High Speed Passenger Rail Corridor Conference

U.S. Department of Transportation

Federal Railroad Administration

March 26 & 27, 1996
Washington, DC

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HIGH SPEED PASSENGER RAIL CORRIDOR CONFERENCE
March 26 & 27, 1996
FRA & FHWA
Room 2230, NASSIF Building

Tuesday, March 26

I. **INTRODUCTION/OVERVIEW** - Administrator (8:30 - 9:00 a.m.)

- o Purpose of the Conference
- o 1997 Budget Request
- o HSGT Commercial Feasibility Study / HSGT Policy Status
- o Next Generation Program - Status

II. **STATE BY STATE STATUS REPORT** - Cikota/State Representatives (9:00 to 10:15a.m.) Each state to provide a brief status report to emphasize information of interest to others and lessons learned.

- o Description of Corridor Plan
- o Status of Improvements
- o Funding Strategy
- o Legislative Authority/Needs (DOT/PUC) e.g. Private Grade Crossings
- o Discussion

III. BREAK - 15 minutes

IV. STATE BY STATE STATUS REPORT (Contd.) 10:30 a.m. to 11:15 a.m.

V **FRA HSR ACTIVITIES** - Deputy Administrator (11:15 to 11:45 a.m.)

VI. **PRESENTATION: DOT ON THE INTERNET** - Zarnetske (11:45 to 12 p.m.)

VII Lunch Break - 12 to 1 p.m.

VIII. **PRESENTATION: HSR SAFETY** - P. Olekszyk/D. Smith/English/Orth (1 to 2:15 p.m.)

- o Passenger Rail Equipment
- o Other Safety Requirements for HSGT
- o HSGT Safety R&D - Orth
- o Questions and Answers

IX. BREAK - 15 Minutes

X. **ROUND TABLE: GRADE CROSSINGS** - (2:30 p.m. to 4 p.m.) B. George/ J. Smailes/R. Winans

- o Overview - Smailes
- o HSGT Grade Crossing Issues
- o FHWA Program - Louick/Winans

XI. BREAK - 15 Minutes

XII. **PRESENTATION: HSGT TECHNOLOGY ENHANCEMENT** - Ditmeyer (4:15 - 5 p.m.) The purpose of this session is to outline FRA's current programs, to answer any questions about R&D and to discuss how FRA staff can best serve states' needs.

- o Next Generation Technology Development
- o Questions and Answers

Wednesday, March 27

XIII. **ROUND TABLE: HSGT FUNDING** - Don Baker, NYDOT, J. Basso, S. Cooper, Mongini (8:30 to 11:00 a.m.)

- o HSGT Commercial Feasibility Study/National Policy - Mongini
- o State Infrastructure Banks - Program Status/Applications - J. Basso
- o Innovative Financing Projects - Cooper
- o ISTEA Reauthorization - Cooper

XIV. BREAK 15 Minutes

XV. ROUND TABLE: HSGT FUNDING (Contd.) 9:45 a.m. to 11:00 a.m.

XVI. **REVIEW & SUMMARY DISCUSSION** - McQueen (11 to 12 p.m.)

High Speed Passenger Rail Corridor Conference
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March 26-27, 1996

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OVERVIEW OF FRA HIGH SPEED GROUND TRANSPORTATION PLANNING INITIATIVES

In addition to the work in HSGT technology development and demonstration, which is described in much more detail elsewhere in this notebook, FRA has also undertaken a number of other initiatives which may be of interest to our State partners. These initiatives are in the following areas:

National Studies and Policy Analysis
Planning Techniques
Planning Assistance to States
Environmental and Safety Review of HSGT Projects
Improved Communications Among Interested Parties

While the FRA staff has been involved in all of these areas for some time, we have been especially busy with national studies and policy analysis over the last two years and we are now shifting more of our resources to the other areas. Since in these other areas we are in many ways more involved with our State partners, we hope to receive valuable input at this conference regarding the areas where our work is most helpful to the States.

Following is a description of initiatives in each area:

NATIONAL STUDIES AND POLICY ANALYSIS

Commercial Feasibility Study (CFS)

ISTEA required the Secretary to send to Congress a study of the commercial feasibility of high speed ground transportation (HSGT). This will be the first in-depth study of the applicability of a broad range of HSGT systems to different corridors across the U.S. and we have chosen to do a very thorough job to serve as one of the main bases for authorizing legislation for transportation assistance. The study is essentially complete and will be sent to Congress in the next couple of weeks.

National HSGT Policy

This too was mandated by ISTEA and is expected to be made available in draft form for review shortly after the CFS is sent to Congress. We benefited from a series of outreach sessions last spring and summer to obtain input from States and other interested parties. The final version will go to Congress in June, providing additional support for the reauthorization of ISTEA as the Department formulates its position on the legislation later this year.

PLANNING TECHNIQUES

Documentation of CFS Models

During the course of the CFS, FRA and the Volpe National Transportation Systems Center and contractors have developed models for estimating the ridership, revenues, construction cost, operating cost and public benefits, and for conducting a financial and economic analysis of alternative HSGT systems as applied in a number of corridors. Although many States have already conducted such analyses, some of the CFS models and the research underlying them may also be of use to States who wish to pursue further analysis. One example of these models is the operating cost model which allows the user to specify alternative assumptions regarding maintenance standards, crew sizes and other details. FRA plans to document this model for use by others. Similar work can be done on other models if there is a demand and as funds permit.

PLANNING ASSISTANCE TO STATES

Planning Grants

Although the Swift Rail Act authorized up to $45 million per year for high speed rail planning grants covering most activities short of actual construction, funds have not been appropriated for a variety of reasons except for certain funding earmarked for specific States. This year (FY 1996) FRA can make available a small amount of funding ($1 million), subject to 50/50 matching, for such grants from our R&D budget. We recently issued a Notice of Funds Availability in the Federal Register and have begun to receive applications. Criteria for award of the grants will be based on factors mentioned in the Swift Act.

ENVIRONMENTAL AND SAFETY REVIEW OF HSGT PROJECTS

In the past, when a potential HSGT project has progressed to the point of franchise award, FRA has worked with the State government to facilitate its implementation and to ensure that FRA's statutory mandates in the areas of safety regulation and environmental review are fulfilled. The most recent case is in Florida, where the State has recently announced that it has chosen the Florida Overland Express (FOX) as a franchisee to provide rail service connecting Miami, Orlando and Tampa on dedicated rights-of-way using trains based on French TGV technology. FRA is forming a task force to review the FOX design as it evolves to ensure that it meets exacting standards of safety. In addition, FRA will be working with the environmental staff in FHWA field offices and Florida DOT to ensure that the information necessary for doing an environmental assessment is collected and the assessment is done using procedures that cannot be challenged successfully in court, in order to provide a solid basis for the Administrator's record of decision.

IMPROVED COMMUNICATIONS AMONG INTERESTED PARTIES

FRA's Program Development Division has an outreach staff of individuals who are assigned to work closely and keep in touch with States that are developing high speed rail projects. Recently we have begun to consider ways in which we can use modern computer and communications technology to foster the exchange of information and ideas between FRA and the States and also among the States.

As a first step, for those who do not have them, we will be sending you the E mail addresses and phone numbers of our outreach staff and of other staff members with particular areas of responsibility and expertise. As a next step, we will soon be establishing a presence on the internet through FRA's section of the DOT web site. One of the first efforts in this area will be to publish the draft version of the National High Speed Ground Transportation Policy for public review and comment at this site when it comes out a few weeks from now. This may also be an excellent way to disseminate the latest results of our research development and demonstration projects. We will also be improving the site to be more user friendly and, if there is sufficient demand, establish some sort of bulletin board where other users can put information of general interest. This is a new area for us and we welcome your suggestions on ways we could make this effort as useful as possible to our State partners.

OTHER POSSIBLE INITIATIVES

There are several other areas in which we have not been active but which we could develop if there is sufficient interest and resources:

- Sponsoring curriculum development for courses in HSGT planning.
- Sponsoring short courses in HSGT planning.
- Making available the Volpe Center staff for consultation on planning techniques and/or for application of those techniques in planning and feasibility studies.
- Sponsoring research in areas of particular interest either directly or through the Transportation Research Board.

We would like to know how many States are interested in any of these topics.

STATE BY STATE STATUS REPORT: Cikota/State Representatives

- o **FRA Outreach Activities**
- o **State Reports**

  - Alabama
  - California
  - Florida
  - Illinois
  - Indiana
  - Louisiana
  - Maryland
  - Massachusetts
  - Michigan
  - Minnesota
  - New York
  - North Carolina
  - Oregon
  - Pennsylvania
  - Virginia
  - Wisconsin
  - Washington

- o **Discussion**

PRESENTATION: DOT ON THE INTERNET - Zarnetske

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VARIOUS PROJECTS OF THE COUNCIL OF COOPERATING GOVERNMENTS

1. Sponsored and monitored the rail study completed by Parsons Brinckerhof and Rust Engineering from Atlanta GA to Tuscaloosa AL.

2. Initiated action to convert Alabama's Highway Department to a DOT, making Alabama eligible for more than highway funds.

3. Conducted three regional seminars in Atlanta, New Orleans, and Memphis on high speed rail and its future in America.

4. Passed model state legislation to allow Alabama's DOT to close "redundant" or unsafe grade crossing to permit higher speeds on existing track.

5. Hosted a meeting of four southern states where their DOT representatives agreed upon a proposed high speed rail corridor for the Southeast.

6. Co-Sponsored a successful high speed rail demonstration with the Federal Railroad Administration and Amtrak.

7. Continue to work with the media to promote and educate the public on improved passenger rail travel.

California High Speed Rail Activities
Status Report
March 1996

INTRODUCTION

One of California's continual challenges is providing effective transportation to support its rapidly growing population. Over 32 million people currently live in California. By the year 2020, California's population is projected to increase to over 48 million people. Development of a high speed rail (HSR) system in California is one alternative that can help to meet the state's growing transportation needs. High speed rail has proven to be a safe, energy efficient, environmentally sound form of transportation.

OVERVIEW

Four major studies are being conducted by consultants for the California Intercity High Speed Rail Commission to evaluate the feasibility of implementing an HSR system in the state. These include: a Corridor Evaluation and Environmental Constraints Analysis; Ridership Demand/Market Analysis; Economic Impact Analysis and Mode Cost Comparison; and Institutional Analysis and Financing Options study. Findings from these studies and the Los Angeles to Bakersfield High Speed Ground Transportation Preliminary Engineering and Environmental Study (completed in November 1994) will be used to determine the feasibility of implementing an HSR system in California. A draft Final Report will be available for public comment by September 1996. The Final Report will be submitted to the Governor and Legislature by December 1996.

CORRIDOR ALIGNMENT ALTERNATIVES

Phase I of the Corridor Evaluation and Environmental Constraints Analysis examined three potential corridor alignments: U.S. 101 (the Coastal Corridor), Interstate 5 (Central Valley), and State Route 99 (Central Valley). These corridors were analyzed for their capacity to maximize ridership, minimize costs, and avoid environmental obstacles. Based upon these criteria, the Commission, at its May 1995 meeting, decided to focus Phase II efforts on the Interstate 5 (I-5) and State Route 99 (SR-99) alignments. The U.S. 101 coast alignment was determined to be more suitable for speeds below 150 mph.

RECENT EVENTS

At its February 2, 1996 meeting in Fresno, the ɔmmission decided to focus its resources on the SR-99 alignment alternative ɛ sed on rideship and revenue forecasts, capital, operating and maintenance cost estim s. The Commission cited the SR-99 alignment as having higher ridership forecas ıd better services to cities in the Central Valley than the I-5 alternative. The st ng public support for SR-99 demonstrated at Commission meetings and public workshops throughout the state was also recognized by the Commission. In addition several elected officials addressed the Commission in support of the SR-99 option be ore the recent decision. In addition, the Commission decided to focus study efforts on Los Angeles' Union Station as the Los Angeles HSR terminal, with the possibility of a future extension to Los Angeles International Airport. The Commission concluded that there was insufficient information available at this time to select a northern pass into the Bay Area, a southern pass into the Los Angeles Basin, or a Bay Area alignment. The studies will continue to focus on the analysis of the mountain passes in northern and southern California and the Bay Area alignment options.

SUMMARY OF FINDINGS TO DATE

- cities in the Central Valley are much better served by the SR-99 corridor than by the I-5 corridor alignment.

- capital costs for the Los Angeles-Bay Area se ıent of the system vary between $10 - $20 billion, based on technolc route length, whether the route travels through or around urban area and which mountain crossings are used.

- revenues from a statewide HSR system will exceed operational costs.

- the proposed extensions to San Diego and Sacramento contribute significantly to passenger volume and revenues.

- although all routes will result in some degr e of environmental impact, there are no "fatal flaws". The environmer ı impacts can be mitigated.

- high speed rail ridership between Los Angeles and San Diego alone would be nearly 4 million people annually, without the rest of the system in place.

UNDERSTANDING THE FINDINGS

High Speed Rail Technologies

The Commission is studying three technology groups including: high speed systems (125 - 150 mph); very high speed systems (180 - 220 mph); and magnetic levitation systems (200 - 310 mph). For purposes of comparison very high speed (VHS) and magnetic levitation (Maglev) systems are shown in Table I.

Ridership Analysis

Ridership analysis figures reflect total projected passengers and revenue between the Los Angeles Area and the San Francisco Bay Area for the year 2015. These data include passengers using proposed extensions to Sacramento and San Diego. Fares used to calculate revenue and ridership are based on 70% of the airfare between Los Angeles and the San Francisco Bay Area.

Capital, Operating and Maintenance Costs

Capital costs include funds required to construct the system and purchase rolling stock. These costs are presented as ranges since each corridor includes alternative alignments. Operational costs include the costs to operate and maintain the system.

Environmental impacts

Four main categories of environmental constraints and impacts were studied:

- natural environment impacts: water resources, threatened and endangered species, and air quality issues;
- social/cultural resources impacts: issues related to parks and recreation, wildlife refuges, socioeconomic impacts, environmental justice, and farmland;
- land use impacts: compatibility with surrounding land uses, consistency with regional plans, growth inducement, noise and vibration, visual quality, and electromagnetic fields;
- engineering/environmental constraints: soil/slopes issues, seismic issues, hazardous materials/waste, regulatory compliance, and mitigation costs.

Table I - Ridership, Revenue, and Cost Ranges of Various Alignment Options

Technology Option	VHS	Maglev	VHS	Maglev
Alignments Between Los Angeles and San Francisco				
	State Route 99		Interstate 5	
LA-SF Express Travel Time (hrs:min)	2:42-2:50	1:58-2:03	2:31-2:35	1:51-1:54
Annual Ridership (in millions)	9.5-10.8	12.6-14.4	8.1-9.6	11.9-13.0
Annual Revenue (in millions)	$310-346	$440-484	$284-328	$412-457
Annual O & M Costs (in millions)	$228-248	$232-252	$209-252	$212-256
Capital Costs (in billions)	$10.6-15.4	$15.5-20.0	$10.0-14.0	$14.3-19.1
Alignments Between Los Angeles and San Francisco With Sacramento/San Diego Extensions				
Annual Ridership (in millions)	20.0-23.2	26.7-29.3	19.7-20.1	26.0-26.1
Annual Revenue (in millions)	$632-670	$893-955	$647-656	$890-895
Annual O & M Costs (in millions)	$351-368	$358-375	$314-368	$320-375

FUTURE ACTIVITIES

Upcoming Commission Meetings

April 8 (Los Angeles)

- extensions/stations analysis
- mode cost analysis
- jurisdictional analysis
- partnership options
- financing options

June (Sacramento)

- transportation policy workshop
- financial cost/benefit analysis
- financing & partnership plan
- economics impacts analysis
- approval of Ridership Report
- approval of Corridor Eval Rept

August (San Francisco)

- preliminary study recommendations
- review draft feasibility report

October

- conduct public hearings
- prepare Final Report

December

- submit Final Report to Governor and Legislature

The Final Report will include Commission recommendations, an action plan, discussion of the studies findings and conclusions, and public comments.

Look for the California Intercity High Speed Rail Home Page on the Internet.

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Florida Department of Transportation

Background

Since the early 1980's, the State of Florida has been engaged in planning and in seeking the implementation of a high speed rail transportation system. In 1984, following a visit to Japan, then Governor Bob Graham asked the Department of Transportation to investigate the feasibility of building a high speed rail system in Florida. The Department commissioned a feasibility study that was conducted by Barton Aschman Associates. The results of this study indicated that a high speed rail transportation system could be sustained and that it could be built by the private sector if certain public sector funding and incentives are made available.

This led in 1984 to the enactment by the Florida Legislature of the Florida High Speed Rail Transportation Commission Act. This act created the High Speed Rail Transportation Commission and gave it the responsibility of seeking private sector interests in building a high speed rail system through a public/private partnership. A request for proposals was issued in 1987 to which two proposals were submitted in March 1988. One of the proposals, submitted by the Florida High Speed Rail Corporation, initially relied on real estate development revenues to pay for the project, and later, with their real estate development approach rejected by local governments, proposed a 2.5¢ per gallon gas tax to cover the infrastructure costs of the high speed rail system. The other proposal, submitted by the Florida TGV Company, relied on extensive ridership revenues and some unidentified government sources to fund the project. The financing plans for both proposals were not met with much support at the state and local levels and both proposals were withdrawn. Florida TGV withdrew its proposal in November 1989 and the Florida High Speed Rail Corporation in July 1991. Also in July 1991, the High Speed Rail Commission was abolished by the Florida Legislature and its responsibilities were transferred to the DOT.

High Speed Rail - New Beginning

After its assuming the responsibility for Florida's high speed rail transportation program, the Florida DOT undertook a program of study to identify options for rail system development. The results of this effort defined a range of options from which decisions could be made. The Department initiated studies in three areas to gather information. Market research was conducted to determine intercity travel patterns, purposes and volumes within the state. Technology was evaluated to determine what is currently available and what may be available for future consideration. Finally, corridor assessments were made on a statewide basis to identify possible intercity routes and determine related infrastructure development costs.

The studies were not conducted in isolation, but were assisted by several advisory groups. These

groups were composed of state and local officials, transportation and planning experts, business persons, environmental advocates and interested citizens. It was through the guidance of these advisory groups that a balanced outcome was achieved.

In April 1992, the Florida Legislature amended the High Speed Rail Act. The amended act streamlined and simplified the high speed rail franchise and certification process, allowed for the incremental and segmented implementation of high speed rail and reduced the emphasis previously placed on real estate revenues to fund the high speed rail project.

On February 28, 1995, the Department issued a new Request of Proposals (RFP) soliciting proposals from private sector companies to finance, build, and operate a high speed rail transportation system linking Miami to Orlando and Tampa. In this RFP, the Department offered to become a financial partner in the project by making available $70 million per year in state funding.

Hiigh Speed Rail Proposals

On October 31, 1995 and in response to the RFP, five applicants filed applications with the Department for franchise and submitted the requisite $25,000 application fee. The five applicants were:

1. Florida Magplane, Inc. proposed to connect Miami to Orlando and Tampa using new magnetically-levitated passenger vehicles operating at top speed of 300 mph. These vehicles called magplanes would levitate six inches above a 15 foot wide trough called the magway. Revenue service on the entire Miami-Orlando-Tampa system would begin in 2006 and total project cost was estimated at $5.56 billion.

2. Florida Maglev Consortium proposed to build a magnetic levitation transportation system linking Miami to Port Canaveral, Orlando and the Tampa Bay area. The technology proposed is currently under development at a test facility near Edgewater, Florida. Revenue service on an initial segment would begin in 1999 and the full system would be completed in 2005 at a total estimated capital cost of $5.33 billion.

3. Italferr, a subsidiary consulting company of the Italian State Railways, would build a system after appropriate study. The company proposed to defer decisions regarding technology to be used, financing and other system detail until after planning studies have been completed.

4. Florida Rail Corporation (owned by Raytheon Infrastructure Services, ABB Traction, Amtrak, and Keith and Schnars) proposed an incremental implementation approach to developing high speed rail. Four phases of implementation were proposed. Under the proposal, high speed rail operations at 125 mph would not begin until 2016 and electrification of the system to establish operations at 150 mph would not be accomplished until 2021. The total cost of the system was estimated at $4.3 billion. Rail Florida proposed several train technologies, from the Danish-built IC3 Flexliner trains for initial phases of operation, to diesel and electric

powered ABB X-2000 trains in later phases.

5. Florida Overland eXpress (FOX) (owned by Fluor Daniel, Odebrecht Contractors, Bombardier, and GEC Alsthom) proposed to build an advanced high speed rail system using the French TGV technology that would operate on fully dedicated and completely grade-separated railroad. The full Miami-Orlando-Tampa system would be completed in 2006 at a total capital cost of $5.1 billion. FOX requested the State to contribute $95 million (escalated) for 35 years and to provide subordinated state loans to the project.

Franchise Award

The RFP contained specific information requirements for an application for a high speed rail transportation system franchise and specific evaluation criteria with which to judge the information contained in an application. These criteria are based on the statutory requirements enumerated in the High Speed Rail Act.

Using the statutory and RFP criteria, the Department, with the aid of expert consultants, conducted an assessment of each application. In conducting the assessment, the Department utilized the contents of the applications, staff and consultant analyses, reports of state, regional and local governmental agencies, the report and recommendations of the Citizens' Planning and Environmental Advisory Committee, information received during statewide public meetings, and public comments submitted to the Department.

Based on this assessment, the proposals submitted by Florida Magplane, Florida Maglev Consortium and Italfcrr were found to be not responsive to the requirements of the RFP and therefore did not comply with the terms and provisions of the High Speed Rail Act. The proposals submitted by FOX and the Florida Rail Corporation were found to be responsive to the RFP and the requirements of the Act. However, the FOX proposal was determined to be more comprehensive and complete offering the state the best plan among all submitted proposals for the implementation of high speed rail in Florida. On February 27, 1996, the Department issued a Proposed Agency Action granting an exclusive franchise, subject to certain terms and conditions, to Florida Overland eXpress for the planning, locating, construction, operating and maintaining a high speed rail system connecting Miami to Orlando and Tampa.

With its selection as the franchisee for the Florida high speed rail project, Florida Overland eXpress (FOX) can now begin the process of developing a high speed rail system for the state of Florida in a partnership with the Department. The franchise award, however, includes terms and conditions that must be met by FOX over the next several months. The principal milestones that must be adhered to are:

- Await a three week public notice period.
- Issue an agency final order that is the actual award of the franchise.

- FOX and FDOT must enter into a finance agreement within 90 days after issuance of the final order that is acceptable to both the Department and to FOX.

- After finance plan approval, FOX and the Department must enter into a pre-certification agreement to establish the framework for the certification process.

- At that point, the certification process begins where project details such as preliminary engineering, final route selection, environmental analysis, growth management compliance and financial commitments are addressed.

- Final project certification occurs upon approval by the Governor and Cabinet and at that point, construction can begin. The actual certification phase of the project is expected to take two to three years to complete.

