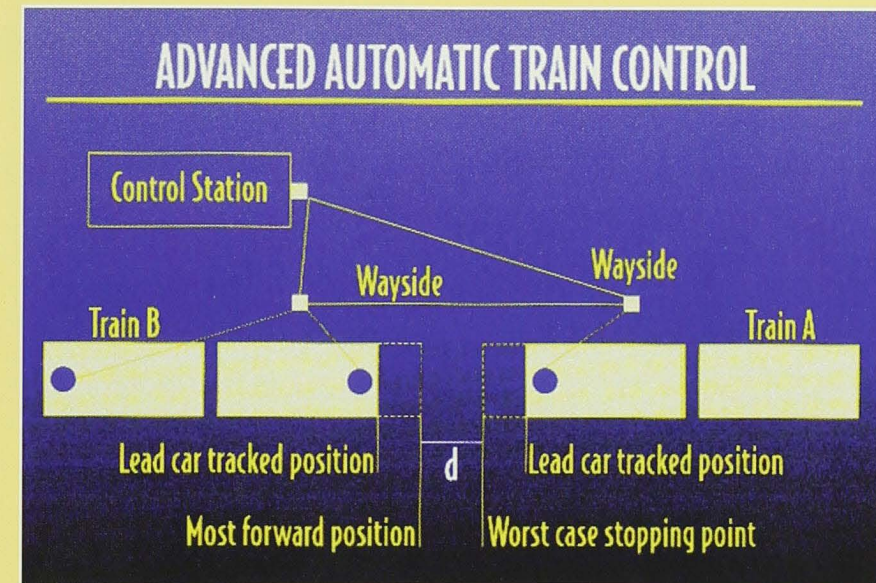
The rail equipment and systems component emphasizes activities such as radio-based communication and control systems, research on special guideway systems, and safety related issues. Advancements in vehicle and train control technologies enable transit agencies to provide higher quality service at lower costs. One example is the advanced spread-spectrum radio system that has been adapted to



40-Foot Fuel Cell Transit Bus

train control – the Advanced Automatic Train Control System (AATC), developed, tested, and now being deployed at the Bay Area Rapid Transit District (BART), involves a partnership of BART, the Defense Advanced Research Projects Agency (DARPA), FTA, Raytheon and Harmon Industries. Precise location of a train in real-time and use of software for safety-critical applications allow trains to run at closer separation distances while improving safety. The system allows fast recovery in case of unexpected events and permits energy management for reducing operating costs.

To improve fixed guideway system capacity and safety without adding more tracks or modifying



stations at enormous cost, FTA initiated the operational testing and deployment of radio-based or communications-based train control (CBTC) systems. Work is on-going with the Federal Railroad Administration (FRA) and the Institute of Electrical and Electronics Engineers in developing CBTC standards and other rail transit system standards. CBTC systems are also applicable for grade-crossing protection and optimization of rail and road vehicle throughput at grade-crossings. Rail systems safety is a high priority of the FTA. Special emphasis is placed on the use of new technologies to ensure safety of equipment operations and passenger security. Research is also underway on low-speed magnetic levitated (maglev) systems and other rail system innovations.

CIVIL INFRASTRUCTURE

The major elements in the civil infrastructure component are project delivery innovation, tunnel design and construction, and transit station design. Research in this component area focuses on innovative technologies, including advanced simulation systems, that minimize cost through better design and construction of components of fixed guideway systems, including

tunnels and stations. Work continues on the assessment of innovative technologies to identify ways to achieve greater efficiency in the design and construction of tunnels and stations.

Turnkey (where design, construction, and in some cases finance, operation and maintenance are contained in one contract) is a promising project delivery method to help expedite schedule, control costs, and better allocate and manage implementation risks. Essentially, turnkey involves a single point of responsibility.

The goal of FTA's Turnkey Demonstration Program is to determine if the turnkey method can produce time and cost savings through improved project procurement and development.

