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**Metrication of Roadside Hardware**  
*by Malcolm H. Ray*  
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The recently updated *Guide to Standardized Highway Barrier Rail Hardware* contains some important recommendations regarding metrication of roadside safety hardware.

**Performance of Epoxy-Coated Prestressing Strands at Elevated Temperatures**  
*by Glenn A. Washer*  
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The findings of a recent series of experiments to determine the temperature at which epoxy softening causes slip, the effect of slip on the stress in the strands and the transfer length, and the effect of cyclic temperature variations are summarized.

**The Local Technical Assistance Program: Key Areas of Accomplishment**  
*by Patsy Pratt Anderson*  
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A recent survey of local transportation officials in 39 states reveals the most beneficial aspects of this technology transfer program.

**Fifteen Years of HPMS Partnership: Accomplishments and Future Directions**  
*by Norman C. Mueller*  
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The Highway Performance Monitoring System helps measure the investment accountability of vast amounts of public funds; provides a variety of information to Congress for evaluating highway programs and funding; and serves the analytical needs of FHWA, the transportation community, business, industry, and the general public.

**INTERCHANGE: Global Road Transport Knowledge Exchange Network**  
*by Ray G. Griffith*  
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INTERCHANGE, which is to be operational by September 1995, will make available to road professionals throughout the world a vast storehouse of technical, managerial, and policy-related information.

**Metric Conversion - How Soon?**  
*by David Smith*  
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More than 200 years after the metric system began to spread throughout the world, the United States shares the dubious distinction with Burma and Liberia as one of only three nations that has not converted to the modern metric system. FHWA is trying to rectify this situation.

**The Top Truck and Bus Safety Issues**  
*by Stan Hamilton*  
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The first Truck and Bus Safety Summit in Kansas City, Mo., recently identified the 17 most significant truck and bus safety issues.
Bridge Research: Leading the Way to the Future
by James D. Cooper and Eric Munley .................................................................23
Research is an essential and substantial part of the nation's investment in highway bridges.

Crossing the Delaware!
by Mike Britt, W. Denney Pate, and Lou Triandafilou ........................................28
A unique combination of contractor prequalification, design preparation, structural details, and precast concrete segmental construction was used to build the Delaware state Route 1 bridge over the Chesapeake and Delaware Canal.

TransGuide Leads the Way in Innovative Transportation Management
by Vincent P. Pearce ........................................................................................................35
TransGuide is San Antonio’s new state-of-the-art traffic management system that emphasizes intermodal/interagency cooperation and innovation in technology and procurement.

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California’s Temporary Freeway Bridge
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When a bridge recently collapsed, Caltrans used an innovative temporary bridge to reopen the route in only eight days.

Navigating the Future
by James A. Arnold ........................................................................................................4
Navigation and positioning technologies are being revolutionized by the Global Positioning System (GPS). GPS has applications in every area of transportation.

Vehicle Compatibility With Roadside Safety Hardware
by Jerry A. Reagan ........................................................................................................11
Many issues must be resolved in the development of design and evaluation methodology for roadside safety structures.

Advantage I-75 Prepares to Cut Ribbon on Electronic Clearance
by Joe Crabtree .............................................................................................................16
Advanced technologies allow trucks to have their weight and credentials checked electronically at highway speeds, eliminating the need to stop at multiple weight station along the I-75 corridor.

Pacific Rim TransTech Conference ...........................................................................22
The PacRim Conference attracts more than 1,700 participants from more than 50 countries to take "A Ride Into the Future."

TQM: It Really Works!
by Mark Chatfield .......................................................................................................24
The Federal Lands Highway Office uses total quality management to improve efficiency for six consecutive years.

Lessons From the Kobe Quake
by Jim Cooper and Ian Buckle ....................................................................................28
American and Japanese engineers cooperate so that they learn from each other’s experiences, and the lessons of the Kobe earthquake in January 1995 have much applicability in the United States.

Rewarding Environmental Excellence
by Ginny Finch .............................................................................................................38
Projects in seven states are selected by FHWA to receive the first Environmental Excellence Awards.
Roundabouts: A Direct Way to Safer Highways
*by Leif Ourston and Joe G. Bared*

The superior safety record of modern roundabouts in Western Europe is attracting attention in the United States.

No. 3, Winter 1996

A Revolution in Winter Maintenance
*by Brian Chollar*

Where in the past, states focused their energies and resources on deicing wintry roads, new technologies stress preventive anti-icing measures.

New Links to South Africa

FHWA’s Office of International Programs and the National Highway Institute are actively involved in a cooperative, technology transfer program with the Republic of South Africa’s Department of Transport.

Demonstration Project 93 - Making the Most of Today’s Technology
*by John McCracken*

This project encompasses the joint efforts of 25 U.S. and foreign manufacturers who have formed partnerships with FHWA to promote and demonstrate the latest available technology to state and local jurisdictions.

Narrow-Gap Improved Electroslag Welding for Bridges
*by Krishna K. Verma*

Demonstration Project 102 is designed to transfer a new advanced welding technology to state transportation agencies and bridge fabricators.

“Attention Motorists ... The Bats Have Landed on our Bridge!”
*by Paul Garrett*

Austin, Texas, has adopted the largest urban colony of bats in the world, roosting between the beams of the Congress Avenue Bridge, and publicizes the bats as a tourist attraction.

A Living Memorial
*by Bonny Falk and Bob Bryant*

FHWA has dedicated a memorial marker and grove of 11 Oklahoma redbud trees at the Turner-Fairbank Highway Research Center in homage to the 11 FHWA employees who lost their lives in the April 1995 bombing in Oklahoma City.

Linking the Delta Region With the Nation and the World

FHWA is publishing a report about the progress achieved in transportation and employment in the Lower Mississippi River area from 1990 to 1995 and about transportation improvement as a key to continued economic development in the area.

The National Highway Designation Act of 1995

On Nov. 28, 1995, President Clinton signed this landmark legislation, which designates 260,000 kilometers of roads as the National Highway System (NHS). NHS is going to be the backbone of our national transportation network.

The National Highway Institute: A 25-Year Record of Achievement
*by Charles Barton*

The National Highway Institute, 25 years old in 1995, has become highly esteemed both at home and abroad for its role in technology transfer and as a vital provider of highway technology to the national and international highway communities.

The CONMAT Initiative: Charting an Innovative Path to the Next Century
*by Harvey M. Bernstein and Richard A. Belle*

In August 1995, 11 different basic construction material (CONMAT) groups formally joined forces to take on the task of creating the high-performance construction materials and systems for a revitalized infrastructure capable of
withstanding the demands of the next century.

**Aerodynamic Design of Highway Structures**  
*by Dryver R. Huston and Harold R. Bosch*

FHWA is developing improved design and retrofit methods and educating designers in the use of modern methods.

**No. 4, Spring 1996**

**The National Highway System: A Commitment to America’s Future**  
*by Rodney E. Slater*

The National Highway System is the centerpiece of the Federal Highway Administration’s commitment to provide a safe, modern, and efficient transportation system to serve the American people, and it is the backbone of our nation’s 21st century transportation system.

**Road Tours: Reaching Out to the People**  
*by Evelyn Fierro*

Since April 1994, FHWA leaders have traveled 80,000 kilometers, coast to coast and border to border, to meet with thousands of people who use, construct, maintain, and manage our transportation system.

**The National Highway System Designation Act of 1995**  
*by Nancy Bennett*

This article is a summary of the major provisions of the NHS Designation Act, including system designation, safety, motor carrier programs, funding and innovative financing, mandates and requirements, and other provisions.

**Economic Importance of the National Highway System**  
*by Thomas P. Keane*

The signing of the NHS Designation Act released $5.4 billion in federal-aid highway funds targeted to NHS. In addition, there are direct, indirect, and induced employment and financial benefits.

**The Future FHWA**  
*adapted from several FHWA sources*

FHWA is “building on the past with an eye to the future” by taking a proactive stance to anticipate and meet the nation’s burgeoning transportation needs.

**Technology for Work and Travel**  
*by William Zaccagnino*

FHWA is using available technology to ensure a future with a high-tech transportation network that meets our transportation needs, supports our national defense, provides economic growth, and adds to the quality of life in the United States well into the 21st century.

**“Find the Good and Praise It”**  
*adapted from an FHWA report*

This article highlights some of FHWA’s significant program accomplishments since June 1993.

**The Secretary’s Highway Safety Action Plan**  
*by Frederick G. Wright Jr.*

This plan is a series of actions, some ongoing and some planned for the future, that addresses some of the specific safety issues of the NHS Designation Act and the emerging state responsibilities in the federal-state partnership in highway safety.

**The National Highway System -- Financing Its Future: The Role of Innovative Finance**  
*by Jane F. Garvey*

Congress in the National Highway System Designation Act of 1995 enacted a number of improvements in the
way the states and others may finance NHS and other transportation infrastructure. Collectively, these provisions are termed “innovative finance.”

**Milestones for U.S. Highway Transportation and the Federal Highway Administration**

*compiled by Richard F. Weingroff*

This is a time line of significant events in the history of highway transportation in America from 1892 to the present.

**FHWA’s Quality Journey**

*by Fred Jones*

Deeply imbedded in the tradition and core values of FHWA is the commitment to provide the highest quality services to our partners and, together with them, to deliver the very best highway transportation system to the nation. NHS is going to provide the future focus for applying quality improvement ideas, practices, approaches, and new technology.

**A New Face for FHWA in a New Era**

*by David Smith*

An effort to broaden and diversify the FHWA work force, particularly in senior management positions, is playing a significant role in ensuring that FHWA efficiently meets its operational requirements and maintains a highly effective and motivated work force.

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Federal Aid Road Act of 1916: Building the Foundation
by Richard F. Weingroff.................................................................2
The Federal Aid Road Act of 1916 established the federal-aid highway program that transformed America’s roads from alternately dusty and muddy trails to the most advanced and comprehensive road network in the world.

From 1916 to 1939: The Federal-State Partnership at Work
by Richard F. Weingroff.................................................................7
The period following World War I and through the 1920s was a golden age for road building, and although the federal-aid highway program felt the impact of the Great Depression in the 1930s, it was during this decade that the master plan for a system of interregional highways was developed.

Federal-Aid Highway Act of 1956: Creating the Interstate System
by Richard F. Weingroff.................................................................10
This article explains the development of the interstate network from the initial master plan of 1939 to the 1956 act that created the National System of Interstate and Defense Highways.

Three States Claim First Interstate Highway
by Richard F. Weingroff.................................................................18
Whether Missouri, Kansas, or Pennsylvania should be credited with the first interstate highway depends on how “first” is defined.

Poetry of the Open Road
by Tamara Broberg
Poets have long recognized the parallels between roads and life and have used roads in both the literal and metaphorical senses to express their insights to our culture.

Artists Look at Roads
by Richard F. Weingroff.................................................................22
Art, as well as movies and poetry, is another form of cultural expression that “captures” the omnipresence of roads in our surroundings.

Local Government Highway Finance Trends, 1984-1993
by Leonard S. Goldberg .................................................................24
This article gives a brief historical overview of local government highway finance trends from 1921 to 1983, takes a closer look at the data from 1984 to 1993, and illustrates the important role played by local governments in the arena of public sector highway financing.

Engineering Marvels
The Dwight D. Eisenhower System of Interstate and Defense Highways has been called one of the “Seven Wonders of the United States.” This article discusses a few of the extraordinary sections of the system.

Atlanta to Showcase ITS Traveler Information
by David F. Williams.

The Traveler Information Showcase in Atlanta this summer is a $14 million partnership of federal, state, and local agencies and the private sector to provide the most complex, integrated transportation management and travel information system in the United States.

Condition and Performance of the Interstate System? After 40 Years
by Clifford M. Comeau

The interstate system has been incredibly successful. Consequently, the reliability of the system and the preservation of its physical assets are key policy and programmatic concerns for the entire transportation community.

Road Movies
by Richard F. Weingroff

Roads are so much a part of our lives that it is natural that automobiles and highways have played significant roles in hundreds of movies. This is a partial listing of films in which highway travel plays a prominent part.

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Eight Steps Toward a “Smarter” National Highway System
by Christine M. Johnson

The Federal Highway Administration has already begun to implement these steps to increase the capacity and efficiency of our existing highway systems.

Congestion Pricing: Reducing Traffic Jams Through Economics
by Ginny Finch

Congestion pricing is a promising concept for reducing gridlock on major highways during peak travel periods and for reducing congestion costs -- wasted fuel, air pollution, and travel delays.

Performance of Epoxy-Coated Rebars in Bridge Decks
by Jeffrey L. Smith and Yash Paul Virmani

Epoxy-coated reinforcing steel provides effective corrosion protection that can extend the service life of concrete bridge decks.

FHWA Launches New Nationwide Seismic Bridge Design Training
by James W. Keeley

“Seismic Bridge Design Applications” is FHWA’s new training course for practicing bridge/geotechnical engineers on “how to” apply the American Association of State Highway and Transportation Officials (AASHTO) seismic analysis and design requirements for different bridge types across the United States.

Aftermath of the Kobe Earthquake
by Hamid Ghasemi, Hisanori Otsuka, James D. Cooper, and Hiroyuki Nakajima

The lessons learned in the aftermath of the Hanshin/Awaji Earthquake in the Kobe, Japan, area on Jan. 17, 1995, have real relevance for the United States. The bridges in central and eastern United States within the seismically active New Madrid Zone are very similar to the types of bridges in the Kobe area, 60 percent of which were damaged by the earthquake.