CHICAGO - ST. LOUIS HIGH SPEED RAIL PROJECT
Work Progress Update

Since publication of the *Chicago-St. Louis High Speed Rail Financial and Implementation Plan*, in May 1994, the state of Illinois has progressed work on the high speed rail project in several areas.

1) The department has selected a consultant team, headed by De Luew, Cather & Company, to conduct the next phase of engineering and environmental analyses. The consultant team has commenced work on preparation of a draft environmental impact statement for the proposed Chicago-St. Louis high speed rail corridor. The EIS process is scheduled to be completed in 18-24 months.

The other major component of the study process will involve a more detailed analysis of proposed grade crossing safety improvements required for the Chicago-St. Louis corridor. Clearly, the concept of operating high speed trains raises concerns about safety at all the existing rail/highway grade crossings on the Chicago- St. Louis corridor. Public input, to be solicited early in the process from local officials and interested groups, will help guide the consultant team in developing a new grade crossing safety plan which will be acceptable to the public. A public information hotline has been established to assist the public in learning more about the project study, and to allow interested parties an opportunity to provide comments on the high speed rail project. **The hotline number is 1-800-555-3672**. The information line is available 24 hours a day, seven days a week.

Other tasks in this phase of the study include:

- Analysis of potential train operating speeds along the high speed rail corridor;
- Updating and correcting annual average daily traffic (AADT) counts at all crossings;
- Traffic studies within each municipality potentially affected by the proposed project; and,
- Analysis of train control and grade crossing signal system needs.

The EIS process will analyze both the existing Amtrak route (Chicago-St. Louis via Joliet), as well as two Peotone route options. The alternative routes include Chicago-Peotone-St. Louis via Kankakee, utilizing existing railroad facilities (Illinois Central from Chicago to Kankakee, and Conrail from Kankakee to Dwight); and, Chicago-Peotone-St. Louis via Wilmington, utilizing a new 20-mile track alignment between Peotone and Wilmington. The alternative routes will be analyzed both with, and without, a service stop at the proposed South Suburban Airport near Peotone.

The consultant team has completed all field reviews for endangered species, wetlands and archeological sites. A draft report of grade safety improvement recommendations has been prepared, and a train operations analysis will be completed later this year. We anticipate beginning the public involvement process later this year. A series of workshops for local elected officials is planned to begin in June. The purpose of the workshops is to present the results of the consultant's grade crossing analysis and to gather information from the local officials on how crossings in their communities may be impacted by any proposed improvements.

2) Section 1010 of the Intermodal Surface Transportation Act of 1991 (ISTEA) has provided the state of Illinois with $1.75 million for testing of Vehicle Arresting Barrier (VAB) systems.
The VAB is a prototype system which is based on technology used by the U.S. Navy and Air Force to help bring jet airplanes to a stop on aircraft carriers and short airstrips. The VAB utilizes a safety net which catches and "drags" a vehicle safely to a stop prior to reaching a crossing. The idea behind using the VAB system at grade crossings stems from the need to develop new **protection devices** which could guarantee non-intrusion of a vehicle at existing grade crossings on high speed rail corridors.

Federal funding will allow Illinois to develop as many as three test sites for the VAB units. The proposed sites include a township road, a state highway, and a city street. The crossings were selected as test sites because they offer a wide array of vehicle types with which to test the VAB systems. The township road crossing will allow us to test the system with rural and farm traffic. The state highway and city street crossings will allow us to test the VAB's with a high percentage of urban and tractor-trailer traffic.

The Department has awarded a contract for fabrication of the VAB systems to The Entwistle Company of Hudson, MA. Entwistle's "Dragnet" prototype grade crossing VAB system is similar to the VAB system they designed for use on the Kennedy Expressway in Chicago. Extensive crash testing has been performed on the grade crossing prototype and Entwistle is now preparing for fabrication of the test units. The department is planning to let a contract for installation of the VABs, with installation anticipated for the fall of 1996. A thorough analysis and evaluation, including human-factors and mechanical operations, will be conducted on the VAB systems after they are operational.

Included as part of the technology demonstrations will be an impact detection system. The detection system will include a video recording of every vehicle arrestment. The system will also send an electronic signal to the local police authority and VAB system maintenance contractor to alert them of a system "hit". This detection system will help the department analyze the performance of the system.

3) The state of Illinois has received a federal grant for track construction project in the southern part of the corridor. These funds will be used to rebuild and signalize freight tracks in the East St. Louis area to help reduce train congestion and traffic delays in the East St. Louis area. When complete, this track construction project will allow existing Chicago-St. Louis Amtrak trains to be rerouted into and out of St. Louis proper. It is estimated that the current Amtrak schedule could be reduced by at least 20 minutes with these improvements. Further, these improvements will be an essential component in the development of high speed rail.

High Speed Rail In Indiana
A Summary of Current Activities

Indiana, largely because of its key location in the heart of the midwest, continues to be a key player in the development of a midwest high speed rail network. Following are brief summaries of several important high speed rail activities currently occurring in Indiana.

***Detroit to Chicago corridor** - The track improvements along the Detroit to Chicago segment of the federally designated Chicago Hub Midwest high speed corridor are progressing steadily. The portion of the route through northwest Indiana is a very difficult area to traverse, however, due to the extreme congestion of rail lines and roadways coming east out of Chicago. A connecting route through this area has been plotted that utilizes several different grade-separated right-of-ways, that are no longer in active freight use.*

The cost to acquire this corridor is substantial, estimated at between 15 and 25 million dollars. Amtrak officials have contacted INDOT officials about assisting in the purchase of the corridor. At this point no purchase plan is in place. Urgency exists with this corridor because segments of the right-of-way could soon be lost to development.

***High Speed Rail Feasibility Study** - The Indiana DOT is working with the Indiana High Speed Rail Association (INHSRA) on the development of a High Speed Rail Feasibility study. The study will examine approximately nine potential corridors through Indiana, examining their economic feasibility and the full costs and benefits of developing the routes. The cost of the study is primarily being paid for by INDOT with a portion of the costs coming from funds raised by the INHSRA. The INHSRA has applied for funds from the Indiana Department of Commerce to assist with the study.*

***Indiana High Speed Rail Association** - This group has been in place for slightly more than two years and has been successful at promoting increased awareness of high speed rail at the local level throughout Indiana. Monthly meetings are held at various locations around the state. This year the group will be hosting a regional event focusing on the development of a midwest high speed rail network. The group also participates in meetings of the Midwest High Speed Rail Compact and with other associations working to promote high speed rail.*

***Hosting of Midwest High Speed Rail Compact Meeting** - The Indiana DOT hosted representatives from the seven state Midwest High Speed Rail Compact last September. The Compact meets twice annually to coordinate and discuss high speed rail developments. In a related event, INDOT sponsored an independent High Speed Rail Symposium in September 1994 to bring the various interested players together to discuss a wide variety of topics pertaining to high speed rail.*

***Section 1010 projects** - Indiana has successfully applied for and received Section 1010 grants for use to improve grade crossing safety along the federally designated midwest high speed rail corridor. Funds have gone to improve safety at a private crossing near Michigan City and to implement a four quadrant gate system in Michigan City.*

STATE OF LOUISIANA
PASSENGER/COMMUTER/HIGH-SPEED EFFORTS

In the course of developing a long-range intermodal transportation plan for Louisiana, considerable interest was shown for increased passenger and new commuter rail service throughout the State. Long range planning estimates indicate that Louisiana's east/west interstate highway corridors will exceed peak capacity within the next 10 years. Alternatives to expanding the interstate system had to be considered and a long range statewide plan was developed through the year 2015.

Passenger or Commuter Rail Service will play a significant role as part of a balanced National Transportation System (NTS) in meeting the future demand for intercity, intrastate, and interstate travel within Louisiana.

This plan is intended to satisfy the U.S. federal corridor planning activities as specified in (HR 4867) the Swift Rail Development Act of 1994.

Louisiana has selected Morrison Knudsen as the prime consultant to develop a Louisiana Rail Passenger/Commuter Master Plan. The "Plan of Action" will be prioritized in phases for implementation of passenger/commuter rail service in the designated corridors. The system recommendations will integrate passenger and commuter rail, air, water, inter-city bus, private auto, and connecting public transportation creating a true intermodal transportation plan that will project short and long term goals through the year 2015. The plan will address problems, needed legislation, freight railroad/shipper concerns, and infrastructure improvements that will be needed for proper implementation. The priority will be given to passenger/commuter service in the New Orleans to Shreveport corridor with the first phase of service on the New Orleans to Baton Rouge Segment due to high motor vehicle volumes on Interstate 10 between these two metropolitan areas.

Louisiana is also working with Amtrak to establish on a trial basis Passenger Service from New Orleans to Mobile, Alabama serving the Mississippi Gulf Coast. Startup service is expected in June 1996.

Louisiana working in conjunction with the Southern Rapid Transit Commission, the New Orleans Aviation Board completed a "Deep South" High Speed Corridor Feasibility Study. The study was conducted by Morrison Knudsen Corporation working in association with Frederick R. Harris, Inc., and Saizan and Associates, Inc. Formal requests have been made to FRA for official designation.

Mass Transit Administration
Baltimore, MD

MAGLEV (High Speed Rail)

Status of MTA issues regarding MAGLEV:

- **Identified 40 miles for potential alignments along I-95/ Amtrak/Baltimore Washington Parkway and independent of BWI Parkway**
- **Evaluated three stations at Camden Yards, BWI Airport and Union Station**
- **Estimated capital cost at $1.5 to $2 billion. Ridership estimated at least 20,000 riders daily.**
- **Elevated for entire length with 16 minute travel time between Camden Yards and Union Station**
- **Preliminary evaluation of environmental effects**

The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Ten Park Plaza, Boston MA 02116-3969

William F. Weld
Governor

Argeo Paul Cellucci
Lieutenant Governor

James J. Kerasiotes
Secretary

MASSACHUSETTS

HIGH SPEED RAIL STRATEGY

NORTHEAST CORRIDOR

Support and encourage Amtrak's high speed rail effort.

- Electrification Project
- NECIP - MBTA participation
- Train set acquisition

Massachusetts actively supports the Northeast Corridor improvements through participation in CONEG's High Speed Rail Task Force, legislative support, and coordination of MBTA investments in the corridor with Amtrak.

OTHER EFFORTS

Massachusetts has partnered with New York State in an analysis of the Boston - Springfield - Albany - New York City corridor as a potential route for high speed surface transportation technology.

This corridor has been the focus of extensive review and analysis, with findings of market opportunities for alternatives to both highway and air travel. The development of a high speed surface transportation system in this corridor has considerable support from local, regional and state governments in both Massachusetts and New York. Private sector support has been expressed by the business community along the corridor, most especially in the greater Springfield area.

To effectively compete with existing modes of travel, a new technology system would ultimately need to achieve service level speeds of at least 125 m.p.h.

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Such a system has real potential to integrate into and connect the components of the existing transportation network, including existing rail service into Canada.

Furthermore, this system would achieve real needs of relieving congestion on the overburdened I-95 corridor, and would enhance the economic development potential of currently isolated regions of both states.

INCREMENTAL APPROACH

Massachusetts believes an incremental approach to the development of this corridor system is essential to success. The use of the existing freight rail line for modest expansion of passenger operations needs to be explored and detailed, in concert with the railroad owner, and with an eye toward utilization of currently available technologies.

Massachusetts further believes a regional approach is essential to the success of these incremental steps, and seeks to continue the partnership with New York State in this effort, as well as encouraging the participation of local government and private business.

Massachusetts anticipates filing for federal financial support for this effort through the Federal Railroad Administration.

MICHIGAN RAIL PASSENGER ACTIVITIES

1. AMTRAK Services in Michigan

Pere Marquette Service. Through the cooperative efforts of MDOT, AMTRAK and Westrain Collaborative, the Pere Marquette service returned to seven day a week daily service in late October 1995. Because of high costs, no food services are being provided; however, options are being evaluated. This route was targeted for elimination as a part of AMTRAK's first phase of nationwide service eliminations. MDOT and AMTRAK were able to work out a temporary arrangement for the service to continue after April 2 on a limited four day a week schedule with no food service. MDOT, AMTRAK and Westrain are working to develop an implementation plan to make this service self-sufficient sometime after the year 2000. The Westrain Collaborative is a local entity formed to oversee the operation and marketing of the service. This entity is comprised of the chambers of commerce, transit agencies and planning organizations along the route. Their efforts are coordinated with AMTRAK through MDOT. They are starting to develop and focus local support for passenger rail service in West Michigan. MDOT has provided $50,000 to Westrain to market and advertise the service.

International Service. In the AMTRAK second phase route reductions, the restructure of the "International" was announced. MDOT has received Michigan Transportation Commission approval for the continuation of the existing service until the end of September 1996. At the present time, Superliner and Santa Fe bilevel coaches are being used, and are being well received by the passengers. MDOT and AMTRAK are undertaking an aggressive program to improve awareness of this service and increase ridership on a short term basis. It is MDOT's intention to have an implementation plan in place to move this service to self-sufficiency sometime after the year 2000. As one step toward this, a fare increase was put into effect. MDOT, AMTRAK and VIA Rail have commenced discussion of alternatives and options for the future. Discussions have also begun with U.S. and Canada customs to improve the present operations and re-engineer this process for the future.

Detroit-Chicago Corridor Service. The Detroit-Chicago Corridor's ridership growth has been slowed by AMTRAK's nationwide service cuts, including the elimination of the Detroit-Toledo segment. November 1995 ridership showed a slight increase over the same month previous year after 10 straight months of ridership being lower than same month previous year. MDOT will continue to monitor ridership and work with AMTRAK and the communities along the corridor to develop a strategy to increase ridership.

2. Regional Rail Study for Southeastern Michigan

The study is managed by MDOT in cooperation with SEMCOG (Southeastern Michigan Council of Governments) with De Leuw, Cather & Company of Michigan being the prime consultant. The Study is entering its eighth month with infrastructure inventory, equipment evaluation, and major generators analysis (Technical document No.1) being complete. Work is nearly complete on the development of service options and rail passenger demand estimates (Technical Document No.2). A decision will be made in March whether to proceed with the last half of the study, depending on

the passenger demand and farebox revenue estimates.

3. Introduction of All Reserved Seating

This project began in February 1995 as a six month demonstration. Standee problems have for the most part been eliminated. There were several instances of standee problems shortly after the start. These have tapered off to only an occasional incidence caused by coordination problems between the AMTRAK and VIA Rail reservation systems. Methods to prevent this are being explored.

4. Station & Platform Projects

Video Ticketing and Information System. MDOT and AMTRAK have undertaken a project to install a video ticketing and information system at three locations on the Pere Marquette route. At the unmanned stations in Grand Rapids, Holland and St. Joseph, a video ticketing and information machine will be installed with a based station located at the manned Niles facility. This will allow the station agent at Niles to provide customers at these unmanned facilities information and tickets for any train on the AMTRAK system. The safety and security at unmanned facilities is also improved. MDOT and AMTRAK see this as a great benefit for customers using unmanned facilities.

Detroit New Center Permanent Station. Negotiations with General Motors (GM) on the purchase of the property are moving forward. MDOT is waiting for GM's counter offer. This purchase should be completed by or shortly after the end of the year. MDOT and the Detroit Economic Growth Corporation have met with several private developers to determine if there is a market for development of the site beyond the needs for the Intermodal facility. All the developers were very interested. The City of Detroit and MDOT are working on details for the further development of the site and the other improvements necessary to insure the successful operation of the facility.

Royal Oak Platform. Construction of the brick paver walkway has been completed and the platform in placed. Some 150-200 passengers boarded at this platform on Sunday, October 29. A dedication ceremony was held on November 2, 1995.

Dearborn Greenfield Village Group Tour Platform. This platform has been completed and a dedication ceremony was held November 2. The first tour group used the new platform February 12, 1996. School group reservations are being taken for the spring opening of the renovated Greenfield Village Smith Creek Station. This allows AMTRAK passengers direct access to the Village park and railroad.

Dowagiac Station. The renovated station, new ADA compliance platform and city street were dedicated November 3. This project also included closing two public crossings and improving the warning devices at two other crossings. A third crossing may be closed in the future. This overall project has included several sources of State, Federal, local and private funding in a true partnership to improve safety and benefit the economic well being of the community.

5. High Speed Rail

Comstock Township. MDOT, in conjunction with the Kalamazoo County Road Commission, Comstock Township, FHWA, FRA (Chicago and Washington DC), and property owners adjacent to the corridor, are developing a frontage road that will allow twelve private crossings and one public crossing to be closed by fall of 1996. Design is underway and the right-of-way is being purchased with construction scheduled to start in spring and the frontage road to be opened in Fall 1996. This project is being funded with State, Federal and local funds with some right-of-way being donated by private property owners.

High Speed Positive Train Control System. Work is progressing on the development of the next generation of train control system to be installed on the AMTRAK owned right-of-way in Michigan. A ground breaking was held on November 3 at Dowagiac in conjunction with another dedication ceremony. Materials have been ordered for the signal system and the associated track structure improvement work. Crossing work has begun. Signal system field installation is scheduled to begin in spring. Completion of both the signal installation and track work is scheduled for next year with testing and operating at speeds over 100 MPH to begin in fall of 1996.

6. Other

Turbomeca RTL II. MDOT had the Turbomeca-AMTRAK train set on demonstration in Michigan on November 2-3, 1995. This is a rehabilitated turbo train set refitted with a new turbine engine and a rehabilitated interior. This tour was a part of MDOT's continuing effort to showcase developing technology and educate the public on the benefits of high speed rail passenger transportation. There were several events and ceremonies schedule around this tour including the dedication of the Greenfield Village and Royal Oak platforms, ribbon cutting for the Dowagiac improvements, and the ground breaking for the High Speed Positive Train Control System.

Southeast Michigan Attraction Brochure. MDOT is working with the Southeast Michigan Visitor and Convention Bureau, Greenfield Village and others to develop a brochure focused on rail to provide information related to the attractions of Southeastern Michigan and their accessibility by public transportation. This is a demonstration project and, if successful, will be expanded to all the Michigan communities along the corridor to promote travel to Michigan by rail. This is one of MDOT's new efforts to develop community support for high speed rail and to help raise community awareness of it's benefits.

IC3. MDOT is working with AMTRAK to develop a long term demonstration project to re-introduce Diesel Multiple Unit (DMU) technology in this country. One of MDOT's goals is to develop a rail and transit feeder system to the Detroit-Chicago Corridor. The IC3 type of equipment appears to fit well. MDOT and AMTRAK are working to implement a demonstration project that is customer- oriented and cost-effective.

1996 High Speed Rail: Briefing Paper

Prepared by the Minnesota Department of Transportation,
Office of Railroads and Waterways, March, 1996.

INTRODUCTION

This briefing paper updates the status of high speed rail in Minnesota and Wisconsin, as it relates to funding and feasibility study issues.

TRI-STATE HIGH SPEED RAIL STUDY, PHASE II

In 1994, the Minnesota Legislature appropriated $630,000 for the next phase of high speed rail analysis in the Twin Cities-Milwaukee Corridor. As the legislation is written, Minnesota will contribute $500,000 if Wisconsin and the federal government match that amount. Mn/DOT will use the remaining $130,000 for the additional cost of administering the study as the lead state.

Issue:
Wisconsin has matched Minnesota's funding for a Phase II HSR study. The Federal government must match Wisconsin and Minnesota's funding for the Phase II HSR study or the Wisconsin funds are not available.

Late in 1995, Wisconsin passed legislation to match Minnesota's funding for the feasibility study of high speed rail service in the southern corridor identified in Tri-State High Speed Rail Study. The funding is contingent upon the federal government matching the Wisconsin and Minnesota monies with $1 million. If this is not possible, Wisconsin may use the funds for other high speed planning as determined by WisDOT. At the time of this writing, Wisconsin is completing a high speed rail feasibility study of the Milwaukee-Chicago corridor. Progress on the Twin Cities to Milwaukee high speed rail connection is contingent upon the findings of the proposed service along that corridor.

Mn/DOT has made several overtures to the Federal Rail Administration (FRA) and Wisconsin to discuss ways in which the states can work together on the next phase of the study. It is not clear if FRA has the necessary funding available to match Wisconsin and Minnesota to the extent identified by the Wisconsin Legislature. If this is the case, the study will have to be delayed until the match issue is resolved. With Wisconsin's focus being on the Milwaukee-Chicago corridor, some work remains in getting phase II started. Communication with FRA and Wisconsin officials are continuing.

Recent High Speed Rail Activities in New York State

In February, 1995, the New York State Department of Transportation (NYSDOT) completed testing at 125 MPH of an upgraded RTL Turboliner train set, commonly referred to as the RTL II, on a section of the Empire Corridor from Schenectady to Stuyvesant, NY. NYSDOT won a grant award of $3 million from the Federal Railroad Administration (FRA) to assist in the funding of improvements to the turbine powered RTL train. Improvements included installing a new Makila TM-1600 turbine in each of the two power cars, as well as refurnishing the interior seating areas, and repairing and repainting the exteriors. The rehabilitation of the RTL power cars was managed by the turbine supplier, Turbomeca of Grand Prairie, Texas, and performed by Morrison-Knudsen in Hornell, NY. In addition, Amtrak refurbished the interiors, including a matching paint scheme of the two passenger coaches and cafe car which completed the train set.

As part of the overall program to demonstrate 125 mph on non-electrified corridors, NYSDOT funded track improvements between Schenectady and Stuyvesant, NY. After resolving liability issues (temporarily) to allow the testing along the route which is owned and operated by Conrail, a waiver was approved by the FRA temporarily allowing maximum speeds of 125 MPH, and under balance of up to five inches. Braking tests were performed on the Northeast Corridor. Due to the Turboliner's light weight and superior braking ability, it was determined the signal system along the test zone was capable of operating safely at 125 MPH. A series of acceleration tests were then performed which validated the RTL trainset's ability to operate at speeds of 125 MPH in non-electrified territory. The refurbished RTL trainset was then restored to regular revenue service as of March 1, 1995, between Schenectady and New York City.

Test results of the RTL II revealed that the new turbine engines were approximately 20 percent more fuel efficient than previous turbine power plants, and performance to date has been excellent. The new Makila turbines also incorporate a modular design and utilize a computerized control system which should improve maintenance activities.

A $6 million appropriation has been included for NYSDOT in the federal transportation legislation to assist in a more comprehensive upgrading of one or more of the remaining RTL Turboliner fleet. NYSDOT has also received a $10 million appropriation in the 1995-96 state budget for high speed rail improvements. Part of the state's appropriation will be used to match the federal funds to produce a more comprehensive upgrade. Under this program a majority of the train systems will be upgraded and modernized, including a comprehensive upgrading of the

interiors and hotel systems of the passenger areas. A consultant contract to produce performance specifications is currently being finalized. This data will be used to produce detailed specifications and final design and engineering plans for the RTL III trainsets. The NYSDOT hopes to embark upon the actual remanufacturing of at least one trainset sometime in 1997.