Research is currently underway to demonstrate the usefulness of turnkey project delivery as a means of developing transit infrastructure projects in the United States. The following five projects are



Urban Magnetic Levitated System



Transit Turnkey Project Delivery

participating in the FTA Turnkey Demonstration Program: New Jersey Hudson-Bergen Light Rail Transit; San Juan Tren Urbano Transit; Bay Area Rapid Transit District's San Francisco International Airport Extension; Los Angeles Union Station Gateway; and the Baltimore Central Light Rail Transit (LRT) Extensions. Early reports on the newly opened Baltimore Central LRT Extensions reveal time and cost savings in the procurement phase and reduction in the per-mile construction cost for the line segments. The contractor's designs of LRT and roadway grade-crossings were highly innovative and produced savings in capital, operation, and maintenance costs.

INNOVATIVE FINANCING

Innovative Financing involves the application of a wide variety of established and newly emerging financing techniques, commonly used in other sectors of the economy, to transit. Effective use of these techniques can reduce the financing costs of transit infrastructure and therefore reduce the overall cost of providing transit service. In addition, they provide opportunities for transit systems and private sector firms to develop mutually beneficial partnerships for infrastructure investment. Some of these

financing techniques include: Transit Finance Corporations; Lease/lease-back Transactions; Cross-border Leasing; Certificates of Participation; State Infrastructure Banks and Turnkey Procurement.

Joint Development projects focus on removing the obstacles to partnerships between transit systems and private sector developers in order to foster more effective use of transit system owned property. The benefits of Joint Development include: securing a revenue stream for the transit system; increasing transit ridership; and shaping land use patterns by partnering with the private sector to develop real estate and other agency-owned assets adjacent to rail, bus or other transit facilities.

FLEET OPERATIONS

Currently, transit operators are not taking maximum advantage of fully integrated advanced communications, infrastructure and equipment technologies in their bus fleets. As a result, the operational costs of many existing fleets are higher than necessary. FTA's Fleet Operations program area focuses on shaping America's future by ensuring a transportation system that is accessible, integrated, efficient, and offers flexibility of choices.

The goal of FTA's efforts in Fleet Operations is to increase efficiency, average speed, and throughput of transit fleets through technological improvements. These efforts include research on transit capacity and quality of service, demonstration and promotion of advancements in communication and information technologies, coordinated transportation services and operations, innovative urban design, and systems integration. The major elements of this program are: Transit Capacity and Quality of Service, Transit Intelligent Transportation Systems, Bus Rapid Transit Initiative, and Mixed Rail Corridor Operations.

TRANSIT CAPACITY AND QUALITY OF SERVICE

This program component conducts research, empirical analysis, simulation model development, and testing activities to improve transit operations, provide consensus design standards, and offer demand and supply parameters for transportation planning. The results are compiled into the Highway and Transit Capacity and Quality of Service Manuals. Training is planned around the updated Highway Capacity Manual and the newly developed Transit Capacity and Quality of Service Manual.

TRANSIT INTELLIGENT TRANSPORTATION SYSTEMS

Transit Intelligent Transportation Systems (Transit ITS) is an element of the Department of Transportation's ITS Program. Transit ITS is a comprehensive approach to applying advanced technologies to transit to improve customer service and reduce system operating costs. Transit ITS is organized in parallel with the National ITS Program and has three components: Metropolitan, Rural, and the Intelligent Vehicle Initiative. The



Transit Fleet Management Center

Metropolitan component of Transit ITS focuses on urban and suburban transportation in the areas of traveler information, fleet management, and electronic payment. The Rural component of Transit ITS addresses these same areas to improve the effectiveness of transit in rural areas. The Intelligent Vehicle Initiative involves automating transit vehicle control and safety systems. Each of these three components encompasses the Architecture and Standards component that seeks to ensure regional integration and interoperability.

BUS RAPID TRANSIT INITIATIVE

This initiative seeks to demonstrate, in partnership with local entities, how a combination of ITS technologies, traffic engineering, advanced technology buses, and urban design enhancements can significantly increase speed and ridership and reduce travel time, operating costs and emissions. Bus



Electronic Payment

Rapid Transit (BRT) represents a new way of looking at bus service. BRT includes many of the following features: exclusive lanes, signal preemption, faster fare collection (pre-paid boarding areas or proof of payment), high-quality streetscape design, station-area amenities, zoning for transit-supportive land uses at station areas and along corridors, and ITS technologies.



