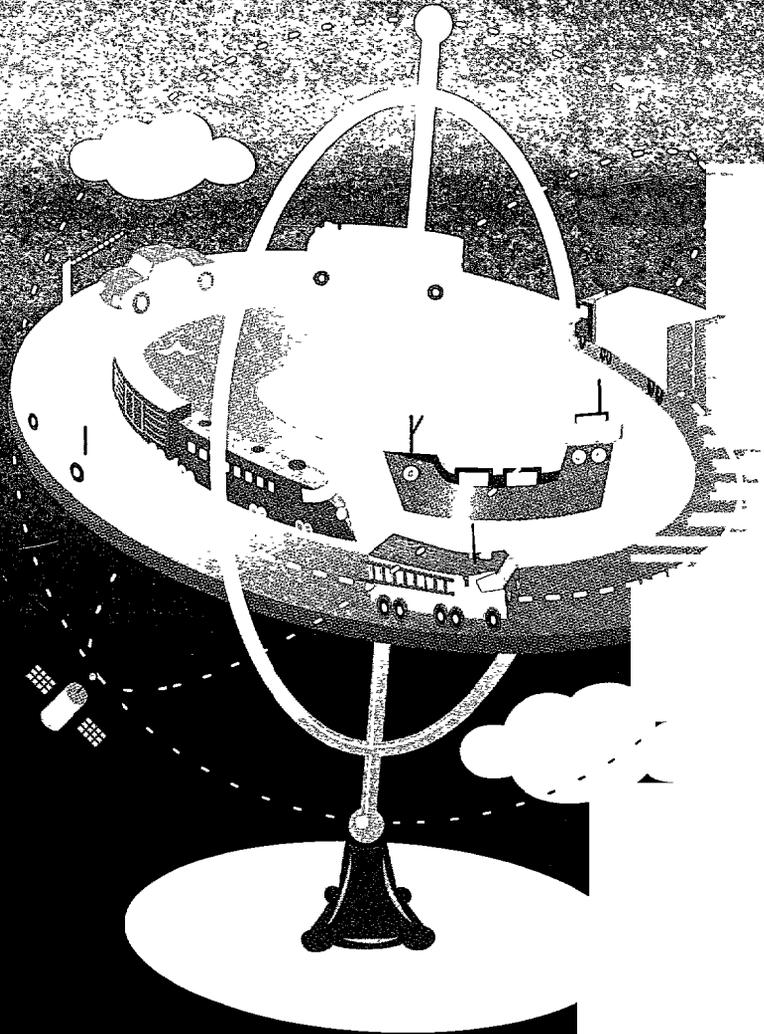


A PUBLICATION  
OF  
THE INTELLIGENT  
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SOCIETY OF AMERICA

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TRANSPORTATION

MOVING  
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INTO THE  
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# A Magazine By Demand

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The staff of the Intelligent Transportation Society of America did not sit down and decide to create a magazine. Our 700 member organizations sat us down-and with all the weight that 50 Fortune 500 companies, 31 states, 46 universities, major national laboratories, the U.S. Department of Transportation, and local government representatives can bring-with all the commotion that 20,000 individual members can create, you got us to agree that yes, we would like to provide you with a 4-color magazine.

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Our private sector members said it's well and good that they can exhibit their products and services once a year in the United States and once a year abroad. But give us government officials, financial markets, more businesses, and more transportation professionals, they said. Our public sector members clamor constantly for more information on what's going on-about projects, products, services, public/private partnerships, and who is leading the charge.

So we did some exploring, and came up with a winning team. The prototype in your hands is the result of a partnership that brings to the table the assistance and savvy of Fortune magazine, the talents of the Custom Publishing Group, and the commitment of the ITS AMERICA members. And what's more-it's FREE!

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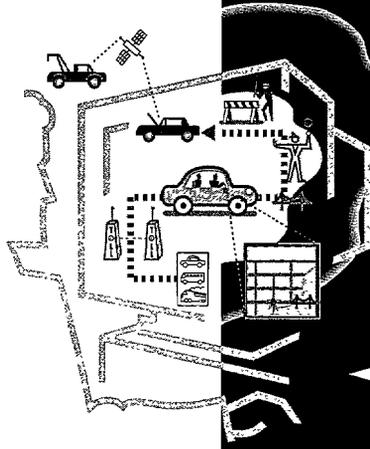
Communications

**Editor**

Henry G. Bowles

**Design**

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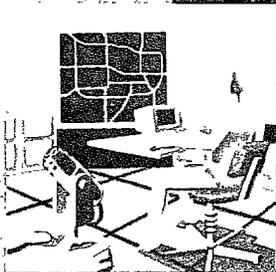


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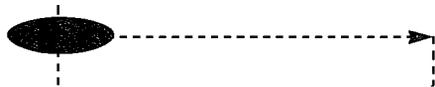
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# Intelligent Transportation

MOVING TRANSPORTATION INTO THE INFORMATION AGE

A

Makes life better



Gives choices



Gets you there quicker and safer



Gets you there cleaner



Reduces freight costs



It's the Washington Beltway at 5:30 on a weekday evening. As a commuter heads north at the end of a long day, he abruptly slams on his brakes. Another backup at the American Legion Bridge heading into Maryland.

This is the nightly story on a stretch of I-495, the 60-mile-long ribbon of concrete and steel that encircles the nation's capital, and it is a scene shared by drivers all around the country—on the LBJ in Dallas, the Loop in Chicago, the Long Island Expressway in New York, and throughout the Los Angeles freeway system. It's bad now, but just imagine what it could be like in five years, or in 10 or 20.

"Contrary to conventional wisdom, new highways are not the answer," says James Costantino, executive director of the Intelligent Transportation Society of America.

Known as ITS AMERICA, this Washington, D.C.-based organization is spearheading efforts by industry, academia, and government agencies to use advanced communications, electronics, and computer technologies in surface transportation systems. "Urban planners and transportation experts realize that cities are running out of real estate to increase their transportation infrastructure," says Costantino. "In most parts of the country, building new highways and adding traffic lanes are no longer options."

