

FEDERAL HIGHWAY ADMINISTRATION

A RENEWED INTERNATIONAL FOCUS

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The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), calls for the Federal Highway Administration (FHWA) to participate in activities that will increase the U.S. highway community's access to innovative technologies and improve the nation's highway network. Although this appears to be a new direction for FHWA, its predecessors [the Office of Public Road Inquiries (OPRI), and the Bureau of Public Roads (BPR)], long ago promoted the international exchange of transportation-related information. Supported by data collected through a Department of State project to gather information on the status of European road construction methodologies and practices, Congress established the Department of Agriculture Office of Public Roads in 1893 (1, p. 518).

In 1901 OPRI Director Martin Dodge stated that there was much the United States could learn from other countries (2). Similar opinions were also expressed by BPR Chief MacDonald at the 24th Annual American Association of State Highway Officials (AASHO) Meeting in 1938 (3), and by former FHWA Administrator Thomas D. Larson in 1991 (4):

Our transportation network is our greatest economic asset. If we do not give it our best—and Europe's best—we will undermine our own success. Internationally, our ability to compete in the world markets is dependent on our ability to demonstrate our expertise. We are today a world leader in highway technology, but that reputation will slip, along with our competitiveness, if we do not expand our technology sharing,



1993 visit by John Cutrell, Director, Office of International Programs, FHWA (third from left); and Bert Schacknies, International Programs Officer, FHWA (second from right); to Russian Federation's Parliamentary Committee on Transport, Communications, and Space. Alexei Adrov (third from right) is Chairman of the Full Committee and former member of the Presidium of the Supreme Soviet.

in both directions, with the international community.

Establishing FHWA as a leader in the international highway transportation community is an area of emphasis for the agency. To achieve this end, it is pursuing activities mandated by ISTEA, Section 6003, that include

1. Searching abroad for technology to help solve domestic transportation problems,
2. Lending technical assistance to developing countries and countries in transition, and
3. Assisting U.S. industry to compete in the global marketplace.

These initiatives, grouped under the agency's International Highway Transportation Outreach Program, are guided by newly convened coordination groups made up of FHWA's research and technology offices, as well as the American Association of State Highway and Transportation Officials (AASHTO), the Transportation Research Board (TRB), the states, and the private sector.

To accomplish its goals, the agency has expanded its international participation. In addition to continuing its long-time commitment to the International Road Federation (IRF) and the Road Transport Research Program of the Organisation for Economic Cooperation and Development (OECD), FHWA joined the Permanent International Association of Road Congresses (PIARC) in 1989. FHWA has increased its participation in international cooperative research and development projects (entering into agreements with Japan, Sweden, and Finland, among others). The agency also continues to operate its visitor program.

Technical Assistance Efforts

During the past 60 years, FHWA's international initiatives centered on providing technical assistance to developing countries and those in transition. Known for its work to establish highway transportation networks in developing countries, FHWA has contributed to road programs in Kuwait, Saudi Arabia, the Philippines, and Turkey, and has played a major role in building the Pan American Highway system.

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FHWA's technical assistance efforts focus on program-wide and institutional issues rather than specific studies, highway projects, or problems. Generally such assistance is provided under government-to-government agreements. However, in some cases, a multilateral institution such as a regional development bank or the World Bank requests FHWA's assistance on a project development mission. Although ISTEA allows FHWA to fund foreign technical assistance projects, the main source continues to be funded by the requesting institution.

Technical Assistance to Russia

FHWA is funding a series of activities to extend technical assistance to the Russian Federation's Federal Highway Department (FHD). At FHD's request, FHWA will serve as its "senior technical advisor" in laying the groundwork for establishing the laws and institutions needed for a Federal-aid type highway program.

Activities envisioned by FHWA include providing FHD with advisors, analyzing its framework for institutional and legal needs, assisting in the formation of a competitive road construction industry, introducing U.S. concepts on leasing construction equipment, establishing training programs in the United States for Russian highway experts, and undertaking studies on how to demonstrate U.S. technologies in Russia.