NYSDOT has also received a $2 million grant from the FRA to manage a research and development effort for high speed, lightweight diesel locomotive. This project is now underway and should be completed during 1997. The project is being performed by the Republic Group, South Carolina.

The Federal Highway Administration (FHWA) has awarded two grants to NYSDOT, for a total of $3.875 million, to develop and field test an advanced rail/highway communications system. This system is a component of the ATLAS train control system being developed by General Railway Signal (GRS) of Rochester, NY.

Closely associated with this effort is a research project initiated during the high speed technology development program, referenced above, which enables a real time video display of grade crossings within the cab of the power car. Although additional research and development needs to take place, this wireless video transmission holds considerable promise for railroad safety and security monitoring.

The state's overall objective of the high speed rail program is to reduce travel time while improving the level and quality of service along the Empire Corridor. For example, improvements in the Albany to New York City corridor are focused on reducing the present express service to two hours or less for the 145 mile distance between the two cities.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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GARLAND B. GARRETT JR.
SECRETARY

STATUS OF HIGH SPEED RAIL PLANNING
March, 1996

Charlotte-Raleigh-Richmond-Washington Corridor Master Planning

Governor James B. Hunt, Jr. has called for two-hour air travel competitive service between Charlotte and Raleigh by the year 2000, and has created the bipartisan Transit 2001 Commission to recommend implementation and financing alternatives.

The States of North Carolina and Virginia have formed a partnership to develop the Federally designated high speed rail corridor that will link Charlotte, Raleigh and Richmond with the Northeast Corridor at Washington, DC. Amtrak's Capital Projects staff serves as project managers. The detailed planning, preliminary engineering and design for this project are under way and will be developed in two phases: Charlotte to Raleigh and Raleigh to Richmond. Preliminary engineering on the Richmond to Washington portion of the corridor has already been secured by the Virginia Department of Rail and Public Transportation.

Southeast High Speed Rail Study

North Carolina plays the "lead state" role in supervising a study designed to model and project potential high speed passenger rail ridership between urban areas in the Southeast region. Sponsored by the States of Georgia, North Carolina, South Carolina, Virginia and Florida, and supported by the Federal Railroad Administration, the results of the study will also be used to evaluate candidate high speed corridor routings for planning and corridor preservation purposes. A consortium headed by KPMG Peat Marwick is contracted to perform the work, which should be completed by June, 1996.

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OREGON HIGH SPEED RAIL PROJECT
STATUS REPORT
March 1996

The Oregon High Speed Rail Project is being developed to help Oregon deal with the transportation needs of the state's growing population. Plans call for upgrading the existing railroad infrastructure incrementally, using surplus capacity, to supplement the I-5 freeway as traffic volumes continue to grow. It provides important economic links between Willamette Valley cities, where 70% of the state's citizens live, and Pacific Northwest Rail Corridor cities, including Seattle and Vancouver, Canada. The entire state benefits from the rail project with better intercity bus service, better connections to the national transportation network, business opportunities for Oregon products and tourism, jobs and improved access to employment. Currently about 25 full time, living wage Oregon jobs are a direct result of this program.

Late in January 1996, a stable funding source for Willamette Valley passenger train and *Thruway Buses* was approved by the Legislative E-Board. This action is expected to keep the system operating through June 30, 1997, concluding a seven month period of stopgap financial support. During the first twelve months of operation 60,000 passengers used the system. The train carried 75% of this group with 25% traveling on the *Thruway Buses*. Over 19,000 riders have used the system in four months Starting October 1, 1995. Four daily Eugene - Portland round trips (1 train and 3 buses) are offered by this program.

During the recent Northwest flood the *Cascadia* train was suspended for over two weeks, February 7 through 27. Track problems in Washington State forced termination of long distance trains at Portland. Schedules were protected by chartered buses until service could be safely resumed.

Oregon sponsored *Thruway Buses* has only one round trip run canceled during the flood by high water. Stabilized funding has encouraged the Thruway Bus operator, *Oregon Coachways*, to invest in upgraded equipment. A freshly painted, premium coach, with a wheelchair lift, was assigned to the run this month. A similar second bus will be coming on line in the near future.

With the funding crisis over, ODOT staff is working to increase revenues and to maximize system benefits to Oregon citizens. As a part of this program Oregon products will soon be featured on the corridor trains. Other activities will include tourism programs to increase visitors into the state, and specialized transportation services such as increased package express business. This effort is expected to make the system more self sustaining by having the greater portion of the operating costs paid by user fees.

The next series of construction and upgrade work will take place in the Portland area where the greatest impact on train performance can be made. Work activities include modernization of track structure at the north end of Union Station and installation of Positive Train Separation (PTS) train control system between Union Station and the Columbia River to complement the work taking place in Washington State. The PTS work, delayed slightly by the change of personnel due to the Burlington Northern-Santa Fe merger, is now proceeding on schedule with the expectation of completion in 1997. After installation of the PTS system a period of testing will follow to check the performance of PTS in a controlled safe environment. The northwest PTS system is expected to become a prototype for the nation. The railroads are investing over $40 million and governments are contributing an additional $5 million in the PTS project.

Phase one of the Oregon High Speed Rail Project is designed to raise passenger train speeds to 79 miles per hour, over 80% of the 125 mile corridor, between Eugene and Portland. This will be accomplished by modernizing congested zones along the route, to reduce the run time to under two hours, and generate increased user revenues to support operations. It has been forecast to cost about $60 million.

This spring Oregon is focusing efforts on establishing a solid financial base for the program. Oregon Governor Kitzhaber has established a series of "Blue Ribbon" committees headed by former US-DOT Secretary Neil Goldschmidt, to research and recommend future transportation priorities for the state. A Spanish Talgo Train sponsored by the Oregon Business Coalition for High Speed Rail will be touring the Oregon corridor on March 29 and 30 to build citizen support for the program. The financial package developed will provide adequate funding to complete the first phase of the project as described earlier in this report.

The Oregon High Speed Rail Corridor Improvements Summary follows on the next page.

High Speed Rail Corridor Improvements Summary		
Project Package *From the Oregon High Speed Rail Business Plan, August 1994*	**Potential Portland-Eugene Service Schedule (Round Trips)**	3/18/96 **Cost (1994 Dollars)**
Phase 1: Portland Area speed and reliability improvements	2 hours 20 minutes (2)	$ 7,336,562
Phase 2: Selected speed increases Eugene-Portland	2 hours 15 minutes (2)	$ 3,624,651
Phase 3: Bridge improvements Eugene-Portland	2 hours 13 minutes (2)	$ 3,862,500
Phase 4: Eugene-Portland-Vancouver capacity improvements	2 hours 13 minutes (4)	$ 5,642,274
Phase 5: 79 mph upgrade: Eugene-Portland	2 hours 3 minutes (4)	$ 21,634,207
Phase 6: Speed and capacity increases: Vancouver WA - Portland and Eugene-Portland	2 hours 1 minute (5)	$ 8,407,236
High Technology Train Rolling Stock		$ 10,000,000
Funding for Marketing, ODOT Staff and and unrecovered operations costs.	*To be paid out over an 8 to 10 year period*	$ 20,000,000
	Total	**$ 80,507,430**

Future Improvements *(signal system, crossing closures, by-passes, etc.)*	1 hour 22 minutes (6-8)	*Does not include total above.* **$ 370,000,000**

A $100 Million investment in High Speed Rail Buys:

* Use of privately owned infrastructure valued at over $250 million. *(Replacement value over $2 billion)*
* An alternative to driving in the 125 mile Portland-Eugene Corridor.
* Operating speeds of 79 miles per hour over 80% of the line.
* Reduce Eugene-Portland run time under two hours. *(Present run time is 2 hours 37 minutes)*
* Advanced Technology Passenger Trains for Oregon.
* Additional Passenger Train Frequencies in the Corridor.
* Extra corridor frequencies by supplemental ***Thruway Bus*** runs.
* Expanded ***Thruway Bus*** services including rural feeder routes. *(Eugene-Bend-Burns-Ontario, Portland-Astoria/Seaside and others)*
* Development of intermodal stations at Albany, Eugene and Salem.
* An improved intercity passenger network for Oregon.
* Safer and more efficient freight train operations.
* Eight or more years financial support for corridor operations.
* Preparation for higher passenger train speeds over 80 mph.
* Retains economic ties between Oregon and the NW Region.
* The project is demand driven and may not require full build out to achieve goals and maximize cost recovery.

A $152 Million Investment in the I-5 Freeway is Buying:

* The I-5 Salem by-pass project which involves 7.5 miles of freeway.
* Adds one traffic lane in each direction including related structures.

KEYSTONE CORRIDOR INITIATIVE

The Pennsylvania Department of Transportation is exploring opportunities to enhance passenger rail service on Amtrak's 104 mile, fully electrified rail corridor between Harrisburg and Philadelphia. The Department has recently engaged professional services to conduct an in-depth assessment of the line. The study will include recommendations for capital investment, infrastructure improvements, ownership, management and operation, equipment and service levels, and a business plan. In addition to providing cost estimates for needed capital investment to bring the line up to a state of good repair, incremental improvements and costs to achieve higher speed service will also be provided.

Although Pennsylvania's initial application for Section 1010 Grade Crossing Improvement Funds was denied and the Harrisburg-Philadlephia corridor is not currently designated by FRA as a high-speed rail development corridor, we believe that an incremental approach to achieve higher speed service in this corridor could be "core" to an eventual cross-state system, and beyond.

ALLEGHENY COUNTY MAGLEV INITIATIVE

Maglev, Inc., is a Pittsburgh based consortium of public, private, and university interests collectively pursuing its long term objectives to develop a regionally based Maglev industry, build and operate a regional system, and integrating this system with economic development in the region. Maglev Inc. proposes a link between the (CBD) Central Business District and the airport as a first link in this much larger regional network. Study activities to date have been financed with grants from state, federal and local agencies and private interests.

VIRGINIA RAIL PASSENGER SERVICE STUDIES

The Virginia Department of Rail and Public Transportation (DRPT) has been studying the feasibility of improving and reinstituting passenger rail service in several corridors throughout the state:

A. WASHINGTON, D.C. - RICHMOND RAIL CORRIDOR STUDY

The Department has recently completed a detailed study of improving rail passenger service in the Washington, D.C. to Richmond. A Phased Rail Improvement Program is recommended to incrementally improve speeds and train frequency in the corridor. The first three phases of the program will increase maximum speeds from the current 70 mph to 90 mph. These improvements will reduce approximately 20 minutes off of the current 120 minute travel time between Washington, D.C. and Richmond. The cost of these first three phases is approximately $13.4 million. Phases 4 through 6 involve the construction of a third main line track, procurement of high speed rolling stock, and other improvements to get maximum speeds up to 110 mph and frequencies up to hourly. The total cost of Phases 4 through 6 is $350 million.

Funding The Commonwealth Transportation Board of Virginia has allocated $13 million of Statewide Surface Transportation Program funds over a four year period to begin the improvements identified in this study. ISTEA does not currently allow STP funds to be spent on inter-city rail projects. However, the Virginia Railway Express (VRE) does operate in this corridor between Fredericksburg and Washington, D.C. Projects on this portion of the line would directly benefit VRE and are thus eligible for funding. STP funds will only be used north of Fredericksburg until such time as the law is changed to allow states more flexibility in determining how their federal transportation funds are spent.

B. BRISTOL TO WASHINGTON, D.C. AND BRISTOL TO RICHMOND RAIL PASSENGER STUDY

The Department has completed a preliminary study on the feasibility of instituting passenger rail service from Bristol to Richmond and to Washington, D.C. The study has demonstrated a high level of demand for twice daily service which operates at conventional speeds but utilizes modern tilt trains to minimize overall travel times.

A second phase of this study will be undertaken to address various operational and institutional issues identified in Phase 1. The Department will be working closely with Norfolk Southern, the owner of the track which

would be used for the proposed service, to identify problems that the passenger trains would cause for their freight operations. Railroad operations will be modeled to identify where conflicts may occur and to test proposed improvements. Ridership, revenue and operating cost projections will be refined in this second phase of the study. Phase 2 will be completed by January 1997.

C. MAIN STREET STATION STUDY

The City of Richmond has completed its study to examine the feasibility of establishing a multi-modal transportation center in the old Main Street Station in downtown Richmond. The study, which was finished in March 1995, recommends that the station be redeveloped into a multi-modal facility providing rail, local and intercity transit, taxi and limousine service. The study addresses the improvements needed to the station itself, as well as access requirements and rail improvements needed.

D. SOUTHEAST RAIL CORRIDOR STUDY

VDRPT is working with the States of North Carolina, South Carolina, Georgia and Florida to conduct a market evaluation of the potential demand for high speed rail of the region. This study is analyzing travel patterns between major urbanized areas in the five state region to determine the potential market for high speed rail. Extensive surveys of automobile, rail, air and bus travel have been conducted, and the data is being analyzed. This study should be completed by the Spring of 1996.

E. CHARLOTTE - RALEIGH - RICHMOND MASTER PLAN

The State of North Carolina has received funding from the Federal Railway Administration to develop a Master Plan for improving its passenger rail corridor. The second phase of this study includes the link between Raleigh and Richmond. The Commonwealth has been working with North Carolina to select the best route for this service and to analyze improvements needed. This study should be completed in mid-1996.

F. RICHMOND - NEWPORT NEWS RAIL STUDY

As part of their Major Investment Study of improving the Interstate 64 corridor between Richmond and Newport News, the Virginia Department of Transportation has agreed to provide approximately $500,000 to study improvements to rail service in the corridor. This study will be performed in conjunction with the City of Newport News, which is about to begin a study of light rail service in the CSX corridor between Hampton, Newport News and Williamsburg.

1996 SESSION

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HOUSE JOINT RESOLUTION NO. 252
AMENDMENT IN THE NATURE OF A SUBSTITUTE
(Proposed by the Senate Committee on Rules
on March 4, 1996)
(Patron Prior to Substitute—Delegate Robinson)

Establishing the High-Speed Rail System Commission.

WHEREAS, there have been studies conducted by the General Assembly on various aspects of the high-speed rail service between Richmond and Washington, D.C.; and

WHEREAS, other parts of the Commonwealth want to determine the usefulness of high-speed rail service in their locations; and

WHEREAS, the benefits of a national intermodal transportation system are enormous, offering the promise of (i) lowering overall costs by allowing each mode to be used for the portion of the trip for which it is best suited; (ii) increasing economic productivity and efficiency, thereby enhancing the nation's global competitiveness; (iii) reducing the congestion and burden on overstressed infrastructure investments; (iv) improving mobility for elderly, disabled, isolated, and economically disadvantaged persons; (v) generating higher returns from public and private infrastructure investments; and (vi) reducing energy consumption and contributing to improved air quality and environmental conditions; and

WHEREAS, high-speed rail service will be a critical component of the Commonwealth's system of intermodal transportation; and

WHEREAS, there is currently a mix of private and public entities involved in the financing, management and maintenance of Virginia's rail system; and

WHEREAS, coordinated planning and evaluation will contribute to the most efficient and effective use of Virginia's transportation resources; and

WHEREAS, increased rail ridership offers the opportunity for communities with rail stations to expand pleasant, economically viable residential or commercial facilities near those stations, resulting in environmental benefits to the affected communities; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the High-Speed Rail System Commission be established. The Commission shall make recommendations necessary to assure the presence of a high-speed rail system in Virginia, including an overall plan and financing alternatives.

During its deliberations the Commission shall address the following questions:

1. Where in the Commonwealth will high-speed rail service be most effective and efficient, given the goals of an intermodal system?

2. What are the roles of the various private and public entities now involved in the planning and delivery of high-speed rail service?

3. What timetable should be used for the development of the high-speed rail system?

4. How should system construction and expansion be financed?

The Commission shall consider other aspects of the creation of a high-speed rail system for the Commonwealth as they find necessary.

The Commission will build on preliminary work done by the Department of Rail and Public Transportation and several private studies and report its findings to the 1997 Session of the General Assembly.

The Commission shall consist of 16 members appointed as follows: the Chairman of the House Committee on Finance; the Chairman of the House Committee on Transportation; two members of the House of Delegates appointed by the Speaker of the House of Delegates; the Chairman of the Senate Committee on Transportation; one member of the Senate as recommended by the Co-chairmen of the Senate Committee on Finance and one member of the Senate, to be appointed by the Senate Committee on Privileges and Elections; one member of the Board of Transportation Safety, one representative of the Virginia Railway Express, and one citizen of the Commonwealth, all to be appointed by the Speaker of the House of Delegates; one representative of commercial rail lines and one citizen of the Commonwealth, to be appointed by the Senate Committee on Privileges and Elections; the Lieutenant Governor; the Secretary of Commerce and Trade; the Secretary of Transportation; and the Executive Director of the Department of Rail and Public Transit. The chairman of the Commission shall be a state elected official serving on the Commission.

The Commission shall be staffed by the Division of Legislative Services, assisted by the staffs of the House Committee on Appropriations and the Senate Committee on Finance.

The direct costs of this study shall not exceed $ 6,750.

The Commission shall complete its work in time tc submit its findings and recommendations to the Governor and the 1997 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

Implementation of this resolution is subject to subsequent approval and certification by the Joint Rules Committee. The Committee may withhold expenditures or delay the period for the conduct of the study.

WISCONSIN'S INTERCITY PASSENGER RAIL INITIATIVES

- In October 1989, the frequency of **Amtrak's *Hiawatha* corridor service** between Milwaukee and Chicago was increased from 3 to 5 daily round trips under a 403-b contract between Amtrak and the states of Wisconsin and Illinois. In October 1991, two more daily round trips were added under state sponsorship.

- In May of 1991, a tri-state study assessing **high speed ground transportation options for the Chicago-Milwaukee-Twin Cities corridor.** The study concluded that a southern corridor is preferred for future high speed rail service. The southern corridor generally follows the route of Amtrak's *Empire Builder* through Wisconsin, i.e., the Soo Line Railroad's mainline from Chicago to Milwaukee to La Crosse.

- As an outgrowth of the tri-state study, Wisconsin and Illinois co-sponsored a more detailed feasibility study of **high speed rail options between Chicago and Milwaukee.** Begun in 1992, the *Chicago-Milwaukee Rail Corridor Study* is nearly complete. Phase I identified the Soo Line Railroad/Metra rail corridor as the preferred alignment option, with diesel-electric locomotives as the initial technology of choice. Phase II provides a blueprint for reducing the rail travel time from city-center to city-center from 90 to 60 minutes.

- Also in 1992, the FRA designated the Chicago-Milwaukee segment as an integral component of a Chicago-hubbed HSR corridor including Chicago-St. Louis and Chicago-Detroit under the provisions of **Section 1010 of the ISTEA.** In 1993, WisDOT was awarded a $350,000 grant to study alternative ways to eliminate grade crossing hazards in Sturtevant.

- In January of 1993, WisDOT released its *Report to the Governor* which recommended **extensions of conventional Amtrak service** from Milwaukee to Green Bay and from Milwaukee to Madison. At the Governor's request, the Legislature approved a $50 million (GO) bond authorization to pay for the state's share of the initial start-up costs. Expending this money was, however, made contingent on Amtrak committing to provide the equipment and operating the service. Such a commitment has not been forthcoming.

- WisDOT also analyzed additional passenger rail options as part of its statewide, multimodal panning effort known as *Translinks 21*. This analysis confirmed the need for improved intercity rail passenger service in certain major travel corridors. A **multimodal statewide travel simulation and forecasting model** was developed as part of the *Translinks 21* planning process. This model is used to analysis how the traveling public will respond to various rail passenger scenarios.

The Chicago-Milwaukee Rail Corridor Study

The *Chicago-Milwaukee Rail Corridor Study*, co-sponsored by the states of Illinois and Wisconsin, is a detailed analysis of the feasibility of high speed rail service from downtown Chicago to downtown Milwaukee -- a distance of some 90 miles. The study creates a blueprint for reducing the city-center to city-center travel time by rail from 90 to 60 minutes.

The study blueprint defines how high speed rail service can be implemented in the corridor with minimal environmental disruption by use of existing rail rights-of-way. Because the selected rail corridor is already heavily used by CP Rail , Metra and Amtrak, considerable time and effort was devoted to developing a plan that simultaneously meets the future needs of all three rail users.

The study has defined the capital investment and operating costs associated with three implementation scenarios. Financial analyses of the forecasted revenue and cost streams associated with each scenario reveal that a considerable amount of public funding will be required to implement any one of the three.

A bi-state agreement and public-private partnerships will need to be forged in order to move the project beyond the study stage.

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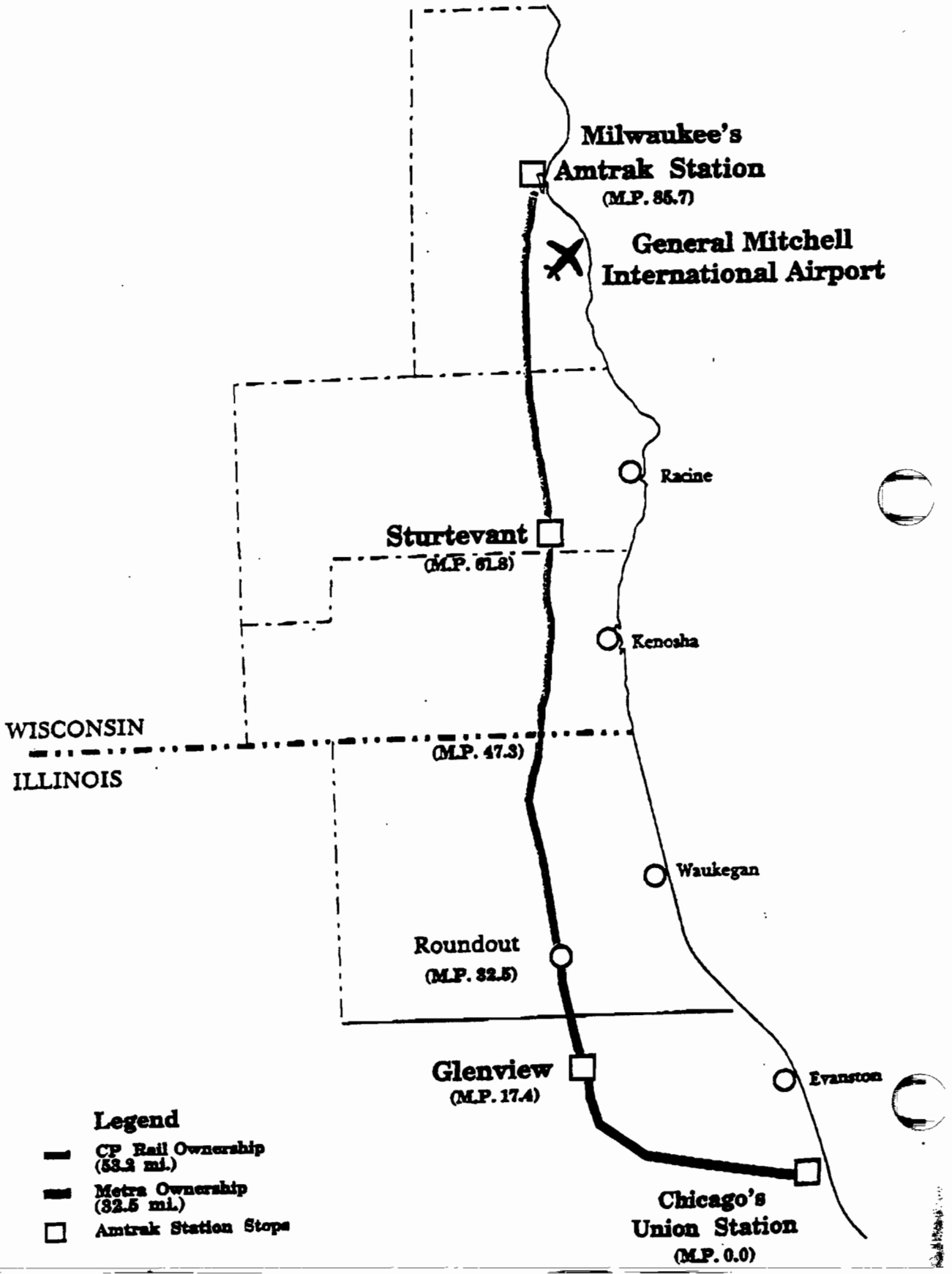
Milwaukee – Chicago Rail Passenger Service

Ownership of Rail Corridor Used by Amtrak



The Tri-State High Speed Rail Study

The *Tri-State High Speed Rail Study*, co-sponsored by the states of Illinois, Minnesota and Wisconsin, was a broad-brushed evaluation of the feasibility of high speed ground transportation alternatives between Chicago, Milwaukee and Minneapolis/St. Paul. The consultant team of TMS/Benesch conducted the study and results were released in May of 1991.