The answer is to make better and more intelligent use of existing highway and transportation networks. How? As both industry and governments agree by making vehicles and highways "smarter" through the use of computer and communications technologies. The Government Accounting Office supports this conclusion; the GAO has determined that road capacity in the U.S. could be safely increased some

For More Information  
strate the development, deployment, and acceptance of

of transportation, not only in the U S but for the rest of the world as well In the process, it is becoming a huge new industry

"The ITS industry in America is projected to grow to as much as \$200 billion a year by early in the next century," says Federico Pena, the U S secretary of transportation. Pena believes that the industry should have the principal responsibility for developing the technology and marketing the products that will bring high-tech transport to America "Ultimately, the extent to which ITS technologies are used will depend on the commitment of the private sector," Pena says "As in our support for other technologies, the Department of Transportation is looking to market forces—the free choices of millions of users—to define the winners and losers. But government does have a clear role in helping to develop technologies which show promise of success."

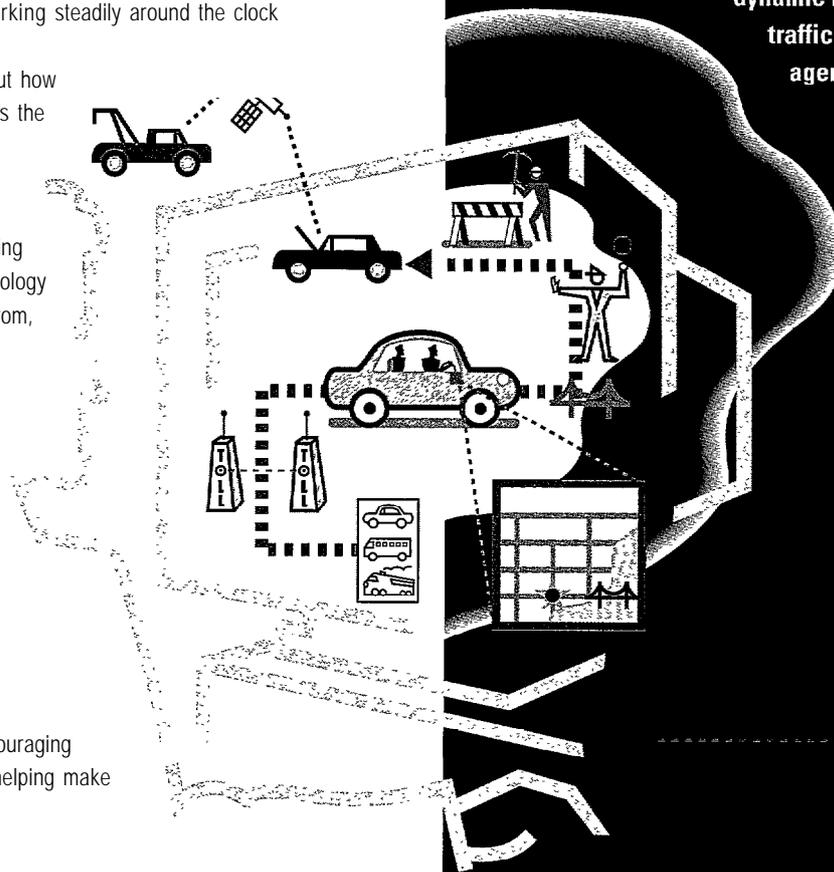
### LOOKING TO THE FUTURE

"As we approach the 21st century, we're seeing a new and increasing effort across the world to employ high technology to improve our transportation systems," says Frank Francois, executive director of the American Association of State Highway and Transportation Officials (AASHTO) and former chairman of ITS AMERICA "I think what we've seen so far is just the beginning."

Highways of the future will be quite sophisticated and technology-laden, as will be the cars and trucks that use them. But in most cases neither the roads nor the vehicles will look all that different from those of today. The secret of their efficiency? The extensive use of advanced electronic and information processing, largely unseen but working steadily around the clock to keep traffic flowing.

We have the technology, but how does it all work together? That's the focus of innovative companies that specialize in bringing together diverse technologies. "EDS is in the business of getting people, information, and technology together," says George Newstrom, corporate vice president of EDS. "The solution to many of the challenges of the ITS lies in the creative use of information."

For example, EDS is using cameras at 15 busy intersections in New York City to photograph cars that run red lights. This is a client/server system that is generating an average 700 tickets a day, encouraging more law-abiding driving and helping make



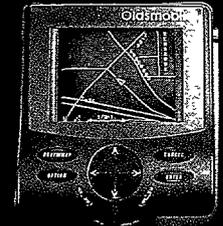
## WISH UPON A GUIDESTAR

Drivers who have waited patiently for intelligent transportation technology to make its way to automobile showrooms have just had their wish come true.

Oldsmobile's Guidestar navigation system is here.

Brought to Olds' Eighty-eight LSS model through a collaborative effort involving Rockwell, Zexel, Delco

Electronics, and the automaker, the dealer-installed Guidestar provides a wealth of information to keep drivers on track.



Guidance is offered with visual prompts and synthesized voice commands.

A four-inch color display offers menus that walk a driver through the mapping process, plan routes according to destination information they receive, and even offer points of interest along the way. The system identifies an automobile's exact location while in motion by using dead reckoning and CD-ROM map disks, with cross-checking via global positioning system (GPS) satellite data. The display's map moves along with the car's progress on the road.

The Guidestar system is designed to be expandable, so drivers using it can eventually expect to benefit from dynamic route guidance provided by traffic control centers and other agencies in the future. □

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Gives route choices

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## Peña: Deployment Is Our Top Concern

A conversation between Federico Peña, U.S. secretary of transportation, and James Costantino, Ph.D., executive director, Intelligent Transportation Society of America.

**Secretary Peña:** America is undergoing a technological revolution in transportation as we apply advanced communications, electronics, and computer technologies to "intelligent" surface transportation systems. Transportation is moving into the information age. The federal government has a leading role in these developments, but we need to team up with local governments and the private sector to make these systems work.

