

# DOT News



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Passenger screening stations like this one at Denver's Stapleton International Airport have greatly reduced the possibility of weapons being smuggled aboard air carriers.

## The System Works

### Air Passenger Screening Effective

The nation's passenger screening program at airports is doing its job, Federal Aviation Administrator John L. McLucas said in a report covering the first six months of 1976.

During that time, when some 191 million passengers boarded aircraft, the screening system detected 2,840 firearms and seven explosive or incendiary devices.

It also resulted in 422 persons being arrested for carrying firearms and explosives and prevented what the FAA believes were five possible hijackings or other crimes against civil aviation.

"These figures are convincing evidence that this country's anti-hijacking program has been and remains effective despite the hijacking of a U.S. airliner on September 19," Dr. McLucas said. "In fact, it's interesting to note that the hijackers in this instance studied the screening system carefully and decided they could not smuggle actual weapons on board the aircraft. So they carried a number of ordinary objects through the system and used them to construct dummy bombs once on board."

### Turn Back the Hands of Time

The time is close at hand to adjust the time. Daylight saving time will end, and standard time will commence at 2 a.m., Sunday, October 31.

You move the hands on your timepiece back one hour.

Congress would not go along with DOT's proposal to extend daylight saving time—from the first Sunday in March, to the first Sunday in November.

### DOT Awards Presentation Is Set for Oct. 27

Presentation of awards to DOT military and civilian personnel for heroism, or for outstanding achievement will be made by Transportation Secretary William T. Coleman, Jr., on Wednesday morning, October 27, in the Departmental Auditorium, Constitution Avenue, between 12th and 14th Streets, N.W.

Since the program was established as an annual event in 1968, awards have been presented to 347 persons in DOT—294 civilians, and 53 members of the U.S. Coast Guard.

Three categories of awards are presented—valor, outstanding achievement, and meritorious achievement.

The award for valor is earned for acts of heroism where the recipient has placed his own life in jeopardy to come to the aid of another. This award has been presented 29 times since 1968.

The Secretary's Award for Outstanding Achievement is presented in recognition of the most exceptional level of performance by members of the Department. Over the past eight years 33 DOT members have won this award.

The Secretary's Award for Meritorious Achievement is the second highest performance award and it has been presented to 232 civilian and military recipients since 1968.

Free bus service to and from the ceremony will be available at DOT headquarters, at the FAA building, and at the Trans Point building. Departure time is 9:30 a.m. The ceremony is scheduled to start at 10:30 a.m.

Persons desiring to attend must obtain permission from their supervisors, and time off will be charged to duty time.

Additional details may be obtained from Bradford Stanerson, x-62164.

Dr. McLucas noted that "bluff hijackings" of this kind are a unique threat to aviation security and require additional measures. He said that FAA is sponsoring development work on electronic "sniffers" able to detect minute quantities of the gases given off by explosives.

(See HIJACK, p. 2)

### Take it ... Or Leave it

All annual leave to be taken in 1976 must be scheduled and approved in writing before November 20, the day that begins the third biweekly pay period prior to the end of the leave year.

"Civil Service Commission regulations require that all annual leave be approved before this cut-off date," said Hobart Douglass, Chief, OST personnel policy division.

Mr. Douglass suggests that managers encourage employees to submit requests for annual leave before this date, especially those employees who will lose leave unless it is taken this year. Mr. Douglass said that once leave is forfeited it cannot be restored.

### 55 m.p.h.: A Law That Saves Lives

Some 9,000 lives have been saved in motor vehicle accidents each year since the national speed limit was set at 55 miles-per-hour in 1974. Of these, the National Highway Traffic Safety Administration estimates at least half owe their lives to the lower, more uniform speeds.

NHTSA Administrator John W. Snow said "We can't deny that the 55 mph law is one of the most effective safety meas-

ures ever implemented in this country. But we need to do a better job in communicating to the public its tangible benefits in saving lives—"we" meaning government at all levels, business and industry."

Mr. Snow said NHTSA is embarking on a "consumer-centered" three pronged approach that will emphasize the priority areas of speed control, use of safety belts and avoidance of drinking and driving.