WesTrack: The Road to Solutions
by Terry Mitchell

WesTrack, a new pavement test track in Nevada, uses four driverless trucks, operating about 20 hours per day, seven days a week, to apply load to its 26 test sections.
Test Roads: Designing the Pavements of the Future
by Terry Mitchell ............................................................................................................................................................................23
FHWA and a number of states and other partners are conducting pavement studies, using full-scale test tracks and machines that simulate traffic loads, to gain real-world experience that will result in improved roadway design and construction.

The Promise of High-Performance Concrete
by David C. Smith ..........................................................................................................................................................................27
The enhanced strength and durability of bridges that incorporate high-performance concrete (HPC) in beams, decks, and piers promise to reduce the lifetime cost and deterioration of these structures. To encourage further research and to promote the use of HPC, FHWA is showcasing HPC in regional events and demonstration projects in the eight states that have become active partners with FHWA by constructing or preparing to construct bridges with HPC.

Intelligent Transportation Systems in Japan
by Hideo Tokuyama ......................................................................................................................................................................37
In Japan, intelligent transportation systems are one of several essential elements in creating a global advanced information and telecommunications society.

Smart Road, Smart Car: The Automated Highway System
by Nita Congress ............................................................................................................................................................................42
The National Automated Highway System Consortium is making significant progress toward the development of an automated highway system that will combine intelligent transportation systems (ITS) technologies to maximize safety and efficiency and to reduce congestion and associated costs.

No. 3, Winter 1997
“Quality Journey” Update: Results That Make a Difference
by Margherita DiCenzo and Trish Day ........................................................................................................................................2
The Federal Highway Administration (FHWA) is on a “quality journey” to improve processes and procedures.

The Highway Safety Information System: Transforming Data Into Knowledge
by Jeffrey F. Paniati and Forrest M. Council ..................................................................................................................................4
HSIS provides information about the safety performance of the highway system and, more specifically, the effects that changes in highway design and operations have on safety.

Architects of Change: Creating America’s 21st Century Intermodal Transportation System
by Rodney E. Slater ...........................................................................................................................................................................10
The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was the first step in adapting our post-Interstate, 20th century transportation network to the demands of the 21st century. Now, through the process of developing the post-ISTEA legislation in 1997, this administration, Congress, and the transportation community are architects of change.

The National Highway System: A Commitment to America’s Future by Cheryl Hoffman and Lawrence Paulson 12
FHWA is well into the process of developing the post-ISTEA legislation that will usher the nation’s transportation system into the 21st century.

Keep the Good Times Rolling: ISTEA Success Stories
by Cheryl Hoffman and Lawrence Paulson ....................................................................................................................................17
There are many “success stories” to illustrate the immense impact of ISTEA.

Development of a Bridge Steel Database
by Glenn Washer and Greg Nelson ...............................................................................................................................................27
The Historic Bridge Steel Database consolidates information from various studies so that it can be widely used.

South Carolina Trooper Is Top Inspector
Trooper Alonzo Hutto comes out on top in a five-day, international contest to inspect commercial vehicles to detect mechanical defects and other vehicle and driver safety hazards.

Timber Bridges in the United States
by Sheila Rimal Duwadi and Michael A. Ritter

Historically, timber was the primary material for bridges. Thousands of timber bridges still exist today, and state and local authorities continue to build some bridges with wood.

Internet Watch
by Dick Stirba

This article introduces a new, regular feature in Public Roads; Internet Watch will track new and interesting developments in transportation resources on the Internet.

Geosynthetic Reinforced Soil Piers: A Bridge From the Past to the Present
by Doug Rekenthaler

A GRS pier at the Turner-Fairbank Highway Research Center was loaded to 9800 kilonewtons (2.2 million pounds force) and could have supported more.

Closing the Technology Gap
by David C. Smith

The state of the art in technology, in many cases, is well beyond the state of the practice in the U.S. transportation community. Addressing this “technology gap” is foremost in the minds of FHWA planners as reauthorization approaches.

Moving Forward Smartly: The Role of ITS in the NEXTEA
by Jeff Lindley

Intelligent transportation systems are essential tools for improving the nation’s transportation system in the next century. The post-ISTEA legislation must address the challenges and choices to accelerate ITS deployment.

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CMCRA: Where the Tire Meets the Road
by Dr. Brian Chollar and Dr. Mohammed Memon

New chemically modified crumb rubber asphalt eliminates many previous problems with the use of crumb rubber in pavements.

Highway Statistics
by Mary K. Teets

For 51 years, the Federal Highway Administration has been publishing Highway Statistics, and exhaustive database of U.S. highway statistical information.

ATMS Human Factors Experiments Produce Design Guidelines
by Nazemeh Sobhi and Michael J. Kelly

The designs of concepts, controls, and computer displays for Advanced Traffic Management Systems affect operator efficiency.

New Inventions and Patents

Three researchers at the Turner-Fairbank Highway Research Center are recognized for new inventions and patents.

Park Project Is a Paragon of Partnership
by Kevin M. Mentz, Eric Worrell, and F. Dave Zanetell

A rapid, coordinated, and cooperative response to a natural disaster averts an economic crisis in the area around Zion National Park.
High-Performance Materials: A Step Toward Sustainable Transportation
by Susan Lane, Eric Munley, William Wright, Marcia Simon, and James D. Cooper .......................................................... 19
High-performance materials promise a stronger, more durable transportation infrastructure.

FHWA’s Applied Highway Infrastructure Research Program on Composite Materials
by Martin W. Hargrave, Eric Munley, and Thomas J. Pasko ................................................................................................................ 23
FHWA has designated composite materials research as a high-priority research area.

Building the Bridge to the 21st Century With ... Aluminum?
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Aluminum offers the potential of long-term savings in new construction and of substantial savings and less traffic
delay in bridge deck replacement.

High-Performance Steel: Research to Practice
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High-performance steel possesses superior weldability and toughness compared to conventional steels in the same
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Structural Monitoring With GPS
by Keith Duff and Michael Hyzak ................................................................................................................................................ 39
Recent advances in GPS technology make it a cost-effective structural deformation monitoring tool to inspect bridge
safety and performance.

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A Preliminary Field Evaluation of Ultraviolet-Activated Fluorescent Roadway Delineation

A two-part study by the Federal Highway Administration (FHWA) shows that drivers can see ultraviolet-activated fluorescent roadway markings at a greater distance in comparison with standard roadway markings.

WesTrack: Putting ITS to Work
by Colin Ashmore and Terry M. Mitchell

The WesTrack Driverless Control System, which controls three driverless heavy trucks circling the WesTrack course at 65 km/h, is addressing issues that are very similar to the real-world requirements of an automated highway system.

Nondestructive Evaluation for Bridge Management in the Next Century
by Steven B. Chase and Glenn Washer

FHWA is sponsoring a large program of research and development in new technologies for the nondestructive evaluation of highway bridges.

Overcoming an Identity Crisis: The Intelligent Transportation Industry and ITS America’s National Awareness Campaign
by James Costantino

ITS America has initiated a campaign to elevate the awareness of intelligent transportation benefits among the general public, industry leaders, and public officials.

Demo ’97: Proving AHS Works

In August 1997, a proof-of-technical-feasibility demonstration will be conducted in San Diego to show that an automated highway system is a viable and practical option for meeting travel demands and enhancing mobility without building new highways.

Steel Bridge Coatings Research
by Robert A. Kogler Jr. and Shuang-Ling Chong

The FHWA’s High-Priority National Program Area for bridge coatings research aims to define the most cost-effective...
means of protecting steel bridges with durable coatings.

**NexTea**  
*by Cindy Burbank, Cheryl Hoffman, and Lawrence Paulson*  
Several versions of legislation defining the federal highway program and its budget are under consideration by Congress.

**Truckers Deliver a Piece of Their Mind**  
*by Stan Hamilton*  
About 200 truck drivers at seven “listening sessions” make known their views on how the hours-of-service regulations should be changed.

**Transportation Asset Management**  
*by Charles Nemmers*  
“Asset management” promises to be an important planning and decision-making tool to assist transportation officials to systematically maintain, upgrade, and operate physical assets, such as roadways and bridges.

**The Phoenix**  
*by Kathy A. Conrad*  
An Oregon artist sculptures life-size replicas of geese, swans, and cranes from trees removed to accommodate a highway expansion project.

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**The 3:16 Syndrome**  
*by Cynthia Burbank and S. Lawrence Paulson*  
The most controversial issue in the debate to develop a surface transportation authorization bill is how to apportion the funds among the states so that the “formula” will be acceptable to both houses of Congress.

**The National ITS Program: Where We’ve Been and Where We’re Going**  
*by Christine M. Johnson*  
The National Intelligent Transportation Systems Program is the foundation for an information and communications infrastructure that will enable the nation to develop a more efficient surface transportation system.

**The National ITS Architecture: A Framework for ITS Infrastructure**  
*by Lee Simmons*  
The National ITS Architecture is the centerpiece of the program for developing intelligent transportation systems.

**The Intelligent Vehicle Initiative: Advancing “Human-Centered” Smart Vehicles**  
*by Cheryl Little*  
The Intelligent Vehicle Initiative aims to accelerate the development, availability, and use of integrated in-vehicle systems that help drivers of cars, trucks, and buses operate more safely and effectively.

**ITS Is Already Paying Dividends**  
*by Maria Koklanaris*  
Many intelligent transportation technologies are already improving life for millions of drivers and passengers.

**Building Smart Infrastructure to Serve Travelers and System Managers**  
*by Jeff Lindley*  
A critical goal of the U.S. Department of Transportation (DOT) is the development of an intelligent transportation infrastructure that will enable ITS products and services to work as a powerful and effective team to save time and lives and improve the quality of life.

**The ITS Professional Capacity Building Program**  
*by Thomas F. Humphrey*
DOT has launched a five-year program to elevate the knowledge, skills, and abilities of surface transportation professionals to advance new technologies and programs.

**NHI Charts New Course for the Future**  
by Jacqueline M. Richardson

The National Highway Institute, a leading source of comprehensive technical training and educational programs for transportation professionals, is expanding its reach to other customer groups, designing courses to focus on learner results, and improving the effectiveness and quality of NHI services.

**Road Safety Audits: Scanning for “Gold” Down Under**  
by Michael F. Trentacoste

An American team visits Australia and New Zealand to learn about road safety audits, a process to identify potentially dangerous features of the highway operating environment.

**Interactive Highway Safety Design Model: Design Consistency Module**  
by Raymond A. Krammes

The Design Consistency Module is one of five modules of the IHSDM, an integrated system of modules that highway planners and designers can use to evaluate the safety of highway geometric design alternatives within a computer-aided design (CAD) environment.

**The Search for Optimal Asphalt**  
by Brian Chollar and Mohammed Memon

At the Turner-Fairbank Highway Research Center, research on chemically modified asphalts is an ongoing project that has already resulted in furfural-modified asphalt, compatibilized crumb rubber asphalt, and chemically modified crumb rubber asphalt.

**No. 3, November/December 1997**

**“... From Dense Ignorance and Otherwise”: A Not Entirely Serious Look at America’s 100 (Plus) Years War with Europe**  
by Richard Weingroff

For more than 100 years, the United States and Europe have waged a friendly competition to build the best highways.

**FHWA’s International Technology Scanning Program**  
by Robert A. Ford and Donald A. Symmes

The program looks throughout the world for the best and most appropriate technology, management practices, and research that can be cost-effectively adapted to programs in the United States.

**New CVO Technologies Hit the Road**  
by Nels Ericson

The “Technology Truck” is part of a program to inform state and local decision-makers about the state of the art in commercial vehicle technologies and the benefits of the Federal Highway Administration’s (FHWA’s) Intelligent Transportation Systems (ITS)/Commercial Vehicle Operations (CVO) Program.

**Puttin’ on the RITS**  
by Michael Kulbacki

The Colorado Department of Transportation, in cooperation with FHWA, instituted a series of initiatives to develop a rural ITS (RITS) program.

**The ARTS Compendium: FHWA’s Electronic Rural ITS Project Tracking System**  
by Galina Belfor, Lee-Jane Chen, Charles Liu, Paul Pisano, and Eileen Singleton

FHWA created the Advanced Rural Transportation System (ARTS) Compendium as a tool to track current technology applications related to rural areas and to help identify areas in need of further research and field testing.

**The Current Status of ITS in Japan**
The people of Japan look to intelligent transportation systems to solve pressing traffic problems.

**Actual Hands-off Steering? And Other Wonders of the Modern World**  
*by Bob Bryant*

Demo '97, the demonstration of the technical feasibility of automated highway systems (AHS) technologies by the National AHS Consortium, was a huge success.

**Where Flowers Bloom, So Does Hope**  
*by Bob Bryant and Bonnie L. Harper-Lore*

On Aug. 27, 1997, U.S. Secretary of Transportation Rodney E. Slater dedicated a roadside native wildflower garden in honor of Mrs. Lyndon Johnson.

**Utah’s I-15 Design-Build Project**  
*by Roy O. Nelson*

The largest single design-build highway contract in the United States provides for the reconstruction of I-15 through the Salt Lake City metropolitan area in time for the 2002 Winter Olympics.

**Three Years Later and Exceeding Expectations: Highway Innovative Technology Evaluation Center (HITEC)**  
*by Peter Kissinger and Nicole Testa*

Created three years ago as a first-stop service center to speed the introduction of innovative technologies into the highway marketplace, HITEC has filled an unprecedented role in the highway community.

**Wetland Mitigation: An Early Effort**  
*by Cheryl M. Nash and Morgan Cotten*

An award-winning wetland compensation project in Illinois is now a model for similar wetland mitigation in the Midwest.

**No. 4, January/February 1998**

**Surface Transportation and Global Positioning System Improvements: L5 and DGPS**  
*by James A. Arnold*

The two primary improvements to GPS — L5, the second civilian GPS downlink frequency, and Differential GPS — have significant applications for surface transportation.