The study analyzed **two distinct corridors** through Wisconsin and Minnesota:

- A Southern Corridor roughly following the route used by Amtrak's *Empire Builder* from Milwaukee to La Crosse with two options of going from La Crosse to the Twin Cities. The first option would be to follow the Empire Builder route from La Crosse going north along the Mississippi River Valley through Red Wing to the Twin Cities. The second option would be a route from La Crosse going west to Rochester and then north to the Twin Cities.

- A Northern Corridor going north from Milwaukee through Oshkosh/Appleton/Green Bay and then west through central Wisconsin and eau Claire to the Twin Cities.

The study also analyzed **three distinct speed/technology options**:

- "Amtrak upgrade" steel-wheel on steel-rail trains with a cruising speeds of 125 mph using diesel-electric motive power. (This option was not analyzed for the northern route because conventional rail passenger service does not exist in this corridor.)

- "Very high speed" steel-wheel on steel-rail trains with a cruising speed of 185 mph using overhead electric power. (The costs developed for this option were based on the TGV/ICE technologies. The use of tilting technologies was not included in the analysis.)

- "Super speed" magnetic levitation trains with a cruising speed of 300 mph. (The costs developed for this option were based on the Transrapid system.)

The study **conclusions** were:

- The potential travel market for high speed ground transportation services from between Chicago, Milwaukee and the Twin Cities is a combination of the short-distance almost intra-urban Chicago-Milwaukee market and the long-distance Chicago/Milwaukee-Twin Cities market. Together, the two markets offer a significant potential for high speed rail.

- From an environmental, economic and financial perspective, the Southern Corridor is preferred to the Northern Corridor---but only marginally. Many of the benefits of the Northern Corridor could be realized by establishing high speed ground transportation links between Green Bay and Milwaukee and between Eau Claire and the Twin Cities.

- From a financial investment perspective, the preferred ordering of the speed/technology options is 125 mph, 185 mph and 300 mph. The financial investment analysis computed and compared the Net Present Values and Internal Rates of Return for specified technology and corridor options for both public and private financing scenarios.

- From an economic benefits perspective, the ordering of the technology options depends on the sources and availability of capital. The economic benefits analysis computed and compared the Consumer Surplus for specified technology and corridor options relative to the costs associated with each option assuming public sector financing.

- From an environmental perspective, the use of existing rail rights-of-way is clearly preferred over the development of new rights of way. Implementation of the 125 mph technology option in the Southern Corridor would cause the least amount of environmental impact.

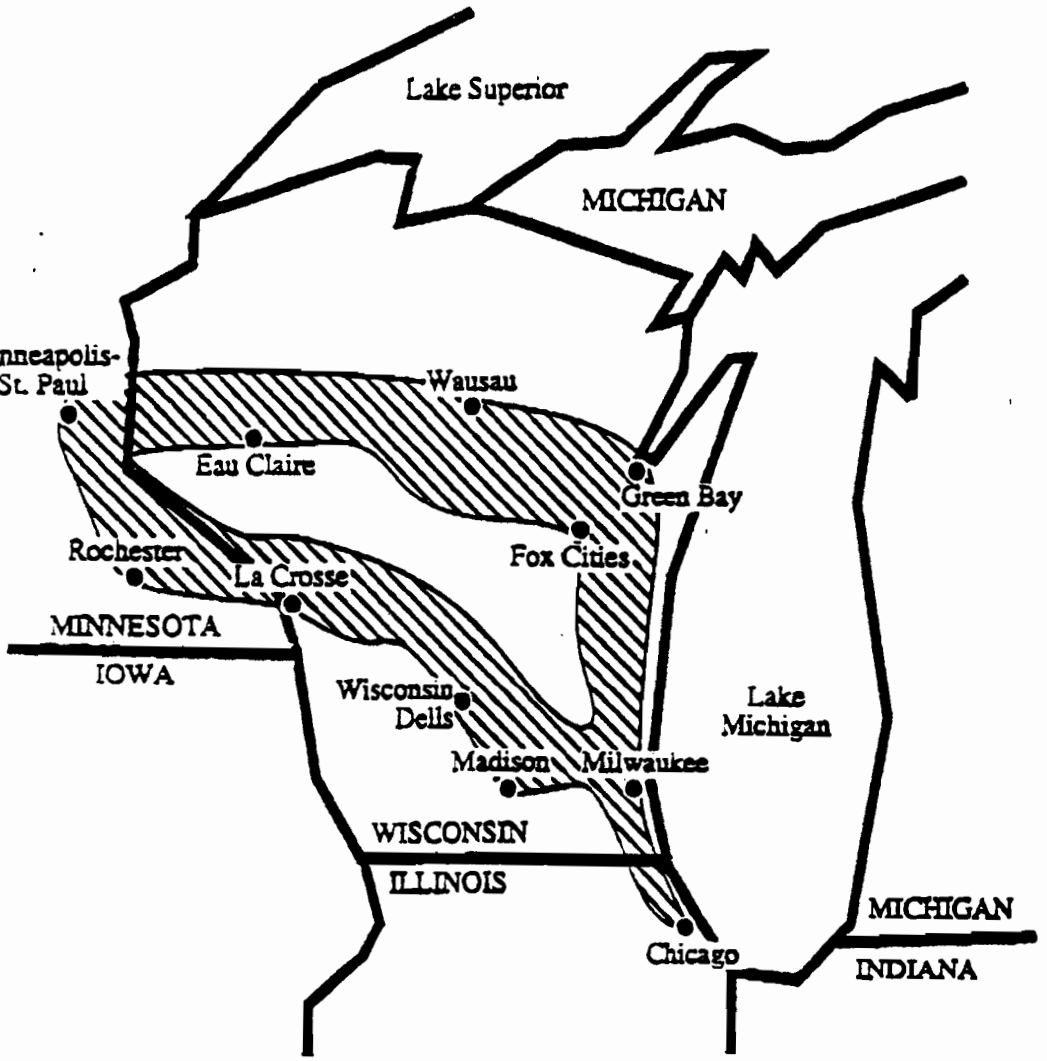
The consultant team also recommended that a **more detailed and comprehensive feasibility study** be undertaken to identify a preferred approach to implementing high speed ground transportation in the Chicago-Milwaukee-Twin Cities corridor. The following elements were recommended for inclusion in the study.

- Collection of a comprehensive and consistent origin-destination travel data set designed specifically for a new set of travel forecasting models.

- Development and testing of alternative travel forecasting models for the corridor.

- A more detailed and comprehensive technology appraisal which would include an analysis of the benefits and costs associated with the use of tilt trains in the corridor.

Northern and Southern Corridors
Tri-State Study of High Speed Rail Service



SECTION 1010 OVERVIEW

FRA was delegated as the lead agency in the Department of Transportation for selecting the five high-speed rail corridors and for allocating the funds available each year. The $30 million authorized for the six years of the program for the elimination of highway-railroad grade crossing hazards is provided to FHWA under the Federal-aid highway program. FHWA and FRA Office of Safety concurrence are required on these annual allocations.

The goal is to use the Section 1010 funds to support the advancement of HSR in these corridors while maximizing the reduction of grade crossing hazards.

The emphasis of the program was changed with the 1994 allocation, and has continued since then to emphasize innovative approaches to improve the safety at grade crossings. Upgrades of existing warning systems, also eligible for funding under other federal programs, would not be considered as significant when compared to innovative approaches, but would also not be eliminated from consideration. Treatment of private crossings (Section 1010 is the only program that provides funding for their treatment) would also receive priority.

The other evaluation criteria include the comprehensiveness of the grade crossing plan, the status of corridor development, the extent of non-1010 funding committed for grade crossing hazard elimination, and an evaluation of the crossing hazard (the number of intercity passenger trains and the number of corridor miles for which the alignment has been decided, assuming one grade crossing per mile).

The allocation of FY 93, 94 and 95 funds totals $15.5 million. Of the $14.5 million balance remaining for the next two years of the program, the total available for obligation for 1996 is $9.5 million.

SECTION 1010
FUNDING ALLOCATIONS BY STATE BY FISCAL YEAR
(in $ millions)

State	FY 93	FY 94	FY 95	FY 96 (req)
CA	1.2	0.6	1.35	1.525
FL	.25	.6	.7	1.66
IL	.95	.8	.5	1.5
IN	---	.3	.4	DNA
MI	1.2	.6	1.0	1.95
NC	.45	.4	.45	.45
OR	.25	.15*	DNA	DNA
VA	.45	.5	.6	1.56
WA	.25	.45	1.0	.55
WI	---	.1	DNA	DNA
Total	5.0	4.5	6.0	9.195

* Oregon could not accept these funds in 1994 due to a funding limit problem stemming from their reorganization. These funds remain reserved for ORDOT, but will be reallocated in FY 97, the last year of the program, if ORDOT does not apply in 1997.

DNA = did not apply

VEHICLE ARRESTOR NET

In 1993 a grant for $950,000 was awarded to the state of Illinois for an arrestor net demonstration. The arrestor net is similar to the nets used aboard aircraft carriers to catch aircraft in an emergency, and is used now by highway departments to close roads for maintenance work or access ramps for reversible HOV lanes. The concept in Illinois will have the net stored in a metal housing above the roadway. When the train activates the lights and gates at the crossing, the arrestor net will also be activated and will lower from its housing to block both lanes of the roadway. This framework will also have flashing lights. The arrestor net is secured by two spools of stainless steel tape, with different resistances, on each side of the framework. Vehicles are stopped when they impact the net by pulling out these tapes through metal pins which deform the tape and absorb energy. These pins can be adjusted to increase resistance as needed. The first spool is used to stop small cars and trucks. The second spool is engaged after the first spool is fully used, after about 30 feet, and has much higher resistance in order to stop fully loaded semitrailers. The installation of these arrestor nets will include a video system to record vehilce impacts. An evaluation of the mechanical operation of the system and a human factors evaluation of driver reactions will take place during the one year demonstration.

The state has requested $1.5 million to install and evaluate six barriers at three grade crossings. The applications have been reviewed and a decision will be made shortly. The three locations selected for the demonstration are:

1. Trunk Rte 35A, near Chenoa, (Southern Pacific(SP), mile post (mp) 105.93) Grade crossing # 290786R
2. US Route 136, McLean, (SP, mp 141.2) Grade crossing # 290964A
3. Hawthorne St., and frontage road, Hartford, (Gateway Western Railway and SP, SP mp 264.85) Grade crossing # FAU 8975.

TECHNOLOGY DEMONSTRATION PROJECTS

Section 1036(c)

On November 30, 1992, the Federal Railroad Administration (FRA) published a "Notification of Funds Availability" (NOFA) in the Federal Register, seeking "Expressions of Interest" from prospective grantees for the National High-Speed Technology Demonstration Program. In response, 46 "Expressions of Interest" were received. After an initial screening, 34 projects were deemed responsive to the NOFA and received a more detailed review by FRA with the input of Volpe National Transportation Center (VNTSC) and Federal Highway Administration (FHWA) with regard to those areas where these agencies have specialized expertise.

The goal was to select those projects that offered the best possible return on our investment for advancing the development of high-speed rail (HSR).

Applications selected in the initial screening process could be categorized as follows:

Grade crossing protection/elimination - Ten were received in this area for various types of barriers, netting systems, and trespasser detection (lasers, video cameras);

Motive power - Six were received to demonstrate or develop high-speed locomotives using diesel/electric, liquefied natural gas (LNG), or advanced turbine engines;

Train control systems - Three were received to examine global positioning, satellite communications, and improved train line technology for audio/video communication to match that of European and Japanese HSR systems;

Miscellaneous - The remainder involved other applications to support the general development of HSR, such as improving wayside monitoring of train cars (consist) while underway, obstacle detection, improvements to brakes, trucks, rail manufacturing techniques, etc.

In May, 1993, following review of these expressions, preliminary selection for award was made based on the legislative evaluation criteria and merit of the proposals. Four prospective grantees were subsequently requested to submit detailed proposals which

formed the basis for technical and cost negotiations. These proposals were:

Consolidated Launcher Technology, Chesapeake, VA $400,000 for the Friendly Mobile Barrier;

Connecticut DOT, $800,000 for a four quadrant gate with obstruction detection and notification to the locomotive engineer;

Florida DOT, $252,000 for a low cost grade separation;

New York DOT, $3 million for the retrofit of an RTL turbo train to be demonstrated in a test area on the Empire Corridor at 125 mph.

The following year, 1994, two projects were earmarked by committee in Congress:

Illinois DOT, $2.5 million for an environmental impact study and other work to support development of the Chicago - St. Louis corridor.

North Carolina DOT, $1 million to develop a design and construction master plan and examine new technologies for the Raleigh to Charlotte corridor (which will be done in coordination with VADOT in the development of the southeast high-speed corridor).

Below is a status of each of the grade crossing projects.

SCHOOL STREET PROJECT, GROTON, CT

The State of Connecticut received a grant for $800,000 to develop an advanced grade crossing warning system which will use four quadrant gates with an obstacle detection system and a communication system to notify the locomotive engineer of an obstruction in adequate time for the train to be stopped (basically the Swedish X2000 system adapted for Amtrak's signal system). The total project cost from the grant is $1 million, with the balance of $200,000 being provided by the State. So far, the state has provided an additional $18,600 for civil engineering work at the site.

The location for this project is at the School Street at-grade crossing in Groton, milepost 131.50, on the Northeast Corridor. It is a two lane road protected now by gates, flashing lights and bells. It provides access to a residential area and three boat yards.

The design of the system and the road work needed at the site is complete. A public information meeting was held in Groton, CT on February 29, 1996 to explain the project to the local citizens and answer questions. Materials have been ordered and construction will begin this summer, with completion expected by late summer 1996. Check out of the system will begin in early fall, followed by acceptance testing in October and November. A one year evaluation period will begin in December, 1996.

LOW COST GRADE SEPARATION

The State of Florida has received a grant for $252,000 to develop a low cost grade separation. The total cost and time of construction is expected to be approximately 50 percent less than the time and cost of a traditional pile supported, concrete wall and beamed structure. The total project cost was estimated in their original submission at approximately $400,000.

The design being considered uses a multi-plate SuperSpan system of prefabricated, corrugated (6 inch by 2 inch) steel panels forming an arch that rests on 8.5 foot high reinforced concrete stem walls which protect the arch from train derailments or lost cargo. Reinforced concrete "thrust beams" are poured along the upper portion of the completed structure and extend outwards at 45 degrees to the line of the roadway, acting as retaining walls to prevent horizontal movement of the soil during backfill and to increase the ease of compaction. The road would be built on top of the backfill as for any other type of grade separation. One option which used a precast concrete arch was discarded as too costly.

The prefabricated steel system known as SuperSpan has been used for more than 20 years to form arches for grade separations for highways and railways. Costs for the original concept were approximately $400,000, but due to unforeseen site conditions and other detailed design considerations, the cost has escalated to approximately $1.4 million.

THE FRIENDLY MOBILE BARRIER

The friendly mobile barrier (FMB) is a crash attenuation device positioned behind four-quadrant crossing gates. The FMB rises from a vault in the roadway, after the crossing gates go down, preventing motor vehicles from penetrating and blocking the tracks while stopping the vehicle safely. The barrier uses five steel frames holding nine torsional springs per frame, or 36 springs in total, to absorb the energy of impacting vehicles. A rubber pad is on the front end. When impacted, the springs rotate, absorbing energy, and are held in place by a ratchet to prevent rebound. These ratchets must be released manually after impact. The system will stop passenger cars and light trucks while averting fatal injury to the occupants and will prevent large trucks from gaining access to the crossings at speeds up to 45 mph.

Four vehicle impact tests were conducted in March, June and July 1995. Modifications were made to the barrier's design following each test. Although in each test the barrier stopped the vehicle, each vehicle was severly damaged. The barrier also suffered damage in the first three tests. The final test, with a small car (1,800 lbs) caused no damage to the barrier, although it did cause significant damage to the car. Reliability tests will be performed this spring, 1996.

Costs to install this barrier are estimated at $200,000 to $250,000 per unit. Four units are needed for crossings with a two lane road, one barrier per lane on both sides of the tracks to totally block the crossing, or approximately $800,000 to $1 million for a two lane road.

VEHICLE PROXIMITY ALERT SYSTEM (VPAS)
TESTING AT TRANSPORTATION TECHNOLOGY CENTER, PUEBLO, CO

Section 1072 of ISTEA requires the Federal Highway Administration (FHWA) to coordinate field testing of Vehicle Proximity Alert System (VPAS) concepts and comparable systems to determine the feasibility of their use by priority vehicles (emergency, police, school buses, hazmat) as an effective highway-rail grade crossing safety device. VPAS devices are being tested as a result of the FRA/FHWA intermodal cooperative efforts to integrate rail and highway technology in support of the Intelligent Vehicle Highway System (IVHS).

Eleven responses to an announcement in July 1993 were received and evaluated by a joint committee of FHWA and FRA members.

Four systems, representing three basic approaches to alerting the driver of a motor vehicle, were selected for testing. Other systems may be tested as technological approach and funding allows.

These devices provide the driver of a motor vehicle an audible and visual warning that a train is approaching a highway-rail grade crossing, alerting the driver in sufficient time to safely stop.

A grade crossing was outfitted for conducting these tests on the Facility for Accelerated Service Testing (FAST) track and the Railroad Test Track (RTT) at TTC.

The testing and evaluation of the VPAS prototypes will be done in two phases. First, reliability testing in the controlled, but realistic, railroad environment of TTC will be completed. When it has been determined that the devices will work reliably as the manufacturer claims, they will be installed on a working railroad for testing in an operations environment in FY 96.

SmartStops Unlimited, Inc. (formerly Engineered Safety Products) A 3-point system which has radio devices on the train, the priority vehicle, and at the crossing, enabling a priority vehicle to detect a train approaching within a .1 to .5 mile radius;

RF Solutions - A 2-point system using radio communication between the train and the priority vehicle with a range of up to .5 miles;

EARS Systems, Inc. - A one point system which recognizes the sound frequency of the train whistle, using only one receptor in the priority vehicle.

Dynamic Vehicle Safety Systems - A one point system that recognizes the Front of Train/End of Train Device (FRED) signal broadcast by many trains in freight service.

The second phase of testing will begin in 1996. This work will include development of an in-service test plan, purchase of VPAS equipment, and the subsequent analysis and evaluation of the data collected in the field by the Volpe National Transportation Systems Center. Purchase of test equipment, and performance of the tests and data collection will be by railroad and state personnel under the supervision of test personnel from TTC.

TEST PROCEDURES

The testing was done in four phases:

Phase I - Proof tests of the system, to characterize the basic functionality of the equipment, and determine if it works as the manufacturer says is will work (FAST);
Phase II - Detection performance tests to determine the system's performance and its relative consistency of operation under good conditions (FAST);
Phase III - Performance limits tests to determine the maximum range of the systems under good conditions, with both a stationary and moving highway vehicle (RTT); and
Phase IV - System response to poor conditions testing, such as temperature extremes, precipitation, blowing dust, EMI, buildings, etc. (RTT).

Prototype Information

SmartStops Unlimited, Inc (formerly Engineered Safety Products) - Train Presence Warning Device

A three point radio frequency (RF)system using dual-tone multiple frequency (DTMF) codes for system communication which uses transceivers mounted on the locomotive and at the grade crossing, operating at 151.6 MHZ, to activate a receiver in the vehicle.

The locomotive transceiver transmits its signal at a constant rate when the locomotive is in motion. A second transceiver at the crossing and the in-vehicle receiver are normally in standby mode.

As the locomotive approaches, the pole-mounted crossing transceiver is activated and issues its signal which is picked up by any priority vehicle within a .1 to .5 mile radius (test results at TTC demonstrated a range of 2 to 3 miles, which will need to be reduced to minimize false and nuisance activations). There is also a return signal to the locomotive operator by the grade crossing transceiver that the grade crossing has picked up the transmitted signal.

The transceiver uses a shortwave radio signal collected by a signal discriminatory-sympathetic 12 volt DC battery powered receiver, mounted to the dash board of the priority vehicle.

RF Solutions - "TrakAlert" System

The **TrakAlert** is a radio frequency system operating in the 902 - 928 MHZ frequency band, which operates within specified output power and spectral dispersion limits in order to qualify under Part 15 of the FCC Rules and Regulations for unlicensed operations. It uses a coded spread spectrum signal to minimize interference from undesired signals within the same frequency band. A transmitter is mounted on the locomotive, and a receiver is mounted in the priority vehicle. Both the transmitter and receiver use omni directional antennas which have equal gain in all directions along the horizon; this is to ensure early warning for all vehicles, regardless of their aspect to the approaching train. Detection range is .5 mile, and maximum system lock up time is 1 second. When the train is detected, both a visual and audible alarm are activated. The visual alarm is a light emitting diode and the audible alarm beeps approximately once per

second, and may be squelched if desired. Once activated, the alarms continue to alert the operator as long as the train is within detection range.

The transmitter is 8" w x 3" h x 8"d, mounted on the locomotive. It is designed to operate from 110 VAC, 60 Hz power. The receiver is mounted on the dash of the priority vehicle, and has the same dimensions as the transmitter: 8" x 3" x 8". It operates on the 12 VDC supply of the vehicle.