Public-private partnerships are essential in applying advanced technologies to surface transportation. The Intelligent Transportation Society of America has more than 750 organizations who are members from industry, academia, the research community, government agencies, and public interest groups. We embody that public-private partnership and are pleased to serve as an advisory committee to your department.

**What is the department's goal in guiding this technological revolution?**  
**Secretary Peña:** Deployment is our top concern. To reach full national deployment, the public sector needs to take the leadership in gaining consensus on an architecture that will enable industry and private organizations to build and purchase with confidence. We must also take the lead in investing in the public infrastructure that will help open the market. But we also need the private sector.

We estimate that nearly \$210 billion will be required by the year 2011, with consumer and private sector purchasing and investment decisions accounting for about 80% of these costs.

**Secretary Peña:** A representative of the General Accounting Office recently testified before Congress that we need to see a more predictable market for investors.

*The Wall Street Journal* reported on August 8 that the market for electronic toll-collection systems could rise to \$1.75 billion by 2005, up from \$225 million today. That is just one example. As experience with the technology grows, we believe more investors will be attracted.

**Secretary Peña:** I intend to articulate to the American people and to Congress that we can save lives and reduce congestion and energy consumption with the use of this technology. ITS offers more choices to the traveling public and the commercial freight industry. We have the opportunity to be the world's leader in this technology with the potential to dominate the global market, if we act now.

Big Apple intersections safer for pedestrians and drivers EDS has applied technology to transportation in other ways as well, working with commercial rail companies in tracking shipments to help ensure more efficient delivery to market and providing the national system that supports the federal law that mandates one driver, one state and one license for all commercial vehicles

### BRING ITS TO THE HIGHWAY

Operational test projects across the country are field testing other smart transportation systems Participants Include mainstream corporations such as EDS, Siemens, Rockwell, and Delco Electronics

And telecommunications companies-among them BellSouth, Bell Atlantic and NYNEX-are heavily involved in ITS Automakers like Ford and General Motors are at the forefront of applying intelligent technologies to their vehicles for safer and more efficient driving many of these companies are partners in projects that use ITS technologies

"For decades, Rockwell has been a major supplier of equipment and components to virtually every arm of the transportation industry," says Kent M Black, Rockwell's executive vice president and chief operating officer "Now we're applying advanced electronics, systems integration and low-cost manufacturing skills to move transportation systems to even safer and more efficient levels "

There are nearly 80 operational tests under way in the U S right now "The FAST-TRAC operational test project in southeastern Michigan is currently the largest program of its type in the world," says Ronald P Knockart, vice president of Intelligent Vehicle Highway Systems North America at Siemens Automotive "These field tests, funded in part by the U S Department of Transportation, focus on different aspects of ITS This is an important part of moving intelligent transportation technologies from development to actual use "

### A MAJOR NATIONAL EFFORT

The DOT has established four priority corridors as part of a program to support continuing deployment of intelligent transportation systems and services throughout the country The department is requiring that at least \$43 million be spent annually within these corridors on ITS-related projects

One of these is the I-95 Northeast Corridor, from Virginia to Maine which, according to federal highway administrator Rodney E Slater, "is demonstrating how technology can be applied to NTS [the national transportation system] " The current list of participants in the I-95 Corridor Coalition shows the breadth and scope of the endeavor This includes 12 toll authorities that operate major facilities within the corridor, 14 state and local DOTs and federal agencies, the AAA Foundation for Traffic Safety, Amtrak, the ATA Foundation, the American Bus Association, ITS AMERICA, and the National Private Truck Council

"Although Europe established the early lead in the development of ITS through widespread government initiatives in the 1980s,"

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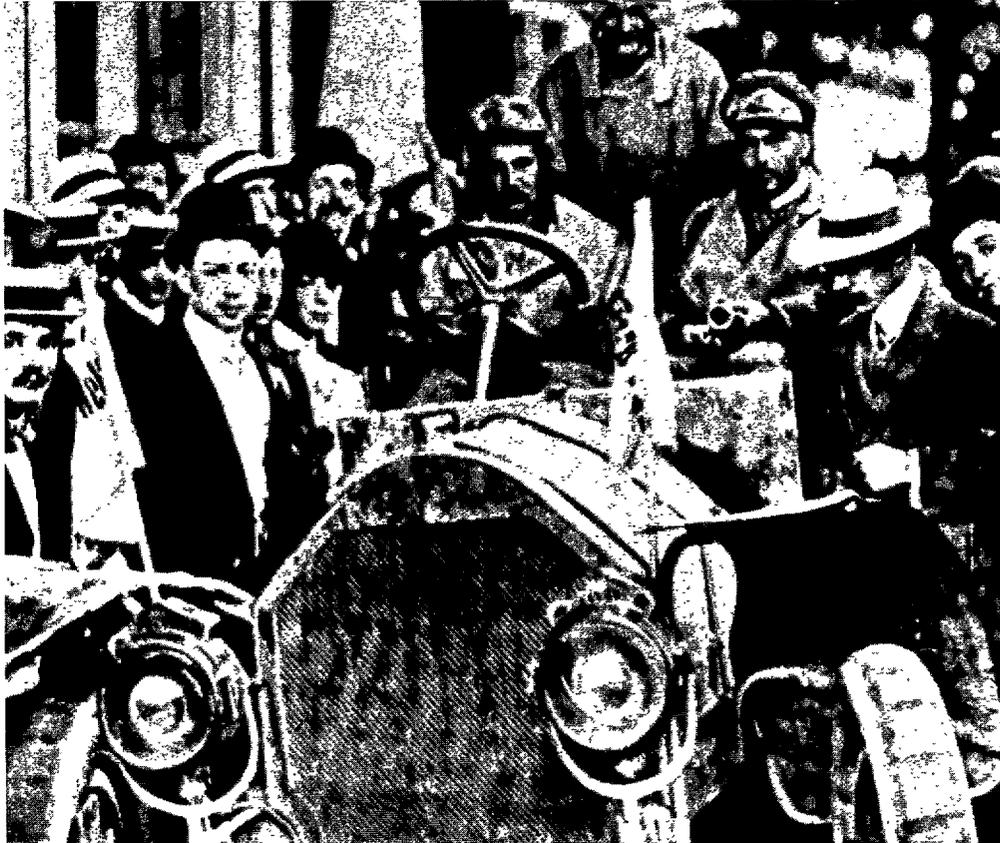
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## MOVERS AND SHAKERS ON CAPITOL HILL

When President George Bush signed the Intermodal Surface Transportation Efficiency Act (ISTEA) into law in December 1991, it wasn't just for another highway bill reauthorization. For the first time, the words "intermodal" and "efficiency" appeared as more than transportation jargon. Right off the bat, the bill set up an intermodal system with "insistent attention to the concepts of innovation, competition, energy efficiency, productivity, growth, and accountability."