**Sticking With ROSAN**  
*by Maria Koklanaris*

The Road Surface Analyzer (ROSAN) will completely change the way engineers and technicians characterize pavement.

**One LTAP Strategic Plan Implemented 57 Ways**  
*by Anna K. Bennett*

The Local Technical Assistance Program has produced a strategic plan to be administered by 57 different LTAP centers.

**FHWA’s Photometric and Visibility Lab**  
*by John Arens and Mark Reilly*

The P&V Lab conducts studies on light, color, and retroflection to measure the retroreflectivity of traffic control devices and fluorescent materials and the proper visibility of signs under diverse driving conditions.

**Be ALERT for Efficiency and Safety**  
*by Leslie Busler*

Advanced Law Enforcement Response Technology (ALERT) enables police and other public service officers to cut data-collection time at the scene of a crash or traffic violation by 20 percent to 50 percent.
The Human Factors Field Research Vehicle: FHWA Takes Its Show on the Road  
*by Doug Rekenthaler Jr.*

This vehicle enables researchers to collect a wide variety of driver-related data in real-world driving conditions.

FHWA Forms an Extended Superpave Technology Delivery Team  
*by Gary Henderson*

The formation of this team to provide overall Superpave program coordination and oversight marks an expansion of FHWA resources devoted to Superpave field implementation.

FHWA’s New Leaders Have Strategic Vision  
*by David Smith*

FHWA begins 1998 with a new federal highway administrator and a new strategic plan.

The Garrett A. Morgan Program: Shaping the Future of Transportation  
*by S. Lawrence Paulson*

The Morgan Program encourages and prepares today’s students for future careers in transportation.

Welfare Reform and Transportation: There Is a Connection  
*by Carol Harbaugh and Theresa Smith*

FHWA seeks to remove the barrier of transportation access for welfare recipients and members of the working poor.

Federal Cost Allocation Study  
*by James W. March*

The first federal highway cost allocation study since 1982 evaluates the equity and economic efficiency of the federal highway user-fee structure.

No. 5, March/April 1998

Small Business Innovation Research Program  
*by Charles W. Niessner*

The Small Business Innovation Research Program stimulates small business innovation and meets federal research and development needs.

Soil Stiffness Gauge for Soil Compaction Control  
*by Scott Fiedler, Charles Nelson, E. Frank Berkman, and Al DiMillio*

FHWA teams with the Department of Defense’s Advanced Research Programs Administration to develop an easy-to-use portable soil stiffness gauge that will save time and money.

Strategic Highway Research Program: An Investment That Has Paid Off  
*by Michael Halladay*

The Strategic Highway Research Program resulted in more than 100 products developed to improve highway performance, durability, safety, and efficiency.

1999 Environmental Excellence Awards

FHWA announces the call for entries for the 1999 Environmental Excellence Award.

Sustainable Transportation: The Road from Kyoto  
*by Kevin Heanue and Susan B. Petty*

As a result of the 1997 Kyoto Conference, our nation explores options to reduce the consumption of fossil fuel to protect global climate and create a sustainable transportation system.

The Ties That Bind: The 10-Year Fight for 0.6-inch Diameter Strands  
*by Sue Lane and Doug Rekenthaler Jr.*

FHWA paves the way for high-performance concrete by increasing the diameter of prestressed strands from 0.5 inches to 0.6 inches.
Replacing Oakland’s Cypress Freeway
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A community redesigns and rebuilds a major freeway after a devastating 1989 earthquake.

It Takes More Than Mirrors to See Your “True Profile”
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Partners in Motion: D.C. Congestion Busters
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FHWA and the U.S./Canadian Commercial Vehicle Safety Alliance celebrates International Highway Transportation Safety Week June 1 through 6.

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After nearly 37 years, Hawaii completes its new interstate.

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Highway finance questions are answered through national data from FHWA’s highway finance statistics program.
HIPERPAV: A User-Friendly Tool to Help Us “Build It Right”

by Stephen W. Forster

HIPERPAV, a Windows-based computer program, provides guidance on the design and construction of concrete pavement.

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National ITS Architecture
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Building a Bridge to the Public: The Alaska Experience
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Iowa Department of Transportation created a unique and functional rest area along Interstate 35 with a design that combined the agricultural history of the area with modern technology.

Bridging the Centuries: Moving Virginia’s Bridge Program Into the 21st Century
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Ultra-Thin Whitetopping  
by Charles J. Churilla  
UTW has proven to be a low-cost, effective, and fairly simple solution to the problem of repairing pavement at high-trafficked intersections.

The First Channel Bridges  
by Christopher J. Allen and Frank Naret  
The Channel Bridge, a precast-concrete superstructure system that uses post-tensioned segmental construction, is an innovative solution to increasing the vertical under-clearance of a bridge.

Staying in the Loop: The Search for Improved Reliability of Traffic Sensing Systems Through Smart Test Instruments  
by David Gibson, Milton K. (Pete) Mills, and Doug Rekenthaler Jr.  
Find out how FHWA developed an inductive loop tester to quickly and accurately measure the quality and performance of installed inductive loops.

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TEA-21 Supports FHWA’s Strategic Goals  
by Kenneth R. Wykle  
FHWA Administrator Kenneth Wykle explains how the Transportation Equity Act for the 21st Century (TEA-21) moves us towards a 21st century transportation system.

The State of Research  
by Robert J. Betsold  
FHWA’s associate administrator for research and development discusses the impact of TEA-21 on the federal highway research program.

Marketing: Helping to Develop the Transportation System for the 21st Century  
by John I. Cagle  
FHWA uses marketing techniques to “find the needs and fill them.”

The Seven Habits of Highly Effective Marketers  
by Stephen W. McDaniel  
FHWA and other highway professionals can use seven basic marketing principles to more effectively accomplish their missions and serve their customers.

We’re on the Eve of Construction  
by Mike Jones  
FHWA takes the lead in the critical last step before construction – the acquisition of the necessary land and other property rights – to protect the rights of property owners and displaced persons and to protect the public’s interests.

The ITS Metropolitan Model Deployment Initiative  
by Toni Wilbur  
The recent opening of model deployment projects in Seattle, San Antonio, Phoenix, and New York City are the culmination of an initiative, jointly sponsored by FHWA and the Federal Transit Administration, that began in October 1996.

The Great River Road Celebrates 60 Years  
by Karen Haas Smith  
Great River Road, one of the oldest, longest, and most unique scenic byways in North America, celebrates its 60th birthday this year.

Laboratory Testing of the Performance of Moisture-Cured Urethanes on New Steel
FHWA has been actively involved in the study of climate-tolerant, durable bridge coatings to ensure extended painting seasons and coating lives.

**Better Load Ratings Through Nondestructive Evaluation**
by Glenn Washer and Paul Fuchs
FHWA recently tested and evaluated two state-of-the-art prototype nondestructive evaluation systems that, in comparison with theoretical calculations, provide a much more accurate measure of a bridge’s load-carrying capacity.

**Maintaining the Customer-Driven Highway**
by Jim Sorenson, Ed Terry, and Dan Mathis
FHWA’s Office of Program Quality Coordination recently conducted a national quality improvement review of highway maintenance and construction operations to find ways to minimize traffic backups and travel delays caused by maintenance and rehabilitation projects.

**Urban Freeway Renewal**
by David O. Cox
FHWA examines the national issue of finding cost-effective and customer-sensitive methods to reconstruct freeway pavements.

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**No. 4, January/February 1999**

**Effects of Partial and Total Sleep Deprivation on Driving Performance**
by Robert D. Peters, Esther Wagner, Elizabeth Alicandri, Jean E. Fox, Maria L. Thomas, David R. Thorne, Helen C. Sing, and Sharon M. Balwinski
A study conducted jointly by the Federal Highway Administration’s (FHWA’s) Human Factors Laboratory and the Walter Reed Army Institute of Research (WRAIR) examined the effects of progressive sleep deprivation on driving performance to assess the rate of crashes and the changes in driving performance resulting from sleepiness.

**A Silver Bullet: Shoulder Texture Treatments**
by Ann Walls
Shoulder surface treatments, such as rumble strips, reduce crashes by alerting drowsy drivers that they are drifting off the roadway.

**It’s a Jungle Out There: Using the Bullnose Guardrail to Protect the Elephant Traps**
by John D. Reid, Martin W. Hargrave, and Doug Rekenthaler Jr.
FHWA, in conjunction with state departments of transportation, is working to improve guardrail systems. Bullnose guardrails are a safe and effective solution to protecting drivers from falling into the elephant trap of side-by-side bridges.

**Introducing FHWA’s NDE Validation Center**
by Brent M. Phares, Glenn Washer, and Mark Moore
The only center in the world dedicated entirely to the evaluation and validation of nondestructive evaluation (NDE) technologies for highway infrastructure opens at FHWA’s Turner-Fairbank Highway Research Center.

**CVISN: The Information Highway Meets the Asphalt Jungle**
by Michael Curtis and Jeff Secrist
CVISN links the disparate intelligent transportation systems technologies already having an impact on the world of commercial vehicle operations.

**Making What’s Good Even Better**
by Anthony R. Kane
FHWA’s executive director explains the restructuring of FHWA’s headquarters and field organizations.

We Are ONE DOT!
ONE DOT is a management strategy that builds on the strength of mutual collaboration between the agencies of the U.S. Department of Transportation to reduce duplication and save resources.

Office of Motor Carriers and Highway Safety: Always “Safety First”
Involving the Public in Improving Air Quality
Traffic-Flow Theory

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Getting Smoother Pavement: An Arizona Success Story That’s Adaptable Nationwide
Brownfields and Bikeways: Making a Clean Start
FHWA’s Computer Systems Are Ready for the Year 2000
by Larry Neff
FHWA is on-track in its five-phased approach to ensure that all FHWA computers are Y2K-compatible.

by Pamela Crenshaw
The U.S. DOT in partnership with 22 transportation associations and professional groups developed the “Steps for Action,” a compilation of information for addressing Y2K problems from the educational, management, technical, and institutional perspectives.

Value Pricing Helps Reduce Congestion
by John T. Berg and Felicia B. Young
A federal pilot program is exploring the use of “value pricing” to increase travel options by providing incentives to shift some trips to off-peak times, alternative modes, or less congested routes.

No. 6, May/June 1999

“Doing Futures” — Creating a Preferred Future in Highway Safety
by Lorena G. Beauchesne
The Federal Highway Administration has started a process to identify the actions it must take now and in the future to “create” the future it desires.

Improving Safety Through Peer Exchanges
by Barbara Kenefake and Ayman Smadi
National peer exchanges, began in 1994 by the FHWA’s Office of Motor Carriers, help to identify the “best practices” related to selected specific elements of the Motor Carrier Safety Assistance Program.

National Transportation Week, May 16-22
by Karen Haas Martin
From May 16-22, the transportation community will celebrate National Transportation Week to increase public awareness of transportation and to educate the public about transportation issues.

An Immediate Payoff From FHWA’s NDE Initiative
by Adrian T. Ciolko and W. Phillip Yen
Advanced nondestructive evaluation and nondestructive flaw-detection technologies played a vital role in the successful emergency structural evaluation of the Cochrane Bridge in Mobile County, Ala.

Designing Highways With Older Drivers in Mind
by Elizabeth Alicandri, Mark Robinson, and Tim Penney
Aging affects a wide variety of skills that are critical to safe driving. Indeed, studies have shown that older drivers have high rates of crashes, injuries, and fatalities on a per-mile-driven basis. As the percentage of Americans aged 65 and older continues to grow, this significant problem grows in magnitude.

FHWA’s Driver Performance Laboratory
by Kathryn Wochinger, Cathy Emery, and Elizabeth Alicandri
The Driver Performance Laboratory at the Turner-Fairbank Highway Research Center investigates issues of driver performance related to highway and traffic engineering and to the design of in-vehicle information systems.

The National Driver History Initiative
by Brian M. McLaughlin
FHWA and the National Highway Traffic Safety Administration are sponsoring a driver history pilot project in nine states to improve systems for recording traffic convictions and for exchanging driver safety information among courts, police, and licensing agencies.
What’s a Work Zone?
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Currently, no nationally recognized definitions of work zone or work-zone accidents exist. FHWA is involved in an
effort to develop a standardized definition of work zone to enable researchers to assess the current state of work-
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The National Work-Zone Safety Information Clearinghouse
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Opened in February 1998, the clearinghouse has the most comprehensive library of information on work-zone safety.

Safety Is Our North Star ........................................................................................................32
The outcomes of the National Transportation Safety Conference, held March 2-3, 1999, are the beginning of a
transportation safety action plan and a memorandum of understanding signed by government officials and chiefs of
industry, trade, labor, and law enforcement, pledging to make safety a priority in their organizations.

1999 International Highway Transportation Safety Week, June 1-5 ........................................37
The aims of the activities of this special week are to promote the message that all drivers are responsible for ensuring
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Human Factors Recommendations for TMC Design
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FHWA’s International Geotechnical Engineering Scan
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In March 1998, a team of geotechnical and structural engineers from FHWA, state highway agencies, and industry
went to Canada and Europe to discuss practices for implementing load and resistance factor design methods; to
investigate innovative contracting practices; and to identify new or improved mechanically stabilized earth-wall
technologies, ground-improvement methods, and in situ testing procedures.

Does Asset Management Deserve a Closer Look?
by Dena M. Gray-Fisher ........................................................................................................50
The American Association of State Highway and Transportation Officials approved an asset management strategic
plan that outlines AASHTO’s activities to advance asset management among the organization’s members.

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NHI’s Instructor Certification Program
by Marketta Kopinski

The National Highway Institute (NHI), the external training branch of the Federal Highway Administration, offers a new program to upgrade the skills of its instructors.