ISTEA International Trade Corridor Study

The emerging economic integration of North America under the United States-Canada Free Trade Agreement and the proposed North American Free Trade Agreement (NAFTA) depends on improving highway transportation between the three countries.

Independent of NAFTA, a Congressional study to assess the existing and emerging multimodal trade routes and transportation subsystems among the United States, Canada, and Mexico is under way. The ISTEA International Trade Corridor study focuses on the borders, their approaches, trade corridors, and multimodal issues.

Conducted in response to ISTEA Sections 6015 and 1089, the study findings will be used to help determine the trans-

portation improvements needed to support economic growth. Overall, the project will assess and recommend specific steps to improve the multimodal transportation infrastructure among countries; increase efficiency of regional transportation networks, to increase transport productivity; use advanced technology to promote trade; and describe as appropriate new institutional arrangements for planning, designing, and implementing needed improvements.

International Highway Technology Scanning Program

"Scanning" is the term used by FHWA for the process of locating, acquiring, and disseminating technology or information. Scanning accelerates the development and implementation of advanced technologies and allows for a more efficient use of research funds.

FHWA's Scanning Program was developed to seek out innovative technologies from abroad. Involved in passive technology transfer activities for many years, FHWA readily sent U.S. technology overseas, but imported little technology for domestic use. Only recently, through its International Outreach Program, has FHWA actively set out to bring back foreign innovations and technologies. The desire to remain economically and technologically competitive has contributed to FHWA's change in focus. Participation in organized, large-scale technology exchanges with other advanced countries characterizes FHWA's International Highway Technology Scanning Program.

Through the Scanning Program, highway professionals and technical experts representing the public and private sectors travel abroad to scout for technologies with high potential for solving U.S. transportation problems such as those associated with intelligent vehicle-highway systems (IVHS), safety, environmental issues, pavement design, geotechnical engineering, and investment policy. The FHWA Technology Scanning Program serves as a vehicle for selecting, assessing, and importing technologies beneficial to the United States.

Two internal groups oversee the Scanning Program as well as other international activities carried out by the agency. The

International Coordination Board (ICB), chaired by FHWA Executive Director E. Dean Carlson, includes FHWA Associate Administrators as members. As an advisory committee, the ICB sets policy and establishes program objectives. A lower-tier group, the International Coordination Group (ICG) is responsible for reviewing and approving FHWA scanning activities and other ventures. The ICG and ICB work to identify technologies of interest to the U.S. highway community, evaluate findings, assist in their implementation, and generate agency-wide participation. Involving FHWA managers in the technology-exchange process ensures that the agency remains an active participant in technology exchange and implementation.

Ultimately, successful implementation is one of the primary objectives of FHWA International Technology Scanning Program. The experts sent abroad identify an implementation plan long before a scanning trip is begun. Narrowly defined technologies that can be implemented within the user community are treated differently from broader ones that require implementation at the institutional level.

The International Technology Scanning Program is made up of three components:

1. International technology reconnaissance and team visits, which place teams of federal, state, academic, and private sector experts in selected countries to investigate specific topics;
2. International technical cooperation and exchange, involving participation in committees, working groups, and conferences of international technical organizations dealing with highways and the exchange of experts to undertake in-depth investigations; and
3. International technical information management, studies to improve the acquisition and dissemination of foreign technical materials to the U.S. highway community.

International Technology Reconnaissance and Team Visits

A variety of scanning techniques are used to conduct the studies and report back on the findings. These include seminars and different types of scanning teams: reconnaissance, technical review, and manage-

ment. Published reports, workshops, and the use of pilot cities are several methods used to transfer new information.