This system has not yet been tested.

EARS Systems, Inc. - Train Horn Detection System

The EARS system was developed as an early warning system for visually informing the hearing impaired driver of an automobile of the proximity of an emergency vehicle. A microphone unit receives an audible frequency signal transmitted by the siren, the signal is analyzed to determine the type of siren, and a visual and audible message is given to the vehicle driver.

Research has been conducted concerning detection of locomotive horns, and adjustments to the system have been made to allow the sensor unit to detect locomotive horns and relay this information to the driver.

Test results showed the device to have limited range, have difficulty in detecting the locomotive horn, and be susceptible to false activations from wheel screech, wind noise, etc.

Dynamic Vehicle Safety Systems (DVSS)-

This is a one point system that will detect the Front of Train/End of Train Device (FRED) that is used by many freight railroads, but <u>not all</u> railroads, and <u>not</u> by Amtrak. The system is a radio receiver in the priority vehicle which activates a visual and audible warning to the vehicle driver when the FRED signal is detected.

Testing was just completed on this at TTC, and the device did well to detect the FRED device, although a test report has not yet been received from TTC.

PRESENTATION: HSGT TECHNOLOGY ENHANCEMENT - Bob McCown

- **Next Generation Technology Development**
  - Program Background
  - Activities Underway
- **'97 Budget and Opportunities**
- **Discussion of State's Technology Needs**

NEXT GENERATION HIGH-SPEED RAIL TECHNOLOGY DEVELOPMENT

PROGRAM OVERVIEW

Federal Railroad Administration
Office of Research and Development

February 14, 1996

BACKGROUND

Highways and airport facilities on vital intercity corridors around the nation are suffering unacceptable congestion as travel demand grows. Construction of new limited access highways can cost $40 million per lane mile, and airport expansion is often not feasible because of surrounding development. High speed ground transportation systems such as those which have been built in Europe and Japan provide superb service quality, but implementation of such systems in the United States has been prevented by hign costs and the difficulties associated with acquiring new right of way.

Existing railroad routes provide an attractive, practical alternate to meet present and future mobility demands in corridors connecting major urban areas up to 400 miles apart. Technology is presently available to operate trains at speeds of 110-125 mph and potentially up to 150 mph on existing infrastructure, as has been applied on the Amtrak Northeast Corridor. These technologies can provide competitive trip times on the order of three hours in selected corridors. In this document, "high speed rail" refers to speeds greater than 110 mph.

A number of state Departments of Transportation are implementing or considering implementing high speed ground transportation systems on existing rights-of-way as a viable alternative to increased investment in intercity highway and airport capacity. For example, the State of Florida no longer permits freeway expansion to more than 6 through lanes plus 4 specialized lanes, and has made available a stream of $70 million per year to implement high speed ground transportation in the Miami-Orlando-Tampa corridor.

The Clinton Administration has proposed that Federal surface transportation assistance funds be made available at State option as part of a Unified Transportation Infrastructure Investment Program (UTIIP) for financing high speed ground transportation systems. Whether or not the Administration's proposal is accepted it seems likely that States will move ahead on their own to implement high speed rail projects.

As mandated by Congress, FRA is performing a commercial feasibility study (CFS) of high speed ground transportation. Preliminary estimated costs from the ongoing CFS and similar State-sponsored studies are $300,000, $550,000, $3 million, and $5 million per mile to upgrade existing railroad to operate at 90, 110, 125 and 150 mph respectively.

Further development and demonstration is needed to provide cost effective high quality service in applications in the U.S. FRA has identified three program areas where

development and demonstration activities have a high potential return on investment when upgrade programs are implemented:

- **Advanced Train Control** systems particularly suited to maximizing the capacity of railroads to carry a mix of high speed passenger, commuter, and freight trains with minimal risk of collision and at considerably lower cost than conventional railroad signal and control systems.

- **Non-Electric Locomotives** to achieve the speed and acceleration capability of electric trains without the expensive infrastructure of railroad electrification.

- **Grade Crossing Hazard Elimination**, including barrier systems and innovative warning devices that provide nearly the same security as grade separations but at much lower cost.

At the same time we have an opportunity to take advantage of technology developed largely for defense application now finding new uses in high speed rail, such as use of the Global Positioning System (GPS) satellites for automatic train location and high strength lightweight materials to reduce train weight and improve performance.

The Next Generation High Speed Rail Technology Development Program is built around the above concepts to make available the new technology and devices that are particularly suited to US applications for near-term implementation of high speed rail by the States. Federal sponsorship of the program is necessary because no single state represents a large enough market to justify the necessary technology development efforts. The railroad supply industry perceives the market to be too limited until several corridor upgrades are underway.

The Next Generation program is based on partnerships with suppliers of technology, railroads, and State governments. The program contains both high risk, more futuristic development of components (in FRA's Research & Development budget) and lower risk demonstration of off-the-shelf technology (in the Next Generation High Speed Rail budget). By working with State and railroad partners we will be providing a real-world environment for the application of these technologies, preparing the way for a smooth introduction when States are ready to implement their systems.

The states which have already initiated HSR development programs are listed below. A majority would begin with service around 125 mph. Such service would likely be over existing track also used for freight.

EXISTING HIGH SPEED RAIL DEVELOPMENT EFFORTS

State	Current Top Speed	Target Speed
California	90 mph	125 mph
Florida	79 mph	125 mph +
Illinois	79 mph	120-125 mph
Michigan	79 mph	125 mph
New York	110 mph	125 mph
Pacific NW	79 mph	110 mph
Virginia	79 mph	125 mph

PROGRAM OBJECTIVE

The specific objective of the Next Generation Program is to support the availability of cost-effective high speed technology on existing infrastructure, with a target of permitting cost-effective upgrades to high speed service, relying on proven technologies, in the range of $2 million to $3 million per mile by the year 2000. The Amtrak Northeast Corridor (NEC) presently provides the only high speed rail service in the nation. The chart below compares the proposed Next Generation service upgrades with the methods by which high speed was achieved on the NEC:

GETTING TO 125 mph

	NEC Model	FRA Tech Upgrade Model
Train Control	CETC*	HSPTC*
Locomotive Propulsion	Electric	Non-Electric
Grade Crossing Hazard	Eliminate	Reduce/Protect
Cost to Accomplish	$10M+ per mi.	$2-3M per mile

*CETC - Centralized Electrification and Traffic Control; HSPTC - High Speed Positive Train Control

NEXT GENERATION HIGH SPEED RAIL PROGRAM
FY 1995 FUNDING

$25 million was appropriated for Next Generation High Speed Rail activities in FY 1995 (October 1994 - September 1995).

Project Areas	Funding
Technology Development	
High Speed Positive Train Control Demonstrations	$ 8.0 M
High Speed Non-Electric Locomotive Technology	$ 3.0 M
Grade Crossing Hazard Reduction, Lightweight Materials, Other Innovative Technologies	$ 2.5 M
Upgrade Test Track at TTC	$ 3.5 M
Corridor Planning * Grants to corridors: Oregon, North Carolina, Illinois	$ 5.0 M
Commercial Feasibility Study*	$ 2.5 M
Administrative Funds	$ 0.5 M
TOTAL	**$ 25.0 M**

* Funds for these activities are in the Next Generation Program appropriation but the activities are not part of the Technology Development program.

HIGH SPEED RAIL TECHNOLOGY PROGRAM
FY 1995 ACTIVITY HIGHLIGHTS

During FY 1995, major initiatives were begun in three primary areas:

1. **Advanced Train Control:**

   Projects were begun to apply demonstration advanced train control systems to portions of the Detroit-Chicago ($6.08 million of Program funds) and Chicago-St Louis ($1 million of Program funds) rail corridors to improve safety and capacity while permitting shorter trip times. Additionally, a grant was given to the state of Washington ($750,000) to evaluate the suitability of the BNSF/UP Positive Train Separation system for potential high-speed operation between Portland and Seattle. These projects are continuing in FY 1996.

2. **Non-Electric Locomotive:**

   The State of New York and FRA entered into a cooperative agreement to develop a lightweight, high speed diesel/AC traction locomotive using $2 million of Program funds. In cooperation with the Department of Defense Advanced Research Projects Agency (DOD-ARPA) and FRA, the University of Texas will develop a flywheel suitable for use in flywheel/turbine hybrid locomotives using $750,000 of Program funds. In cooperation with the Association of American Railroads and other industry organizations, upgrade of the Transportation Technology Center Railroad Test Track (RTT) to permit testing at sustained speeds of 150 mph was begun using $3 million of Program funds. These projects are continuing in FY 1996.

3. **Grade Crossing Hazard Reduction, Lightweight Materials, Other Innovative Technologies:**

   Several projects were begun to address grade crossing safety issues, high speed track integrity and ride quality issues, and locomotive noise. These projects are continuing in FY 1996.

FRA HIGH SPEED RAIL
FY 1996 PROGRAM FUNDING

$24.205 million is appropriated for Next Generation High Speed Rail demonstration activities in FY 1996 (October 1995 - September 1996).

$ 9.378 million is appropriated for research and development for high speed rail in FY 1996 (October 1995 - September 1996) , including both technology and technical support for safety assessments,.

Table Note: In the following tables NGHSR denotes funding from the Next Generation High Speed Rail program budget and HS R&D denotes funding from the high speed portion of the Research and Development budget.

I. ADVANCED TRAIN CONTROL

Projects	FY 1996 Funding	
	NGHSR	HS R&D
Detroit to Chicago Corridor This project begun in FY 1995 is to install and demonstrate an Incremental Train Control System (ITCS) on 71 miles of the corridor between Detroit and Chicago.	$ 3.0 M	
Chicago to St. Louis Corridor This project begun in FY 1995 is to install and demonstrate an Advanced Train Control (ATCS) on 104 miles of the corridor to permit higher operating speeds and capacity.	$ 6.0 M	
(continued on next page)		

Projects	FY 1996 Funding	
	NGHSR	HS R&D
Positive Train Separation (PTS) System This project is to cooperate with the state of Oregon and the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) freight railroads to further develop the BNSF/UP Positive Train Separation system to permit high speed passenger service. Specific components of the project are described below: 1. Migration Path to HSR This work by PTS support contractor GE-Harris began in FY 1995 under contract to the state of Washington with support from an FRA grant. One task is to determine how PTS can evolve to support high speed service. A second task is to apply GE-Harris's precision train simulator model to determine the effect of introducing high speed passenger operations on freight lines. The model will be quantify potential costs and benefits of using positive train separation and the effect of adding high-speed passenger traffic on existing corridor freight traffic flow. The third task is to assess the interoperability of the PTS system with the ITCS and ATCS high speed systems being sponsored by FRA. 2. PTS Application Demonstration and Assessment PTS will be installed to enhance passenger operations on about 10 miles of route in downtown Portland on the Portland-Seattle-Vancouver, BC corridor. The system will permit trains to operate at track speed where limitations of the existing signals now require significantly reduced speeds, saving up to 20 minutes of trip time for selected trains. The location of the system in downtown Portland will permit assessment of the reliability of the PTS communications links in an area where dense railroad and commercial radio traffic is present. 4. Differential Global Positioning System (DGPS) Coverage In cooperation with the Coast Guard and Army Corps of Engineers, the state of Oregon and the FRA will work to establish DGPS coverage in the area of the Columbia River valley to confirm adequacy of DGPS for train control purposes in areas of very rugged terrain.		$ 5.0 M
SUBTOTAL	$ 9.0 M	$ 5.0 M
ADVANCED TRAIN CONTROL TOTAL		**$ 14.0 M**

II. NON-ELECTRIC LOCOMOTIVE

Projects	FY 1996 Funding	
	NGHSR	HS R&D
Advanced Locomotive Propulsion System (ALPS) In cooperation with the DOD Advanced Research Projects Agency, The University of Texas/Austin will develop and demonstrate a hybrid locomotive drive system combining a large flywheel and gas turbine engine to match the acceleration of an electric locomotive without the need for catenary.		$1.728M
New York State In-Service Demonstration Conduct reliability, maintainability, and performance evaluation of a small fleet of non-electric trainsets in high-speed service.	$ 6.0 M	
Transportation Technology Center Test Track Upgrade Continue project to upgrade 13.5 mile track loop to permit testing of high-speed trainsets at sustained speeds of 150 mph. The upgrade is necessary to complete acceptance testing of Amtrak's NEC high speed trainsets.	$ 3.0 M	
SUBTOTAL	$ 9.0 M	$1.728M
NON-ELECTRIC LOCOMOTIVE TOTAL		**$ 10.728 M**

III. GRADE CROSSING HAZARDS AND INNOVATIVE TECHNOLOGIES

Project Areas	FY 1996 Funding	
	NGHSR	HS R&D
State Grade Crossing Demonstrations Demonstrate hazard minimization technologies to protect both right-of-way from intrusion and highway traffic from damage.	$ 1.0 M	
Innovative Technologies Select and begin new projects and continue projects begun in FY1995 to further develop promising technologies for enabling the implementation of high speed rail.	$ 3.5 M	
SUBTOTAL	$ 4.5 M	
GRADE CROSSING AND INNOVATIVE TECH. TOTAL		**$ 4.5 M**

IV. SAFETY OF HIGH SPEED GUIDED GROUND TRANSPORTATION SYSTEMS

Project Areas	FY 1996 Funding	
	NGHSR	**HS R&D**
System Safety Evaluations * Evaluate safety issues associated with advanced train control systems, high speed rail vehicles, operator interface, grade crossing and other relevant safety issues.		$2.025M
Grade Crossing 800 Number Demonstration * Place signs with crossing identifier and 1-800 number so the public can promptly notify authorities of hazards at crossing.		$0.625M
SUBTOTAL		$2.65 M
SAFETY OF HIGH SPEED GROUND TOTAL		**$ 2.65 M**

V. CORRIDOR PLANNING

Project Areas	FY 1996 Funding	
	NGHSR	**HS R&D**
Corridor Planning Technology and Demonstration * Develop and demonstrate technologies to assist states in planning HSR implementation.	$1.25M	
SUBTOTAL	$1.25M	
CORRIDOR PLANNING TECHNOLOGY TOTAL		**$ 1.25 M**

VI. ADMINISTRATIVE EXPENSES

Administrative Expenses	NGHSR: **$ 0.455 M**

* These activities are conducted separately from the technology development activity.

VII. PROGRAM FINANCIAL SUMMARY

Project Area	FY 1996 Funding	
	NGHSR	HS R&D
Advanced Train Control	$ 9.0 M	$ 5.0
Non-Electric Locomotive	$ 9.0 M	$ 1.728 M
Grade Crossing Hazards and Innovative Technologies	$ 4.5 M	
Safety of High Speed Guided Ground Transportation Systems		$ 2.65 M
Corridor Planning Technology and Demonstration	$ 1.25 M	
Administrative Expenses	$ 0.455 M	
SUBTOTAL	$ 24.205 M	$ 9.378 M
HIGH SPEED RAIL FY 1996 PROGRAM TOTAL		$ 33.583 M

TECHNOLOGY OVERVIEW AND PROGRAM OBJECTIVES

A. TRAIN CONTROL

I. State-of-the-art Technology - 1995

A. For 79 mph or less: Train is located by detection circuits wired to track, engineer observes wayside signals and complies, no onboard equipment or enforcement (90% of U.S. track miles)

B. For 80 mph to 125 mph: Train is located by track detection circuits; wayside signal indications relayed into cab through track; train control based on signals in track; onboard system enforces speeds, stops train if engineer does not comply (Amtrak NEC, selected other main lines)

C. Advantages: Proven technology

D. Disadvantages: Costly to install and maintain, existing systems not fully interoperable (i.e. Conrail locomotive system works on NEC, but does not work with Union Pacific control system.)

II. GOAL: High Speed Positive Train Control (HSPTC) - 2000

A. Onboard equipment automatically locates train; digital radio links train with control system; onboard computer and database check for unsafe operations and stop train if necessary.

B. Advantages: No wiring to track reduces installation and operation cost; with foresight systems can be made interoperable; will ultimately permit higher track capacity using 'flexible blocks' rather than 'fixed blocks' based on wayside signal spacing and track segments.

C. Disadvantages: Computer and communications integrity must be established for all operating situations.

III. APPROACH

A. Technology: Automatic location will be done by Global Positioning System (GPS) augmented to obtain necessary accuracy; digital radio links train and wayside; onboard computer uses onboard database to compare actual location and speed with radioed authorities; system stops train if engineer does not comply.

B. Demonstration systems:

1. Incremental Train Control System (ITCS) starts with existing signal system, radios information to train; FRA is sponsoring demonstration on Amtrak line in Michigan. FRA awarded a $6.08 million grant to MDOT on March 3, 1995 and $3.0 million will be awarded in FY 1996. MDOT and Amtrak are providing over $12 million in cost sharing. Construction is now underway and operation of test trains at 100 mph is planned for Fall, 1996.

2. Positive Train Separation (PTS) system radios central commands to train, uses some existing signal information; development for freight service in Pacific Northwest is sponsored by Burlington Northern Santa Fe and Union Pacific railroads; FRA will sponsor study of migration path to HSR and apply and evaluate PTS to enhance passenger operations in Portland, OR. A cooperative agreement for initial activities was awarded to the State of Washington on August 18, 1995 and coordinating activities are underway. BNSF and UP will have invested over $34 million for PTS development and prototype testing by 1997.

3. Advanced Train Control System (ATCS), as developed over 10 years by the railroad industry, will use full central control commands radioed to each train. On September 30, 1995, FRA awarded Illinois DOT the first $1.0 million increment with $6.0 million to follow in FY 1996 for a cooperative agreement to demonstrate and evaluate ATCS on the Chicago-St. Louis corridor. IDOT will provide $6 million in cost sharing for the project.

C. Crosscutting research:

1. Assess communications integrity for urban/heavy traffic environments.
2. Assure interoperability - Task force has been established, the first meeting was held August 23, 1995.
3. Assess corridor capacity to accommodate passenger and freight traffic simultaneously.

HIGH SPEED POSITIVE TRAIN CONTROL

Project	FY-95	FY-96	FY-97	FY-98	FY-99	2000
Incremental Train Control (ITCS)	A------DEV---------B----------DEMO---------C--EVAL------					
BNSF/UP Positive Train Separation (PTS for HSR)	D---DEV----------▲--------DEMO--------A-EV-					
Advanced Train Control Systems (ATCS)	▲----------DEV---------▲----------DEMO----------▲					
Crosscutting R&D (Communications, Interoperability)	▲---E-----F----------RESEARCH----------					

Milestones:

A . . . Grant awarded by (FRA - Michigan DOT) (3/3/95)
B . . . Wayside installation began
C . . . Target for first high speed (100 mph) test
D . . . Cooperative agreement awarded (FRA - Washington DOT) (8/18/95)
E . . . Interoperability Task Force convened (8/23/95)
F . . . Onboard Interoperability Task Force Meeting (12/23/95)

B. NON-ELECTRIC LOCOMOTIVE

I. State-of-the-art Technology - 1995

A. For 110 mph or less: Diesel-electric locomotives, such as the General Electric AMD-103 or the General Motors F-40 are used. Acceleration capability limits them beyond 100 mph.

B. For 110 mph to 125 mph: Electric locomotives are used on the Amtrak NEC; the upgraded Amtrak/FRA/NYSDOT Turboliner can operate up to 125 mph but acceleration is limited.

C. Advantages: Proven technology; reliable, maintainable; electric locomotives have greater acceleration capabilities.

D. Disadvantages: Electrics require catenary at $2-3 million/mile; conventional locomotives limit service quality by extending trip times and are heavy, wearing out track.

II. GOAL: High Speed Non-Electric Locomotive - 2000

A. Increased self-contained power supply and/or reduced weight permit locomotive to accelerate rapidly, both to reach initial speed and to recover after slowing for curves.

B. Advantages: Substantially reduced trip times result from increased average speeds; installation of catenary is not required; technology has dual-use with Defense and has export potential.

C. Disadvantages: New technology must be proven to be economical, reliable, maintainable, environmentally acceptable or beneficial.

III. APPROACH

A. Technology:

Potential prime movers are turbines, lightweight diesel engines, fuel cells. Alternating current (AC) electronic transmission systems apply advances in power electronics to increase efficiency, flexibility, reduce weight. Energy storage devices can substantially increase short-term acceleration capability.

B. Demonstration systems:

1. Advanced Locomotive Propulsion System (ALPS) will use flywheel energy storage to double acceleration of turbine-powered locomotive. Sponsored by FRA and awarded through DOD Advanced Research Projects Agency.

2. Lightweight Diesel Engine/AC Traction system will be installed in modified powercar(s) for demonstration; power is greater at equal weight to turbine.

3. Further Enhancements to RTL Turboliners: With New York State DOT (NYSDOT) , conduct reliability and maintainability demonstrations of enhanced turbine-powered trainsets to assure that promise of new technologies can be delivered in practice. FRA will award $6 million in FY 1996 and NYSDOT will provide $6 million in matching funds to further enhance existing Amtrak RTL Turboliner trainsets.

C. Crosscutting research:

1. Continue project to upgrade high speed test track at Transportation Technology Center to assure availability of test site.

2. Identify and develop new concepts which significantly increase performance.

3. Investigate noise and vibration suppression methods.

4. Investigate lightweight materials to reduce train weight while assuring crashworthiness for occupant protection.

NON-ELECTRIC LOCOMOTIVE

Project	FY-95	FY-96	FY-97	FY-98	FY-99	2000
Lightweight Diesel AC/Traction	▲-----DEV-------▲----------DEMO---------▲----EVAL---					
Flywheel/Turbine	▲----------DEV----------▲ ▲----------DEMO---------▲					
Enhanced Turboliner Reliability/Maintainability Demonstration	▲------DEV------▲----------DEMO---------▲					
Test Track Upgrade	▲-------UPGRADE----------▲--------TEST----------▲					
Efficiency Improvements R&D	▲-------RESCH-----▲ ▲-----DEMO--▲ ▲--------DEV-------▲					
Crosscutting R&D	▲----------RESEARCH----------					

C. GRADE CROSSING HAZARD REDUCTION

I. State-of-the-art Technology - 1995

A. For 110 mph or less: Grade crossings are permitted. States and railroads cooperate to determine protection levels including passive crossbucks, flashing lights, two quadrant gates (close only 'entering' lanes of road.) Lights and/or gates activated by circuits wired to track.

B. For 110-125 mph: FRA permits crossings only if "impenetrable barrier" blocks highway traffic when train approaches. Above 125 mph, no crossings will be permitted.

C. Advantages: Proven technology

D. Disadvantages: Permits highway vehicles to intrude in front of or collide with side of train; costly to install and maintain.

II. GOAL: Acceptable Grade Crossing Risk Level - 2000

A. Crossings eliminated whenever possible; advanced train control systems supply train location and speed information to activate warnings; onboard warning systems assure crossings are clear after barriers are in place.

B. Advantages: Barriers limit risk to passengers and employees on high speed train; no wiring to track reduces installation costs; onboard warning permits train to stop if crossing is blocked.