Another Step Toward a Nationally Integrated Traveler Information System
by R. Dale Thompson

Traveler information systems have evolved to become sophisticated dissemination devices, which provide travelers with valuable information. FHWA has taken the lead in developing a strategy to guide federal activities and national interest in the development and implementation of a National Traveler Information System.

Highways and the New Wave of Economic Growth
by Walter L. Sutton Jr. and David Marks

Having a seamless intermodal transportation system will determine whether the country will succeed in a “fifth wave” of industrialization. FHWA is doing its part by improving highway infrastructure, the backbone of the nation’s intermodal network.

FHWA Fiber-Optics Research Program: Critical Knowledge for Infrastructure Improvement
by Richard A. Livingston

The Las Cruces highway bridge in New Mexico is part of FHWA’s research effort that is exploring the use of fiber-optic sensors in highway applications. This research is yielding valuable information about highway construction.

Pothole Patchers Demonstrated in California
by R. Clayton Slovensky

The California Department of Transportation (Caltrans) and FHWA hosted a demonstration that allowed vendors to display their equipment and materials and to introduce new pothole-patching technologies to prospective clients.

Managing Car-Crunching Sinkholes
by L. Rick Ruegssegger and Thomas E. Lefchik

The Ohio Department of Transportation initiated an Abandoned Underground Mine Inventory and Risk Assessment process to find out where abandoned mines may exist beneath interstate highways and other roadways. These mines represent an existing, undefined, and yet possibly significant risk to the safety of the traveling public.

FHWA Helps Restore Historic Neighborhood in Los Angeles
FHWA, Caltrans, the city of Los Angeles, and neighborhood redevelopment agencies joined together to restore some historical ambiance to the Adams-Figuroa Historic District in Los Angeles.

**The Hoover Dam Bypass**

*by Terry Haussler and Doug Rekenthaler Jr.*

Route 93, the roadway leading up to and over the Hoover Dam, which is a National Historic Landmark and one of the world’s wonders of civil engineering, is becoming a dangerous bottleneck. Transportation experts examine the options for a high-speed bypass.

**FHWA Presents the 1999 Environmental Excellence Award Winners**

FHWA announced the winners of the 1999 Environmental Excellence Awards on Earth Day (April 22) 1999.

**Sign Simulator Validated in FHWA Study**

*by Karen R. Mahach, Kathryn Wochinger, Rafael Marshall, and Deanne Eppich*

The sign simulator “signsim” is used by FHWA to evaluate a group of traffic signs that were proposed as national standards. FHWA researchers discuss the validation process of this simulator.

**All’s Quiet on the Wasatch Front: Technology Keeps Traffic Moving**

*by Melanie Buck*

The Utah Department of Transportation has launched CommuterLink, an intelligent transportation system of electronic traffic equipment, computers, and communication systems, to make traveling along the Wasatch Front safer and more efficient.

**Top 10 Construction Achievements of the 20th Century**

An international panel of construction industry executives and editors select the top 10 construction projects of the 20th century.

**No. 2, September/October 1999**

**How Transportation Systems Talk to Each Other**

*by David Smallen*

Intelligent Transportation Systems need national standards to run smoothly. Improved communications linking localities and regions together in a way that results in an improved transportation is the goal of ITS. This requires a system that is interoperable.

**Gold-Rush Ghost Town Gets a New Alaska Yellow Cedar Bridge**

*by Frank W. Muchmore*

Through the Wood in Transportation (WIT) cost-sharing demonstration grant program, the Alaska Department of Transportation and Public Facilities and their partners built a yellow cedar bridge over the Nelson Slough to provide reliable access to Dyea Flats, Alaska.

**Innovative Traffic Control Practices in Europe**

*by H. Gene Hawkins Jr., W. Scott Wainwright, and Samuel C. Tignor*

In May 1998, 10 U.S. traffic engineers traveled to Europe to observe innovative traffic control practices and identify those practices that could be implemented in the United States.

**Rural Road Safety: a Global Challenge**

*by Patrick Hasson*

The Organisation for Economic Co-operation and Development (OECD) created a program to address the safety issues associated with rural roads. Under the Road Transport Research (RTR) Program, national road researchers from OECD member countries exchange and share information. An expert group examined rural road safety problems and made suggestions for possible solutions to lessen the social and economic consequences of rural road crashes.

**CORBOR Improves Safety, Mobility, and Productivity**
CORBOR, the combination of FHWA’s National Corridor Planning and Development Program (NCPD) and Coordinated Border Infrastructure Program (CBI), provides funding for major national transportation projects. These projects develop the 43 corridors identified by Congress and improve transportation near the borders with Canada or Mexico.

Pedaling into the 21st Century by Kenneth R. Wykle FHWA Administrator Kenneth Wykle discusses the significant role that bicycling plays in the building of liveable communities.

Big Bridge, Little Bridge: The Big Dig Soars Across the Charles River by Sybil Hatch Two new bridges are being built over the Charles River as part of Boston’s Central Artery/Tunnel project, the largest, most complex, and technologically challenging highway project attempted in American history. The new bridges will more than double the traffic capacity of the existing I-93 double-decked, steel-truss bridge, built in 1959.

Eisenhower Transportation Fellowships: Proving Ground for the New Transportation Professionals by Ilene D. Payne The Dwight David Eisenhower Transportation Fellowship Program (DDETFP) offers annual full-time opportunities in research, development, and technology transfer projects to students interested in the transportation industry.

Value Engineering: An Incredible Return on Investment by Keith Borkenhagen Value engineering is a multidisciplinary, systematic tool for identifying, analyzing, and solving problems. FHWA is promoting this approach to find new and better ways of doing things. In fiscal year 1998, the return on investment was more than 120 to 1.

Managing Resources and Preparing for the Y2K Weekend by John W. McCracken FHWA is continuing to help transportation operators identify and resolve potential Y2K problems, and FHWA is also reaching out to help develop contingency plans in the event that Y2K repair efforts fail or that failures are beyond the control of transportation operators.

FHWA’s Traffic Research Lab (TReL): Searching for Keys to Unlock the Nation’s Gridlock by Juan Morales, Raj Ghaman, and Doug Rekenthaler Jr. FHWA’s Traffic Research Laboratory (TReL), which is part of the Advanced Traffic Management System (ATMS) Research and Development (R&D) Program, was established as a comprehensive experimental testbed and analysis toolbox to facilitate FHWA’s complex, multifaceted R&D program.

No. 3, November/December 1999

New Technologies Improve Cost-Effectiveness of CMA by W.C. Ormsby In an effort to find an efficient, economical, and environmentally acceptable treatment for pavements to remove ice and snow on roadways, FHWA conducted a study, which found that calcium magnesium acetate (CMA) was an excellent alternative deicer to salt. This article discusses CMA and the economics of using CMA instead of salt.

TFHRC Hosts Collaborative Retroreflective Testing Effort To ensure that commercially available retroreflectometers meet the requirements of the state highway agencies, FHWA contracted with HITEC to perform a standard group evaluation of the devices.

The PAIR Initiative: Repairing and Revitalizing Our Nation’s Physical Infrastructure by Richard A. Belle The Partnership for the Advancement of Infrastructure and its Renewal (PAIR) aims to put an end to the...
management-by-crisis approach to infrastructure repair and renewal. PAIR will work with leaders from both the private and public sectors to form collaborative partnerships that bring the best construction technologies and processes to the marketplace.

FHWA Creates an Office of Asset Management
by Madeleine Bloom .................................................................21
FHWA established the Office of Asset Management on Feb. 1, 1999. FHWA aims to effectively manage transportation systems from a user’s perspective and to make integration a major goal of the new office.

TRB Superpave Committee: Keeping Superpave™ Implementation on the Road
by Neil F. Hawks .....................................................................23
TRB Superpave Committee works to keep the Superpave program alive and well.

Knowledge Management: Everyone Benefits by Sharing Information
by Mike Burk .........................................................................27
FHWA is taking steps to better manage the collective expertise of its employees and partners. With managed knowledge, information can flow across organizational lines, reach the people who can use it in ways that best promote the FHWA’s goals, and enhance service to the customer.

Are You Ready for Y2K?
In a report entitled Are You Ready? Managing Transportation Resources Through the Y2K Weekend, which is available on the Internet at http://www.fhwa.dot.gov/Y2K/y2k.pdf, FHWA and Public Technology Inc. provide information and suggestions to help governments to prepare for the Y2K weekend and to build public confidence in the adequacy of those preparations.

FHWA Partners With Brigham Young University to Develop State-of-the-Art Hydraulic Modeling Environment
by Larry A. Arneson ...............................................................32
FHWA has partnered with Brigham Young University to explore two-dimensional computer modeling of surface-water flows. This modeling provides a level of detail and accuracy not previously available to highway hydraulic engineers.

Highway Finance Information: A Key 21st Century Transportation Decision-Making Tool
by Thomas W. Howard ............................................................40
Highway finance data is currently used extensively for a wide range of key efforts, and FHWA plans to make greater use of highway finance data in the future in support of the Department of Transportation’s Strategic Plan and in other forward-looking ways.

Condition and Performance of Epoxy-Coated Rebars in Bridge Decks
by Ali Akbar Sohangpurwala and William T. Scannall .................................................44
FHWA and partners provided funding for a joint research project to evaluate in-service bridge decks constructed with epoxy-coated reinforcing steel. The study examines the long-term performance of epoxy-coated reinforcing steel in concrete bridges and structures exposed to salt.

No. 4, January/February 2000

The Customer-Driven Development of Human Factors Design Guidelines
by Christopher A. Monk and Joseph Moyer .................................................................2
The Federal Highway Administration (FHWA) undertook a six-year research program focused on issues related to in-vehicle information displays in order to provide design assistance to advanced in-vehicle systems engineers.

A More Precise Sense of Where We Are
by James A. Arnold, Rudy Persaud, and David Smallen ...............................................7
The Nationwide Differential Global Positioning System, which will be operational across the country by 2002, will provide such precise, real-time location information that it will create an ever-increasing number of applications.
The 1999 National Quality Initiative (NQI) Achievement Awards
by Donald Tuggle .......................................................... 14
The National Quality Initiative, a partnership of FHWA and 12 other highway-related organizations, presented its achievement awards to states with highway projects that demonstrate the quality process and results, customer focus, teamwork, innovation and value, and long-term improvement.

DOT Vision for Transportation Research
by David Smallen .......................................................... 19
The Department of Transportation’s approach to research emphasizes cooperation, information-sharing, and development of formal research agendas among the agencies within the department and across the federal government. It also promotes partnerships with state and local governments, academia, and the private sector to encourage innovation and accelerate implementation.

Recent Developments in Federal Project Finance
by David Seltzer .......................................................... 26
Recent federal legislation continues the trend of introducing “innovative finance” techniques. Two prominent financing programs that have attracted particular attention are “GARVEE bonds” and “TIFIA.”

Western Federal Lands Highway Division Responds to Northwest Emergencies
by Edward Hammontree, Richard Barrows, and Brian Allen .......................................................... 30
The Emergency Relief for Federally Owned Roads Program has been used extensively since 1977 on federal lands, such as national forests, national parks, Bureau of Land Management lands, Indian reservations, and wildlife refuges, for emergency relief from natural disasters or catastrophic failures. But, in March 1996, the Western Federal Lands Highway Division formed a cross-functional team to respond to the large number of requests for assistance.

Pavement Preservation: Preserving Our Investment in Highways
by Robert M. Davies and Jim Sorenson .......................................................... 37
If we take a proactive approach in maintaining our existing highways, we can reduce costly, time-consuming rehabilitation and reconstruction and the associated traffic disruptions ? improving mobility, reducing congestion, and providing safer, smoother, longer lasting pavements.

MUTCD ? The Millennium Edition
by Linda L. Brown .......................................................... 43
FHWA is completing the first substantial rewriting of the Manual on Uniform Traffic Control Devices in more than 20 years. This manual contains the standards and guidance for the design and use of signs, pavement markings, traffic signals, and other traffic control devices.

Developing NDE Technologies for Infrastructure Assessment
by Glenn A. Washer .......................................................... 44
This article provides an overview of FHWA’s program for developing nondestructive evaluation technologies for the inspection and evaluation of highway infrastructure.

No. 5, March/April 2000

Developing an “Operations Vision”
by Kenneth R. Wykle .......................................................... 2
The United States is shifting focus from highway construction to optimizing the performance of the existing highway system by actively managing, maintaining, and operating it in an integrated, intermodal fashion.

Safety Leadership Today for a Safer Tomorrow
by Dwight A. Horne .......................................................... 4
The Department of Transportation has a clear strategic goal about safety and is structured to implement it.

National Work Zone Safety Awareness Week ? April 3-7 .......................................................... 8
FHWA, ATSSA, and AASHTO agreed to designate April 3-7 as National Work Zone Safety Awareness Week.
Basics of Concrete Barriers
by Charles F. McDevitt
Concrete barriers appear to be simple, but in reality, they are sophisticated safety devices.

A Safe Place to Rest
by Maria Koklanaris
Truckers say that finding an appropriate place to take a much-needed rest is a challenge.

The Quest for Quality: Pennsylvania’s Meyersdale Bypass Project
by Robert R. Long Jr.
The Meyersdale project set a new standard for public-private partnering in Pennsylvania.

Why Asset Management Is More Critically Important Than Ever Before
by Anthony R. Kane
In a time of rapid change, state departments of transportation should be leading the change and thinking of themselves as businesses with billions of dollars of assets.

Beware of Invasive Species
Each year, more than $23 billion nationwide is lost to the effects of invasive plants and animals.