Curitiba Bus – "Surface Metro"



Traveler Information Kiosk

MIXED RAIL CORRIDOR OPERATIONS

The demand for commuter rail and light rail transit in mixed rail corridors is increasing at the same rate as highway congestion and suburban population growth. The different physical and operational requirements of freight and rail transit traffic present challenges and interoperability issues. Train control, monitoring, and signal system design requirements are specialized for each operator, further heightening the challenges posed by mixed rail corridor operations. Activities will involve examining the differing requirements attendant to ensuring the highest levels of safety while operating rail transit service in active freight railroad corridors. Work in this area will assist in reducing conflicts and will improve the safety and reliability of freight and passenger service in joint operations territory.

SPECIALIZED CUSTOMER SERVICES

The goal of Specialized Customer Services program area is to ensure a transportation system that is accessible, integrated and efficient, offers flexibility of choices to riders, and enhances community living. Activities are designed to improve services tailored for low-income, elderly and other transit-dependent travelers including per-



Cleveland Euclid Avenue BRT Plan



Specialized Customer Services

sons with disabilities. Better services improve access to jobs, educational opportunities, health care and other essential activities for those most in need of transit.

Increased emphasis is also being placed on service innovations for residents of rural and suburban areas, and citizens impacted by welfare reform. Several programs already in place include: Rural Transportation Services, Older American Accessibility Program, Job Access and Reverse Commute Grant Program, Human Service Coordination, and Project ACTION for implementation of the Americans with Disabilities Act.



POLICY AND PLANNING

The goal of research in support of Transportation Policy and Planning is to improve the quality and scope of the information available to decision makers on the various transportation options

available and the impacts of those options. Sound investment decisions by State and local government officials and policy makers require knowledge of the social, economic, and environmental costs, and the mobility and accessibility benefits of alternative courses of action.

This transportation policy and planning research will: improve the acceptability of alternative institutional arrangements for providing mobility, develop better approaches to multimodal system evaluation, explore the transportation implications of sustainable development issues, as well as seek ways to ensure intermodal connectivity, and exploit the latest advancements in planning technologies to provide the information that policy setters and decision makers need.

FTA policy research in support of improved system evaluation and sustainable development will include a continuing program of assessing the effects of the FTA program and the benefits of transit in general. This research area is the source of current information on transit assets, performance, conditions, finance, innovative finance techniques, and investment needs. It includes the analysis and promulgation of the available data on transit performance, conditions, and

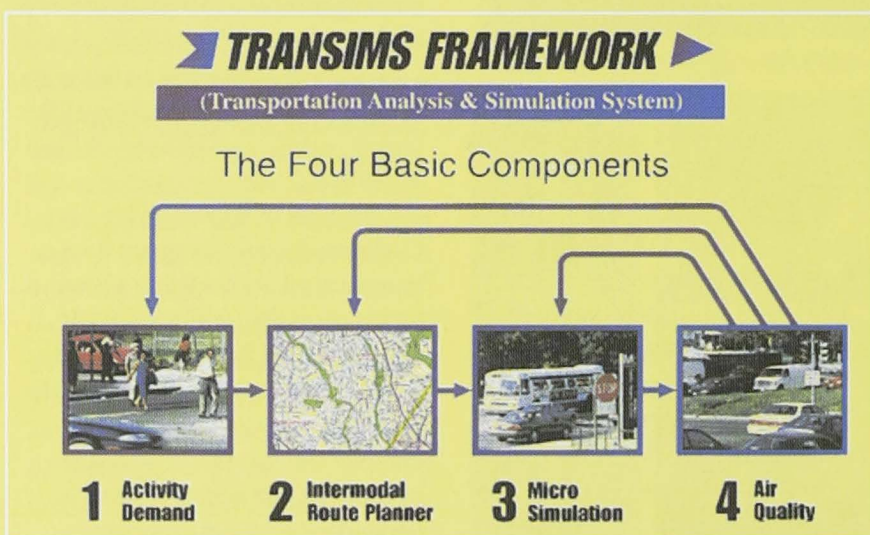


Intermodal Airport Station

needs, as well as the development of new data sources needed to provide decision makers at the national level with needed information.