Reconnaissance Scanning Teams

Composed of two members, these experts travel abroad to determine the state of the art or practice in a particular subject area. FHWA and the Minnesota Department of Transportation recently cooperated on a reconnaissance review to study pedestrian and bicycle safety in Scandinavia. As a result of that visit, a technical review team visited other European countries and a major demonstration project was developed. Minnesota volunteered the city of Hutchinson as a pilot city for a project to implement traffic-calming devices and auto-free zones that would further help integrate bicycle and pedestrian traffic into Hutchinson's transportation system. The project is cosponsored by the Minnesota Department of Transportation (DOT), FHWA, and the Finnish National Road Administration.

Technical Review Teams

Consisting of approximately six technical experts, technical review teams are made up of professionals from FHWA, state highway agencies, the research community, and the private sector. These reviews are performed to assess narrow technical areas where, based on the merit of the findings, implementation can be accomplished within the user community.

A recent geotechnology tour provided the U.S. highway community with access to research findings and implementation strategies for soil-nailing technologies. Undertaken in September of 1992, reviews of soil reinforcement techniques were conducted in France, Germany, and the United Kingdom. The estimated value of European research findings provided to the team significantly offset the cost of the scanning study. A detailed final report, *FHWA International Scanning Tour for Geotechnology, September–October 1992: Soil Nailing Summary Report* (5), is now available and Demonstration Project No. 82: Soil Nailing, is currently under development by FHWA.

Intermodal planning was the study topic for a team examining various aspects of the European Community's complex, capital-



Painted signs and contrasting pavement texture separate bicycle from pedestrian traffic beside road in Helsinki, Finland.

intensive intermodal freight systems and facilities. The summary report will be available in early 1994.

Management Teams

Consisting of 15 to 20 high-level managers and technical experts, management teams are made up of upper-level staff from government and industry, as well as technical experts from the field of study. These large teams look at broader program issues requiring major management decisions to implement a change of direction in the area being studied. Areas requiring institutional change for implementation include design philosophy and creative approaches to highway program management.

Management team studies include the 1990 European Asphalt Study Tour and the 1992 U.S. Tour of European Concrete Highways (6), as well as the recent study of requirements and practices concerning construction quality and performance.

Ongoing and Future Scanning Studies

Several other scanning studies are planned or under way. These include the National Personal Transportation Review, a study to investigate survey methodologies and approaches used abroad (in preparation for the United States' 1995 National Personal Transportation Survey) and Advanced Technology Applications, a review of technologies such as robotics. Also included

are Pavement Design Relationships to Truck Suspensions and Safety Management, a look at safety audits. Future scanning studies will address laboratory facilities and capabilities abroad and methods used in other countries to market advanced highway-related technologies.

The International Highway Technology Scanning Program has yielded major insights into promising technologies and methods for improving our nation's institutional structure. European technologies used in asphalt and concrete pavements, soil stabilization, and pavement condition assessment, for example, are being used in U.S. demonstration projects. The benefits from these findings alone have made the scanning program a cost-effective and timely use of available resources. The alternative to international technology scanning involves more expensive, risky, and time-consuming research, development, and demonstrations. It costs less to borrow technology than to create it.

Technical Cooperation and Exchange

To successfully transfer practices from abroad, United States technical experts must develop professional relationships with their counterparts. Adopting innovative practices requires both endorsement by key U.S. highway professionals and the

support of international experts. FHWA promotes such relationships by working with international organizations, developing exchange agreements, and establishing regional technology exchange centers.

International Technical Organizations

FHWA is active in the two primary international technical organizations that concern highways: PIARC and the Road Transport Research Program of OECD. Through participation in these organizations, FHWA remains informed of the most pressing road transport issues facing the United States and other member countries. Membership also provides opportunities to learn about the latest innovations in other advanced countries at very little cost. The savings are particularly dramatic when compared with efforts to duplicate the research and new technologies domestically.