It also said: no more business-as-usual. In the words of the bill: "Practices that resulted in the lengthy and overly costly construction of the Interstate and Defense Highway System must be confronted and ceased." Period.

Senator Daniel Patrick Moynihan of New York was a major player in crafting the bill that officially launched the IVHS program. New Jersey Senator Frank Lautenberg, architect of the Intelligent Vehicle Highway Systems Act, which was included in the bill, has been a leading IVHS supporter from day one. The act funds IVHS at roughly \$660 million over six years, called for a strategic plan for IVHS to be produced, and a fully automated roadway or test track to be in operation by 1998.

Another senator from New York, Alfonse D'Amato, is the ranking minority member of the Senate Appropriations Subcommittee on Transportation. New York's Long Island region has over \$90 million in IVHS projects in its capital program.

Senator John Warner from Virginia, ranking minority member of the Environment and Public Works Committee, said in a floor statement last March 3: "The allocation of resources to bring IVHS technologies to the National Highway System offers a tremendous opportunity to improve mobility, enhance safety, and reduce congestion through electronics, communications, and control technologies."

Chairman of the House Public Works Committee, Representative Norman Mineta of California, and then-Representative Bob Carr of Michigan, who was chair of the House Appropriations Subcommittee on Transportation, also are strong champions of the IVHS/ITS movement. Says Mineta: "ITS [intelligent transportation systems] is an important part of the 'efficiency' in ISTEA."

Says Carr, "IVHS is truly an exciting area that holds the promise of changing the way we travel and the way we think about traveling in America." Oakland County, Michigan, just north of Detroit, is home to the FAST-TRAC operational test of advanced highway and vehicle technologies.

Pennsylvania Representative Robert Borski, as chairman of the House Public Works Subcommittee on Investigations and Oversight, is closely following the intelligent transportation systems program, and introduced legislation for a national transportation system with more funds for urban areas.

Congressional support for IVHS has increased from \$214 million in fiscal year 1994 to \$227.5 million for 1995. □

says Siemen's Knockeart, "it is the U.S. -in the opinion of the Europeans in the Industry-that has swiftly taken over the lead and is charging ahead with the U.S. DOT's aggressive effort to develop a national ITS architecture which will allow for compatibility of products and systems across state lines."

He adds "Europe can only watch as the U.S. lays the groundwork for the world's first national ITS architecture, because Europe's nations, which share these same growing traffic congestion problems, do not as easily share the same priorities, standards, or views on the solutions."

### INTELLIGENT USE OF TECHNOLOGY

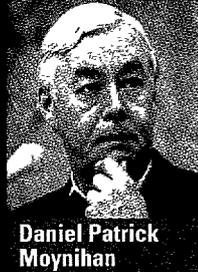
One of the most advanced technologies being applied to ITS today is the global positioning system. For many years this combination of satellites, a transponder, and a computer was the province strictly of private pilots and ocean vessels. Today, anybody can own sophisticated GPS technology for as little as \$500. The piece of equipment held in the hands of soldiers in the Gulf War that could tell them precisely where they were in the featureless desert can also tell drivers where they are, what's happening on the road ahead, and suggest alternative routes. GPS is not a next-century solution. It's today's technology, just like many others we use in everyday life.

The automated highway system (AHS) is considered the next major goal. The idea is to create expressways free of human error-and cars with "virtual" drivers. The Department of Transportation is required by the 1991 Intermodal Surface Transportation Efficiency Act, or ISTEA, to have a prototype developed by 1997. Recently, a General Motors-led consortium was awarded a \$200 million federal contract to develop an AHS prototype in partnership with the DOT.

"The National Highway Traffic Safety Administration is doing research on many aspects of the AHS and automatic vehicle control systems," says AASHTO's Francois. "The PATH Project [Partners for Advanced Transit and Highways], with Caltrans and the University of California at Berkeley, is well along in testing a variety of techniques that might be used."

While it will be years before smart cars will be driving down smart highways robotically, ITS is already being used by drivers in many parts of the world. These technologies range from the simple entrance ramp meters that control the amount of traffic entering a congested freeway to the HELP (Heavy Electronic Vehicle License Plate) program that allows 18-wheelers to travel from British Columbia to Texas without stopping at a single tollbooth or weigh station.

Buses equipped with onboard collision avoidance equipment have already registered improved safety on the road. Selected toll roads, bridges, and tunnels are now equipped with automatic toll collection systems that bill drivers without requiring a stop. Several hundred thousand onboard navigation systems are in use in Japan, and Oldsmobile is now offering a similar option with its Guidestar GPS navigation system, currently available on eighty-Eight LSS.



Daniel Patrick Moynihan



Frank Lautenberg



Norman Mineta

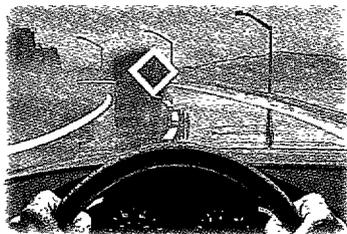


Bob Carr

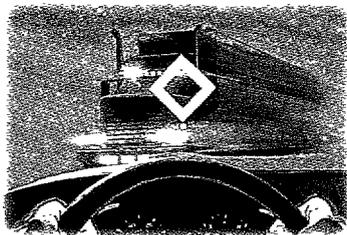
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*A storming night on the highway.*



*You can't see five feet ahead.*



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models in California and soon to be available nationally Delco Electronics low-cost Telepath 100 navigation system also began production this fall

Under ITS, technology can be applied to Improve mobility and transportation productivity, enhance safety, conserve energy resources, and reduce adverse environmental effects In short ITS saves time, money, and lives.