A Transit Performance Monitoring System analyzes transit industry trends and needs in greater detail. A new financial model for assessing transit investment requirements nationwide is under development. These tools improve the understanding of the role of transit in providing mobility and accessibility.

Among the technological advances in transportation planning is a new approach to travel demand forecasting known as the Transportation Analysis and Simulation System or TRANSIMS. This computerized modeling system is based on simulation techniques originally developed for defense applications. TRANSIMS is intended to provide decision-makers in metropolitan planning organizations and state departments of transportation with more accurate information on transit ridership, traffic flow and emissions of air pollutants from transportation sources. These new models also provide more accurate information on other areas such as safety, noise, and fuel consumption. FTA is partnering with the Federal Highway Administration



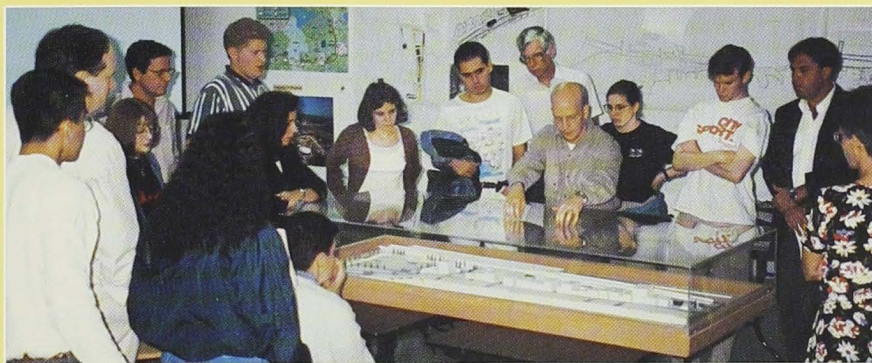
(FHWA) and the Environmental Protection Agency in the development of TRANSIMS.

The recent agreement between the Departments of Interior and Transportation on the expansion of transit systems at the most auto-congested National Parks provide opportunities to design and test transportation innovations such as clean-fuel bus systems, ITS traveler information systems, turnkey project delivery, creative financing arrangements. Planning and preliminary design is already underway at Grand Canyon, Acadia, Zion, and Yosemite National Parks and FTA is providing technical assistance through peer-reviews and technology transfer.

PROFESSIONAL CAPACITY BUILDING

FTA's program initiatives to build professional capacity in the transit industry are directly linked to the DOT Strategic Plan and the transit industry strategic planning recommendations — to attract and maintain an educated workforce to assure economic prosperity in the 21st century. Professional Capacity Building activities will focus on upgrading existing skills, strengthening organizational relationships, and exploring short-term solutions and innovative human resources practices to meet performance and productivity demands. Long-term emphasis will focus on attracting new and diverse professionals to the industry. Special emphasis is placed on improving day-to-day transit management and operations while linking the introduction of new technology with the knowledge and skills required to provide service effectively.

FTA plans to use the resources and tools of advanced simulation systems to enhance the quality of



San Juan Tren Urbano students in Professional Development Program.

the workforce by making realistic training possible without risking real-life incidents. Training courses will be offered in the use of advanced simulation models to assist the transit industry in the design and construction of state-of-the-art transit systems and system components.

FTA programs currently in place to assist the industry in meeting its human resources development needs are the University Transportation Centers Program, the Garrett A. Morgan Technology and Transportation Futures Program, the Transit Cooperative Research Program and the National Transit Institute.

UNIVERSITY TRANSPORTATION CENTERS PROGRAM

FTA continues to provide support for research, education, and technology transfer activities at ten regional University Transportation Centers and four National Centers. Technology transfer activities are monitored and documented to foster the application of research results to day-to-day operations. FTA will broaden the focus of the Centers to better encompass transit industry research and education needs, regionally and nationally.