Secretary of Transportation William T. Coleman, Jr., addressing conferees at a transportation forum in Atlanta. More than 700 persons attended, including George Busbee, governor of Georgia, William G. Milliken, governor of Michigan and Alabama governor George C. Wallace.

### Transportation Forum Draws 700

More than 700 persons from DOT's eight-state southeastern region were given an update on national transportation policy by Transportation Secretary William T. Coleman, Jr., in a mid-September transportation forum in Atlanta.

Included in the group were state and local government officials, consumer and minority group members, and business representatives attending the first of what is expected to be a series of regional transportation conferences, according to the OST Office of Public Affairs which sponsored the forum.

Mr. Coleman, the first Secretary of Transportation to formulate a national transportation policy, said the policy statement "... is not meant to be a detailed roadmap which, if followed precisely, will lead to a transportation Utopia. It is instead a guide to where we should be going in our transportation developments, and how to get there."

The Secretary identified four policy areas he described as key elements of his national transportation policy:

- the private sector should continue to bear primary responsibility for meeting

the nation's transportation needs

- federal subsidy should be considered only as a last resort in dealing with specific short-term economic problems in the transportation industry
- the diversity of our multimodal transportation system is a national asset and should be retained with the allocation of resources being more equitable among competing modes of transportation
- state, local and federal governments should share financial responsibility

When the transportation policy statement was issued a year ago, Secretary Coleman urged public comment and criticism, saying that a living, national transportation policy must reflect an evolving consensus of what the American people want and expect from their transportation system.

The Atlanta forum entitled "Transportation U.S.A.," attracted participants from Alabama, Florida, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Georgia.

(See FORUM, p. 2)

### Quotable ...

I believe the best way to meet the economic challenge (to the airline industry) is to overhaul regulatory policies which are largely to blame for the industry's low earnings. Improved profits will ease the airlines' capital deficiencies, attract new investments and permit new aircraft orders and acquisitions. That in turn will stimulate the development and production of better aircraft, for sales domestically and abroad. While this may seem like a simplistic solution to some, it is the way the private enterprise system has worked in this country for 200 years, and all that is preventing it from working now is the inability of a naturally competitive industry to compete where it counts most—in price.

Secretary of Transportation William T. Coleman, Jr.  
Address to the Aero Club  
Washington, D.C. Sept. 28, 1976

## Deputy Under Secretary Lutz To Top Metro Job

Deputy under secretary of transportation Theodore C. Lutz has been named general manager of the Washington Metropolitan Area Transit Authority, according to Sterling Tucker, Metro board chairman.

Prior to his appointment as deputy under secretary in July, 1976, Mr. Lutz had been the department's deputy undersecretary for budget and program review, a post he assumed in March of 1973.

From 1970 until he joined the Department of Transportation, Mr. Lutz was the senior budget examiner for the National Capital Area Affairs in the Office of Management and Budget. He joined the Bureau of the Budget, Executive Office of the President, in 1968 as a budget examiner.

Mr. Lutz received the Secretary of Transportation's Award



Theodore C. Lutz

for outstanding performance in 1975 and the Secretary's Award for superior performance in 1973.

Mr. Lutz, a native of Philadelphia, received his bachelor of arts degree from Carleton College, Northfield, Minn., 1967, and his master of public administration degree in 1968 from Syracuse University's Graduate School of Citizenship and Public Affairs.

## James Christian Selected UMTA Chief Counsel

James M. Christian has been appointed chief counsel of the Urban Mass Transportation Administration (UMTA).

Prior to his appointment, Mr. Christian was deputy minority counsel of the House of Representatives District of Columbia Committee which oversees Washington, D.C., government operations.

Before joining the congressional staff, Mr. Christian was an associate of the Washington law firm of Arent, Fox, Kintner, Plotkin and Kahn and later, the firm of Hudson, Leitch and Davenport. In the latter position he was engaged in coordinating federal activities for Detroit.