Currently, ITS technologies are focusing on six key areas of development:

#### **ADVANCED TRAFFIC MANAGEMENT SYSTEMS**

Advanced traffic management systems (ATMS) is a concept being examined in many major urban areas to reduce gridlock. ADVANCE in Chicago, SMART and Pathfinder in Los Angeles, TravTek in Orlando, FAME in Seattle, and Minnesota Guidestar in Minneapolis These are operational tests that bridge the gap between R&D and full-scale deployment of proven technologies, most are highly visible and well along in prototype and demonstration stages

These systems collect, use, and disseminate information regarding congestion and incidents causing traffic tie-ups. They use sensors, reports from police communication networks, roadside-mounted video cameras, and even call-ins by individuals as input data to sophisticated computer systems which predict road conditions and alert drivers to alternative routes.

One of the latest large-scale ATMS deployments is being showcased in the first phase of San Antonio, Texas' "smart" highway,

which is being tested as a model for other states When completed, the largely FHWA-funded project will use a network of sensors embedded in a 26-mile stretch of roadway, changeable message signs, and an array of computers to keep drivers apprised of changing conditions

#### **ADVANCED TRAVELER INFORMATION SYSTEMS**

Advanced traveler information systems (ATIS) assists travelers in a variety of ways For drivers, this means information on current and near-future traffic conditions, road hazards on intended routes, and weather conditions, as well as accommodations, services, and recreation-even where to find parking. Onboard navigation systems, like Oldsmobile's Guidestar and the GPS-based route guidance system being developed at Ford, not only provide electronic road maps, but will ultimately offer route guidance with constantly updated information from advanced traffic management centers.

An example of a combined ATMS/ATIS approach is FAST-TRAC (Faster and Safer Travel through Traffic Routing and Advanced Controls), a demonstration traffic management program in Oakland County, Michigan, just north of Detroit Key elements of FAST-TRAC are video traffic surveillance, adaptive traffic signal control, and traffic accident information from Michigan State Police and Oakland County Sheriff Department computers Siemens' All-Scout system, which uses traffic-light-mounted infrared beacons to communicate with vehicles, provides onboard navigation and dynamic guidance. Route guidance is provided by voice messages and a simplified instrument panel display.

A unique approach to ITS is offered by SmarTraveler, which is assessing the effectiveness of delivering real-time travel conditions throughout eastern Massachusetts. A product of SmartRoute Systems, a firm that designs and deploys early-stage ITS technologies, SmarTraveler is designed to reach travelers before they leave home or office, enabling them to change their route, travel time, or even mode of travel, depending upon conditions

Donald Dashefsky, head of NYNEX's Project Northstar, an In-vehicle travel information service in the New York City metropolitan area and parts of Connecticut and New Jersey, says "The future of intelligent travel is not restricted to In-vehicle applications There Isn't a system available today that we know of which provides the range of services we're testing in the manner we're delivering them-on-line, Interactively, and using existing telecommunications Infrastructure and user-friendly interfaces "

Dashefsky notes that the Project Northstar team is developing interfaces to offer user information through a variety of wireless and wire-line devices, including fax machines, laptop computers, and pagers "Project Northstar offers services travelers have said they want, through technology they understand, delivered by people with whom they can Interact," he says

Other forms of onboard navigation are coming to the fore for highway driving "We have a product we're working on that doesn't require beacons, a variation of our All-Scout navigation system," says Siemens' Knockart "It will give you guidance Information,

## **NYNEX CORPORATION**



**William C. Ferguson  
Chairman and CEO**

**NYNEX is a worldwide, multi-billion-dollar telecommunications company delivering voice, data, image and video communications to millions of people every day.**

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networks, as well as in new technology, to deliver an ever-growing array of advanced telecommunications services to its customers.

**Project Northstar, for example, is a joint public/private trial with the Federal Highway Administration that uses Intelligent Transportation System technology to offer vehicle operators real-time access to travel and traffic information and assistance.**

# **NYNEX.**

Lowers costs

Speeds delivery

Improves safety

Reduces paperwork

electronic yellow pages, and a whole host of other driver information at the lowest cost " Another affordable approach is that used by the GPS-based Delco Electronics Telepath 100, which offers textual navigation information on the display of an in-dashboard AM/FM/cassette receiver

**ADVANCED VEHICLE CONTROL SYSTEMS**

Advanced vehicle control systems (AVCS) encompasses much more than the robotic automobiles that some people envision in the years ahead Obstacle detection and collision avoidance systems are already finding their way on selected cars, trucks, and buses Next up intelligent cruise control, being developed by Ford and other automakers ICC integrates obstacle and collision detection technology with a vehicle's conventional cruise control system to help prevent crashes, relieve driver stress, and improve traffic flow

"We have a number of demonstrator projects in this country, including one we're publicly showing that has to do with a project called vision enhancement," says Gerry Conover, Ford's manager of technical information and ITS The radar-based device examines the road ahead, defining the roadway edges and detecting if obstacles or other traffic are present It then identifies those on a head-up display so the driver can take appropriate action

One obstacle-avoidance system already making school bus rides a bit safer for children is Forewarn, developed by Delco Electronics Forewarn uses microwave radar to detect an object or a person or a child in front of, beside, or beneath a school bus A driver gets both visual and audible warnings if something or someone is detected in those areas

"The focus of vehicle safety is moving more and more from crash protection to crash avoidance," says Ford's Conover. "The goal is to provide the driver with tools to help reduce the chance of a crash-causing error in the first place." Indeed, research shows that human error is responsible for the majority of all crashes, and improving driver reaction time by just half a second can reduce the number of incidents by as much as 60%