Roadways and the Land: The Landscape Architect’s Role
by Elizabeth E. Fischer, Heidi Hohmann, and P. Daniel Marriott
Landscape architects have been integrally involved in the planning and design of the nation’s highways and parkways.

Critter Crossings
by Ginny Finch
Roads affect animals in several ways, including roadkill, habitat loss, and habitat fragmentation.

Hydraulics Testing of Wilson Bridge Designs
by J. Sterling Jones
The designs of the new Wilson Bridge on the National Capital Beltway are tested for scour effects.

Wireless Communications: A Modern Necessity
by Lester G. Finkle II
A state wireless communications program using highway rights of way can create a win-win situation.

TRANSIMS Is Coming
by Kimberly M. Fisher
TRANSIMS is a series of integrated transportation and air quality analysis and forecasting models.

No. 6, May/June 2000

by Richard F. Weingroff
The first issue gives us a window into the concerns of its time, which are, in some ways, unique to the era, but then again, some things seem to never change.

IDAS: A Tool for Integrating ITS Into the Planning Process
by Gene McHale
IDAS is designed to pick up where the traditional four-step planning models end.

Turbo Architecture: A Tool for Leveraging the National ITS Architecture
by the National ITS Architecture Team
Turbo Architecture is a software tool that makes it significantly easier to build ITS architectures using the National ITS Architecture as a reference.

Communities of Practice
by Mike Burk .................................................................18
Communities of practice are networks that identify issues, share approaches, and make the results available to others.

Middle School Students Design Future Cities ..........................................................22
During National Engineers Week, student teams were recognized for their creativity in designing cities of the future.

The Partnership Initiative: A Unified Agenda for Highway Research and Technology
by Michael Halladay ........................................................................................................23
The goal is a national R&T agenda and the outlining of appropriate roles of all participants in a robust R&T program.

Vermont Rest Area Uses Green Wastewater Treatment System
by Molly Farrell, Liz Van der Hoven, and Tedann Olsen ..............................................27
Vermont installed a modular sewage-to-reuse system to recycle wastewater back into the restrooms of a rest area to flush toilets.

The Federal Transportation Livability Initiative ? Building Livable Communities for the 21st Century
by Elizabeth E. Fischer.....................................................................................................30
Livable communities adhere to “smart growth” practices to ensure a better quality of life and strong, sustainable economic growth.

An Australian Road Review
by Bonnie L. Harper-Lore ...........................................................................................35
FHWA’s roadside vegetation specialist gets a firsthand view of the Australian perspective of vegetation management.

Advantages of the Split Intersection
by Joe G. Bared and Evangelos I. Kaiser.........................................................................38
By separating the opposing directions of traffic, the split intersection facilitates smoother traffic flows with less delay.

One Mile in Five: Debunking the Myth
by Richard F. Weingroff..............................................................................................45
It is not true that one mile in five on the Interstate Highway System must be straight to serve as an emergency airstrip.

National Transportation Week, May 14-20 ......................................................................47
A number of activities are planned to focus attention on the role of transportation in the United States.

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National Research Projects on Recycling in Highway Construction
by Marcia J. Simon, Warren H. Chesner, Taylor Eighmy, and Howard Jongedyk ..............................................2
The Federal Highway Administration and the National Cooperative Highway Research Program have sponsored several research projects—some ongoing and others recently completed—pertaining to the use of recycled materials in highway construction.

The Recycled Materials Resource Center
by Bryan J. Magee ..................................................................................................................................................11
This national center was established in 1998 at the University of New Hampshire to promote the appropriate use of recycled materials in the highway environment. RMRC will conduct about 30 research projects over the first six years of operation.

Lessons Learned: TxDOT’s Efforts to Increase the Use of Recycled Materials
by Rebecca Davio ..................................................................................................................................................16
The Texas Department of Transportation shares lessons learned from five years of experience with a recycled materials program.

How NCDOT Is Building a Recycling Culture
by Ashley T. Memory ...........................................................................................................................................24
The N.C. Department of Transportation is demonstrating the cultural benefits of recycling to encourage local participation.

National Transportation Week: Sounding Reveille for Transportation
by Conni Morse ....................................................................................................................................................28
Transportation Secretary Rodney E. Slater and three former secretaries of transportation kicked off a successful National Transportation Week, May 14 through 20, 2000.

Geosynthetic Reinforced Soil Structures Can Carry the Load
by Maria Koklanaris ...............................................................................................................................................30
FHWA’s Geotechnical Research Team demonstrates the prodigious load-bearing capacity of geosynthetic reinforced soil.

Scanning European Advances in the Use of Recycled Materials in Highway Construction
by Katherine Holtz and T. Taylor Eighmy ...........................................................................................................34
In September 1999, a team of U.S. engineers went to several countries in Europe to see how the Europeans achieve such a remarkable recycling rate—frequently reaching 100 percent—in the highway environment.

Managing Change in FHWA
by Peter C. Markle ...............................................................................................................................................41
FHWA’s program manager for change management lays out his plan to assist in the continuing transition to a new organizational structure and to evaluate the effectiveness of the restructured organization.
Highways and Bridges on the Brink of the New Century
d by Clifford Comeau and David Smallen.................................................................43
The 1999 Status of the Nation’s Highways, Bridges, and Transit: Conditions and Performance report to Congress shows that the higher federal highway funding levels of the past few years have begun to pay off with better pavement, improved bridges, and safer highways.

The National IVI Meeting .................................................................................................48
On July 18 and 19, representatives of federal, state, and local governments; industry; and universities will meet in Washington, D.C., to discuss intelligent vehicle initiative (IVI) technologies and plans for the future.

No. 2, September/October 2000

d by Richard F. Weingroff .................................................................2
Because of its sheer size and scale, the Interstate Highway System became controversial as soon as the construction program began, and its impacts, particularly on our cities, remain controversial.

LANI and the Leimert Park Project
d by Kathleen A. Bergeron .................................................................16
The Leimert Park Project in Los Angeles is a model program for using transportation to help revitalize communities.

Enhancing Pavement Smoothness
d by Mark Swanlund .................................................................20
A survey of highway users revealed that pavement smoothness is the user’s most desired highway “product” and smooth pavement also makes economic sense. So, FHWA’s task is clear? to work with states and others to improve pavement smoothness.

Surviving the Turbulence: the Transportation-Air Quality Arena, 1999-2000
d by Michael Koontz .................................................................23
The conformity process wields considerable control over many transportation plans and programs. Recent legal proceedings and other developments that add to this dynamic process have taken hold from the transportation and technology side.

Strategic Plan for Transportation and Air Quality Research, 2000-2010
d by Mike Savonis .................................................................29
The relationship between transportation and air quality is complex and will challenge researchers well into the future.

Atlanta “Conforms” to Clean Air Requirements
d by James M. Shrouds .................................................................35
For more than two years, Atlanta’s ability to use federal transportation funds for transit and highways was severely limited. However, in the last year, Atlanta has made a major turnabout in it transportation and air quality planning.

Measuring Economic Impacts of Federal-Aid Highway Projects
d by William P. Anderson and Arthur C. Jacoby .................................................................37
A study is underway by FHWA and the Boston University Center for Transportation Studies to quantitatively assess the direct, indirect, and induced economic effects of several categories of highway improvement projects.

Transportation in the 21st Century
d by Robert E. Skinner Jr. .................................................................42
The executive director of the Transportation Research Board presents a broad view of transportation and change, discusses some important trends and characteristics of transportation that will influence its evolution in the United States, and comments on specific proposals that have been advanced for transportation.
Using Monte Carlo Simulation for Pavement Cost Analysis
by Keith D. Herbold

The Federal Highway Administration (FHWA) developed a model and made arrangements with 10 states and two pavement associations to prepare case studies illustrating the application of risk analysis to life-cycle cost analysis in pavement design. The studies show that with limited training in probabilistic principles and in the application of risk-analysis software, state highway agency personnel can apply the probabilistic approach to their current life-cycle cost-analysis procedures.

ITS Peer-to-Peer Program
by James Pol

This program provides free technical assistance to agencies seeking to improve transportation operations through the deployment of intelligent transportation systems.

Design Evaluation and Model of Attention Demand (DEMAnD): A Tool for In-Vehicle Information System Designers
by Christopher A. Monk, M. Joseph Moyer, Jonathan M. Hankey, Thomas A. Dingus, Richard J. Hanowski, and Walter W. Wierwille

FHWA developed a behavioral model that predicts the performance of drivers interacting with an in-vehicle information system (IVIS) and a prototype software package that uses the behavioral model to evaluate the attention demanded to operate a given IVIS.

Studying the Reliability of Bridge Inspection
by Brent M. Phares, Dennis D. Rolander, Benjamin A. Graybeal, and Glenn A. Washer

FHWA’s Nondestructive Evaluation Validation Center initiated a comprehensive study to determine the reliability of visual inspection of highway bridges. The general objective was to provide an overall measure of the reliability and accuracy of routine and in-depth inspections and to study the influence of human and environmental factors on inspection reliability.

Ultrasonic Inspection of Bridge Hanger Pins
by Benjamin A. Graybeal, R.A. Walther, Glenn A. Washer, and Amy M. Waters

FHWA’s Nondestructive Evaluation Validation Center conducted a study to determine the reliability of contact ultrasonic techniques in the field to accurately locate defects in hanger pins.

The Northwest Transportation Technology Exposition
by Catherine Nicholas and Clayton Wilcox

State and local transportation maintenance and engineering specialists from throughout the Pacific Northwest attended a technology exposition in September 2000 at Moses Lake, Wash., to observe new technologies and equipment in action.

Faster, Easier, Cheaper ? Pyrotechnical Anchoring
by David Smallen

A French machine, using firecracker-type explosives ignited by a gas generator, shoots anchoring piles into the ground at 644 kilometers (400 miles) per hour.

Practical Research Answers Real-Life Questions
by Sybil Hatch

Two concurrent research programs funded by FHWA, ADSC, and others are being conducted to study anomalies in drilled shaft construction.

A Nondestructive Impulse Radar Tomography Imaging System for Timber Structures
by Jose E. Hernandez and Sheila Rimal Duwadi

The micropower impulse radar technology developed at the Lawrence Livermore National Laboratory shows good potential for the nondestructive inspection of timber structures because of its small size and low power consumption.
and because its imaging capability is expected to accurately show the extent and location of problem areas and to produce data that can be more easily interpreted than conventional ground-penetrating radar data.

**Strategic Work-Zone Analysis Tools**  
*by John Harding* ..........................................................44  
The SWAT program addresses work-zone factors and stresses the importance of accounting for work-zone influences when making transportation-improvement decisions.

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**No. 4, January/February 2001**

**Learning to Beat Snow and Ice** *by Deborah Vocke* .............................................................................................................2  
More than 1,500 people from 36 states and 14 nations participated in the 5th Annual Eastern Winter Road Maintenance Symposium and Equipment Expo.

**Safe Plowing — Applying Intelligent Vehicle Technology** *by Robert A. Ferlis, Shahed Rowshan, and Cathy Frye* .............................................................................................................3  
The California and Minnesota departments of transportation use the Global Positioning System, a geo-spatial database, radar, and intelligent vehicle technologies to enable snowplow operators to “see” snow-covered roads and obstacles.

**Improving Roadside Safety by Computer Simulation** *by Dean L. Sicking and King K. Mak* .................................................9  
Computer simulation of vehicular impacts is rapidly developing as a reliable alternative to full-scale crash testing.

**Using the Computer and DYNA3D to Save Lives** *by Martin W. Hargrave and David Smith*..................................................13  
Within the past decade, FHWA has led a program focused on employing and expanding the capabilities of a new crash-analysis tool, DYNA3D. DYNA3D is a nonlinear finite element code that can be used with the computer to replicate three-dimensional motor vehicle crashes.

**LS-DYNA: A Computer Modeling Success Story** *by John D. Reid, Martin W. Hargrave, and S. Lawrence Paulson*.............................................................................................................21  
When the bullnose guardrail system failed a crash test, researchers went back to the drawing board — or rather, back to LS-DYNA, a complex computer analysis system — to find the solution.

**Preservation of Wetlands on the Federal-Aid Highway System** *by Kirstyn White* .............................................................26  
FHWA is moving steadily toward its goal of achieving a 50-percent increase in wetlands acreage resulting from federal-aid highway projects from 1998 to 2008.

**Internal FHWA Partnership Leverages Technology and Innovation** *by Bob Bryant*.................................................................30  
Two organizations within FHWA — the Research, Development, and Technology Service Business Unit and the Federal Lands Highway Core Business Unit — have a rich history and a continuing program of internal partnering to enhance FHWA’s research and technology delivery to the agency’s customers.

**New Applications Make NDGPS More Pervasive** *by James A. Arnold*.................................................................39  
The Nationwide Differential Global Positioning System offers such a dramatic improvement in the accuracy of positioning information obtained via radio signals emitted by the 24 Global Positioning System satellites orbiting the Earth that it makes possible a myriad of new applications and enables other technologies to function at improved levels.

**Center for Excellence in Advanced Traffic and Logistics Algorithms and Systems (ATLAS)** *by David Gibson, Alan Hansen, and Pitu Mirchandani* .............................................................................................................44  
The University of Arizona with the support of FHWA established a center of excellence for the research and
development of algorithms, software, and systems to advance the state of the art and the state of the practice in traffic management systems and logistics management systems.

**National Work Zone Awareness Week (April 9 to 12) — Enhancing Safety and Mobility in Work Zones**

In a continuing effort to promote safety and mobility in work zones, FHWA, ATSSA, and AASHTO will sponsor the second annual National Work Zone Awareness Week from April 9 to 12, 2001.