PIARC works through 18 standing technical committees and working groups that address, among other issues, road surface characteristics, technology exchange, tunnels, pavements, economics and finance, safety, environment, natural disasters, IVHS, and heavy freight vehicles. The United States has members (selected from FHWA, AASHTO, state highway agencies, TRB, the Strategic Highway Research Program, and the academic community) on all but one of the 18 committees. In addition, 4 of the committees [Heavy Freight Vehicles, Surface Characteristics, Modern Traffic Control and Management (IVHS), and the PIARC Winter Roads Congress] are chaired by the United States. The FHWA Administrator is charged with representing U.S. interests in PIARC.

In contrast to PIARC, OECD has no standing committees. Its working method consists of forming ad hoc international expert groups that are dissolved after completing their work (a work period generally lasts about 18 months). Topics are selected for study after consultation with the PIARC Secretariat to prevent overlap between the work programs of the two organizations. Currently, topics addressed by the expert groups include advanced logistics and road transport, environmental impact assessments of roads, roadside noise abatement, resource allocation for road maintenance and rehabilitation pro-

grams, congestion control and demand management, repair of bridge substructures, and training for truck drivers. The Department of Transportation is represented on the OECD's Road Transport Research Program Steering Committee by a member of the Office of the Assistant Secretary for Policy and International Affairs. The TRB Information Services Manager represents U.S. interests on the Operational Committee of the International Road Research Documentation (IRRD) data base. Another continuing OECD committee is that which operates the International Road Traffic and Accident Database (IRTAD).

Member countries of the OECD take part only in those groups of interest. FHWA chairs 2 of the 15 ad hoc expert groups in which it participates. The strengths of this working method are its flexibility in addressing the most urgent topics of the day and the exposure given to the large number of federal and state experts able to participate in expert groups that come and go.

Research and Technology Cooperation Agreements

FHWA cooperative activities bring world experts together to solve problems in mutually agreed-upon technical and research areas. Highway professionals from the United States are working with their counterparts in many other countries, including Japan and Sweden.

In May 1992 FHWA and the Japan Ministry of Construction concluded an Implementing Arrangement for cooperation in road-related activities. FHWA Executive Director E. Dean Carlson led the first U.S. technical delegation to Japan. FHWA and Japan's Public Works Research Institute agreed to work together on IVHS, safety, earthquake engineering, environmental issues and highway noise, long-term pavement performance, and bridge-coating materials.

During a 1992 visit to Sweden, a delegation of FHWA and Minnesota DOT experts signed a Memorandum of Understanding (MOU) for technical cooperation. The parties agreed to cooperate in the areas of pavement performance; highway safety; and highway planning, design, construction, and maintenance.

A 1992 MOU for technical cooperation

was also signed with the Finnish National Road Administration to establish an international technology exchange center.

International Developmental Exchange Program

FHWA International Developmental Exchange Program places highway professionals in foreign road administrations experienced in key technical areas. Those assigned are encouraged to participate in seminars or workshops held in other near by countries. For FHWA, the International Developmental Exchange Program increases the level of technical expertise available in the agency and helps cultivate a broader international perspective.

Regional Technology Exchange Centers

FHWA is working with its counterpart countries to establish regional highway technology exchange centers that will facilitate the dissemination of technical information on an international level. The first of these centers was established in Finland and another is anticipated for Australia.

Modeled on the Local Transportation Assistance Program (LTAP) Technology Transfer (T²) Centers, the regional International Technology Exchange Centers (ITECs) will serve as focal points for acquiring foreign technologies, promoting U.S. expertise abroad, and increasing the transfer of U.S. technologies to other countries.

As part of its responsibilities to such a center, FHWA will provide technical information on U.S. highway technologies, research findings, and training and demonstration materials. The host country will reciprocate by making accessible its research findings and implementation materials, as well as those of the surrounding countries. Training courses and seminars will be opened to participants in all of the involved countries, and demonstration projects, jointly developed by the United States and participating countries, will showcase highway technologies and expertise.