C. Disadvantages: Barriers must close well in advance of train arrival to confirm crossing is clear and permit train to stop if necessary; mechanical systems will be costly and must be maintained; barriers will damage motorists who ignore warnings.

III. APPROACH

A. Technology: Advanced train control systems will monitor and communicate train locations and speeds and will stop train if crossing is not clear. Four quadrant gates (block all highway lanes) provide increased protection with existing technology. Movable barriers will protect crossings which can not be closed.

B. Demonstration systems:

1. Michigan HSPTC demonstration includes upgrade of 57 public grade crossings to provide constant warning time and 21 private grade crossings to have an active warning light where presently only a crossbuck is used.

2. Demonstrate onboard warning systems in locomotive cabs.

3. Other innovative concepts will be sought for integrated demonstration and assessment for efficacy on revenue corridor.

C. Crosscutting research:

1. Assess driver reaction to extended crossing closure times.

2. Identify and develop effective, practical, economical barrier designs.

GRADE CROSSING HAZARD MITIGATION

Project	FY-95	FY-96	FY-97	FY-98	FY-99	2000
Integrate crossing warnings with highway Intelligent Transportation Systems (ITS)	▲---RES--▲ ----DEV----▲----------DEMO--------▲					
Demonstrate Hazard Elimination	▲ -----DEV-------▲----------DEMO----------▲					
In-Cab Warnings	▲--RES--▲ -DEV--▲----------DEMO----------▲					
Innovative Concepts	▲---RES---▲----------DEV----------▲ ▲----------DEMO----------▲					
Crosscutting R&D	▲----------RESEARCH----------					

and use the revenue from a PFC at Pellston Regional Airport of Emmet County under the provisions of the Aviation Safety and Capacity Expansion Act of 1990 (Title IX of the Omnibus Budget Reconciliation Act of 1990) (Public Law 101–508) and Part 158 of the Federal Aviation Regulations (14 CFR Part 158).

On February 21, 1996, the FAA determined that the application to impose and use the revenue from a PFC submitted by the County of Emmet was substantially complete within the requirements of section 158.25 of Part 158. The FAA will approve or disapprove the application, in whole or in part, no later than May 22, 1996.

The following is a brief overview of the application:

PFC Application No.: 96–04–C–00–PLN
Level of the proposed PFC: $3.00
Proposed charge effective date: April 1, 1996
Proposed charge expiration date: May 31, 1997
Total estimated PFC revenue: $27,600.00
Brief description of proposed project(s):
Expand automobile parking lot;
Rehabilitate automobile parking lot;
Rehabilitate Taxiway "B"; Install chain link fence.
Class or classes of air carriers which the public agency has requested not be required to collect PFCs: air taxis and charters.

Any person may inspect the application in person at the FAA office listed above under **FOR FURTHER INFORMATION CONTACT.**

In addition, any person may, upon request, inspect the application, notice and other documents germane to the application in person at the County of Emmet.

Issued in Des Plaines, IL, on March 5, 1996.

Benito De Leon,

Manager, Planning/Programming Branch, Airports Division, Great Lakes Region.

[FR Doc. 96–5833 Filed 3–11–96; 8:45 am]

BILLING CODE 4910–13–M

Federal Railroad Administration

Notification of Funds Availability for Next Generation High-Speed Rail Corridor Studies

AGENCY: Federal Railroad Administration; Department of Transportation.

SUMMARY: Pursuant to the Department of Transportation and Related Agencies Appropriations Act for Fiscal Year 1996, (Public Law 104–50 (November 15, 1995)), the Federal Railroad Administration (FRA) has $1 million in next generation high speed rail funds available for grants to eligible participants for high speed rail corridor planning assistance, including preliminary engineering and operational analysis, and other planning activities. This notice sets forth the criteria by which FRA will make its selection of grant recipients. The FRA strongly supports the advancement of high-speed rail in congested corridors where it can be an important component of a balanced transportation system. Further, FRA believes the development or continuation of high-speed rail in specific corridors should be undertaken as a partnership of states, localities, and the private sector, with support from the Federal government. Pursuant to the Swift Rail Development Act of 1994, (Public Law 103–440 (November 2, 1994)), the Secretary may provide financial assistance to a public agency or group of public agencies for corridor planning for up to 50 percent of the publicly financed costs associated with eligible activities. Not less than 20 percent of the publicly financed costs associated with eligible activities shall come from State and local sources, which State and local sources may not include funds from any Federal programs.

CRITERIA FOR FUNDING: Eligible participants are encouraged to submit a request for this funding which addresses the following criteria:

1. The level of interest in the chosen corridor demonstrated by State, regional, and local governments and elected officials or other interested groups. Interest can be shown by the past and proposed financial commitments and in-kind resources of State and local governments and the private sector.

2. The extent to which the proposed planning focuses on systems which will achieve sustained speeds of 125 mph or greater.

3. The degree of integration of the corridor into metropolitan area and statewide transportation planning.

4. The potential interconnection of the corridor with other parts of the Nation's transportation system, including the interconnection with other countries.

5. The anticipated effect of the corridor on the congestion of other modes of transportation.

6. Whether the work to be funded will aid the efforts of State and local governments to enhance compliance with Federal environmental laws and regulations.

7. The estimated level of ridership and the estimated capital cost of corridor improvements, including the cost of closing, improving, or separating highway-rail grade crossings.

8. Whether a specific route has been selected, specific improvements identified, and capacity studies completed, and whether the corridor has been designated as a high-speed rail corridor under Section 1010 of the Intermodal Surface Transportation Efficiency Act of 1991, Public Law 102–240 December 18, 1991).

ELIGIBLE PARTICIPANTS: Any state government, local government, organization of state and/or local governments, or any combination of such entities is eligible to apply for funding.

DEADLINE FOR REQUESTS FOR GRANT APPLICATIONS: Eligible participants desiring to apply for this funding, should notify FRA by letter, and FRA will respond initially by providing a standard grant application package. For priority consideration, FRA requests that the completed grant application packages be returned to the below address by June 30, 1996.

ADDRESSES: Applications should be submitted to: Honorable Jolene M. Molitoris, Administrator, Federal Railroad Administration, ATTN: RDV–11, 400 Seventh Street, S.W., Room 8206, Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT: John F. Cikota at (202) 366–9332.

Issued in Washington, D.C. on March 5, 1996.

Jolene M. Molitoris,

Federal Railroad Administrator.

[FR Doc. 96–5821 Filed 3–11–96; 8:45 am]

BILLING CODE 4910–06–P

National Highway Traffic Safety Administration

Denial of Petition for a Defect Investigation

This notice sets forth the reason for the denial of a petition submitted to the National Highway Traffic Safety Administration (NHTSA) under 49 U.S.C. § 30162(a)(2) (formerly section 124 of the National Traffic and Motor Vehicle Safety Act of 1966, as amended).

By letter dated July 26, 1995, R. David Pittle, Ph.D., Vice President and Technical Director of Consumers Union (CU), petitioned the Administrator of the National Highway Traffic Safety Administration (NHTSA) to investigate the Century Model 590 child safety seat. Dr. Pittle's request was based on testing conducted for CU by an independent testing facility that utilized the 20-pound test dummy included in the test

STATEMENT OF JOLENE M. MOLITORIS, ADMINISTRATOR
FEDERAL RAILROAD ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
BEFORE THE
HOUSE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
SUBCOMMITTEE ON RAILROADS

MARCH 5, 1996

Good afternoon, Madame Chairwoman and members of the Subcommittee. With me today representing the Federal Railroad Administration (FRA) are Mr. Bruce M. Fine, the Associate Administrator for Safety; and Mr. Grady C. Cothen, the Deputy Associate Administrator for Safety Standards and Program Development.

The tragedies of the past several weeks on our Nation's railroads have struck deeply at each and every one of us at FRA. I personally visited the accident scenes at Secaucus, New Jersey, and Silver Spring, Maryland. The Deputy Administrator was the first senior federal official on the scene at Silver Spring; the Associate Administrator for Safety traveled to freight rail accident sites at Cajon Pass, California; St. Paul, Minnesota; and Tennessee Pass, Colorado. While the destruction remains vivid for us and for those FRA inspectors assisting the National Transportation Safety Board (NTSB) in its investigation of these recent rail accidents, the images pale in comparison to the terrible losses suffered by the victims and their families. The Secretary of Transportation joins me in extending our deepest sympathies to those mourning the death of their loved ones as a result of these tragedies.

Chairman Hall on behalf of the NTSB has effectively summarized what is known about each of these accidents. Based on FRA's findings and preliminary NTSB announcements, I issued two Emergency Orders, which I will submit for the record, relating to safety issues involved in the accidents, the first such orders in more than five years. Using the emergency

order procedure, one of FRA's most powerful authorities, I acted quickly and decisively on behalf of railroad employees and the public in order to ensure the safety of our Nation's rail system.

Emergency Order No.18 imposed certain requirements on movement of freight trains by The Atchison, Topeka and Santa Fe Railway Company (Santa Fe Railroad) over Cajon Pass in California, which was the scene of a fatal accident involving a runaway train on February 1. The order is intended to ensure that those trains have effective braking power when traversing this heavy grade territory by requiring operable two-way end-of-train (EOT) devices or an alternative method providing equivalent safety. The order also requires specific inspections of braking systems at Barstow, California.

Emergency Order No. 20, as amended following a meeting with intercity and commuter passenger railroads, requires these railroads to take certain actions to ensure the safety of their operations that involve hauling passengers in the lead car. The order requires adherence to new operating rules designed to prevent a recurrence of the accidents in Secaucus and Silver Spring. The order also requires inspection and proper marking of emergency exits on passenger equipment, and the submission by the railroads of an interim system safety plan addressing the safety of these types of passenger operations.

In addition to the overwhelming loss of life in the five rail accidents last month, February's accident record is also frustrating to each person in the rail industry and in FRA because the accidents occurred after what had been, overall, the two safest years in rail history, 1994 and 1995. You asked me last week, Madame Chairwoman, for my assessment of why these accidents are happening. Obviously the definitive accident report will be made by the

NTSB, the lead agency for accident investigation. But I will attempt to answer your question generally first and then address each element individually.

Answering your question requires a complex response. Beyond technology and regulations, effective railroad communications and adequate training of employees play a critical role in ensuring safety. Safety derives ultimately not only from rules, standards, equipment, and technology, but from the actions and the interactions -- or the absence thereof -- of the individuals who are key to the safety of railroad operations.

Safety Gains

The railroad industry has made great strides in safety since 1978, the worst year in recent history. Deferred maintenance on the main lines is largely a thing of the past. Locomotives, freight cars, and passenger rolling stock incorporate much improved materials and technology. Research into the causes of track buckling, advances in track components, and any number of other advances have permitted us to move more people and goods with a high degree of safety. For instance, the train accident rate has fallen from over 14 per million train miles in 1978 to less than four per million train miles in each of the last two years.

FRA has played its part in achieving rail safety gains. Our regulations level the playing field among railroads and establish a minimum level of safety to which all must conform. Participation in joint research, improved standards for tank cars, alcohol and drug testing requirements, locomotive engineer certification requirements, field compliance and partnership efforts directed at a broad range of safety hazards--all of these actions and others have driven down the accident and casualty totals, while the freight industry has continued to enjoy a post-Staggers Act resurgence and rail passenger service has grown.

We can foresee additional gains that will advance safety. Electronically controlled braking, now under development by the industry, will yield major benefits to safety and economic efficiency. Positive train control (PTC) will dramatically reduce collisions and overspeed accidents. Other advances in technology, which we will discuss at a forthcoming hearing, will also make the railroad environment safer.

In particular, to ensure safety the railroad industry and public policy makers must deal with the biggest challenge in transportation safety--the human element. Human factor caused accidents now comprise the largest single causal factor for railroad accidents and a particularly disproportionate number of the most serious accidents. Yet there is no doubt that increasing safety through infrastructure investment is a much more clear-cut and quantifiable safety challenge than is the challenge of effectively dealing with human factor issues. It is therefore very appropriate that this Subcommittee's first hearing on railroad safety should include human factors as a principal theme.

Human factor issues revolve around answers to many significant questions: How do we work constructively with the men and women in labor, management, and the rail supply community to ensure, that to the greatest extent possible, critical elements of the entire system are working together, rather than in conflict? How do we ensure that employees on the front lines are adequately trained, rested and supported with user-friendly technology? How do we foster an environment that truly values and rewards taking the safe course and makes each person in the system responsible for identifying and being a part of the solution to each safety challenge?

These questions must be answered, and the answers must be developed by each element

that has a role in making railroads safer. Government cannot do it alone. Rail management cannot do it alone. Employees and their organizations cannot do it alone. Technology by itself will not suffice. The entire system must work in harmony if the railroad industry is to increase safety and stop the kinds of tragic accidents we have suffered during the past month.

In FRA's investigations related to February's accidents, it has become painfully clear to all involved that many supervisors and craft employees and senior management communicated poorly or not at all. We frequently found insufficient follow-up by management to craft employee concerns. This leads to employee perception that management talks safety first, but in reality regularly sacrifices it when overcome by a need for expediency.

I have begun a dialogue with railroad management and labor about this issue. Almost to a person, management expresses extreme frustration about our contention that such communications problems exist on their railroads. They relate that they personally visit with employees and hold "town hall" type meetings. We recognize that many senior managers do get out and talk with employees; that some railroads have somewhat more mature labor/management programs as compared to others; we congratulate them on their initiatives in these areas. But much more must be done.

I believe there is a commitment in the rail industry to a safe railroad, open communications, and employee involvement, but, sadly, that commitment doesn't always become real, from the Chief Executive Officer and upper management, through the ranks to line supervisors at the division level and below. Those line supervisors are the key to operational safety success or failure. They are the implementors and change agents that make the process work. Unfortunately, we find that many line supervisors operate under a much different set of

values than those espoused by upper management, values long inherent in the railroad industry, which some have described as: "Keep the trains moving at all costs, and never tell the boss there is a problem." This perspective, in FRA's opinion, is one root cause of a serious internal railroad communications problem. We believe that this communications issue must be addressed by the railroad industry with the same levels of investment and quality assurance that has been made in capital programs. Let me add here that we appreciate and understand the difficult role that line supervisors play in the overall rail industry picture. We respect the outstanding job that many of them do, and recognize the dedication and commitment they have toward ensuring industry success.

Top management must assure that the culture throughout the entire organization fundamentally changes if safety is to be achieved. All the capital investment in the world will be for naught if employees are not properly trained to use and maintain upgraded equipment and systems. Top management's message to line supervisors and everyone in the company must be that safety is the first priority, really a matter of life and death; that communication between and among departments, crafts, supervisors, and top management is essential; that everyone's job depends on reporting safety problems and addressing them immediately; and that craft employee concerns are respected, addressed and follow-up made.

In my testimony this afternoon, I will address the major elements of FRA's safety program, give details on grade crossing and human factors issues of most concern to the Subcommittee, summarize our recent regulatory accomplishments and pending rules, and analyze accident/injury statistics and trends.

Elements of the Railroad Safety Program

FRA's primary mission is railroad safety. To accomplish that mission, FRA sets and enforces safety standards, investigates major train accidents, assists the industry in training its workforce on safety laws and educating the public on dangers associated with railroading, conducts research, and encourages cooperative efforts on the part of the industry's various component parts to advance safety in many ways. Of course, the railroads themselves are directly responsible for ensuring the safety of their operations. FRA's role of setting safety standards and monitoring the railroads' performance does not supplant the industry's primary responsibility for safety.

Relationship with NTSB

I would characterize FRA's working relationship with NTSB at this time as very good. It has not always been as positive. When I arrived at FRA in April of 1993, our response time to NTSB recommendations was poor. This is reflected by FRA's historical acceptance rate of NTSB recommendations of 74 percent, which is the second worst in the Department; the Department's average is 80 percent. Over the past three years, I am pleased to report that FRA's record with NTSB has changed significantly. During my tenure, FRA's acceptance rate of NTSB recommendations has increased to 85 percent. Today our initial response to NTSB recommendations averages 44 days, less than half of NTSB's 90-day window.

FRA's Safety Program

When I arrived at FRA, our safety program, which historically had made many important contributions to enhancing railroad safety, was in need of evolution to a different way of doing business in a rapidly changing environment. The regulatory process was not nearly as inclusive as it needed to be, especially in the early stages of rule development. As a result, FRA regulatory

proposals often met with hostility from labor, management, suppliers, and many other quarters. Our inspection and enforcement process largely focused on site-specific inspections and was marked by an adversarial atmosphere.

As Administrator, I have worked daily to change this dynamic. In 1993 and 1994, I invited rail labor, management, and other stakeholder representatives to join me in 10 roundtables to discuss ways to improve safety. I soon learned that without new ways of working together, FRA could never move the regulatory process faster and more effectively. Without changing our safety approach and environment, we could never reach the safety goals that drive us daily--zero accidents, zero injuries and zero deaths. With fewer than 400 safety inspectors to oversee an industry with more than 270,000 employees, 20,000 locomotives, 1.2 million freight cars, and 300,000 miles of track, we cannot rely solely on traditional site-specific inspections and enforcement if we are to increase safety.

Results of the Administrator's Roundtables, internal audits, and scores of external meetings with individuals and groups in every element of the railroad industry, along with the realities of FRA's own resources, produced a compelling mandate for change. In March of 1995, I announced a new safety assurance and compliance program. A key element of the program is the senior labor, management meeting focused on designing a safety action plan on each railroad. FRA convened these meetings (eight in FY95; five to date in FY96; and 20 are scheduled for the remainder of FY96) which include labor and management representatives along with FRA regional administrators who work together based on FRA's safety profile of the railroad and labor and management input, to identify root safety issues system wide to be addressed by the plan. These meetings are based on a commitment from all involved to the elements of a

subsequent safety action plan to be proposed by the railroad, agreed to by labor and FRA, and against which FRA will monitor performance. This type of performance "contract", designed by all parties, assures that we are all working on the same safety priorities and getting more safety for our collective investment.

Having all parties at the table increases FRA's base of substantive and often firsthand information and strengthens FRA's compliance program. FRA inspectors still inspect each railroad and cite violations. But we now have a system safety plan, with problems and solutions identified for an entire railroad instead of by sections of railroad corresponding to eight individual FRA regions. Each of our inspectors knows more precisely what to look for. Consistent with President Clinton's focus on reinventing government, increased safety is our ultimate benchmark, and this evolution of our safety program includes best practices from the public and private sectors to help us achieve our goals.

Through the safety assurance process we have been able to focus collective knowledge, talent and resources from the entire railroad establishment to find new and innovative ways to improve railroad safety. We have already completed 13 comprehensive safety assessments, including six assessments on the larger railroads of the Nation and have scheduled 20 more for the coming year. These assessments identified 33 major safety concerns and 98 secondary safety concerns. The carriers addressed each issue as it was found. This process is leveraging the FRA's resources in ways that could never have occurred in the past. For example, one railroad saw the defect ratio of a selected car fleet fall from 80 percent to three percent from October 1994 to January 1996.

Compliance

The safety assurance program's use of partnerships and teaming in no way means that FRA has ceased using its enforcement tools. Our enforcement tools include civil penalties up to $20,000 per violation ($25,000 for hazardous materials violations) that may be assessed against companies and individuals; orders directing compliance; orders disqualifying individuals from safety-sensitive service; emergency orders; and injunctions. In 1995, we collected more than $5 million in civil penalties. While the annual collection total is down significantly from recent years, FRA was eliminating a large enforcement backlog in those earlier years, which made the annual totals unusually high. The railroads are well aware that, when safety assurance efforts do not produce compliance, FRA will respond with aggressive use of enforcement tools to ensure compliance.

Our recent experience in California illustrates these concepts. After a December 1994 accident at Cajon Pass, the Burlington Northern Santa Fe Railroad (BNSF) agreed to certain changes in its operations to enhance safety. FRA's investigation of the February 1, 1996 accident at that location indicated that those commitments were not all met and that proper procedures to ensure the safety of trains moving over the pass were not always being practiced at Barstow, the inspection point for westward trains heading to the pass. FRA, with the support of California state inspection personnel, sent a team of 64 inspectors (54 inspectors from FRA and 10 from California) to analyze the operations of all railroads that traverse Cajon Pass. These inspectors worked around the clock to assess the safety of all train operations in this area and focused management's attention on areas of non-compliance with Federal rules and regulations as well as the lack of communication between and among line supervisors and craft employees.

As a result of this analysis, FRA issued Emergency Order No.18 to the Santa Fe Railroad

to require certain immediate changes in its practices. Our inspection force is monitoring compliance with that order very closely, and we will take very strong enforcement action on any violations we detect. The point is that partnership is a two-way street. When FRA's efforts with labor and management identify and resolve systemic safety issues and are then met with corresponding action by the railroad involved, FRA does not have to use enforcement to achieve safety improvement. However, where our cooperative efforts do not achieve success, FRA will use all of the tools available to us.

Regulation

In the regulatory area, FRA is also bringing parties together to discuss pending regulatory standards in meaningful and effective ways. In 1995, FRA initiated the first negotiated rulemaking in its history, addressing the need for safety standards to protect trackside workers. This process resulted in the agreement of rail labor, management and FRA on proposed rules addressing this very contentious and crucial safety issue. During my meeting with railroad chief operating officers on February 22, I was pleased that all major railroads agreed voluntarily to implement the proposed protections during this year's construction season as FRA's proposed rulemaking goes through the formal stages of the regulatory process. This is an indication of the type of success bringing all parties to the table can achieve.

With over 40 regulatory initiatives now pending before the agency, using traditional rulemaking procedures for completion of all these rules is no longer adequate. All the affected parties must be involved from the beginning in order for our decisions to be based on the most complete and accurate data. Given the tremendously controversial nature of some of the pending regulatory areas, and the need to balance expected costs and benefits, a collaborative rulemaking

process represents a practical way to attack our enormous rulemaking agenda in a manner that fully involves our customers, makes the best use of FRA's resources, and accommodates the rapidly evolving changes in the rail transportation industry.

To expand the collaborative process, I have proposed establishing a Railroad Safety Advisory Committee (RSAC) based on this same common-sense inclusive approach to rulemaking. And I am pleased to announce that the Office of Management and Budget has formally approved the RSAC, and the announcement will appear in the *Federal Register* this week. Consequently, this committee will be working on some of our toughest regulatory challenges very soon. RSAC will be made up of representatives of railroads, railroad unions, public interest organizations, state safety agencies, and suppliers. The committee will, at FRA's request, consider a wide range of rulemaking issues. On each issue, the committee will attempt to reach consensus on the relevant facts, the range of options, and the appropriate action. Once the committee has achieved consensus on an issue, it will make recommendations to me about the proper course of action. Rules that result from this collaborative process are likely to be more reflective of all the affected interests and more readily implemented. Of course, if consensus cannot be achieved within imposed time frames, then I will not hesitate to take appropriate action to issue necessary rules. But where "buy-in" can be achieved, the end product will enable more effective regulatory standards and practices to be developed.