**No. 5, March/April 2001**

**DOT's Comprehensive Truck Size and Weight Study — A Summary** by James W. March

The U.S. Department of Transportation (DOT) presented to Congress the results of a comprehensive examination of issues surrounding the current federal truck size and weight limits and the potential impacts of changes to those limits.

**Giving Freight a Voice** by S. Lawrence Paulson

DOT has begun a major effort to give visibility to freight issues and to coordinate the modes of transportation. Accordingly, the Federal Highway Administration (FHWA) established an Office of Freight Management and Operations as “Freight’s Voice in FHWA.”

**FORETELL — Finally, someone is doing something about the weather!** by Paul Pisano

FORETELL provides, via Internet, the timely, detailed, and relevant weather-related road information needed by state highway managers and the public.

**Steel Fabrication Technologies Observed in Japan and Europe** by Krishna K. Verma

A team of steel bridge experts visited leading steel fabrication facilities in Japan, Italy, Germany, and the United Kingdom to identify practices that may have current or future value to transportation agencies in the United States.

**Reliability of Visual Bridge Inspection** by Brent M. Phares, Dennis D. Rolander, Benjamin A. Graybeal, and Glenn A. Washer

This article is the second of two on the visual inspection study conducted at FHWA’s Nondestructive Evaluation Validation Center and describes the results of this recently completed study.

**For the Common Good: The 85th Anniversary of a Historic Partnership**

by Richard F. Weingroff

The collaboration to establish a federal-aid highway program in 1916 was the beginning of an enduring partnership between FHWA and the American Association of State Highway and Transportation Officials.

**Telecommunications — Getting More for Your Money** by William S. Jones

New telecommunications developments, even those not designed specifically for transportation uses, bring opportunities and benefits to transportation engineers.

**No. 6, May/June 2001**

**5-1-1: Traffic Help May Soon Be Three Digits Away** by S. Lawrence Paulson

The Federal Communications Commission has approved the use of a three-digit telephone number (5-1-1) by states and local jurisdictions for the dissemination of travel information.

**Using the Dynamic Modulus Test to Assess the Mix Strength of HMA** by Thomas Harman

The dynamic modulus test (E*) is currently under consideration to be added to the Superpave mix design system as a simple performance test.
The ITS Public Safety Program: Creating a Public Safety Coalition by William Baker and Melissa A. Winn

The key goal of the ITS Public Safety Program is to deploy interoperable procedures and technologies for public safety and transportation operations.

Handling the Worst Crash Ever in Virginia by Melissa A. Winn

Through a massive, cooperative effort by fire and rescue units, state police, and the Virginia Department of Transportation, the scene of a 117-vehicle crash was cleared and the highway reopened in only 12 hours.

Moving Ahead — The American Public Speaks on Roadways and Transportation in Communities by Vincent Pearce

On March 20, 2001, the Federal Highway Administration (FHWA) released the results of a nationwide survey, reporting that most highway travelers were satisfied with both the major highways they use and the existing transportation system and options offered by their communities and that the level of satisfaction is higher than in a similar survey conducted in 1995.

Branding America’s Byways by Sharon Hurt Davidson

Over the past year, FHWA has been researching, defining, and beginning to build a brand for the collection of National Scenic Byways and All-American Roads.

Travelers Seek Byway Experiences by Cheryl Newman

Travel trends indicate that Americans increasingly look for travel and vacation experiences that can be found along America’s Byways.

National Work-Zone Awareness Week Commemorated Across the Nation by Ann Walls

The second annual National Work-Zone Awareness Week, April 9 to 12, 2001, to boost awareness of the need to be especially alert and concerned with safety in work zones, was well-received throughout the country. The campaign included activities in 45 states, the District of Columbia, and Puerto Rico.

Work-Zone Traffic Control: Survey of Contracting Techniques by Angela Johnson, Lloyd Rue, Ted Burch, and Dick Clark

The Montana Department of Transportation (DOT) and FHWA’s Montana Division conducted a survey to gain a comprehensive perspective of state contracting practices across the country. The survey results, reflecting the responses from 35 state DOTs, present valuable insights that will help state DOTs to improve their procedures and save money.

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The entire transportation community — public and private sectors — is facing a very critical work force problem, primarily because of the pending retirement of the Baby Boomer generation. To avoid serious repercussions, a more proactive approach to work force planning and development is required.

The Dwight David Eisenhower Transportation Fellowship Program: Preparing for the Future of Transportation by Ilene D. Payne, Leslie C. Porter, and Lisa Crye ............................................................................................................................13

DDETFP awards $2 million annually in six fellowship award categories to undergraduates, graduate students, and selected faculty. In the last decade, about 2,000 fellowships, worth $20 million, have been awarded.

The Millennium Manual Matters by David Smith ...........................................................................................................................................................................17


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QuickZone is software that will estimate traveler delay due to work zones, and by doing so, it will provide a more complete and realistic view of the total construction costs of a road project.

Iowa’s Approach to Environmental Stewardship by Dena M. Gray-Fisher ..........................................................................................................................22

The Iowa Department of Transportation has developed a multiyear education and communication plan to help both its employees and the public to fully grasp the importance of DOT’s actions to balance the state’s transportation needs and the preservation of its environmental resources.

Moveable Barrier Solves Work-Zone Dilemma by Cathy Satterfield ..............................................................................................................................26

While repairs are being made to one of the two bridges carrying U.S. 24/150 over the Illinois River in Peoria, Illinois DOT uses a moveable barrier system to facilitate the most efficient flow of traffic as the other bridge is pressed into “two-way duty.”

Learning From the Big Dig by Daniel C. Wood .................................................................................................................................................................30

Boston’s Central Artery/Tunnel Project — the Big Dig — is providing plenty of lessons for transportation planners and engineers from all over the world.

A Light at the End of the Tunnel by Frank V. Botelho ...............................................................................................................................................37

To help ensure the proper preservation of the nation’s tunnels, the Federal Highway Administration and the Federal Transit Administration joined forces to develop a state-of-the-art tunnel management system, a process that will extend the service life and reduce the operating expenses of tunnels throughout the country.

International Cooperation to Prevent Collisions at Intersections by Cathy Frye .........................................................................................................41

The United States and Japan have established the U.S.-Japan Intelligent Transportation Systems Joint Research Program to find technology-based solutions to reduce the high incidence of crashes at intersections.
Pay Attention — Buckle Up: Safe Driving Is a Full-Time Job from the Network of Employers for Traffic Safety ......47
To help educate employees about distracted driving and combat the human and economic costs of traffic crashes, NETS has made distracted driving the focus of the fifth annual Drive Safely Work Week campaign — Sept. 10-14.

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Low-Altitude Laser Surveys Provide Flexibility and Savings by Lisa Crye................................................................. 2
For two recent road surveys, the Central Federal Lands Highway Division of the Federal Highway Administration (FHWA) used a helicopter equipped with a low-power laser to collect in a few hours the complete range of required information that would have taken several weeks for a ground survey crew to collect.

The Marriage of Safety and Land-Use Planning: A Fresh Look at Local Roadways by Aida Berkovitz..................7
A national focus on the safety of local roadways is needed, and mixed land use and smart-growth policies can ultimately result in safer local roadways through the use of appropriate designs and slower speeds.

Strengthening the Connection Between Transportation and Land Use by Stephanie Roth and Ashby Johnson ......20
From a transportation perspective, smart growth includes the building of walkable communities and providing a variety of transportation choices so that residents have alternatives to the single-occupant motor vehicle to get from one place to another.

Iron and Asphalt: The Evolution of the Spiral Curve in Railroads and Parkways by Mary E. Myers ....................23
This article, reflecting the perspective of a landscape architect, explores the background, evolution, and aesthetic application of the spiral curve and suggests that it be reintroduced into educational programs for landscape architects.

New Life for Old Transmitters: Converting GWEN to NDGPS by James A. Arnold.....................................................28
The recent conversion of two Ground Wave Emergency Network (GWEN) sites in Maryland to National Differential Global Positioning System (NDGPS) broadcast stations is the latest chapter in the emerging NDGPS.

Colossal Partnership: Denver’s $1.67 Billion T-REX Project by Steve Moler..........................................................30
Metro Denver’s Transportation Expansion Project (T-REX), a combined freeway reconstruction and light-rail extension, is as massive as the name implies, and it has gone from a dream to construction in a little more than three years.

One-of-a-Kind Bridge Project Protects National Bird by Dena M. Gray-Fisher.............................................................37
The Iowa Department of Transportation and its construction and design partners are taking extreme measures to protect the environment and our national symbol, the bald eagle, during the relocation of a 40-mile (64-kilometer) segment of U.S. Route 20.

Partnership Protects Pristine Estuary and Wetlands by Maria Koklanaris .............................................................43
The Western Federal Lands Highway Division contributed $500,000 to help purchase Whalen Island, Ore., and save it from development.

Relationship Marketing: A Key to Success and Survival by Kathleen A. Bergeron .....................................................48
Customers tend to keeping going back to people and places they trust, and organizations are learning that moving from simply knowing customers to having customer relationships and managing those relationships appropriately can increase both profits and efficiency.

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Legacy of a Landmark: ISTEA After 10 Years by Ellen Schweppe..........................................................2
The Intermodal Surface Transportation Efficiency Act of 1991 changed the way federal highway programs are structured, planned, developed, and financed.

Creating a Landmark: The Intermodal Surface Transportation Efficiency Act of 1991
On the 10th anniversary of this landmark, Richard Weingroff, the unofficial historian of the Federal Highway Administration, presents a comprehensive account of the issues and politics that shaped the creation of ISTEA and changed the "way we do business" for surface transportation in the United States.

Put the Brakes on Fatalities Day by Ann Walls

On Oct. 10, the Department of Transportation and several organizations celebrated the first annual Put the Brakes on Fatalities Day, and they signed a memorandum designating Oct. 10 of every year as Put the Brakes on Fatalities Day.

No. 4, January/February 2002

A Report of the National Highway R&T Partnership Initiative by Jason McConachy and Robert E. Spicher

This article provides an update on the work and findings of the National Highway Research and Technology Partnership, an initiative in which 160 organizations participated to assess the needs of highway research and technology.

Managing Traffic Flow Through Signal Timing by S. Lawrence Paulson

Traffic signal management is one of the most cost-effective ways to keep traffic moving smoothly and to make streets safer. Efficient traffic signal control systems improve air quality and reduce fuel consumption, reduce traffic congestion, reduce the number of crashes, reduce red-light running, and postpone or eliminate the need to construct additional road capacity.

An Olympic Event: Handling Transportation During the Olympics by John R. Njord

Studying all relevant information, including the lessons learned from previous Olympic Games, the Utah Department of Transportation (UDOT) created and implemented an effective travel demand program to handle the anticipated increase in traffic during the Winter Olympics in February 2002. UDOT’s goals are to get the athletes and spectators to Olympic venues in an efficient and timely manner and to reduce background traffic by 20 percent.

It's the Ride That Counts by Rick Boeger and Roberta J. Crowe

The Maricopa County (Ariz.) Department of Transportation in Phoenix has put in place a program that makes contractors on roadway paving projects put their money where the ride is. Contractors, under this incentive program, can earn as much as an additional 10 percent of total paving costs in incentive bonuses by exceeding the preset standard for smoothness. Conversely, contractors are hit in the pocketbook if they don’t meet the standard.

Lessons Learned About Bridges From Earthquake in Taiwan by Wen-Huei (Phillip) Yen

A U.S.-Japanese team visited 10 bridge sites in Taiwan to evaluate Taiwanese bridge performance during the devastating Chi-chi Earthquake, which occurred on Sept. 21, 1999. The earthquake measured 7.6 on the moment magnitude scale, and more than 2,400 lives were lost as a result of the earthquake.

A Legacy in Art in a New Exhibition by George Austin Hay

The collection of Carl Rakeman’s 109 original paintings documenting the history of highway transportation in America finds a new home at the Texas Transportation Institute. From 1921 to 1952, Rakeman painted this extraordinary pictorial record of the development of travel in this nation. These paintings cover American travel from frontier Indian trails and pre-colonial times to modern highways.

FHWA and Nevada DOT Create a Wetland in Nevada by D. Gail Bellenger

It may be surprising to some, but even Nevada with its desert climate has wetlands. The Federal Highway Administration (FHWA) and the Nevada Department of Transportation created a large wetlands area adjacent to the scenic Washoe Lake to offset the unavoidable loss of wetlands areas as a result of highway construction and maintenance projects in and around Reno and Carson City.

No. 5, March/April 2002

“Stone-Walling” in Arkansas by Laurin R. Lineman

The Arkansas State Highway and Department of Transportation (AHDT) invited the Eastern Federal Lands Highway
Division (EFLHD) of the Federal Highway Administration (FHWA) to assist in the reconstruction of a portion of Forest Highway 65 between Cass and Oark. One of the goals was to “maintain the unique physical relationship of the sheer bluffs [along the Mulberry River], the natural scenery of the Mulberry Valley, and the scenic experience this provides for viewing from the river and road.” To satisfy this goal, EFLHD designed and constructed an aesthetic, natural stone retaining wall.

Arkansas Combines Best Practices for an Innovative Interstate Rehabilitation Program
by Dan Flowers and Sandra L. Otto
AHDT is rehabilitating 380 miles (612 kilometers) or 60 percent of its interstate highways in five years. The department has put together numerous best practices—in financing, project management, construction, and communications—that together create a compelling model for tackling a project of this scope.

Small Investment, Dramatic Dividends—Saving Lives in “Blood Alley” by Dave Davis
The Oregon Department of Transportation, three northwest Oregon counties, a community traffic safety committee, and a Native American tribe worked together to improve a dangerous corridor, dubbed “Blood Alley” by local residents, and as a result, traffic fatalities along the corridor have dropped dramatically over the past three years.