Countries with advanced highway programs and established relationships with neighboring countries are sought as coop-

erative partners in the regional technology exchange effort. (See Figure 1 for a model of an FHWA regional center concept.) The technology exchange center functions as a central point for collecting and distributing information from FHWA, the National Road Administration of the country hosting the center, neighboring countries, research institutes, and the private sector.

In the United States, technical information gathered through ITEC centers will be circulated to the highway community through FHWA, state DOTs, and LTAP T² Centers. ITEC centers will likewise distribute information to the various highway agencies within the region.

Along with a project-specific work plan, each ITEC center is assigned the same basic tasks as the LTAP T² Centers. These include sharing technology, publishing and distributing a newsletter, self evaluation, training, and cooperating on demonstration projects.

The regional international exchange concept has the potential to strengthen highway networks both in the United States and elsewhere by providing highway practitioners and researchers with access to new, implementable ideas and information.

FinnT²

The International Exchange Center in Finland, FinnT², was established by MOU in May 1993. FHWA and the Finnish National Road Administration (FinnRA) will cooperate on training activities and technology exchange. The United States stands to benefit from Finnish cold-weather maintenance and materials applications. In addition to exchanging high-level technologies, FHWA and FinnRA will provide technical assistance to the Baltic countries of Lithuania, Latvia, and Estonia.

Technology transfer centers have been established in each of the Baltics. Through FinnT², FHWA and FinnRA will cooperate in providing training in priority areas such as maintenance, rehabilitation, safety, and quality control. In cooperation with the International Road Federation, FHWA will also help sponsor academic study programs for highway engineers from Lithuania, Latvia, and Estonia. Currently, an Estonian engineer is participating in a study program at the University of New Hampshire.

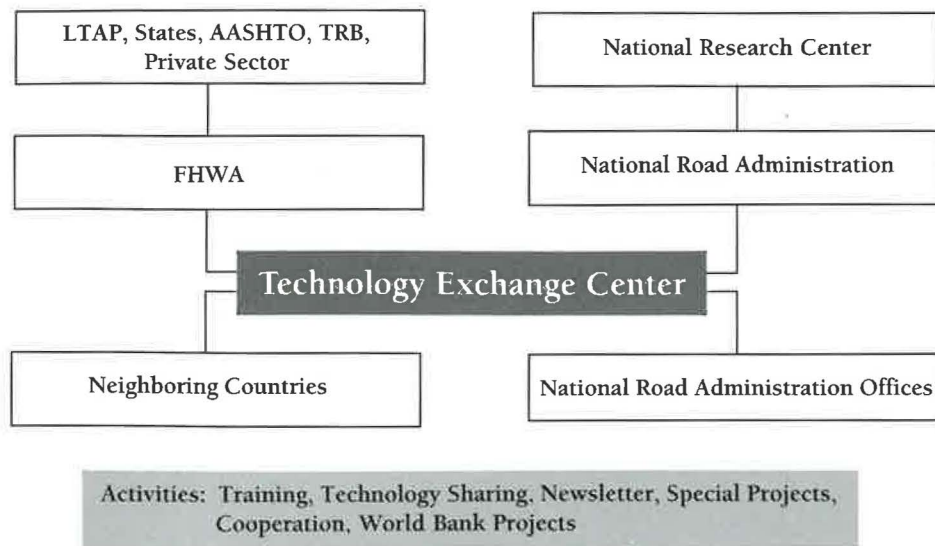


FIGURE 1 Technology Exchange Center concept.

Technology Exchange with Canada

Four of FHWA's northern Regional Offices are working with Canada in an attempt to encourage more technology exchange activities with the provinces of Alberta, British Columbia, Ontario, and Quebec. The Alberta Transportation and Utilities Department (Alberta's highway department) has agreed to exchange information with the bordering U.S. states. In addition, the participants will inform each other of conferences, demonstration projects, and training that may be of mutual interest. Alberta Transportation and Utilities has been placed on the LTAP mailing list and will receive the same newsletters, technical publications, and information received by the LTAP centers. Alberta will reciprocate by providing the United States with copies of its newsletter and research reports.