The new UMTA chief counsel is a member of the District of Columbia bar. He is also a member of the board of directors of the Lawyers' Study Group, president of the Poto-



James M. Christian

mac Fiscal Society, a member of the American Bar Association, the National Conference of Black Lawyers, and the National Bar Association.

A native of Pineville, La., Mr. Christian received his BA in political science in 1970 from Howard University, Washington, D.C., and a JD in 1973 from Harvard Law School where he was a member of the Harvard Student District Attorneys.

## Robert M. Hawk Is Named New NHTSA Info Chief

Robert M. Hawk has been named director of public affairs and consumer services in the National Highway Traffic Safety Administration.

Mr. Hawk comes to his new job after nearly three years as a special assistant to the assistant secretary of transportation for policy, plans and international affairs.

Before joining the Department, Mr. Hawk worked for the U.S. Chamber of Commerce from July 1967 to December 1973. His professional background includes more than 20 years experience in reporting and general newspaper work, industry and government liaison, and public and media relations.

Mr. Hawk began his career in newspaper work in 1956 as an associate editor of Air Force Times. He has held positions as an editorial associate with Traffic World magazine, a public relations representative with the Pennsylvania Railroad, and a rail development representative with the New York Port Authority.

He received his BA in communications from American University in 1962 and attended graduate school at Pace College in New York City.

## Secretary Okays St. Louis Airport Grant Request

Transportation Secretary William T. Coleman, Jr., has approved an application from the St. Louis Metropolitan Area Airport Authority for a grant for federal funds to acquire land for a new major air carrier airport at Columbia-Waterloo, Ill., immediately across the Mississippi River from St. Louis.

The new airport will be located in an area between the farm communities of Waterloo and Columbia, south of East St. Louis, Ill., to replace aging Lambert Field, situated northwest of downtown St. Louis on the Missouri side of the Mississippi River.

Secretary Coleman said his approval is subject to a number of conditions, among them:

- Operations at Columbia-Waterloo will not begin before Jan. 1, 1992, unless a joint authority representing Illinois and Missouri decides otherwise
- Job priority at the Columbia-Waterloo Airport must be given to persons who lose jobs at Lambert International Airport
- Construction and building trade employees from Missouri must be given reasonably equal opportunities for employment in the development and construction
- Land in the vicinity of the airport must be utilized for purposes compatible with airport operations and noise
- The contractors must execute a no-strike guarantee in the construction of the airport
- The Authority must take affirmative action to provide equal opportunities for minorities and women in activities financed with federal funds

Secretary Coleman said that in making the decision he had been influenced primarily by his findings that Lambert Field, even if improved, will not provide sufficient capacity to meet future demands.

Mr. Coleman said that he could not hope that his decision "will receive universal acclaim" but, as a responsible federal official, it was his duty to decide the matter.

## Forum—*from page one*

Deputy Under Secretary Theodore C. Lutz told the morning assembly, "We do believe the federal government has a strong and direct interest in ensuring the development of sound international, interstate, and intercity transportation network." He added, "The Department's legislative proposals for financial assistance and economic regulatory reform all reflect this policy emphasis."

Other speakers at the morning assembly were Mayor Maynard Jackson of Atlanta as well as state and local officials from the region.

Conferees also received a report of the National Governors Conference Transportation Committee that featured remarks by Chairman George Busbee, governor of Georgia; Vice-Chairman William G. Milliken, governor of Michigan; and Alabama Governor George C. Wallace.

Following the morning Q&A session moderated by Secretary Coleman, the afternoon was devoted to five separate forums conducted by DOT officials from the various Administrations.

Overflow attendance marked each of the forums. Among the DOT panelists serving as moderators were: Deputy Secretary John T. Barnum (regulatory reform); Judith T. Connor, assistant secretary for environment, safety and consumer affairs (consumer and environmental affairs); William S. Heffelfinger, assistant secretary for administration (minority employment and contracting); Robert E. Patricelli, administrator, Urban Mass Transportation Administration (urban transportation); and Norbert T. Tiemann, administrator, Federal Highway Administration (rural and small urban transportation).