**COMMERCIAL VEHICLE OPERATIONS**

Commercial vehicle operations (CVO) is aimed at technologies that enable commercial fleets, trucks, and intercity buses to travel their routes without requiring time-consuming stops for weighing, paying tolls and fees, obtaining permits, and completing other administrative tasks It's all handled electronically via radio transponders and "smart" debit cards while the vehicles are in motion Of all ITS programs, CVO has progressed the farthest, with two major demonstrator programs already in place: HELP/Crescent and ADVANTAGE I-75, both operating in the United States and Canada

Besides being an integral part of CVO operations, automatic vehicle identification is also currently being used in electronic toll



collection (ETC) and traffic management systems on toll roads, bridges, and tunnels How important is this? According to one study, an electronic toll collection lane speeds 2,500 cars through in an hour, as opposed to about 800 an hour in a conventional lane with a human toll taker "ETC is to driving what nonstop flights are to air travel," says John Bermingham, president of AT&T Smart Cards

**ADVANCED PUBLIC TRANSPORTATION SYSTEMS**

Advanced public transportation systems (APTS) deals with mass transit, underscoring a consensus that intelligent transportation's scope must reach far beyond cars and roads. "One of the ideas behind ITS is: 'Let's give everybody some benefit,'" says Siemens' Knockart "In our architecture we take the approach that everybody should get something out of ITS, even if they don't own a car"

## CAMERAS ON BUSY STREETS SAVE LIVES

As the lights change at a busy intersection in New York City, a pedestrian steps off the curb to cross the street. But a driver decides to run the red light and accelerates through the intersection. The pedestrian, who quickly has to jump back to avoid being hit, wonders why the city government can't put a stop to such flagrant violations.

Now something is being done. In a decision to bring technology used in more than 80 countries to the United States, New York City hired EDS, LeMarquis and Mulvihill Electric to catch red-light runners in the act.

Suspended high above an intersection, a camera snaps a rear angle photograph of a car as it runs a red light. Once the film is processed and the license plate number clearly shown, the violation is verified and the photo images are captured in a computer system. The system then creates a ticket bearing the photos and sends it to the vehicle's registered owner.

At 15 busy crossings throughout the city, cameras are snapping pictures and generating an average of 700 tickets a day. The photographs provide the kind of irrefutable evidence that most drivers are unwilling to challenge, resulting in 75% of the violators paying their fines.

Besides generating tickets—complete with photos—this client/server system processes fine payments, schedules hearing dates, and enables judges to view the digitized photos on courtroom computers.

The cameras have been so successful that city officials are expecting to expand the program tenfold. With public safety and traffic management issues in the spotlight, a number of other municipalities and counties have expressed interest in the cameras.

ITS' goal in this area is to create a more user-friendly atmosphere that serves to increase mass transit ridership "If it diverted only one out of every five solo drivers, ride sharing would save the United States \$30 billion in congestion each year," says Lawrence D Dahms, executive director of the Metropolitan Transportation Commission in Oakland, California, and chairman of ITS AMERICA

Smart technologies help mass transit in a variety of interesting ways A test program called "Smart Commuter," soon to be launched in Houston, will include continuously updated traffic and transit information, bus choices, and car pool options for travelers at home or at work similarly, computerized information centers in Seattle and Bellevue, Washington, will allow people to match up with car pools and van pools Users could even call up a replacement for a sick car pool member, helpful for high occupancy vehicle lane users or those who only occasionally need a ride

### ADVANCED RURAL TRANSPORTATION SYSTEMS

Advanced rural transportation systems (ARTS) is the final area of interest within the ITS framework Studies show that two-thirds of U S traffic fatalities occur in rural areas, and most of these involve single-car accidents in which a vehicle runs off the road in a remote area

While a clear distinction between the ITS needs of urban and rural America has yet to be established, in cities the emphasis is largely on reducing congestion, improving safety, and helping the environment In rural areas congestion is usually not a problem, so ITS may well take a different shape

According to FHWA's Slater, "Technologies could alert drivers to poor visibility caused by fog or snow, or provide emergency response to travelers in need of help in remote areas " Other ITS technologies helpful to rural highway users include route guidance, two-way communications, automatic emergency signaling, and incident detection

### ITS: AN INFORMATION TECHNOLOGY

Allied Business Intelligence Introduced a market assessment of ITS earlier this year that segmented the industry into four component areas communications, control, sensory, and display Among the more interesting findings, 51% of the component market will result from communications, which advances the notion that ITS is, in the words of ABI's president Tim Archdeacon, "really information [communications] technology applied to transportation."

This points up the tremendous opportunities that telecommunications companies recognize in ITS Since intelligent transportation systems are only as good as the systems responsible for moving their massive amounts of information, both existing telecommunications companies and private networks are vying for position to carry the signals

"Through the utilization of an existing network infrastructure—specifically the public network—transportation agencies are able to focus on their core competencies the movement of people and goods," says Suzanne Mattenson, an intelligent transportation systems applications manager with Bell Atlantic "In turn, the RBOCs [regional Bell operating companies] and the ITCs [Independent telephone companies] will be able to focus on theirs—the movement of information "