Highway-Rail Grade Crossing Safety and Trespass Prevention

From the outset, this Administration has recognized that highway-rail crossings are the largest single generator of fatalities stemming from rail operations. In fact, over half of the

fatalities in rail operations originate at crossings. In 1993, we found a well-intentioned, but foundering, Federally funded State-administered program dedicating large sums of Highway Trust Fund dollars to accomplish safety improvement projects at the Nation's nearly 177,000 public crossings. A goal had been established (which we endorsed) of reducing the number of crossings by 25 percent, but we also noted a struggling, marginally funded Operation Lifesaver (OL) program dedicated to enhancing public awareness of safety problems at crossings; and a fledgling high-speed rail program which was only then beginning to come to grips with the significance of highway-rail crossings, both public and private, to the safety of high-speed rail operations. There was no recognized high-level departmental interest in, or coordination of, highway-rail crossing safety programs.

With respect to funding, in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Congress had continued an older "categorical" program (known by its citation in Title 23 U.S.C. as "Section 130" and funded in previous Highway Safety Acts beginning in 1973) which dedicated set amounts of Highway Trust Fund dollars to making safety improvements at public highway-rail crossings. Under ISTEA, states currently receive about $4.5 billion each year for the Surface Transportation Program. Each year, 10 percent of this must be set-aside for two safety programs, one of which is the Section 130 Program. (The other safety set-aside program is for correcting safety problems at High Hazard Locations.) In ISTEA, the Congress specified that states should continue to fund the Section 130 Program from the 10 percent set-aside at least at the same level as in 1991, about $150 million per year. After both safety set-aside programs are funded at their minimum levels, states may use the remaining set-aside funds, about $143 million per year, for either program. The Federal Highway

Administration (FHWA), which administers this program, estimates that States have obligated over $3 billion since 1974 for nearly 30,000 projects. This has saved almost 9,000 lives and prevented 40,000 injuries. In terms of percentage reductions, this is the most successful highway safety program administered by the FHWA.

Within a year after taking office, Secretary of Transportation Federico Peña called for an Action Plan to address this issue, and focused the efforts of all four DOT surface modal administrations to this effort.

The Action Plan

In June of 1994, Secretary Peña released the Department's Action Plan. It details 55 separate initiatives which since have been or are being, addressed cooperatively by four DOT Administrations. Thirteen have been completed with no further action required, and fourteen are complete with ongoing routines established. These 55 initiatives are organized in six different topical areas. Without going through all 55 items today, I would like to note each of the six areas and a few highlights from each.

1. Enforcement of Traffic Laws at Crossings. Because enhanced enforcement can dramatically improve highway-rail crossing safety, the Department has initiated an outreach to the Nation's law enforcement communities, ranging from patrol officers to judges. An active-duty California Highway Patrolman has just completed a one-year detail with FRA assisting in the development of this outreach effort. FRA will be bringing another officer on board this spring. Working relations with the National Sheriffs' Association, the International Association of Chiefs of Police and the Association of American Railroads'(AAR) Police Section have been established. Articles have been submitted and published that reach these

groups as well as traffic court judges. Photo-enforcement projects are being monitored in California and Florida, and the rules of evidence, which in many States currently preclude the use of such automated measures to facilitate police enforcement, are being reviewed.

2. Rail Corridor Crossing Safety Improvement Reviews. FRA is promoting comprehensive and systematic reviews of all highway-rail crossings along rail corridors, especially along the Nation's principal railroad lines. When doing a corridor review, we encourage State, local government and railroad officials to eliminate little used and redundant crossings within corridors where alternatives exist, especially those on the National Highway System, and to upgrade signs and signals, taking full advantage of state-of-the-art technologies. FHWA and FRA have held jointly a series of meetings with Metropolitan Planning Organizations, States and railroads stressing the need for cooperative intermodal transportation planning to include crossing issues. A checklist for corridor reviews has been jointly developed by FHWA and FRA and distributed to railroad and State principals. In cooperation with the AAR and the Association of State Highway and Transportation Officials (AASHTO), a pamphlet promoting crossing consolidation has been developed, published and distributed. FRA has also researched and published *Highway-Railroad Grade Crossings, A Guide to Crossing Consolidation and Closure*.

3. Increased Public Education and Operation Lifesaver. The Department has developed and initiated a major public awareness campaign, *Always Expect A Train*, in order to increase public awareness of hazards at crossings and of motorist responsibilities at crossings. This campaign has included both Spanish and English television, radio and print public service announcements and advertisements which have been widely aired. To date, FRA conservatively

estimates the value of donated time dedicated to these advertisements has exceeded $[illegible] million. The campaign has reached citizens in all 50 States via 270 television and cable television markets, 673 radio markets and 194 publications.

In addition, other outreach efforts have been undertaken. The FHWA has distributed an On-Guard notice to 270,000 commercial motor vehicle operators. Similarly, advisory bulletins and public service print advertisements have gone to the commercial vehicle trade press. Operation Lifesaver, Inc., the National Railroad Passenger Corporation (Amtrak), the American Trucking Associations, the Brotherhood of Locomotive Engineers (BLE) and the Department have worked together in initiating a "trucker-on-the-train" program. The National Highway Traffic Safety Administration (NHTSA) has encouraged States to utilize funds available under Section 402 Highway Safety Programs for addressing highway-rail crossing safety needs. So far, in fiscal year 1996, nearly $300,000 out of a total of $13.5 million of Section 402 funds are being utilized by 13 State programs.

4. Safety at Private Crossings. FRA is developing minimum safety standards for categories of private crossings and considering a public safety inquiry. For the first time, public funds, available under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Section 1010 high-speed rail initiative, are being used to address safety concerns at private crossings. Projects have been, or are being, accomplished in Oregon, Indiana, North Carolina, Michigan and New York.

5. Data and Research. Adequate data and research provide a foundation for implementation of effective safety programs. A research needs/priority setting workshop was held last April at the Department's Volpe National Transportation Systems Center, with

representatives of industry, States and academia participating, to review crossing and trespass research options. An effort is underway to revise the accident prediction formulas which are part of the DOT resource allocation procedures used by many States and railroads for managing crossing safety improvement programs. An analysis of the demographics of those who die in crossing incidents has been completed and published by NHTSA. And the Federal Transit Administration has defined procedures for collecting crossing statistics on light-rail operations. Other efforts, such as the "1-800" pilot answering system for grade crossing device malfunction reports, will provide a valuable basis for future policy implementation decisions.

6. Trespass Prevention. This goal seeks to raise public awareness that trespassing on railroad rights-of-way is illegal and dangerous. National and regional workshops have been held, which have sought to develop programs targeting local or regional trespass issues, to raise awareness, and to involve public, industry, law enforcement, OL and State officials. FRA is also working on a demographic study of those who die while trespassing, which will assist in targeting future public awareness and enforcement efforts.

The Task Force

Complementing the on-going commitment made in the Action Plan is the effort of the Grade Crossing Safety Task Force established by Secretary Peña following the tragic collision between a school bus and a commuter train in the Chicago suburbs last October. Secretary Peña directed this Task Force, headed by Associate Deputy Secretary Michael Huerta, to review the decision making processes for designing, constructing and operating rail crossings and to report back to him by March 1 with evaluations and recommendations for improvement. The Task Force specifically focused on five priority areas not addressed within the Action Plan initiatives.

These areas include:

I. Interconnected Highway Traffic Signal and Highway-Rail Crossing Warning Devices;

II. Available Storage Space for Motor Vehicles between Highway-Rail Crossings and Adjacent Highway-Highway Intersections;

III. High-Profile Crossings and Low-Clearance Vehicles;

IV. Light Rail Transit Crossings; and

V. Special Vehicle Operating Permits and Information.

As part of the outreach effort which assisted the Task Force, a "Blue Ribbon" Working Group of 24 individuals from diverse backgrounds in both the public and private sectors who have technical and operational experience in highway-rail crossing issues was convened twice in Washington (and more often by telephone) to review Task Force progress, findings and recommendations. Also, the Department opened all available means of communication including a formal docket, a telephone hotline for requesting rail crossing safety publications, a dedicated FAX line, an Internet address and a published mailing address. Finally, the Task Force held three one-day public meetings, in North Carolina, Illinois and California. The Task Force's Report was presented to the Secretary on March 1, and a copy of this report is submitted for the record.

Grade Crossing Regulatory Efforts

Grade Crossing Signal--Maintenance, Inspection, and Testing. Pursuant to the 1992 Rail Safety Enforcement and Review Act, FRA issued regulations for maintenance, inspection and testing of automated warning devices at crossings, such as flashing lights and gates. Those

regulations went into effect on January 1, 1995. FRA expects to publish perfecting amendments that will address issues raised early in the implementation process.

Locomotive Alerting Lights. This week I issued final rules to increase the conspicuity of locomotives approaching highway grade crossings. This matter has long been the subject of study by FRA and the industry. FRA launched a renewed research effort in early 1992 with the objective finding the best approach to motorist recognition of approaching trains. Since enactment of a regulatory mandate in the Amtrak Authorization and Development Act later that year, we have issued two notices establishing "grandfathering" requirements for locomotive alerting lights and have encouraged their early application. Research was completed this past summer, and FRA published a Notice of Proposed Rulemaking (NPRM) to formally require alerting lights on August 8, 1995. A technical conference was held in December to resolve remaining issues, and with publication of the final rule, I am confident that the statutory deadline of December 31, 1997 for trains to be equipped will be met.

Train-Borne Audible Warnings. The Federal Railroad Safety Act of 1994 required FRA to issue rules requiring use of the train horn at highway-rail crossings. FRA responded to that mandate by publishing the *National Study of Train Whistle Bans* (based on an investigation FRA began two years earlier) on June 1, 1995. FRA has conducted outreach to over 160 communities where whistle bans are in effect, asking them for ideas concerning "supplementary safety measures" that may adequately compensate for loss of the train horn, as permitted by law. Our dialogue with communities and review of particular rail corridors has shown deep-seated concern for community quiet and significant complexity regarding risk distribution and appropriate countermeasures. FRA appreciates that these rules must be reasonable, as well as

effective, and sufficient time must be allotted for meaningful public participation. An NPRM is anticipated to be issued this summer, with an initial final rule by early 1997.

Grade Crossing Technology and Research

FRA's research activities are examining a number of possibilities for enhancing safety at highway-rail crossings. Principal areas of focus include: freight car reflectorization; crossing illumination; optimal acoustic warning systems (specifications for train horns); human factors (driver behavior, social factors, education and accident causation); investigation of the reasons for loss of shunts (failures) in train-presence-detection systems; use of fiber optics to enhance signal reliability; video monitoring; obstruction detection; communicating to the locomotive a status display concerning the crossing(s) ahead; highway traffic barriers; private crossing interlockings; passive signs; low-cost grade separations; in-vehicle warning devices; and integration with Intelligent Transportation System and Positive Train Separation technologies.

Within the Department of Transportation (DOT), the Intelligent Transportation System represents a major initiative to provide safer, more efficient highways for the Nation. A key element of ITS is the provision of a communications link between the roadside and vehicles to provide warnings as well as information. As railroads move to PTC with a similar communications network in place, it will be possible for information to be passed between the two systems to make for far safer highway-railroad grade crossings. Information on train location and speed will be passed to the grade crossing where, in turn, it will be passed on to approaching vehicles.

FRA is working with FHWA, NHTSA and the ITS Joint Program Office to develop specifications for the data interface at grade crossings. In addition, four grade crossing warning

technologies referred to as Vehicle Proximity Warning Systems (VPAS) which provide warning communications between trains and road vehicles have been under evaluation at the Transportation Technology Center at Pueblo, Colorado. Performance limits, response to adverse conditions, and system performance and repeatability are being quantified. Depending on final results, consideration will be given to installation of one or more of the technologies on crossings on the PTC test corridors in Illinois, Michigan, and Washington.

In summary, Secretary Peña, in announcing the Action Plan set the ambitious goal of reducing the toll of accidents and casualties by 50 percent or more by the year 2004. This goal is achievable. If FRA's 1995 projections of better than seven percent reduction in those categories in 1995 prove justified, we will have already achieved a nine percent reduction in accidents and a seven and one-half percent reduction in the number of deaths. As the full force of the Action Plan initiatives and the Task Force recommendations and the on-going technology and research activities of the Department begin to take effect, the impact on crossing safety should escalate.

Human Factors in Railroad Safety

About one-third of train accidents and likely most personal injuries to employees occur due to human factors, such as inadequate training, ambiguous or conflicting rules, fatigue, impairing substances, technology that is not designed to work in the same manner that human beings typically think and work, and other causes. Human factor accidents present a special challenge, because root causes are more difficult to determine than for hardware-related accidents, and the effectiveness of potential countermeasures is often subject to dispute. Nevertheless, FRA is engaged in a variety of partnership activities, regulatory actions, and

research efforts, with rail labor and rail management, which support the human element in the rail transportation system. I will discuss some of these undertakings briefly, including initiatives related to fatigue and alertness, locomotive engineer qualifications, railroad operating rules, control of alcohol and drug use, dispatcher training evaluation, yard and terminal safety, potential of PTC as a means of addressing human factors accident causes and locomotive cab ergonomics.

Fatigue and Alertness

A critical human factor issue facing FRA and the railroad industry is the effect of fatigue and irregular work hours on the performance of railroad train and engine crews. As I have suggested, railroad employees want to work safely and efficiently, and they recognize that their own lives, as well as the lives of others, depend on consistent compliance with operating rules, signal indications, and other safety requirements. Available information suggests that these employees face real challenges in managing their work and rest due to the demands of railroad operations and the rigidity of some existing work rules.

NTSB and FRA accident investigations have suggested the need to address irregular work cycles, with particular attention to promoting the alertness of crew members assigned to rapidly rotating shifts that sometimes begin in the late evening. Train and engine crews in road service are sometimes required to report for duty with as little as two hours' notice. If information regarding scheduling of trains is not readily available or is unreliable, or if employees in line to take earlier assignments report sick or are otherwise unavailable, an employee can be called to work suddenly without having adequate sleep. Cumulative fatigue, or sleep deficit, may also be a problem, particularly where assignments are scheduled to maximize crew availability within the law (which permits returning to work with eight hours rest after a duty tour of eleven hours

and fifty-nine minutes). FRA has also noted work patterns on some railroads that may require or permit employees to work long hours on many days successively without a day off, possibly leading to cumulative fatigue. When these industry-specific facts are compared with human factors research findings on shift work, biological ("circadian") rhythms, stress, and fatigue, significant opportunities for improvements in the duty and rest cycles of operating employees become evident.

FRA is conducting two related efforts to help determine the nature of performance decreases operating employees may experience. First, FRA began the second phase of its Engineer Stress and Fatigue Project in April of 1992 and will complete this work next month. This effort observes the performance of locomotive engineers on the Research and Locomotive Evaluator Simulator (RALES) facility at the Illinois Institute of Technology Research Institute. The RALES simulator was developed through FRA research and has served as the model for simulators used in the railroad industry worldwide to train, and assist in qualifying, locomotive engineers. In this study, locomotive engineers are subjected to irregular and stressful schedules consistent with the hours of service law and similar to schedules worked by many engineers. Preliminary analysis of data from tests employing 20 locomotive engineers indicates that engineers' performance deteriorates over the period of a one-week test program, particularly with respect to vigilance (alertness).

The next phase of this work will include evaluation of napping strategies (similar to those under consideration for international aviation), research into automated vigilance monitoring, and other mitigation strategies designed to help engineers deal with shift work problems.

Second, FRA, with the participation of the BLE and major railroads, conducted a limited

study of actual work patterns among engineers. We gathered "activity diaries" from 200 locomotive engineers employed by six railroads. The diaries consisted of self-reporting with respect to quantity and quality of sleep, estimates of alertness at various times while on duty, time on duty, commuting time, and the accuracy of information provided to crews about job-start times. Initial findings of this effort, which will be available in a detailed report within the next few weeks, included the following:

- On average, engineers participating received almost the same amount of sleep as the general population, which was seven and one-half hours. However, for jobs starting between 10:00 p.m. and 4:00 a.m., sleep averaged less than six hours. This means that the engineers began shifts during a period when lack of alertness would be expected with less rest than normal.
- Self-rated alertness was influenced by the circadian rhythms of the respondents more than any other variable. Engineers felt they were less alert during the early morning hours, and these periods extended longer than would be expected for scheduled shift work.
- Engineers reported that the most important change that could improve their alertness was more accurate information about the time of the next job start (permitting better planning of rest).

FRA will follow up this effort with an analysis of diaries gathered from a separate sample of engineers--those participating in the study of work, stress and fatigue using the RALES simulator--to determine actual measures of performance on the simulator can be predicted using software designed to evaluate alertness based on work and rest cycles and biological rhythms.

A joint program of the AAR, the BLE and the United Transportation Union (UTU) is

conducting a large-scale study of the work schedules of operating employees and any correlation between those schedules and the occurrence of unsafe practices. FRA and the AAR/BLE/UTU team meet periodically to share information on our complementary research efforts.

Notwithstanding FRA's comprehensive research effort on fatigue and unscheduled shift work, FRA lacks the regulatory authority provided to the Federal Aviation Administration and FHWA to address hours of duty of safety-sensitive employees. The Hours of Service Act, enacted nearly 90 years ago in 1907 (recently recodified in chapter 211 of title 49, U.S. Code) governs the on- and off-duty periods of railroad operating employees. Congress last enacted major amendments applicable to these employees in 1969, and revised the maximum on-duty period from 16 to 12 hours. Since 1969, railroad operations have changed materially. As I have noted, human factors research into shift work, fatigue, and the body clock has produced a significant body of information that can help guide development of improved crew management practices.

Anticipating the need to address identified issues of fatigue and lack of alertness by employees working long or irregular hours, the DOT submitted a bill in 1991 to repeal the Hours of Service Act, automatically adopt the current provisions of the Act as regulations, and then commence a process of consultation and rulemaking to address emerging safety needs. That bill was not supported by rail labor or rail management and was not enacted.

In 1994, the DOT submitted legislation requesting a more limited authority to approve pilot projects proposed jointly by rail labor and management and to waive statutory restrictions where appropriate to conduct the projects. FRA was then to evaluate the results and report to the Congress. This provision was enacted as section 203 of the Federal Railroad Safety

Authorization Act of 1994 on November 2, 1994. It remains FRA's hope that this process of exploration will build confidence leading to overall reform of the law.

On December 13, 1995, the Southern Pacific Transportation Company (SP), BLE, and UTU jointly petitioned FRA for a waiver of compliance with the Federal hours of service laws affecting train employees. In a notice published in the *Federal Register* on February 6, 1996, FRA invited interested parties to participate in the proceeding by submitting written views, data, or comments to the agency by March 7, 1996. The FRA Safety Board will then determine if the requested waiver of compliance is in the public interest and consistent with railroad safety.

FRA estimates that approximately 172 employees would participate in the pilot project proposed by SP, consisting of 35 locomotive engineers, 37 train conductors, and 100 extra board employees who would serve, when required, as extra engineers and conductors on train runs within the Los Angeles, California area. The safety advantage cited by the applicants is reduction of commuting time for certain employees in the Los Angeles area.

FRA anticipates receipt of a second petition from another major railroad and certain of its operating employees regarding scheduling of road assignments. This application appears to relate more directly to the core concerns associated with service on unscheduled road trains. FRA will also act expeditiously to review and rule on that petition when it is submitted.

FRA is also exploring dispatcher workload, stress and fatigue as a follow-up to our studies of train dispatching offices. Initial phases of work should be completed this year, with development of a methodology for measuring workload and stress levels available in late 1997. We are also looking at fatigue caused by the need to process information rapidly as an issue with respect to operators of high-speed trains.

Although, as I have noted, FRA does not have authority to regulate hours of work of railroad employees subject to the hours of service law, Emergency Order 20 did require the commuter railroads to evaluate their crew management practices. Following the New Jersey Transit (NJT) collision of February 9, the commuter authority found that it was able to eliminate night split shifts without adversely affecting operations. Although we believe this practice is the exception, we are asking each commuter authority to evaluate its practices and report to us within 45 days.

FRA remains optimistic that the work of the NTSB, research conducted by FRA, the joint study undertaken by the AAR, BLE and UTU, the pilot projects authorized by the Congress, and the new partnerships being forged under FRA's transformed safety program will lay the foundation for fundamental reform of the law. Reform in the law will permit us to undertake a consensus-based rulemaking to address the special safety needs associated with train operations, work and rest, utilizing the best data available and recognizing the need for reasonable crew availability, as well as the preeminent requirement that employees be rested and alert.

Locomotive Engineer Qualifications

As a result of the tragic accident at Chase, Maryland, in 1987, standards for the uniformity and adequacy of the qualifications of engineers became a significant concern. Under the Rail Safety Improvement Act of 1988, FRA was required to adopt rules establishing a program for qualifying locomotive engineers. To accomplish this task with the resources available, FRA selected a certification process rather than a traditional government licensing system. This approach also minimizes government intrusion in sensitive employment relationships. The certification process includes FRA review and approval of each railroad's

certification program and establishes requirements for: (1) testing visual and aural acuity; (2) assessing knowledge and performance skills; and (3) eligibility premised on past safety conduct including examination of the person's motor vehicle driving record.

FRA's engineer certification program became effective in 1992. Railroads initially were authorized to certify a person as qualified based solely on the person's prior experience, and persons so certified had to be formally evaluated within a three-year interval that ended in 1995. All engineers must be given prescribed training, testing, and evaluation before receiving certification and must be reevaluated every three years.

In making determinations about a person's eligibility to become or remain a certified locomotive engineer, railroads must consider, where pertinent history exists, the individual's recent conduct (i.e., during the previous three to five years) as a railroad employee and as a motor vehicle operator. Certification candidates have the responsibility for furnishing the data concerning driving history. They have to query the relevant State agency and the National Driver's Register and make the results available to the railroad.

The rule provides a system for evaluating the significance of instances in which the person has been involved with alcohol or drugs either while on duty as a railroad employee or while operating a motor vehicle. Any single incident of substance abuse would trigger an evaluation by a skilled professional (such as a physician or psychologist expert in the treatment of substance abuse) of the significance to be attached to such an event. The professional must consider whether the person is currently dependent on alcohol or drugs or has a treatable disorder involving abuse of drugs or alcohol. If the professional concludes that such a condition exists, railroads can permit the person to perform service only subject to the aftercare and testing

provisions contained in FRA's alcohol and drug rules after sufficient treatment has occurred.

Mandatory revocation of a person's certification is prescribed for multiple instances of work-related detection of substance abuse, regardless of how detected. The period of revocation varies based on the manner of detection. Refusal to submit to chemical testing is treated the same as if the test were positive. Whenever certification is revoked, completion of the requisite time period and an evaluation showing no uncontrolled substance abuse disorder are predicates for recertification.