Other DOT officials participating in the forums were: Gary Broemser, director, office of transportation regulatory policy; Larry McCaffery, chief counsel, Federal Railroad Administration; Martin Convisser, director, office of environmental affairs; RADM A. F. Fugaro, chief of the office of marine environment and systems, United States Coast Guard.

Also, Carmen Turner, acting director, office of civil rights; James A. Hyslop, assistant director of installations and logistics; Theodore C. Lutz, deputy under secretary; Phillip M. Swatek, director, FAA Southern Region; Bruce M. Flohr, deputy administrator, Federal Railroad Administration; and Robert H. Bruton, acting director, office of rural transportation.

## Hijack—*from page one*

Dr. McLucas called attention to the fact that in the first six months of this year there were no successful hijackings of U.S. airlines while there were three completed hijackings elsewhere in the world.

In the 18 months covered by the three earlier annual reports, the agency listed 60 possible hijackings or other crimes against civil aviation that it believes the current security measures prevented.

Of the 2,480 firearms seized, 1,054 were handguns. Of these, 68 percent were discovered by x-ray inspection of carry-on items, 17 percent by physical searches of carry-on items, and 15 percent by weapons detectors that screened passengers.



This is the research safety vehicle (RSV) built under DOT sponsorship by Minicars, Inc., of California as part of the Department's efforts to reduce death and injuries in car accidents. It was on display, along with the RSV developed by Calspan/Chrysler, at the DOT Information Center in the Nassif building.

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Secretary of Transportation \_\_\_\_\_ William T. Coleman, Jr.  
 Assistant to the Secretary \_\_\_\_\_  
 and Director of Public Affairs \_\_\_\_\_ C. Ramon Greenwood  
 Assistant Director for Public \_\_\_\_\_  
 Information \_\_\_\_\_ Robert S. Marx  
 Editor \_\_\_\_\_ Frank J. Clifford

## DOT's Figure Factory

# Computer Pays You—And Much, Much More

There is a computer in DOT headquarters in the Nassif building that knows your name, your pay grade and salary, and your sick and annual leave balance. It knows how much is deducted from your pay for federal and state taxes, retirement fund and charity.

This is the computer that calculates your pay and tells the Treasury Department to write you a check or send the money to your bank.

Like you, it has "off days", gets sick, and uses the telephone a lot. It has brothers, sisters, numerous cousins, and a family tree that goes back several generations.

The family is part of the Department of Transportation's Computer Center which takes up the entire north side of the second floor of the Nassif building and serves all of the administrations and offices within DOT. Contractors doing work for DOT also have access to the computer's services.

Established in July 1974, the center brought together in one location the management, personnel, equipment and tasks of computer units maintained by the Coast Guard and three DOT administrations—Federal Highway, Federal Aviation, and the Federal Railroad.

### Fine-Tuning

The reorganization and fine-tuning is still going on. But, considering the almost daily improvements in computer technology and technique, the time is long distant when management can say the center has reached a perfect state of development.

"We are thinking of replacing the six computers we now have with one or two large-scale computers that can do just about everything," says Albert C. Garon, deputy director of the center.

The paychecks of almost all of DOT's Washington-area employees are processed through the second floor center. Here the numerals and English-language notations on the time-and-attendance cards compiled in hundreds of Departmental offices are translated into holes on a computer card.

The holes reflect changes in pay status—overtime, allotment increase or decrease, promotion, retirement fund contribution, etc.—that determine the net amount to be paid.

The perforated cards eventually become a magnetic tape which is sent to Treasury De-

partment computers which automatically print the paychecks. Which are also perforated, the better to process them on their return to Treasury.

Paychecks destined for bank deposit become a "composite," a single check from Treasury to the institution. A machine printout from DOT payroll offices to the banks listing names, account numbers and amounts to be credited to each account divides up the check.

The payroll occupies only a fraction of the computer center's time. The day-to-day (and even future) operational problems of the Department of Transportation command most of the center's time.

The list of clients is a roster of the administrations and offices of the Department. With the exception of the St. Lawrence Seaway Development Corporation, all the other DOT organizations make use of the DOT computer center.