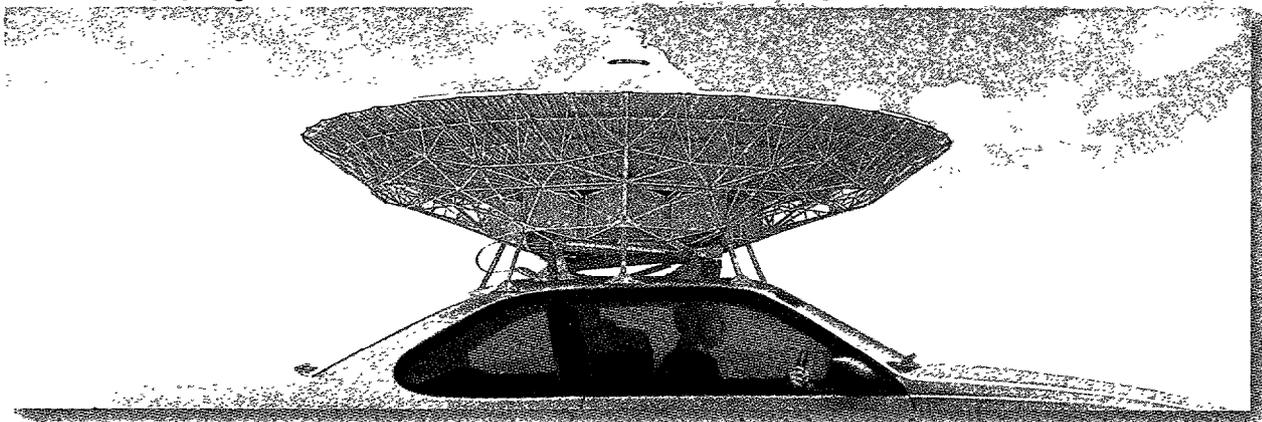




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"The Bell Atlantic Full Service Network makes tomorrow's of an intelligent transportation system today's reality," says Bell Atlantic's Brian Stark "Through a diverse portfolio of voice, data, and video networking supported by our state-of-the-art fiber-optic SONET architecture, sophisticated network management, strategic alliances, and creative vendor partnerships, Bell Atlantic is clearly positioned to meet all ITS requirements "

"Power infrastructure and the telecommunications infrastructure are just sitting there waiting to be utilized," says Jim Gaffey, ITS program manager, BellSouth. Gaffey also points to the obvious strengths that regional Bell operating companies bring to ITS: route diversity, complete redundancy, and survivability of their telecommunications systems under all imaginable conditions, attributes which allow uninterrupted processing of ITS information and rerouting around potential breaks or other problems

## WHO SHOULD BUILD THE ITS INFRASTRUCTURE?



**As ITS moves closer to commercial reality, a debate has emerged as to who should build, operate, and manage the infrastructure—government or the private sector. On one side are the large private telecommunications companies, who have already invested more**

**than \$225 billion on existing fiber-optic cable and advanced data services, and on the other are a number of equally large players who would benefit from the construction of a government-financed stand-alone system.**

**"The present, and evolving, telecommunications structure can efficiently support the majority of ITS applications," says Jim Gaffey, ITS program manager at BellSouth. His view is shared by Richard S. Wolff, executive director of applied research government business development at Bellcore.**

**"Deployment of government-owned and -operated networks would require extensive public sector investment and unnecessarily duplicate private sector investment," Wolff says. He believes the role of government should be to serve as a promoter and catalyst by providing leadership in standards, policy, collaborations in technology development, and incentives for private sector investment.**

**Tom Tauke, executive vice president at NYNEX, also warns that the government should not create a separate communications network for the transportation system. "ITS is a use of the national information infrastructure," he says, "and the NII should serve as the backbone of a variety of communications needs of the country—including ITS needs."**

## DEFENSE CONVERSION

Along with telecommunications, defense conversion is another area where ITS offers great opportunity "Of all the defense conversion initiatives, ITS offers the greatest all-around benefit to defense contractors and the American public," says ABI's Archdeacon.

One of those at the forefront of successfully applying defense and aerospace technology to advanced transportation is Rockwell. Among its many products in this area are a TrafficCam machine sensor that helps monitor and measure traffic flow, an automatic vehicle location system called FleetMaster, and the in-vehicle navigation/route guidance system in the Olds Eighty-Eight LSS.

For truck fleet owners seeking state-of-the-art technology to allow drivers and dispatchers to reliably exchange messages, Rockwell's Pro2000 Mobile Communications System has true total two-way data communications coverage, not only in remote areas, but even inside buildings in major metropolitan areas. Rockwell also leads one of four teams selected by FHWA to define a nationwide ITS open architecture, which will lay the framework for the country's evolving ITS structure

"Our involvement in ITS is a good example of how a diversified, high-technology company can leverage its diversity of talents and technologies to address an emerging market," says Rockwell's Kent Black "Our vast experience in electronics, systems integration, automotive component systems, and low-cost manufacturing provides us a strong base to develop and produce products for the smart car, truck, and highway markets "

## MAKING THE INTELLIGENT CHOICE

Experts around the world recognize ITS as critical to the future of transportation and, in the long run, the most efficient way to remedy the multitude of transportation problems we face today.

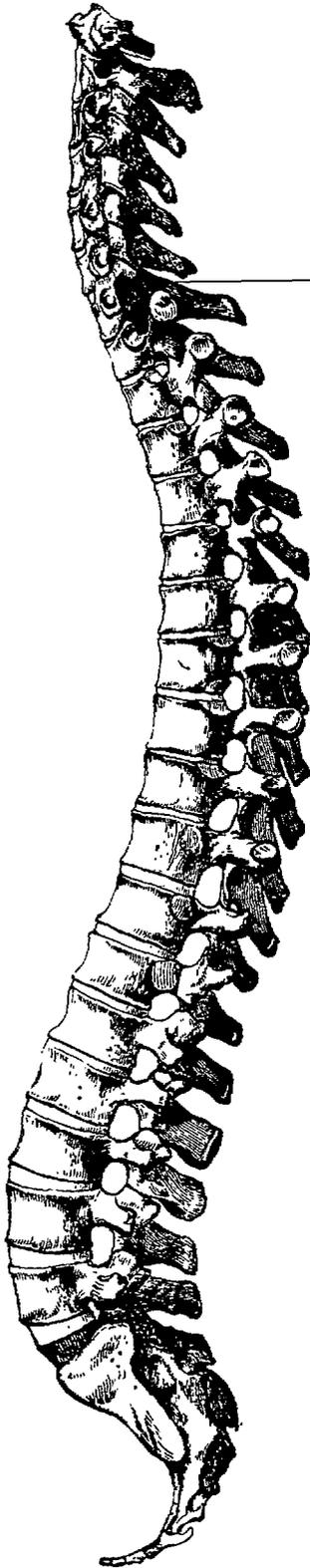
"In the old days, to determine where to build a road, you looked for the path and paved it," says Delco electronics' president and CEO Gary W Dickinson "Now ITS data collection technology will help us find the path most traveled, which will allow us to design new systems and prioritize improvements so we get the most value from our tax dollars "

Dickinson continues "Twenty years after the fact, Apollo is still the technological accomplishments against which society measures all others. Wouldn't it be great if ITS became the technological measure by which future generations measure progress?" ■

Written by: Ron Cogan

Designed by: Deutsch Design Inc.