National Review of the Highway Safety Improvement Program by Kenneth Epstein, Gary Corino, and Donald Neumann
Last year, a national review was conducted of the highway improvement programs in six states. The primary purpose of this review was to document the best, unique safety practices of each State.

Weather: A Research Agenda for Surface Transportation Operations by Gary G. Nelson and Rudy Persaud
Weather crosscuts almost every goal, use, and operation of highways, and yet, meteorology, from a transportation perspective, is focused mostly on the flight operations. To make weather issues an important part of highway programs, people who manage highway operations must seek new techniques and intelligent transportation systems that complement the amazing system of weather-information collection, analysis, and forecasting that exists in the United States.

Highway Quality Awards by the National Partnership for Highway Quality
The National Partnership for Highway Quality recognized 26 States for their outstanding highway projects. The award winners were selected on the basis of the following criteria: quality process and results, customer focus, teamwork, innovation and value, and long-term improvement.

FHWA Model Predicts Noise Impacts by Cynthia Lee and Judith Rochat
The FHWA Traffic Noise Model (TNM) is a new state-of-the-art computerized model used to predict noise levels in the vicinity of highways. TNM uses advanced acoustics and computer technology to improve the accuracy and ease of modeling highway traffic noise, including the design of efficient, cost-effective highway noise barriers.

Synergy in Action: FHWA’s Transportation Pooled-Fund Program by Brett Joseph
The Transportation Pooled-Fund Program enables various public and private entities to “pool” their resources to jointly fund research aimed at solving a wide variety of transportation-related problems. FHWA’s central role is to administer the program and to act as a broker of the funds obligated to pooled-fund projects.

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Arizona Tackles Work Zone Delays by Alan Hansen
The Southwest contributes two innovative operational enhancements that might help keep traffic flowing smoothly during your construction projects as well.

A Hallmark of Context-Sensitive Design by Steve Moler
The reconstruction of U.S. 93 through Montana’s Flathead Indian Reservation showcases one State’s groundbreaking effort to build a safe, efficient highway while protecting wildlife and respecting Native American
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Reducing Points of Conflict by Joe G. Bared, Patrick Hasson, Fred N. Ranck, Hari Kalla, Robert A. Ferlis, and Michael S. Griffith .................................................................26
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Life in the Crosswalk by Tamara Redmon and Levron Boodlal .................................................................32
Public service announcements, demonstration projects, and a university course are key components of a new FHWA push to improve pedestrian safety.

Pushing through the Safety Plateau by Kristine Lee Leiphart .................................................................38
Matching human capital to the changing safety needs of transportation agencies requires ongoing workforce development if fatalities are to decrease.

Data is Key to Understanding and Improving Safety by Michael S. Griffith, Carl Hayden, and Hari Kalla .................................................................42
Road safety audits, more efficient data collection, and a new software tool promise to make our highways safer.

Managing Speed by Elizabeth Alicandri and Davey L. Warren .................................................................48
Interagency collaboration could curb speeding and save lives.

No. 5, March/April 2003

A Natural Choice by Lloyd Middleton and Mitch King .........................................................................2
Using compost for environmentally sound roadside slopes is one time when waste pays off.
   EFLHD investigated the use of compost as an alternate technique to hydroseeding and silt fences for revegetating a steep rockslide on a section of the National Park Service’s Blue Ridge Parkway. The article describes the steps taken in the compost installation, the results, and the economics of compost as an alternate method. The authors conclude by suggesting that FHWA adopt compost as a best management practice for some situations.

Behind the Scenes at the Olympics by Pamela Mathis ........................................................................6
The Utah DOT shares the know-how that it gained from managing transportation for such a major event.
   This post-Olympics article—a follow-up to the pre-Olympics piece that was published in the Jan/Feb 2002 issue of PUBLIC ROADS—is substantially different from the earlier article in that it shares the lessons learned from managing transportation for such a major event. The advice that the Utah DOT provides could be useful to any transportation agency for events such as football games, concerts, and major holiday events. FHWA’s Paul Mooney advised us to focus solely on the Utah DOT’s efforts, for political reasons, so we just mentioned FHWA in passing along with UTA, SLOC, Salt Lake City, and others. The information provided by Utah DOT focuses on interagency cooperation through a jointly staffed TOC, a public relations information campaign, various
operational tools such as increasing the size of the IMT crews and instituting a traffic observers program, making use of CCTVs and VMSs, and extensive training simulations.

Technology Goes Local by John J. Sullivan IV .................................................................10

A showcase program in Florida spurs local implementation of proven highway technologies. The Florida LTAP center initiated a demonstration program that aims to improve technology transfer and implementation at the local level. The article explores Florida’s innovative showcase program and offers several examples of technologies highlighted during these events (equipment for collecting data on pavement resurfacing, open-grade emulsified mix for paving unpaved roads, in-road warning system for occupied pedestrian crosswalks, roundabout for reducing traffic congestion, and construction of a multiuse pedestrian and bike trail through multiagency jurisdictions). The article also discusses guidelines for and evaluation of a showcase, and suggests that other States consider using a similar approach to spurring technology adoption by municipalities and counties.

A Conduit for New Technology by Kathleen A. Bergeron .........................................................15

Videoconferencing can be a cheaper, faster, safer way to spread the news about the latest transportation innovations. Videoconferencing offers a potentially cheaper way to transfer transportation technologies, versus meetings involving physical travel to demonstrate technological innovations. By eliminating travel, videoconferencing means that technology transfer also can occur more quickly and safely. State DOT engineers, for example, may work under a quota policy that permits only one out-of-state business trip per year. The article describes the history of these “virtual meetings” and their use by universities, Federal agencies (including a sidebar on FHWA’s use), the highway industry’s use for training, use by State DOTs and WASHTO-X (a research study of telecommunications by the Western Association of State Highway and Transportation Officials). The article concludes by examining the historical reasons why “picture phones” were slow to catch on and mentions how WASHTO-X is examining why users potentially may be slow to adapt to the changes required by teleconferencing, how people can become comfortable with the equipment, and the differences in meeting style and etiquette. The author had decided to include a brief sidebar comparing the costs of a sample meeting with the costs of videoconferencing, but has not yet provided the sidebar.

The Man Who Changed America, Part I by Richard F. Weingroff .................................................20

President Eisenhower’s interest in good roads began in 1919 and resulted in the Federal-Aid Highway Act of 1956—but he had to fight for his Grand Plan. This lengthy historical article by Richard Weingroff of FHWA is similar to other Weingroff articles that we’ve published in the past in that the article details the political and legislative process during the Eisenhower years of the 1950s when Ike brought the Interstate System into existence. The article begins with 8 pages of background information setting the stage and then begins the legislative process with Truman’s Federal-Aid Highway Act of 1952. Then the author provides a blow-by-blow account of the battle with the Governors over the controversial issue of State versus Federal funding of the Interstate System. The story continues in Part II of the article, which will be published in the following issue of PUBLIC ROADS.

Living Up to a Landmark by Norah Davis ........................................................................36

Building a bridge that will overlook Hoover Dam—and enhance it—is a once-in-a-lifetime engineering challenge. The article begins and ends with the aesthetic challenges of constructing a bypass and bridge in close proximity to Hoover Dam that will be worthy of this national historic landmark. Addressing the aesthetic challenge, selecting a route for the bypass, addressing various cultural and historical challenges, and choosing the type of bridge involved an interagency partnership and consultation with local Native American tribes. The article contains quotes by Administrator Mary Peters, introducing various safety, congestion, environmental, and security problems with the existing road over the dam. Funding is a mix of Federal and State monies.

Putting the Pieces Together by Dan Sunde ..........................................................................40

Washington State’s safety management system helps communities to reduce crash rates and save lives. Although the original ISTEA mandate was later repealed, the Washington State Department of Transportation (WSDOT) embarked on a mission in 1991 to develop a manual to help local agencies implement SMS’s, known as a local agency safety management system (LASMS). WSDOT designed the LASMS manual as a tool to help local
agencies take a broader approach to transportation safety and design projects that would prevent and reduce the number and severity of roadway collisions, transportation-related injuries, and property damage. According to WSDOT, an LASMS should have two primary components: a local SMS committee and an eight-step transportation safety decision-support process. The manual contains information on the tools and processes needed by local agencies to implement these two components, including a list of the positions that should be represented on the SMS committee, a description of steps involved in developing a comprehensive safety policy, and information on the data elements needed to identify high-collision locations.

Where the Rail Meets the Road by Tracy N. Busch and Keri A. Funderburg ..................................................44
A tunneling method used in Russia to run a highway beneath a train track could prove beneficial in the United States in some situations.

Engineers in Perm, Russia, chose to tunnel under railroad tracks to construct a new road for vehicle traffic, and U.S. transportation officials from FHWA and Kentucky visited Perm to view the tunnel. The Russians opted for the tunnel instead of an overpass or an at-grade crossing to avoid disruption of rail traffic during construction. They also believe that tunnels offer safety and economic advantages over bridges, which require more land, and economic benefits compared with at-grade crossings, which disrupt vehicle traffic. The article describes the safety and technical aspects of constructing the tunnel and concludes with possible applications in the United States, mentioning the safety, cost, and drainage issues that would need to be addressed.

No. 6, May/June 2003

Avoiding Voids by Thomas E. Lefchik, L. Rick Ruegsegger, and Robert W. Henthorne...............................................2
Abandoned mines jeopardize the transportation system and public safety, but States are addressing this underground threat.

The authors open by describing several incidents involving abandoned underground mines, including a sinkhole that appeared on I-70 in Ohio in 1995. This incident resulted in formation of the Interstate Technical Group on Abandoned Underground Mines (ITGAUM) in 1997. ITGAUM’s members today include FHWA, 15 States, a turnpike authority, Canadians, and other groups. ITGAUM has held four workshops since then to explore ways to use modern technologies to locate, assess, and repair mines beneath roadways. The article explores the extent of the problem, providing examples from Pennsylvania, Missouri, and Ohio. The authors conclude by describing other related activities, such as development of a manual by ODOT, a FHWA Web site, and creation of a TRB subcommittee.

Proactive Approach to Safety Planning by Roger Petzold......................................................................................6
The annual death toll on our Nation’s highways remains unchanged, but safety-conscious planning may be the answer.

Safety-conscious planning (SCP) may be the answer to the static traffic fatality and injury numbers. The article opens with quotes by Mineta and Peters. The author then defines SCP by listing the range of activities that might be included and the requirements needed to implement it. Next, the article provides State examples of SCP activities—from Iowa, Michigan, and Oregon. Finally, the article describes the TRB multimodal SCP working group’s activities (a publication and forums).

Walls of Fame by John J. Sullivan IV.................................................................................................................10
States share successful strategies for partnering with the public to design aesthetically pleasing noise barriers. This article focuses on the aesthetic qualities of noise barriers rather than their technical effectiveness at reducing noise. The author discusses ways to involve the public in making decisions about the appearance of the barriers, cost of aesthetic treatments, materials, and construction techniques for aesthetic treatments, using case studies from Arizona, Pennsylvania, and Washington State. A sidebar discusses the issue of traffic noise in general, the major mitigation techniques, and FHWA’s handbook on noise barrier design. Another sidebar discusses sample costs for aesthetic treatments, and a third sidebar compares the advantages and disadvantages of common barrier materials.

Lessons Learned by Tianjia Tang and Steve Tonjes..........................................................18
A major highway reconstruction in Orlando, FL, provides clues on how to streamline environmental studies.

The EIS process for the reconstruction and extension of the John Young Parkway in Orlando, FL, provides
several clues for streamlining the environmental study process. The authors’ first advice is to start with a solid transportation needs analysis that discusses the problems the project is expected to solve. The John Young Parkway process started with thorough modeling of needs, and this process and the NEPA process were integrated, reducing the time involved and enabling fatal flaws to be identified early. The second lesson learned was the importance of teamwork. In the JYP project, the project engineer and environmental scientist each had to agree on project scheduling, engineering design, cost, and the environmental reports. The third was to employ a concurrent review process to avoid down time between review and resubmit phases. The fourth lesson learned was to smooth the public involvement process by paying special attention to mandatory requirements such as timing of the public meeting. Also pay attention to the public’s substantive needs such as the right-of-way acquisition and driveway connections to businesses (e.g., take advantage of the expertise of a right-of-way specialist and subdivide controversial issues until you can find common ground). Lastly, pay attention to the public’s emotional needs by working proactively with advocacy groups. The final lesson learned was to think outside the box. In the JYP process, the team sought help from FHWA’s Civil Rights Team to deal with one potentially explosive issue. I've added a short version of this summary as a "Results at a Glance" sidebar that will go early in the article, and I'm working on obtaining an endorsement-type quote that will also go in the beginning (placeholder marked).

**The Man Who Changed America, Part II by Richard F. Weingroff**

President Eisenhower achieved his Grand Plan for the Interstate System with passage of the Federal-Aid Highway Act of 1956—but his interest in the new highways didn’t end there.

This continuation of the interstate story has been condensed to run the same length as Part I. The author begins with a 400-word recap of the defeat of the first interstate bill, enough for readers to remember or figure out what is happening. The story then picks up in 1956 with Ike’s State of the Union and budget messages, the search for a funding mechanism for the interstates, the mounting support for the Federal Highway Act of 1956, and the ultimate passage of the Act. The author then turns to the Act that created the position of Federal Highway Administrator and the appointment of Administrators Tallamy and Volpe. The narrative continues with the early days of construction of the Interstate System, including discussion of funding problems and Ike’s belated discovery that the system included urban freeways. Then comes a description of Eisenhower’s attempt to convince the Soviet Premier Khrushchev of the superiority of the modern U.S. highway system. This is followed by the tax increases to keep the interstate program on schedule during the final days of Eisenhower’s presidency. After he left office, his interest in the interstates continued, and the author’s wrap-up includes mention of a Reader’s Digest article on the interstates that greatly alarmed Eisenhower by describing “corrupt land deals and contracts, shoddy construction, and government officials ‘on the take. Sidebars deal with the place of Ike in history and civil defense.