### Many Uses

The Federal Highway Administration uses the computer to design better roads and bridges. Through telephone linkage to FHWA field offices, and directly in the building, FHWA engineers analyze bridge and road designs in a matter of weeks. In pre-computer days, similar investigation could run into months, and even more than a year.

Stress and strain on bridges caused by wind forces, the weight of traffic, vibration, and aging of metal, to name some factors, can now be checked out using computer "models." The safety and cost saving benefits are evident.

FHWA engineers also use the computer to design highways that are safer and easier on the car and gasoline consumption, as well as getting the most road for the money. For example, alternate design proposals can be fed into the DOT computers that will weigh and evaluate the relative cost in adding five miles of road to avoid bridging a stream or gorge.

Would it be cheaper to build the bridge (considering its long-term cost of maintenance, safety aspects, etc.) and save the cost of five miles of grading, pavement materials, snow removal, and added time and cost to the motorist? The computer can do the computations in a fraction of the time required by traditional methods.

The computers in the center are adept at designing urban and suburban traffic flow patterns which speed traffic, reduce safety hazards and save fuel by scheduling traffic lights so that they permit maximum "green time."

The Federal Railroad Administration's Transportation Test Center in Pueblo, Colo., is soon to be hooked up to the DOT computer center through a remote computer terminal and telephone circuits. All kinds of data, from what effect a given design of locomotive will have on a section of track, to what tomorrow's urban rail transit car will do, will be processed by the center in the Nassif building.

The National Highway Traffic Safety Administration uses the computer center to keep dangerous drivers off the road through its National Driver Register (NDR), a computerized listing of nearly every motor vehicle operator who has had his driving permit revoked or suspended.

Most states routinely submit the names of applicants for driver's licenses to the computer center where they are run through the driver register. Applicants with permits revoked in other states are identified in a matter of hours and the inquiring state notified.

Good as the system is, computer center managers are sure they can speed up the processing of NDR data.

"In the future we'll be able to help law enforcement officers find out in a matter of ten minutes if an applicant's driving permit has been lifted in another state," says Garon. "And then we'll work on getting the response time down to less than ten minutes. This will keep one more rolling disaster off the road before he can do additional damage."



Geoffrey Tate and Ginger Jordan are two of the 157 skilled persons who work in DOT's Transportation Computer Center in DOT headquarters in the Nassif building.

### Life Saver

The Coast Guard uses the DOT computer center to keep track of all ocean-going ships participating in its worldwide AMVER — Automated Mutual Vessel Emergency Rescue—system. The AMVER Center, at Coast Guard 3rd District headquarters on Governor's Island in New York harbor, is linked to the DOT computer center by phone lines and both ends of the connection are manned 24-hours-a-day, seven-days-a-week.

In the AMVER system, two computers back up each other, supported by an emergency power generator standing by to kick-in automatically should the regular power fail. The precaution is well-taken—power for the work-a-day computers in the center is supplied by regular commercial circuits.

It is easy for a vessel to "get into the AMVER computer." Outbound ships file a sailing plan via radio with the AMVER Center giving the name of the vessel, radio call signal (which also gives the ship's registry), route, speed, port of departure, destination and expected time

of arrival. Additional ship and crew data can be supplied by mail, at the discretion of the ship's master.

If an emergency at sea occurs, the captain of the stricken vessel contacts search and rescue forces, giving his position, nature of the emergency and other pertinent information. The rescue unit contacted in turn relays the information to AMVER. AMVER, through the use of the DOT computers, then runs a check of ships in the vicinity (which are also registered with AMVER) to determine those closest to the scene of the emergency. A coordinated rescue plan is then developed.

Busy as the computer center is, running three shifts a day, Monday through Friday, there is still capacity to take on additional tasks.

"The more clients, the lower unit cost of the jobs performed," says Garon.

Available for additional work are one IBM 360/30, three IBM 360/65s and two Control Data Corporation 3300s, operated by a staff of 157 persons. For additional information call x54136.