Pan American Institute of Highways

At the request of the Pan American Highway Congress (PAHC) of the Organization of American States, FHWA helped develop, organize, and nurture a network of technology transfer centers to serve Latin America. In light of FHWA's experience in creating the LTAP Centers, the agency was given the lead in organizing the network known as the Pan American Institute of Highways (PIH). PIH currently houses its headquarters within FHWA's National Highway Institute which, because of its leadership position in

training and technology transfer, plays an important role in selecting, adapting, and implementing technology in Mexico, Central America, South America, and the Caribbean. Currently, the PIH network contains 36 technology transfer centers.

Technical Information Management

The International Technical Information Management program focuses on improving the U.S. highway community's acquisition of foreign technical information. A study entitled "Advanced International Scanning for Highway Technology," is under way to determine the needs of the U.S. highway transportation community for foreign technical information. The study will analyze the existing means by which foreign technical materials are made available to the U.S. highway community, conduct an inventory of the technical materials produced by foreign highway transportation organizations, and assess their availability to the U.S. highway transportation community.

The gathered information will be used to provide FHWA with specific recommendations for improving the acquisition and dissemination of foreign transportation-related technical materials, particularly those dealing with state of the practice,

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TRB International Activities

The Transportation Research Board's international functions include cosponsored international conferences, annual meeting sessions, and other standing committee-sponsored activities.

Since 1968 TRB has exchanged information monthly with OECD's International Road Research Documentation (IRRD) data base. The English-language records of European, Canadian, Australian, and other research information obtained through this exchange program are made available worldwide through TRB's Transportation Research Information Services (TRIS) data base. Updates to the highway research component of TRIS are provided to IRRD for inclusion in that data base for dissemination to international highway researchers.

TRB cosponsors international conferences with other organizations such as PTRC Education and Research Service, Ltd., in England; VTI in Sweden; and the IRF, with headquarters in Washington, D.C., and Geneva, Switzerland.

In addition, many sessions at the TRB Annual Meeting are devoted to international themes, often highlighting the current research and transportation concerns of individual countries. Each year the Committee on International Activities sponsors an **International Roundtable** to provide a forum for international participants to gather and discuss matters of common interest. Last year's Roundtable topic was the impact of European integration on transportation policies.

Two of TRB's 180 standing committees specifically deal with international issues:

the Committee on International Activities and the Committee on International Trade and Transportation. Other committees have active international programs, and TRB has encouraged greater participation by individuals from outside the United States by creating four designated slots on each committee for international members.

The TRB Executive Committee has a direct interest in international issues and has conducted special meetings to review specific areas, such as the transportation problems facing Russia, to identify potential TRB initiatives.

Many of TRB's cooperative research projects include tasks to review, evaluate, and in other ways consider technology advances made outside the United States. Two major projects are geared specifically to learning from abroad.

Highway authorities worldwide share many common concerns in planning, design, construction, operation, and maintenance of highway systems. Recognizing that the potential benefit from information sharing and technology transfer is great, a new National Cooperative Highway Research Program project, **Highway Research Technology—International Information Sharing**, was established in 1993 by AASHTO. The primary objective of this project is to develop and promote a program for a sustained international information exchange that allows state highway agency participation. Project efforts have already led to the participation of several state highway agency professionals in international committees and study tours

and provided the means for allowing foreign experts to inform U.S. transportation officials about foreign developments. The project will also provide a clearinghouse to help disseminate gathered information to interested parties within the public and private sectors to allow better and expedited use of applicable findings.