GARRETT A. MORGAN TECHNOLOGY AND TRANSPORTATION FUTURES PROGRAM

FTA supports the Garrett A. Morgan Program as an educational

initiative to ensure that today's generations are ready to enter the transportation workforce of the 21st century. The program encompasses grades K-12, community colleges, and other colleges and universities offering transportation degrees, as well as lifelong learning. Through partnerships with the transit community, FTA encourages students at all levels to become proficient in mathematics, science, and technology, which enhances their marketability as tomorrow's transit professionals.

TRANSIT COOPERATIVE RESEARCH PROGRAM

The Transit Cooperative Research Program (TCRP) focuses on issues significant to the transit industry with emphasis on local problem solving research. The scope of TCRP includes a variety of transit research fields including: planning, service concepts, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices. TCRP synthesis reports summarize best transit industry practices and

Learn more about the Garrett A. Morgan Technology and Transportation Futures Program and how YOU can help

Moving Through the Years

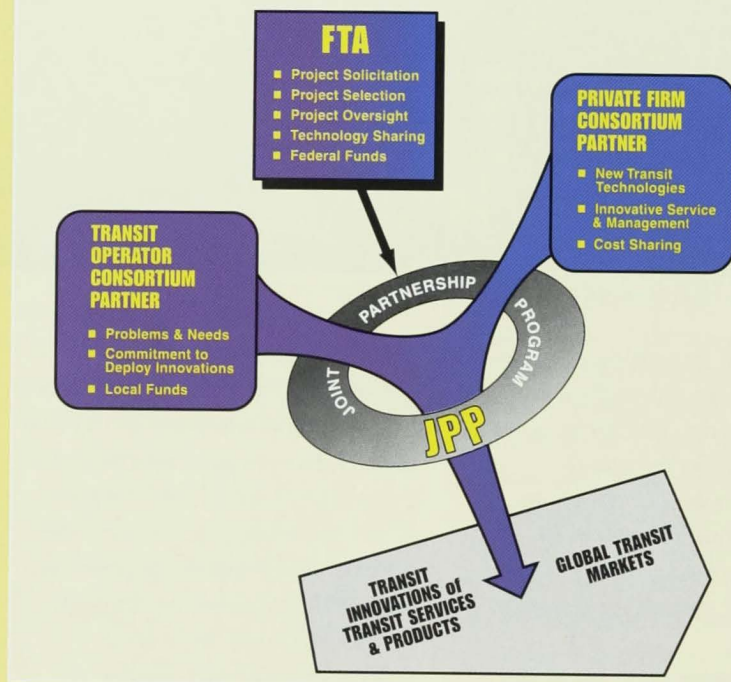
Grades K-5
Grades 6-8
Grades 9-12
Community Colleges and Technical Schools
University
Life-long Learning
Other Links
About Garrett A. Morgan

GARRETT A. MORGAN

United States Department of Transportation

Education and Careers in Transportation

FTA JOINT PARTNERSHIP PROGRAM



have been useful to transit operators.

NATIONAL TRANSIT INSTITUTE

The National Transit Institute (NTI) develops and teaches new methods and techniques to improve transit workforce performance and increase productivity in the workplace. Courses are conducted locally at sites nationwide on a wide variety of subjects, ranging from advanced technology and multimodal planning to management development and training effectiveness. Transit Trainers Workshops are conducted annually to bring together trainers and human resources specialists from the industry to learn the latest techniques in training and to share training experiences on the job. In addition, NTI and FTA are working together to develop and present workshops and seminars designed to assist the transit industry in

understanding and implementing advanced public transportation systems. Programs on geographic information systems, automatic vehicle locator, smartcard and innovative technologies are just a few of the topics under development for future presentation.

IMPLEMENTATION METHODS

The research and technology programs and projects are implemented through various stages of the innovation process — research, testing, evaluations, deployment, architecture and standards development, and mainstreaming. Funding occurs through the National Planning and Research Programs, FTA Capital programs, or through partnerships with other agencies.