**A Lifeline Link by Sybil E. Hatch**

After the wake-up call of the Loma Prieta earthquake, which rocked the San Francisco Bay area in 1989, Caltrans is building what may be the strongest bridge in America.

The collapse of the east span of the San Francisco-Oakland Bay Bridge during the earthquake of 1989 triggered a flurry of activity by Caltrans: major seismic upgrades of bridges in the area and rebuilding of the east span to make it perhaps the strongest bridge in America. It will be a self-anchored suspension bridge and the largest public works project in California history, and it will be designed to withstand an earthquake so severe that it is expected to occur only every 1,500 years. The article describes the seismic safety advances that will help this monumental structure absorb shock, the construction to date, and environmental protection measures.

**A Benchmark for Livable Progress by Robert B. King**

Transportation finds common ground with environmental, economic, historic, and community concerns in northern Delaware.

The author describes a new Delaware transportation project in Wilmington that is combining transportation improvements with addressing environmental, economic, historic preservation, and quality of life concerns. The catalyst was the merger of two firms to form AstraZeneca, the third largest pharmaceutical company in the world. Delaware’s DOT, Department of Natural Resources, and Economic Development Office worked together with 125 representatives from environmental groups, historic preservationists, business leaders, and area residents to develop a master plan that includes a roadway network that separates regional from local traffic and a trail system for pedestrians and bicyclists; wetland preservation and creation, stream restoration, management of stormwater...
runoff, and seeding of meadows; preservation of the historic Blue Ball Dairy Barn and an archaeological site; two parks with recreational amenities; and landscaping and a public art process.

The Fast Lane to Innovation by Marci Kenney and Amy Stearns

University Transportation Centers provide our Nation with an effective vehicle for transportation progress. After a general introduction, this overview of the University Transportation Centers (UTC) program provides a brief history of the Congressional authorization for the UTCs. The authors then describe UTC grant work in 7 areas. Under safety, for example, the UTC in Alabama is studying more effective ways of identifying drivers with diminished physical capabilities, specifically poor vision. The Rhode Island UTC is researching quantification of driver distraction from use of cell phones. Under security, the Mineta Transportation Institute in California has published five research reports on transportation preparedness, including 14 detailed case studies of major attacks and 9 vulnerability assessments of major bridges, tunnels, and transit agencies. In addition, MTI has compiled a running chronology of every reported attack on a surface transportation system that has occurred worldwide since 1920. Finally, it has hosted four national symposia on transportation security summarized on TransWeb, the MTI Web page. Researchers at the Southeastern Transportation Center, University of Tennessee, conducted additional work focusing on the risks of terrorism-related cargo passing through intermodal freight terminals. Having assessed the potential risks at seaports, air cargo facilities, and rail-truck intermodal terminals, they published their findings in a report that is being shared with transportation officials to increase awareness and solicit recommendations for security improvements. I have included detailed summaries of the sections on security, but the authors also describe UTC grant work in the following areas: organizational excellence, mobility, economic growth, and human and natural environments.

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A Natural Balance by Cynthia J. Burbank............................................................................................................. 2
During decades of controversy, FHWA and its State and local partners consistently included environmental stewardship as a goal of transportation projects.

The author’s overview begins with historical background on the interstate construction era, the start of the environmental movement, and NEPA. The article continues with a sidebar on environmentally sensitive interstate projects and other good news, such as improvement in air quality, provision of enhancements such as bike paths and historic preservation, context-sensitive solutions, and the net gain in restored wetlands. The author then turns to a discussion of NEPA, streamlining, categorical exclusions, TEA-21, the other articles in the issue, and context-sensitive solutions (using an example of US 93 in Montana). The article concludes with a mention of the emerging environmental ethic in transportation agencies.

Nurturing an Environmental Perspective by Ruth Rentch and Rachael Barolsky .................................................... 6
A scan tour of seven States sheds light on best practices for honoring environmental commitments in transportation projects.

This article about a scan tour of seven States focuses on the issue of honoring planned environmental commitments during the construction and operation stages. The scan team included representatives from FHWA, State DOTs, EPA, the Volpe Center, AASHTO, and ARTBA. The article describes various themes that emerges from the tour:

- The need to institutionalize an environmental ethic, a top-down commitment to environmental compliance by the leadership and staff at all levels. The authors provide an example from New York.
- Staff positions focused on environmental compliance at the construction and maintenance levels. Texas is the example provided.
- Training courses. Again, Texas is the example.
- Guidance documents, including field pocket guides, manuals and guidelines, and videos.
- Commitment assurance through planning sheets and summaries, forms, meetings, and field reviews.
- Tracking mechanisms, such as databases, forms, and lists.
- Public involvement in an open, cooperative process. The Wyoming DOT recently revamped its system for public involvement. Context-sensitive design is another way to involve the public and preserve environmental resources by building a highway that blends with the landscape.
- Interagency coordination, especially to build trust with resource agencies.

The authors conclude by providing a set of recommendations based on these findings.

The Road to Streamlining by Kreig Larson ............................................................................................................. 10
An indepth look at the NEPA process and ways to expedite it.

The author begins with a statement about NEPA’s benefits and its history of being perceived as a source of delay (see note to FHWA reviewers). A quote by Peters follows and then the article introduces the FHWA study of the impacts of NEPA on the timing and cost of project delivery. This baseline study found that the average time to complete an EIS is 3.6 years. Follow-up research with different parameters determined that the average time is actually 5.1 years and that the time is longest in the Southeast, shortest in Regions 8 and 6. FHWA identified eight case studies that demonstrate successful streamlining measures, and the article summarizes tips from these
examples. The author concludes by describing a Gallup survey to view how stakeholders in the NEPA process view the duration of the process, its quality, and areas for improvement.

**Executing the Executive Order** by Frederick Skaer ................................................................. 14

Federal agencies today are collaborating more effectively on environmental reviews of major transportation projects, thanks to a new Presidential mandate.

The article begins with an explanation of executive orders and then describes the environmental stewardship and transportation executive order, which sets up a task force chaired by Mineta to implement the order. Mineta selected 13 number of projects to receive priority treatment. The author identifies some issues common to the projects and lessons learned to date. The task force is exploring process improvements for streamlining procedures under four laws: the Clean Water, Endangered Species, National Historic Preservation, and the Department of Transportation Act. The author concludes with two examples of environmental stewardship: North Carolina’s ecosystem enhancement program and wildlife corridors.

**A New Approach to Road Building** by Lori Irving ................................................................. 18

Can a new policy change the way people think about transportation agencies and the projects they deliver?

The author describes how context-sensitive design has changed how the public thinks about transportation projects. In defining context sensitivity, she quotes Mary Peters and then provides examples of context-sensitive projects from Delaware and Kentucky that dramatically changed the public’s perceptions. The author then maintains that context-sensitive design and improving the safety of transportation facilities go hand in hand. She concludes with the Kentucky example that makes the point that the extra cost of context-sensitive design (25 percent) was worth it because of the positive response of the community.

**Living with Noise** by Chris Corbisier .............................................................................. 22

Planning land use with highway traffic noise in mind can help local agencies improve residents’ quality of life.

The author describes the concept of noise-compatible land-use planning, which encourages the location of less noise-sensitive land uses near highways, promotes the use of open space separating roads from developments, and suggests special construction techniques that minimize the impact of traffic noise. After introducing some basics about sound and steps that the Federal government has taken to reduce traffic noise, the author goes on to explain the benefits of noise-compatible land-use planning and highlight specific strategies, such as guiding development through zoning and incorporating acoustical solutions into buildings. The author highlights one case study—the Carrington development in Fairfax County, VA—and cites a Washington Post article from November 2002 that reports that Americans are willing to accept higher noise levels outdoors in return for convenient access to a highway. The article concludes by noting the costs associated with planning land uses with regard to noise.

**Bikeways and Pathways** by Andy Clarke .............................................................................. 26

Accommodating bicyclists and walkers will promote a healthier transportation system, a healthier environment—and healthier Americans.

The author opens with quotes from Cindy Burbank and Tom Larson, then discusses use and safety statistics on walking and bicycles. He continues by mentioning the environmental, health, and security benefits of increasing bicycle and pedestrian use. The article continues with a discussion of USDOT and FHWA reports and policy guidance on promoting bike use and walking, and then the funding under ISTEA, TEA-21, CMAQ, NHS, Hazard Elimination for Safe Routes to Schools, and Scenic Byways. Turning to technical knowledge, the author continues with a discussion of AASHTO’s guidebook on developing bike facilities and the software and other technical tools developed by FHWA and NHTS, including the Pedestrian and Bicycle Information Center. San Diego’s Street Design Manual is provided as a successful example of combining multiple objectives and serving diverse users. A more traditional approach is design manuals specifically for biking and walking improvements, such as publications produced by Florida, Oregon, and New Jersey. The author turns to Oregon for examples of some of the benefits of biking and walking improvements, and to Pennsylvania, Colorado, and California for the importance of better conditions for bicycling and walking for transit. The article concludes with the future potential to increase bicycle and walking use, a shining success story from Portland, OR, and a final quote from Cindy Burbank.

**Centering on Environmental Excellence** by Kris Hoellen .................................................. 32
AASHTO is helping State DOTs and others make environmental stewardship and streamlining part of their mission and everyday activities.

The AASHTO Center for Environmental Excellence is a one-stop resource for technical assistance, training, and access to environmental tools. The first goal of the center—sharing information on best practices—is met through a Web site, an award competition, a demonstration program, teleconferences, and an educational report. The center’s second goal is training, problem solving, and partnership building—being achieved through a workshop on environmental management systems, draft EMS templates, a team of technical experts on call, and a CD-ROM on programmatic agreements. The third service—technical assistance—is achieved through the team of on-call experts. The author concludes with a quote from Horsley, who is AASHTO’s executive director.

**New Life for Brownfields**

by Constance M. Hill .......................................................... 36

Across the country, transportation projects play a critical role in revitalizing abandoned industrial properties.

The author opens with a quote by Assistant Secretary for Transportation Policy Emil Frankel about transportation fostering brownfield redevelopment and economic development. (He has approved the quote, as has Cindy Burbank.) The Bush Administration and EPA have identified sites as priorities, and FHWA uses Federal-aid highway funds to help develop brownfields. FHWA also funded a research study to increase understanding of transportation’s role in brownfield redevelopment. The author provides three case studies from the research study: North Marine Drive for a deepwater port in Portland, OR; a bicycle and pedestrian trail in Kansas City, MO and KS for the urban riverfront; and freight-related development on abandoned industrial sites in NJ. The article concludes with further discussion of the research results.

**Air Quality and Transportation**

by Gary Jensen .......................................................... 40

Emissions are on the decline, and efforts from the Federal to the local levels will help continue this trend.

Gary Jensen discusses the success the United States has had in reducing transportation-related air emissions, especially with on-road mobile (automobile) sources. He notes that EPA estimates show that emissions reductions from motor vehicles have accounted for 84 percent of the total emissions reductions of the six criteria pollutants since 1970. He provides basics on air pollution and describes Federal legislation to protect air quality, including the Clean Air Act and air quality standards. Jensen defines nonattainment areas and explains how ISTEA and TEA-21 provide State and local officials with tools and programs, like CMAQ, to improve air quality. He offers Los Angeles, Denver, and Atlanta as examples of metropolitan areas that have improved air quality significantly since 1970. Jensen explains that emissions from motor vehicles have decreased in spite of growth in the U.S. population and the number of vehicle-miles traveled. He concludes by describing new EPA emissions standards and cleaner fuel requirements that will be phased in by 2007, helping further reduce the transportation industry’s contribution to air pollution.

**Solutions from the Sunbelt**

by Alex Levy.......................................................... 44

The southeastern States share strategies to protect wildlife and fragile habitats.

With a growing population and highway network, the Southeast’s ecosystems are under stress. But State DOTs are protecting wildlife habitats throughout the region. The author explores what 9 States are doing to improve ecosystem connectivity, reduce roadkills, and protect human lives and property from animal-vehicle collisions. Florida: While upgrading Alligator Alley, the State found ways to protect the federally endangered Florida panther: underpasses and right-of-way fencing. The State also hosted the first International Conference on Wildlife Ecology and Transportation, signed a MOU streamlining environmental planning, and created habitat banks. Alabama: Wetlands banks to mitigate the impacts of transportation projects are one effort, and another is red spheres on power lines above roadside foraging areas for woodstorks. The article continues in this way through the other southeastern States: North Carolina, Tennessee, Kentucky (prismatic reflectors), Arkansas, Louisiana (prairie preservation), and South Carolina. Federal funding through ISTEA and TEA-21 is mentioned at the end of the article.

**Reviews on the Fast Track**

by Cassandra Callaway Allwell .......................................................... 49

A step-by-step guide to practices that States employ to streamline the environmental review process.

This article on practices that States employ to streamline the environmental review process begins with a success story from Colorado on multi-habitat mitigation purchases. The author then defines environmental streamlining...
and describes various streamlining practices with brief examples (sometimes only a line or two) from a number of States. The practices are described under six categories: integrated planning; context-sensitive designs; programmatic agreements for historic preservation, wetlands, endangered species, and public lands; flexible mitigation such as wetlands banks and regional mitigation; technologies, cross-training, and interagency personnel agreements; and alternative dispute resolution. The author concludes with lessons learned, providing six tips.

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