Eugenia Gorham, a data transcriber, converts source data into punched cards using a Univac 1710 keypunch machine. William Shakleton, a computer operator, feeds data through an IBM 360/65 computer console to the central processing unit.



## Highways in the Sky

### FHWA's Bridge Programs Are Broad in Scope

Charles F. Scheffey, director of research for the Federal Highway Administration since 1970, joined the staff of the office of research and development in 1964 as chief of the structures and applied mechanics division after a career of 20 years in structural engineering design, teaching and research. He taught civil engineering at the University of California, Berkeley, from 1949 to 1965. Current research and development programs under his direction include over one thousand studies funded in excess of \$50 million per year. Mr. Scheffey has a MS in civil engineering from the University of California, and he did advanced study in engineering at the *Technische Hochschule*, Darmstadt, Germany.



Charles F. Scheffey

**Mr. Scheffey, over the years newspaper accounts tell of bridges collapsing and accidents involving buses and trucks penetrating the railings of others. Does FHWA have a R&D program to prevent such disasters?**

Yes. We began investigating bridge failure before the tragedy at Point Pleasant, W. Va., in 1967. Subsequently, increased support for this line of investigation permitted a considerable expansion of our program on the life expectancy of bridges. With respect to heavy vehicles penetrating bridge railings, our program was initiated in 1973.

**Are you working on these problems in FHWA laboratory facilities, or are you sponsoring work in universities?**

Both. FHWA's programs involve many sources of talent. There is a Federal-Aid program which makes some highway construction funds available to state highway departments for research either in their own labs or by university or private research organizations. Similarly, we contract out research to industries, universities, or other federal laboratories. We also conduct research in our lab at the Fairbank Highway Research Station in McLean, Va.

**What about improvement of the safety of bridge railings?**

The problem is to develop a railing system which will retain and redirect heavy vehicles without presenting a hazard to the ordinary passenger car. A successful system developed utilizes an energy-absorbing collapsing steel ring which provides an effective soft impact redirection of light vehicles but has sufficient back-up strength to retain buses and trucks.

**Can these new railings stop or redirect a fully loaded 18-wheel truck-trailer traveling at high speed?**

If by high speed you mean like 70 m.p.h., the answer is no. However, we have tested the collapsing ring system with

an 18-wheeler loaded to 70,000 lbs. and traveling at 45 m.p.h. The vehicle collided with the railing at an angle of 10 degrees and was successfully retained and redirected, although it did subsequently overturn.

Another test was conducted with a 40,000 lb. tractor trailer at 55 m.p.h. and a 15-degree collision angle. This vehicle was also retained and redirected.

**With such systems available, why haven't they been widely installed to prevent accidents such as the recent case where all those high school students were killed by a bus falling off a bridge in California?**

The cost, and the problem of retrofitting an enormous number of structures which are already there. It is questionable that such high performance railings will be economically justified for all bridges.

**We have all seen signs "Bridge freezes before pavement." Why does this occur and what can be done about it?**

A pavement "sleeps" on the warm earth, whereas a bridge is hanging up there in the open air. It loses heat without hope of replenishment and its surface is highly susceptible to freezing.

The obvious solution is to provide the bridge deck with a source of heat comparable to that enjoyed by the pavement. We are experimenting with systems which will do this by using the heat stored in the ground adjacent to the bridge site. The technology is borrowed from the aerospace industry and utilizes "heat pipe" technology. These are nothing but closed tubes containing ammonia.

**Some bridge accidents occur because the older structures are too narrow for modern traffic. What is being done about this problem?**

The bridge replacement program provides for the replace-

ment of bridges which are "over waterways or other topographical barriers . . . unsafe because of structural deficiencies, physical deterioration or functional obsolescence." A narrow bridge certainly falls in the latter class of deficiency. Because funds are limited, only the most inadequate structures on major routes and meeting the criteria "over waterways, etc." have high enough priorities for the money available to permit actual replacement.