The importance of international experience for the urban mobility manager is obvious, yet cannot be overstated. In a global economy, the exchange of information between the United States and other countries is essential. In recognition of these needs, the Transit Cooperative Research Program has established an **International Transit Studies Program** to provide an added dimension to the professional development of urban mobility managers. The program will consist of focused study tours and support for participating in international conferences and committee meetings. It is intended to be an ongoing program, with an anticipated funding of \$250,000 per year for three years with option for renewal. Based on technical merits of the proposals received in an open competition, the ENO Transportation Foundation, Inc., located near Washington, D.C., has been selected to manage this educational program.

TRB also manages three programs supporting Innovations Deserving Exploratory Analysis (IDEA). These IDEA programs, NCHRP-IDEA, Transit-IDEA, and IVHS-IDEA, actively solicit proposals internationally. A category of special interest includes innovative concepts developed elsewhere and not yet applied in the United States.



Four-lane highway in Lithuania linking Kaunas to Klaipeda on the Baltic Sea.



GILLERAN, FHWA

Pedestrian refuge island in Odense, Denmark, is safety feature in a country that encourages walking.

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procedures and policies, innovations, and research in progress.

Since 1968 FHWA has supported the bilateral exchange of information between TRB's Transportation Research Information Services (TRIS) data base and OECD's IRRD database. Together, TRIS and IRRD represent the most comprehensive sources of both domestic and international highway research information available. FHWA has also encouraged the joint development of a computer-readable compact disk (CD-ROM) containing the entire TRIS, IRRD, and TRANSDOC data bases. TRANSDOC is a transportation economics data base produced by the European Conference of Ministers of Transport in Paris. The CD-ROM is planned for mid-1994 availability. The results of the FHWA analysis of domestic requirements for international highway information will be used to supplement the information currently available from TRIS, IRRD, and TRANSDOC on completed international highway research.

Private Sector Support Program

FHWA programs to support private sector competitiveness and promote U.S. goods and services in foreign markets work to increase national economic growth. Program objectives include maintaining a competi-

tive highway industry in the United States and abroad, and working to eliminate transport sector subsidies.

International Promotion of U.S. Road-Related Goods and Services

FHWA is conducting a two-phased study on the promotion of U.S. road-related technology. During the first phase, the study will determine the private sector's interest in jointly promoting its road-related goods and services and will estimate their potential global market. The second phase will inform FHWA on how it can most effectively participate in promoting the technology internationally. An advisory panel formed to guide the contractor and review materials produced during the study includes five representatives from private sector firms involved in international marketing of road-related goods or services and two senior government officials.

Argentine-Uruguayan Binational Commission

At the request of the Argentine-Uruguayan Binational Commission, FHWA assisted in determining the economic feasibility of a 55-km bridge across the Rio de la Plata. Linking Buenos Aires, Argentina, to Colonia, Uruguay, the project is considered a critical link in the Pan American Highway System. The proposed bridge would form part of an interregional trade corridor reaching from Valparaiso, Chile, to Sao Paulo, Brazil. The privately financed toll facility is considered the principal trade corridor within the MERCOSUR, a free-trade zone similar to that proposed in NAFTA.

Conclusion

Although FHWA (along with its predecessors) has participated in international projects since its earliest days, the extent of the programs in which the agency is currently involved is unlike anything that has occurred in the past. Having reached the end of the Interstate era, the agency, in redefining its responsibilities to the states, has taken a stronger role in the international arena. This includes participating in global networks to provide developing countries with an active flow of much-needed technical information and im-

proving the U.S. highway transportation system by importing new and innovative technologies from abroad. Working closely with partners such as AASHTO, TRB, PIARC, OECD, and IRF, FHWA is actively seeking out new technologies and innovations of benefit to the United States.

In doing so, FHWA has come full circle since the late 1800s, when the United States sought outside its national boundaries for technical inspiration. One hundred years later, FHWA is looking to other countries for innovations in key technical areas.

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Pedestrian crosswalk on popular scenic road in Helsinki, Finland, doubles as traffic-calming speed hump.