FTA partners with Federal organizations, such as the FHWA, FRA, DOE, Department of Defense (DOD) and state agencies to identify and deploy new approaches to improving the transit

system. FTA intends to work with DOD and the Department of Justice to deploy anti-terrorism technologies.

INTERNATIONAL MASS TRANSPORTATION PROGRAM

The Transportation Equity Act for the 21st Century includes language which gives FTA the explicit authority to engage in an International Program of technical assistance. The program will include sharing of information with domestic manufacturers and transit operators about new equipment and techniques developed overseas; disseminating information about the worldwide market for transit products; cooperation with foreign public bodies in technology sharing; promotion and information sharing of products and services of the U.S. transit industry and providing technical assistance to foreign entities. In addition, international outcomes are contained in DOT's and FTA's Strategic Plans and FTA's Research and Technology Five-Year Plan.

JOINT PARTNERSHIP PROGRAM FOR DEPLOYMENT OF INNOVATION

The Joint Partnership Program (JPP) for Deployment of Innovation is the primary implementation mechanism for the activities of FTA's National Research and Technology Program. The JPP is made operational through the selection of needs-driven innovations obtained from Periodic industry consultations. Consortium members provide a minimum of 50 percent of the costs, serving as an incentive for deployment and allows for retention of patent and intellectual property rights. Program participation is based on a competitive selection process, including industry participation in research topic selection.



FTA is increasingly entering into joint sponsorship with other Federal, State, and local government agencies, and consortia formed by system suppliers, transit agencies, national laboratories and universities. The objective of these partnerships is to increase competition and leverage scarce Federal funding. Examples of programs involving such partnerships are the ITS Program, funded through the DOT ITS Joint Program Office; the AATC project, sponsored by DARPA and cost-shared on a 50/50 percent basis with a consortium comprised of a transit agency and two equipment suppliers; the Demonstration of Universal Electric Transportation Subsystems (DUETS) program, likewise sponsored by DARPA and cost-shared on a 50/50 percent basis with an industry consortium; and the Fuel Cell Transit Bus Program, which includes substantial DARPA funding.

Some of the research and technology programs in the current National Transit Research and Technology Program are: the National Program, Transit Cooperative Research Program, University Transportation Center Program, Small Business Innovation Research Program, National Transit Institute and the Rural Transportation Assistance Program. Other FTA programs that support transit research and technology development, funded through methods not specifically designed as research and development funding mechanisms, are State Planning and Research, Metropolitan Planning, and Capital Assistance.

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

The Small Business Innovation Research Program (SBIR) is designed to use the nation's small high-technology firms as effectively

as possible to meet Federal research and development objectives and to stimulate the commercialization of innovative products and concepts. A primary goal of the program is to stimulate high-technology innovation within the small business community to enhance the nation's productivity and help the U.S. maintain its competitive leadership in the international marketplace. The SBIR Program is administered by the John A. Volpe National Transportation Systems Center, Research and Special Programs Administration on behalf of all DOT modal administrations. Research topics are selected to reflect FTA's current research needs and may include subjects related to the planning, operation, or management of transit service from technological innovations to improved techniques and procedures.

Accomplishing the goals of FTA's research and technology programs depends upon FTA's ability to form partnerships with public and private sector organizations willing to advance transit innovations and join in leading the innovation process. Many of the activities will require commitments of staff and funds from these sponsoring partners as well as from FTA and other federal agencies.

• • • • • WEB SITE ADDRESSES

Federal Transit Administration
<http://www.fta.dot.gov>

American Public Transit
Association
<http://www.apta.com/>

Community Transportation
Association of America
<http://www.ctaa.org/>

• • • • • FTA CONTACTS

Edward L. Thomas
Associate Administrator, Office
of Research, Demonstration
and Innovation
202.366.4052

Fleet Operations
Office Director
202.366.4991

**Equipment & Infrastructure
and Safety & Security**
Office Director
202.366.0212

**Professional Capacity
Building and Specialized
Customer Services**
Office Director
202.366.0235

Policy and Planning
Office Director (Policy)
202.366.4060

Office Director (Planning)
202.366.4984

October 1998

Federal Transit Administration
400 Seventh Street, SW
Washington, DC 20590