FRA's rule provides a system for evaluating a variety of instances in which an engineer operated a train unsafely. Several types of poor safety performance while at the controls of a train are considered in the evaluation system. For example, operating without proper authority, excessive speeding, and tampering with safety devices are among the types of unsafe behavior that would result in loss of certification. In each of the five specific types of events identified by FRA, the incident involves a very dangerous situation in which it is appropriate to hold a locomotive engineer directly responsible for his or her conduct. Mandatory periods of revocation are provided for single incidents and for multiple incidents of poor train operation. The severity of the response is gradated to deter repeat offenders.

Review of a railroad's decision not to certify or to revoke certification is performed by FRA when requested by the locomotive engineer. Available data indicate that FRA is being asked to review about 70 revocation or denial decisions each calendar year. This constitutes about 12 to 15 percent of the total number of negative railroad certification decisions rendered each year. Initial review by FRA is intended to be simple and prompt. Those dissatisfied with the initial review can request a formal trial-type hearing procedure before a hearing officer.

Hearing officer decisions can be appealed to the FRA Administrator and are reviewable in Federal court after becoming administratively final.

Railroad Operating Rules

Emergency Order No.20, as amended, also contains mandates for rule changes that will bolster safety of push/pull and electric multiple-unit (EMU) operations outside of cab signal, automatic train control, or automatic train stop territory. The "delayed in block" element of the order requires push/pull and EMU trains to operate at reduced speed approaching junctions where collisions with opposing trains might occur, as was the case at Secaucus, New Jersey; Silver Spring, Maryland; and Gary, Indiana (a similar 1993 collision involving two EMU commuter trains). The order also provides for crew communication of signal indications to reinforce in the mind of the engineer the limitations imposed by less favorable signal aspects.

These provisions build on existing railroad operating rules, which serve as a critical element of safety in the rail industry. FRA works with railroads and industry rules committees to encourage reasonable uniformity and to bring about improvements in individual operating rules. Recent accomplishments in this effort include the development of a common book of operating rules for the railroads operating in the Chicago Terminal. FRA also oversees railroads' programs of operational tests and inspections, required under FRA regulations (49 CFR Part 217).

Because of its significance to railroad safety, knowledge of operating rules is an important concern to the FRA, the railroads, and the general public. Two problems exist with regard to operating rules. First, the overall perception of the rule reflects serious shortcomings. Improving readability would make it more likely that rules are thoroughly understood, readily recalled, and correctly applied. Second, while the railroads are required to conduct periodic

operational testing of rule knowledge, they vary in how they conduct this testing, in what standards they apply to gauge results, and in how frequently they test operating employees. A forthcoming research study will examine these two areas and provide recommendations to the railroads on how they can improve their practices concerning writing their own company rules and testing their employees' knowledge of those rules and Federal safety law. This work is planned to begin by the fall of 1996.

Control of Alcohol and Drug Use

In 1986, FRA became the first civilian agency to adopt stringent alcohol and drug testing regulations applicable to a regulated industry, and that action was upheld in a landmark Supreme Court ruling. Subsequently, both random drug testing and random alcohol testing requirements have been added to the regulations, and FRA was among the leaders in the successful effort to implement performance-based criteria with respect to random testing rates in all modes of transportation. FRA continues to operate the only comprehensive post-accident toxicology program applicable both to surviving and deceased safety-sensitive employees, and the results of that program confirm the progress that has been made in reducing alcohol and drug use since the regulations were issued in 1986.

I am proud that FRA has also been an enthusiastic supporter of Operation Redblock and other peer-led prevention programs in the railroad industry. These voluntary efforts are complemented by (i) strong employee assistance programs operated by the railroads and (ii) FRA requirements affirming the rights of self-referral and co-worker reporting--without penalty to the employee who is troubled by a substance abuse disorder.

At the same time, regulations require removal from service for any employee who uses

alcohol or drugs on the job or uses controlled substances without medical authorization at any time. Locomotive engineer certification rules establish a mandatory decertification period of nine months for any first offense where an engineer uses alcohol or drugs on the job or is found impaired by alcohol or drugs while on duty. These sanctions deter alcohol and drug use while encouraging those with substance abuse disorders to seek help early, before an accident occurs and before detection in a random or reasonable cause test.

In 1994, only 7 employees (2.4%) tested positive out of 287 employees providing blood and urine samples for post-accident testing (two for alcohol and five for controlled substances). In over 43,000 random drug tests conducted by the railroads under our rule, only eight-tenths of one percent of employees tested positive for controlled substances in 1994. Over the next few months FRA will be assembling data for 1995, which will include our first year of random alcohol testing.

Dispatcher Training Evaluation

The Rail Safety Improvement Act of 1988 (Public Law 100-342) directed the Secretary of Transportation to conduct an inquiry into whether training standards should be established for train dispatchers. A major FRA study already underway at the time, the National Train Dispatcher Safety Assessment 1987-1988 (FRA Office of Safety, July 1990), revealed extensive variability among railroads in their conduct of initial dispatcher training, inconsistent or non-existent standards for training outcomes and for ascertaining when a novice dispatcher was "qualified," dependence on informal and unstructured on-the-job training (OJT), and uneven practices regarding territorial familiarity and refresher training. In January of 1995, FRA submitted a report to Congress conveying the results of this study.

A primary finding of the safety assessment study was that railroads generally have no established curriculum for training dispatchers and no systematic procedure for determining their proficiency. The FRA is concerned that these shortcomings in training programs may affect safety as dispatcher candidates are hired from applicants having little railroad experience. FRA will conduct further research to develop information on the way dispatcher training is being conducted, recommendations on ways dispatchers' training can be strengthened, and guidance on standards for both initial and refresher training. Special attention will be given to opportunities to employ newer training methodologies that will yield high levels of proficiency and are demonstrably cost-effective.

FRA will initiate this project during the summer of 1996, and harmonize it with a current partnership effort underway between Amtrak and the American Train Dispatchers Department/BLE, which is developing a new training program for Amtrak dispatchers. The Burlington Northern Railroad Company and the Santa Fe Railroad, which currently together operate what is regarded as a benchmark training program, are assisting in this effort.

Yard and Terminal Safety

In 1994, railroads reported 13,080 injuries to on-duty railroad employees. Most of these injuries occurred in yard, terminal and maintenance-of-way operations. This number, while high, reflects a worker injury rate of 5.08, compared to 9.3 of all transportation and public utilities and 8.4 of all private industry. FRA considers injury prevention a key focus of safety enhancement. Anecdotal evidence indicates four primary reasons for many of the incidents leading to these injuries: (1) inadequate safeguards built into procedures and equipment; (2) inadequate training; (3) inadequate supervision; and (4) employee complacency leading to inattention to safety

considerations while performing familiar tasks. FRA's multi-phase safety pro t in this area will identify sources of accident data for operating practices in yard and termi operations so as to identify improvements that might be made by railroad management to reduce employee injuries. Phase I will identify sources of information on the yard and terminal safety problem and identify or develop the evaluation techniques to be used in subsequent phases. Subsequent phases may also address maintenance-of-way safety problems. This project, which began in December 1995, will be accomplished in close cooperation among FRA's Offices of Research & Development and Safety, railroad management, and rail labor.

Locomotive Cab Ergonomics

As part of an effort to evaluate working conditions and safety in the locomotive cab, FRA is developing human factors guidelines for the evaluation of current and proposed locomotive designs. The human factors concerns to be addressed by the guidelines include working conditions and information technology. The initial guidelines consider heating, ventilation, air conditioning, noise, vibration, toilet facilities, cab layout, ingress and egress, visibility, seating and workstation design (hardware and software issues). Human factors considerations will be addressed within the context of relevant operational issues. A final research report is expected to be published within the next few months, and the results will be included in the forthcoming *Report to Congress on Locomotive Crashworthiness and Working Conditions*. Findings will be further refined and utilized by the Railroad Safety Advisory Committee to chart future actions.

PTC as a Means of Addressing Human Factors Accident Causes

At a future hearing, we will describe in greater detail the status of PTC systems. As you know, the Union Pacific and BNSF are developing a Positive Train Separation demonstration

project for over 800 miles of railroad in the States of Oregon and Washington. The railroads now estimate completion of the demonstration by the end of 1997. Our high-speed PTC demonstrations in Michigan and Illinois will also be unfolding rapidly. Lessons from these demonstrations should set the stage for the deployment of interoperable PTC systems before the end of this century. A number of senior railroad operating officials have suggested that one of the major benefits of PTC, in addition to the basic safety benefit, is that PTC will enable the operation of a scheduled railroad. Implementation of would PTC provide dispatchers (and their computers) with accurate, real-time information on the precise location and speed of each train. Dispatchers, in turn, would be able to give each train precise speed control instructions to keep them on or return them to schedule. By scheduling arrivals at terminals, workloads there can be planned in advance so that departure schedules can also be met.

Once a railroad has its trains scheduled and is able to keep its trains running on those schedules, the scheduling of train crews becomes possible. As the Subcommittee should be aware, many freight train crews in the United States, unlike Amtrak and commuter train crews, today do not work on a fixed schedule. One day they can go to work in the morning, the next in the middle of the night, the next in the afternoon, and so on. Crew scheduling will mean that crew members will be able to schedule regular periods of sleep and recreation, reducing family and social tensions and emotional and physical stress.

Of course, PTC also provides improved safety by providing highly reliable checks and balances that limit the impact and propagation of human errors caused by stress, fatigue, illness, or anything else. PTC will include automatic computer checks on track occupancy, redundancy (i.e., dual computers in the control center and on the locomotives), a highly reliable radio data

link and message protocol, accurate position and speed information, and a throttle-brake interface providing for enforcement of authorities and remote intervention. FRA has actively promoted the development of PTC, and I intend to provide the Subcommittee with a full update on our efforts at the next oversight hearing focusing on technology.

FRA'S REGULATORY PROGRAM

Beyond FRA's approach to human factors and grade crossing safety issues, Federal railroad safety standards in general furnish a basis for regularizing and evaluating specific aspects of safety performance, while providing national uniformity that permits railroads to serve passengers and shippers at affordable cost. FRA administers a substantial and broad-based program of safety standards to prevent accidents, mitigate accident severity, and prevent injury to employees, passengers and the public. I would now like briefly to highlight other major recent rulemakings of interest to the Subcommittee.

Hazardous Materials Safety

FRA shares responsibility for hazardous materials safety with the Research and Special Programs Administration (RSPA). On September 21, 1995, in response to the NTSB's concern over the issue of tank car crashworthiness as well as corresponding a Congressional mandate, RSPA with FRA issued a major new final rule addressing tank car crashworthiness. The new rule requires full head shields on new tank cars that require head protection. It eliminates certain older grandfathering requirements, and extends crash and thermal protection requirements to certain additional commodities. In addition, the rule requires periodic inspection of tank car tanks using non-destructive testing alternatives to hydrostatic tests that have proven ineffective in detecting fatigue cracks. The rule incorporates a damage tolerance approach recommended by the NTSB and requires actions that will lead to significant improvements in tank car safety over the next decade.

RSPA and FRA have recently proposed rules to increase the test pressure of frangible discs used as safety release devices on tank cars that carry hazardous materials in liquid form.

These proposed rules, which will be finalized this year, promise to significantly reduce small releases of hazardous materials that frequently cause injury to railroad operating employees.

Roadway Worker Safety

In 1994, in response to the deaths of 24 roadway workers who were fatally injured by moving trains or equipment, FRA undertook its first formal regulatory negotiation, or "reg-neg," to address the safety of roadway workers, those employees of railroads and railroad contractors who, for example, maintain tracks, signals, or other fixed railroad facilities close to tracks. FRA undertook this collaborative approach in order to get the best available information and possible solutions and to build a common consensus on causation and prevention of these accidents, which then led FRA to establish a committee composed of representatives of rail labor and management, and FRA. Chartered early in 1995, the committee presented consensus recommendations to Secretary Peña in May 1995, and recommended proposed regulatory text by the end of that fiscal year. FRA expects to publish those proposed rules in the near future. As noted previously, in response to my request, the railroad industry recently committed to the implementation of the committee's proposed roadway worker safety practices in advance of the promulgation of a rule by FRA. I believe that this voluntary adoption of these pending requirements in time for the 1996 work season demonstrates the ultimate value of the collaborative approach to establishing reasonable and workable regulations enhancing rail safety.

Power Brakes

FRA administers extensive regulations governing the safety of locomotives and freight cars. In 1992, we began a revision of the power brake regulations, including two items specifically mandated by the 1992 legislation: standards for dynamic brakes and two-way EOT

devices. The project was and is a complex undertaking. Three workshops conducted in 1993 provided a foundation to prepare proposed rules. FRA issued an extensive and detailed NPRM in September 1994 and held hearings at several locations across the country. Both management and labor representatives, however, expressed strong objections. Due to these and other strong objections raised by a large number of commenters, FRA announced by notice published on January 17, 1995, that it would defer action on the NPRM and permit the submission of additional comments and alternative approaches prior to making a determination as to how it would proceed in this matter. In considering alternatives for concluding the power brake rulemaking process in order to promulgate reasonable and effective regulations, I determined that a collaborative process would be the best approach. As I have indicated, at the railroad safety summit in September 1994, Secretary Peña committed to a negotiated rulemaking process for trackside worker safety issues, and by the spring of 1995 that committee was formally chartered and progressing rapidly. Rather than request that a separate negotiated rulemaking committee be established solely to consider power brake issues, I believed that a general Railroad Safety Advisory Committee with broader jurisdiction would provide a better way to advance a number of pending rulemakings. Accordingly, freight power braking safety issues will be referred to the RSAC for final resolution. As I have noted, FRA has already separated EOT issues from this rulemaking, and shifted responsibility for passenger train braking issues to the passenger equipment working group.

Passenger Equipment and Emergency Preparedness

Given the attention on passenger car equipment safety standards resulting from the Secaucus and Silver Spring tragedies, I would like to put FRA's emergency actions and other

safety initiatives in context. In 1993, FRA issued the Emergency Preparedness Guidelines for Passenger Trains. These guidelines laid the groundwork for Secretary Peña's announcement at the Rail Safety Summit in September 1994 that FRA would issue passenger equipment standards in two phases: initial standards in three years and final standards in five years. Congress incorporated this proposal in the Federal Railroad Safety Authorization Act of 1994.

Last summer, FRA established two working groups to begin work on a collaborative rulemaking. The Passenger Equipment Working Group is comprised of employee representatives, rail passenger organizations, states, commuter authorities, and rail equipment manufacturers and suppliers. It is charged with two initial tasks. First, the group will prepare a second NPRM for passenger power brake safety. This effort develops from FRA's initial proposal for revision of power brake regulations applicable to passenger service, but a collaborative effort in the working group context will develop standards that are effective and performance-oriented to the greatest extent possible. Second, the working group will develop an NPRM on such remaining issues as vehicle crashworthiness, interior safety, truck performance, emergency lighting, operation of door exits, and inspection, testing and maintenance of equipment. An Advance Notice of Proposed Rulemaking describing in detail the issues before the working group will be published in the near future.

FRA also has formed an Emergency Preparedness Working Group to address such topics as communication to passengers, emergency communications, liaison with emergency responders, first aid, and emergency equipment such as flashlights, fire extinguishers, and the like. That group will prepare an NPRM for issuance in the next few months.

Track and Structures

In response to the requirement included in the Rail Safety Enforcement and Review Act of 1992 to revise FRA's track safety standards for the first time since the 1980's, FRA conducted a series of workshops to lay the foundation for this effort. While FRA staff has over the past 18 months prepared a draft NPRM that includes standards for high-speed service (as separately required by 1994 legislation), FRA now believes that the wide range of technical and economic issues entailed in this revision makes it an ideal candidate for collaborative development. Therefore, FRA will propose that this revision be one of the earliest projects addressed by the RSAC.

Substantial research and testing in the track and structures area will support this revision. With the AAR, FRA has developed a non-destructive means of determining the gage-holding capabilities of railroad ties that offers promise to improve safety through a performance standard. That technology has been tested on CSX under a carefully supervised waiver. FRA also has conducted extensive research into track buckling issues related to continuous welded rail (CWR), and railroad track departments have already implemented those lessons to reduce significantly the number of accidents caused by this phenomenon. As FRA works with labor, management, and others to fashion a comprehensive proposal for further revision of the standards, we will be incorporating new knowledge regarding internal rail flaw detection, as well as maintenance of CWR, gage restraint measurement, and other track safety issues.

In April of 1995 FRA announced the completion of a railroad bridge safety survey and study, as well as an interim statement of agency policy. Our review showed that most railroads do an exemplary job of inspecting and maintaining these critical corporate assets. The interim policy determined that regulatory action is not necessary but that there is a continued role for

FRA in the oversight of railroad bridge inspection programs. However, as a result of FRA's program development and training effort for bridge structural safety, FRA personnel identified several bridges approaching the load-carrying capacity needed to support regular traffic. Most were on small railroads that lack engineering expertise on staff. Although most of these railroads responded cooperatively (and even expressed appreciation for FRA's intervention), I recently found it necessary to issue Emergency Order No. 19, removing from service a dangerously deteriorated bridge on a small railroad near Buffalo, New York. FRA will continue to take decisive action when public or employee safety appears to be threatened by bridge conditions.

Accident Reports Rules

Reporting and receipt of accurate data are fundamental to ensuring effect safety oversight. These data help us determine where to place our resources and whether new safety initiatives are required. In August of 1994, FRA issued an NPRM for revision of its accident/incident report regulations. That proposal included a requirement for internal control procedures, as recommended by the General Accounting Office. FRA conducted extensive public proceedings on this notice, concluding with a public regulatory conference in January of last year. FRA is now preparing a final rule that will strengthen the reporting system by improving the accuracy of accident and injury data, and plans to issue this rule by June of this year.

THE RAILROAD INDUSTRY'S SAFETY RECORD

In order to provide the Committee with a broader report on the industry's overall safety performance, I would like to briefly review the relevant data. These data provide an overall perspective on safety, as reflected from year to year. It should first be noted that FRA's safety statistics for 1995 are projections based on 11 months of preliminary data. That is, these data are

subject to slight revisions due to late and corrected reports, revisions that historically have not exceeded one or two percent of the totals for most data elements. Second, the data compiled here originate with the railroads, and therefore only reflect what is reported to FRA. In addition, I would note for the Subcommittee that questions continue to be raised from many quarters about whether these statistics, particularly those addressing reportable incidents and employee accidents, accurately reflect the true safety performance on the properties. FRA will fully investigate allegations of railroad violations of accident/incident reporting regulations and management practices that may tend to discourage employee reporting of injuries and unsafe practices.

If our investigation of such allegations uncovers evidence that reporting of accidents or employee injuries is being suppressed deliberately, in violation of Federal railroad safety statutes and regulations, FRA will pursue enforcement actions against those railroads and individuals to the fullest extent permitted by law. FRA believes this issue is very important, and we have received and are considering recommendations for even stronger remedies to address this problem. In addition, FRA audits railroads' reporting practices and accuracy; we are now devoting more effort in this area.

In that vein, I assure you, Madame Chairwoman, that FRA's new approach to railroad safety includes even tougher enforcement of the law than in years past. We expect that the use of system safety plans will result in fewer civil penalties assessed because a railroad should be able to comply with a plan it has devised. But, when a railroad violates its own system safety plan in a way that involves noncompliance with the safety laws, FRA will use civil penalties strongly to enforce the law.

With respect to present statistics reported to FRA, train accidents continue to occur in the railroad system, but with low frequency, given the scale of railroad operations. A "train accident" involves the movement of on-track equipment that results in damage to railroad equipment or property equal to an amount above the current reporting threshold, as revised periodically for inflation. (The present threshold is $6,300. As previously mentioned, FRA is in the process of changing that threshold in a rulemaking that will employ a statutorily mandated methodology for determining the proper dollar amount.) FRA believes that the rate of train accidents is a very useful barometer of the state of railroad safety. Certain highway-rail collisions qualify under the technical definition of "train accident." However, to avoid double counting and because they stem from different causes, FRA has excluded those occurrences from the "train accident" numbers that will follow.

As measured by the train accident rate, 1994 and 1995 have been the railroad industry's safest years in history. The train accident rates were 3.82 per million train miles for 1994 and 3.73 per million train miles for 1995, compared with the previous all-time low of 3.97 in 1992. These data reflect the continuing significant improvement in railroad safety since 1978, when 10,991 train accidents occurred and the train accident rate reached 14.62 accidents per million train miles, 3.9 times what it was in 1995. (See attached chart, "Train Accidents.")

After dramatic improvements in the period 1979-1986, the train accident rate has improved 19 percent. Although the rate and frequency of train accidents remain very low, the situation has not been static. Prior to 1988, track or signal caused accidents traditionally far exceeded the number of accidents caused by any other single cause. Human factor caused accidents have been the largest single category in four of the last eight years. Of the 2,459

reportable train accidents in 1995--

- 36% were caused by track or signals;
- 38% were caused by human factors;
- 11% were caused by equipment; and
- 14% were caused by miscellaneous factors such as objects on the track, vandalism, and track-equipment interaction.

Certain trends, unfortunately, are quite evident. Every year, half or nearly half of all deaths associated with railroading occur at highway-rail grade crossings, and 1995 was no exception: 569 of the 1,144 fatalities (50 percent) occurred in these accidents and incidents. Trespasser fatalities declined slightly, but also remained relatively high at 503, or 44 percent of all fatalities. Grade crossing and trespasser fatalities still account for about 90-95 percent of all fatalities. (See attached charts, "Total Casualties--All Accidents/Incidents" and "Total Fatalities--Highway-Rail and Trespassers.")

While these numbers are tragically still too high, fatalities at highway-rail grade crossings still reached an all-time low of 569 in 1995. (See attached chart, "Total Fatalities--Highway-Rail and Trespassers.") In addition, the absolute number of grade crossing accidents reached an all-time low in 1995 of 4,525. There were 13,316 such events in 1978. (See attached chart, "Highway-Rail Crossing Accidents.")

The transportation of hazardous materials by rail has continued to be remarkably safe. The number of train accidents resulting in a release of hazardous materials declined from 55 in 1989 to 27 in 1995, an improvement of 51 percent in six years. There were 136 such accidents in 1978. (See attached chart, "Train Accidents involving Hazmat.") Since 1980, there has been

only one fatality caused by the release of hazardous materials during rail transportation and that fatality occurred in 1986.

Railroad employee safety also showed some signs of improvement in 1994 and 1995 in that the rate of on-duty casualties reached all-time lows of 5.06 and 4.24, respectively, per 200,000 person-hours in 1994 and 1995. The number of employee on-duty fatalities declined from 47 in 1993 to 31 in 1994 and 34 in 1995. The figures represent about 2.5 percent of the 1,226 fatalities for 1994 and 3.0 percent of the 1,144 fatalities in 1995. (See attached chart, "Employee on Duty Casualties.")

CONCLUSION

In conclusion, Madame Chairman, I would like to stress our whole-hearted commitment to railroad safety. Our ultimate objective is zero accidents, zero injuries, and zero deaths. Working together with all who are part of the rail industry, we believe this objective can be achieved.

I thank you for the opportunity to testify before you today, and would be pleased to answer any questions you may have.