As an alternative, the Office of Research has programs to improve the safety conditions of narrow bridges on low-volume roads by better signing or active signals to control opposed direction traffic in such situations. We also are studying methods to permit widening or replacement of short-span bridges at low cost.

**Locally, we have been inconvenienced by the closure or partial closure of a number of bridges for major repairs, apparently due to potholes in the roadway. Is this a nationwide problem?**

Rapid deterioration of bridge pavements and deck structure is a nationwide problem.

**What causes the problem?**

During the early 60's most highway departments instituted a "bare pavements" policy during the winter in an attempt to keep all pavements and bridges free of ice for driving safety. This frequently involved extensive use of deicing chemicals, principally salt. The salt solution penetrates the pores in the concrete and eventually reaches the reinforcing steel. The corrosion produced on the reinforcing steel occupies more space than the steel from which it is derived and creates disruptive pressures which produce rapid disintegration of the deck surface.

**What has been done about it?**

Decks now being constructed use reinforced steel, impregnation of the upper few inches of concrete with polymers, or the "wax bead technique." All of these systems prevent penetration of the chloride solution to the reinforcing steel.

**Is there any way hidden flaws in bridges can be detected, as they are in aircraft manufacture?**

State highway departments now use ultrasonics, magnetic field disturbance, and x-ray examination for field inspections, as they have for many years in the inspection of new bridges.

A number of specialized devices such as the acoustic crack detector and magnetic crack definer have been developed for specific types of bridge inspection work. These devices do not yet satisfy all of our requirements and we are continuing this program with special emphasis on acoustic emission methods and vibration analysis techniques.

**What is acoustic emission?**

A metallic member when loaded emits squeaks and squeals which are not audible to the unaided ear but which can be detected by special microphones. These squeaks and squeals change dramatically in their nature when a significant crack is present.

**What other causes are there of sudden and unexpected bridge failures?**

Bridges fail as a result of earthquakes, high winds, and bridge piers washed out by flooding.

**Do the same bridge problems occur on railroad and rapid transit structures?**

Railroad and rapid transit structures, as a matter of fact, are somewhat more susceptible to fatigue problems because of the high loadings involved. For this reason, we conduct our programs in such a way that the technology developed can be adapted and utilized by designers of bridges regardless of their intended type of loading.

**Have these problems been encountered in foreign countries and are they conducting research we can use?**

The stresses and "diseases" of bridges are worldwide problems. We have a working group under the auspices of the Road Research Committee of the Organization for Economic Cooperation and Development concentrating on the improvement of bridge inspection techniques. This involves us with

the work of most of the Western European laboratories and Japan, Canada, Australia and New Zealand.

We also have been involved for eight years with Japanese engineers in looking at the specialized problems of improving resistance of bridges to earthquakes and hurricane-force winds. Our Fairbank Highway Research Station Laboratories have been studying the aerodynamic stability of large suspension bridges and we have sponsored work in a number of universities with regard to earthquake resistant design of bridges.

**What happens to the results of your programs after a report is produced? Are these reports available to the general public?**

All documents resulting from our program are in the public domain and are available through the National Technical Information Service. Also, FHWA now has a comprehensive system for encouraging the utilization of new technology coming out of the research program or from other sources. The implementation division of our office of development plays a key role in this system. Every report from the research program is examined by this division and a determination is made as to what sort of action is required to ensure that the knowledge represented by the report is brought to the attention of the proper officials both in FHWA and in the state and local highway departments.

This frequently involves the preparation of supplementary materials and "how to do it packages" for those who would logically utilize the results. The Office of Engineering, the National Highway Institute, and the Research and Development Demonstration Program of FHWA also have significant roles in fostering the early adoption and utilization of research results.



Francis E. Unti, Director of the Office of Administrative Operations, and Louise N. Butler, Office of the Executive Secretary, sign up Transportation Secretary William T. Coleman, Jr., in the 1976-77 Combined Federal Campaign. At mid-point, the Department has achieved a participation rate of 41 percent, with the average contribution amounting to \$62.29. Sharing the lead in the drive are Federal Aviation Administration and Federal Highway Administration with 52 percent participation. The drive ends October 26.