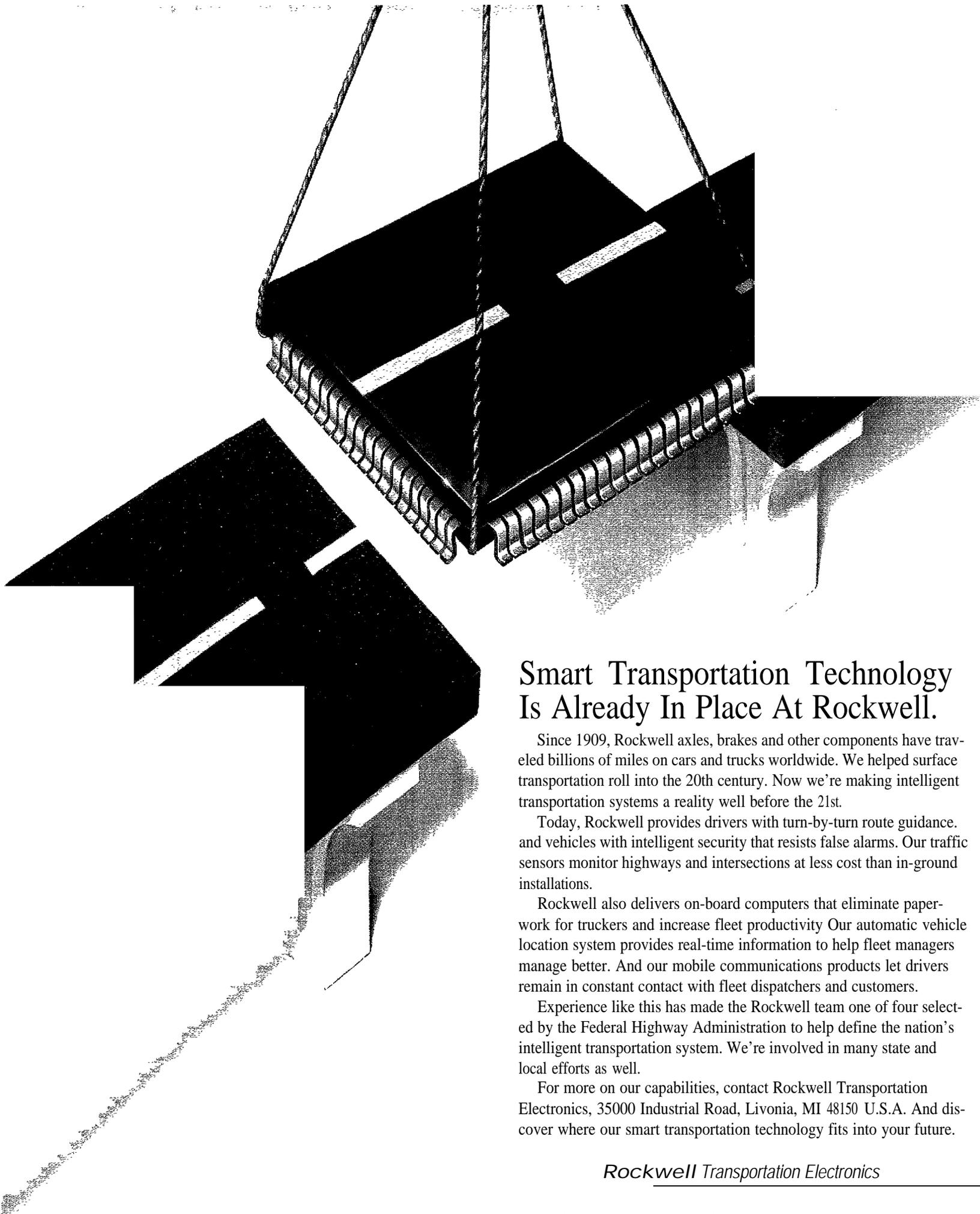
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You don't just grow an  
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It's taken Bell Atlantic@ many years to develop a state-of-the-art communications network capable of handling an ITS system: And over this time, it's proven itself extremely reliable. Our fiber optic SONET technology automatically reroutes information in the event of a cable cut, so the network is practically indestructible. And we're constantly upgrading the technology to provide both flexibility for growth and compatibility for our customers' specific needs. So along with a strong infrastructure comes a name synonymous with complex fiber optic communications systems. And you definitely don't grow that overnight.

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## Smart Transportation Technology Is Already In Place At Rockwell.

Since 1909, Rockwell axles, brakes and other components have traveled billions of miles on cars and trucks worldwide. We helped surface transportation roll into the 20th century. Now we're making intelligent transportation systems a reality well before the 21st.

Today, Rockwell provides drivers with turn-by-turn route guidance, and vehicles with intelligent security that resists false alarms. Our traffic sensors monitor highways and intersections at less cost than in-ground installations.

Rockwell also delivers on-board computers that eliminate paperwork for truckers and increase fleet productivity. Our automatic vehicle location system provides real-time information to help fleet managers manage better. And our mobile communications products let drivers remain in constant contact with fleet dispatchers and customers.

Experience like this has made the Rockwell team one of four selected by the Federal Highway Administration to help define the nation's intelligent transportation system. We're involved in many state and local efforts as well.

For more on our capabilities, contact Rockwell Transportation Electronics, 35000 Industrial Road, Livonia, MI 48150 U.S.A. And discover where our smart transportation technology fits into your future.

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